

ATHABASCA UNIVERSITY

SUPPORTING GLOBAL EDUCATIONAL LEADERS' PURSUIT OF AI-ENABLED
LIFELONG LEARNING FOR ALL

BY

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Abstract

Central to the growing use of AI in K-20 education, is the arrival of a global educational agenda focused on lifelong learning for all. It almost always falls to the leader to implement innovative change without overwhelming and demotivating teachers or faculty. In short, no matter how astonishing the technological innovation is, no matter how grand and worthwhile the agenda, nor how challenging the context in which they take place, change does not become part of public education without the hard work of educational leaders. It follows then that potentially the most significant educational innovation of all time, the design, development, and implementation of AI to enable more equitable lifelong learning for all, is the leader's responsibility.

The response that educational leadership will make locally to this watershed moment in education may very well depend on how they perceive the benefits and opportunities, strengths and weaknesses of AI. Will specific supports help leaders engage more actively in the pursuit of this global agenda for change? This mixed methods research study sets out to answer these questions by working to uncover the practices and perspectives of 65 educational leaders globally who work at different levels of K-20 education in publicly funded systems. Seven key findings were discovered.

AI has made itself at home in the schoolhouse. The way educational leaders in K-20, respond, or fail to respond, will define their roles moving forward. Currently, it is unclear if principals and presidents of K-20 publicly funded educational institutions understand what is meant by a new global agenda for education focused on the realization of lifelong learning for all, whether they see themselves as responsible for co-designing the use of AI in education to help realize that mandate or whether they see how

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they might use their positions of soft power and influence to shape such changes. It is unclear if educational leaders are preparing themselves thoroughly enough for the global educational AI revolution that has only just begun. What might AI have to offer in this challenging educational context and how might educational leadership be supported locally to realize the potential for good? This study seeks to find that out.

Keywords: K-20 senior educational leadership, lifelong learning, human capability theory, artificial intelligence as an educational ally, mixed methods research, self-determination theory and AI educational leadership, moral intelligence for AI educational leadership

Preface

I am interested in how educational leaders, regardless of division, are currently preparing themselves for the further integration of Artificial Intelligence (AI) into education and what can be done to ensure that their relationship with AI and the technology providers that design, develop, and sell it does not become unbalanced. I am interested in doing so because I understand what it is to be an educational leader and how significant the role is when it comes to making change. I had the good fortune of holding senior educational leadership roles in all three divisions: elementary, secondary, and post-secondary. From that vantage point, I saw more similarities than differences among the divisions. Those similarities include, among others, the significance of the role of the leader to the successful integration of meaningful change in the school or institution and the importance of leadership influence to the success of public education in general. However, educational leadership can often be akin to navigation without a clear map. After all, the leader is expected to know the direction to be set and the route to be taken to arrive successfully at the destination. Therefore, I am motivated to help identify what leaders themselves may need in the face of the further integration into education of potentially the most remarkable technology that mankind has ever created at a time when the imperative to enable transformational educational change has never been more urgent. I am motivated to do so before it is too late to make a difference.

After many years in leadership in public education, I ventured beyond the walls of schools and institutions to hold senior management roles in organizations that exist to serve education. Some were privately funded and some publicly funded. Regardless, my work involved leading the transformation of these organizations into an online world. So,

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I understand the symbiotic relationship that exists between digital technology providers and public education. Historically, it has been a value-based relationship built on mutual respect and shared optimism. If that balance is to be retained, then educational leaders in all divisions must be motivated to learn more about AI if they are to lead effectively in this unique moment in time.

Providing educational leadership of publicly funded schools and institutions with practical assistance in such learning is essential because in supporting leadership, those they serve will also be supported. Doing so also matters because there are few principles that should be held onto as tightly as the one that values the flourishing of publicly funded schools. For it is there that our children can go to learn tolerance and acceptance of the perspective of others while exploring their own capabilities. It is there that adults young and old can go to become citizens of the world who are “publicly useful and privately happy.” Educational leadership that ensures this is the case is not inconsequential work. This value was supported in a recent book by Peter Mansbridge, a well-known Canadian news anchor and journalist. His book considered the question of how Canada works and the people who make the nation thrive (Mansbridge & Bulgutch, 2023). Not surprisingly, the school principal and the university president are included because “we can learn from the way they approach their jobs with grace, kindness, and selflessness” (p. xviii). I believe the same could be said of all nations where publicly funded K-12 schools and higher education institutions thrive. I believe that it matters to invest time in understanding how to support public education and its leadership. This study aims to identify what help might be of most use in this unique moment in time

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Chapter 1. Introduction

With the global use of Artificial intelligence (AI) surpassing millions of users daily, leadership of publicly funded educational institutions is facing a watershed moment. This time in history was identified in January 2016 by the World Economic Forum as the Fourth Industrial Revolution (4IR), or as “an upheaval—a dramatic and wide-ranging shift in the way that value is created, exchanged, and distributed across individuals, organizations, and entire economies” (Schwab, 2019, p. 13). Predicted to leave no sector of society untouched, including education, (Schwab & Malleret, 2020), this is the age of exponential technologies. In addition to AI, these technologies include block chain, biotechnologies, cloud computing, 3D printing, the Internet of Things, nanotechnologies, the expansion of computer power and the cost reductions of data storage (Marivate et al., 2021; Yusuf et al., 2020). These technologies are not simply tools that operate in isolation; rather, they are interconnected, “transformative phenomenon” (Olaitan & Mapanga, 2024, p. 2) revolutionizing how public and private sector organizations and occupations of all kinds operate. These revolutions in all sectors of society, “which are redefining what it means to be human by pushing back the current thresholds of life span, health, cognition, and capabilities, will compel us to redefine our moral and ethical boundaries” (Schwab, 2016, par. 28). A significant global uptake of AI, the availability of transformative technologies, the evolution of how people work in all sectors, and a focus on ethical and moral boundaries signal a need for a different set of priorities for educational leadership. This study aims to understand if and how educational leaders are preparing for their reimagined roles and what additional supports are needed.

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It seems apparent that these transformative technologies come with both opportunity and challenge. Given that 1969 was identified as the last year that the world's economy did not overspend the planet's natural resources (Network, 2019), one such opportunity is the need to formulate what Schwab (2016) calls common objectives and values (par. 29). In the case of education, a common set of objectives and values might refer to rethinking what we do to prepare students for the world in which they live, how we do it, and who it is we are hoping they become.

Azorin and Fullan's (2022) study of eight American school districts illustrates such a rethink. In these school districts, "spirit work" or cultivating caring for students as a deep and enduring commitment combined with deep collaboration (p. 134) is seen as the essence of schooling. Although the deep collaboration being described is that of human beings, the concept is reflective of 4IR's interconnected, transformative nature. Azorin and Fullan (2022) identify that these school districts' changes are not completely implemented, but they do represent a shift toward rethinking a different set of objectives and values for education.

The development of students' uniquely human qualities is a response to the infusion of AI into learning that is occurring in the delivery of education. It is generally understood that post-secondary students use AI. International accounting firm KPMG's (2024) report on 423 Canadian post-secondary students showed that:

- 67% say that while they get better results/answers using generative AI although they don't think they're learning or retaining as much knowledge (p. 10)
- 70% say that they are turning to generative AI tools for help rather than asking the instructors (p. 10)

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- 68% save between 1 and 5 hours of academic learning time per week by using generative AI (p. 5)
- 75 % say using generative AI has helped improve the quality of their coursework (p. 5)
- 79 % feel the tool boosts their creativity and clarifies complex readings and issues (p. 5)

Until recently it has been less clear how much AI is used by younger learners. The U.K.'s Internet Matters' 2025 report sampled 1,000 UK children aged 9-17 and 2,000 parents of children aged 3-17 (p. 8) to highlight some of the challenges and opportunities AI chatbots present and to ensure children are considered at the outset of the design of generative AI applications (p. 3). This study found that

- 53% of children aged 9-11 are using AI chatbots and 67% of children aged 15-17. (p.18)
- 23% of children say using an AI chatbot feels like talking to a friend (p. 4)
- 25% would rather talk to an AI than a real person. (p. 4)
- 1 in 4 vulnerable children use AI chatbots because they say they have no one else to talk to. (pp. 4-5)
- 51% of children who have used AI chatbots said they were confident that the advice they get from an AI chatbot is true. (p. 32)

The results show that “[a]s these tools become more sophisticated and emotionally responsive, their impact on children’s wellbeing demands urgent attention” (p. 37).

In 2019, UNESCO reported on AI’s use in education. The report included the description of tools such as virtual teaching assistants (VTAs) and natural language

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processing (NLP), which are already being used to personalize learning experiences, automate administrative tasks, and provide real-time feedback to students. Examples of where in the world these changes are occurring are also described by UNESCO's (2019) report. In Uruguay an adaptive mathematics platform is successfully using AI to provide personalized learning to each student based on an analysis of their experiences and the national curriculum (p. 13). In Kenya, students' real-time data is measured using an AI application enabling administrators to gain insight into complex student data patterns, while allowing learning content to be delivered in multiple formats (p. 15). In the United Arab Emirates, AI enables access for leaders of over 1200 schools and 70 higher education institutions to teachers' professional development experiences, financing operations, performance reports and scores from international assessments (p. 15). More recently, Wang et al (2024)'s bibliometric analysis of 2,223 papers on Artificial Intelligence in Education (AIED) identifies several AI applications currently being used in education to deliver personalized learning, intelligent feedback, automation of administrative tasks, and language teaching through social robots (p. 1). Schlegel et al.'s (2025) study shows that six large language Models (LLMs) have emotional intelligence capability and could assist AI users to make informed, emotionally intelligent decisions (p. 12). De Simone et al.'s (2025) study of the use of LLMs in nine after-school English programs aligned with the Nigerian curriculum for 15-year-olds in Sub-Saharan Africa showed positive impacts on learning outcomes despite internet and power outages illustrating the potential for AI tutoring using LLMs (p. 5) "The six-week pilot generated learning gains that take between 1.5 and 2 years in a business-as-usual scenario... When benchmarked against evidence from both low- and middle-income countries, the pilot

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program ranks among the most cost-effective solutions for addressing learning crises” (p. 3). Such reports and studies illustrate that AI is affecting and will continue to affect how education is undertaken. Given the ever-increasing capabilities of AI, we must assume that educational leadership will also be affected.

It is the case that some educational leadership practices are already being performed by AI. Peifer et al.'s (2022) literature review points out that AI can develop conclusions and make decisions on its own (p. 1028) which are skills that leaders use. Educational leadership is also involved in the development of relationships with stakeholders to influence them to necessitate some action (Connolly et al., 2017, p. 2). Often such influence is exercised through empathetic and compassionate interactions between leaders and stakeholders. Ovsyannikova et al.'s (2025) study explores whether AI can match or exceed the quality of responses from trained human empathizers (p. 1). These researchers hypothesized that people would prefer AI-generated responses over trained human empathizers and third-party evaluators would rate AI-generated responses as more compassionate than human-generated responses. These hypotheses were confirmed by their study. Therefore, despite AI's current inability to feel emotions such as compassion or empathy, it appears AI can reduce stress by generating empathetic responses (Connolly et al., 2017, p. 1). Other researchers have explored AI's ability to be an adviser on strategic plan development (Herse, 2021) and to apply charismatic techniques (Antonakis et al., 2011) in digital interactions with others which may successfully influence behaviour. Both strategic planning and use of interactions to influence others have connections to leadership functions. Other examples of AI undertaking leadership functions include Skyfire and Payman, two AI applications which

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enable AI to post jobs and hire real people (Fitzpatrick, 2024, p. 102). Therefore, AI is performing leadership duties and functions and will continue to develop more capacity to do so. Azorin and Fullan (2022) argue that leadership practices must change as some may not “hold up” in AI-enabled education systems.

Studies like those of Peifer et al. (2022), Ovsyannikova et al. (2025), Herse (2021), Antonakis et al (2022) and others help us to understand that, given the exponential curve of AI advancements, the future may be one “where AI takes over leadership roles” (Quaquebeke & Gerpott, 2023, p. 268). Are current leaders of schools and post-secondary institutions considering such an idea? How are they preparing for and responding to such paradigm shifts?

Central to the growing use of AI in education, is the arrival of a global educational agenda focused on lifelong learning for all. A number of factors have contributed to the identification of this agenda for educational change including the climate crisis, the spread of disinformation enabled by social media, the identification of global disparities in equity of educational opportunities as revealed by the Covid-19 pandemic, the displacement of hundreds of thousands of people due to global conflicts, the connection between education and health, employment, entrepreneurship, well-being and resilience (UNESCO, 2020). The Sustainability Development Goals (SDGs), particularly SDG4, as crafted by the United Nations, and 191 nation signatories (UNESCO, 2015), reflect the growing emphasis on this new educational agenda. Education is believed to be one of the main ways to guarantee human prosperity (UNESCO, 2015) including “reducing inequalities, and empowering people to live healthier and more sustainable lives” (Nazar et al., 2018, p. 487). However, by 2025 “only 17% of SDG targets are tracking towards

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2030 achievement “with SDG 4 (inclusive and equitable quality education) particularly lagging behind. There is a crisis of quality, relevance, equity and inclusion in education” (UNESCO, 2025).

In 2024, UNESCO called for “bold leadership” (UNESCO & Global Education Cooperation Mechanism, 2024). The implication of such a global call to action is that the leadership of schools and post-secondary institutions must consider their response. Studies show the uptake of this global challenge for education needs bold leadership that may be currently lacking. For example, studies have found that teachers thus far do not see the realization of lifelong learning for all as their responsibility. A study by Smaniotto et al., (2022) of 417 teachers in Italian mandatory schools shows that a much stronger commitment and awareness by teachers and schools is needed. “A shift in thinking towards a global view is urgently needed, where education for sustainability is seen as a collective responsibility, like sustainability itself, and to which every educational professional must contribute with knowledge and action” (Smaniotto et al., (2022, pp. 14-15). Lasekan et al.'s (2024) systematic analysis of prescribed Chilean high school textbooks reveals pronounced curriculum limitations with respect to the global challenges as articulated in the SDGs. Their study recommends enhanced teacher training and curriculum development (p. 14), which are two areas of leadership responsibility. The findings of studies like these highlight the critical role of educational leadership in providing the necessary direction and resources to achieve the sustainability agenda including lifelong learning for all.

The implementation of lifelong learning for all enabled by AI has been defined in the literature as a “grand challenge”, which is a complex problem with both technological

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and social components in need of innovative solutions (Ambos & Tatarinov, 2022; Ferraro et al, 2015; George et al, 2016). Ambos and Tatarinov (2022) argue that the capacity of non-profit organizations, which includes publicly funded schools and post-secondary institutions, to address the world's grand challenges "will depend on their ability to renew and reinvent their organizational models (Weiss and Daws, 2007) and develop responsible innovation capability" (p. 93). Because all change is local (Wilbanks & Kates, 1999) and because educational change fails without the direct involvement of its local leaders (Leithwood et al., 2004), educational leadership is seen as instrumental in agendas for complex change such as increased equity of opportunity for lifelong learning for all enabled by AI. Guarasci (2024) argues that educational institutions have a unique responsibility to promote social justice and equity, but its leaders must ask themselves if they are prepared to commit to an "educational agenda in support of an inclusive democracy" (p. 13).

The question becomes whether leaders recognize the benefits and opportunities as well as the risks and challenges of AI as a means by which they can enable greater lifelong learning for all. Will specific supports help leaders engage more actively in the pursuit of this global agenda for change? This mixed methods research study sets out to answer these questions by working to uncover the perspectives and experiences of educational leaders globally who work at different levels of K-20 education in publicly funded systems.

The Context of Public Education K-20

Public education has historically been delivered in three major divisions – elementary, secondary, and post-secondary – driven by the age group of the students, the unique

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perspectives and challenges of teaching and learning in each division, the role of research and how it is conducted, and the idiosyncrasies of internal structures and governance designs. As such, the context of a leader of a primary school in one educational jurisdiction may not have been seen as being very connected to the work of a senior leader in a post-secondary institution in another jurisdiction. However, the arrival of pervasive AI in education and the global challenge to improve lifelong learning for all creates a set of opportunities and challenges that now bind all educational leaders together in unprecedented ways. Specifically, the arrival of AI which has the potential to support and even reimagine what we have come to know as formal education across these levels, and a global sustainability agenda calling for more equitable opportunities to realize lifelong learning for all, means the current context in which educational leaders do their work has much in common, across the three divisions.

AI use is not confined to one division of formal education over the other nor is the need to respond to the global call for educational change through the development of reimagined lifelong learning the responsibility of one division over the others. But AI and the call to action have arrived in an educational context which is already challenging leaders at all levels. This is important because the leadership literature tells us that context is “never a peripheral issue, it is at the heart of successful leadership undertaking” (Mango, 2018, p. 68). Therefore, it is necessary to understand something of those common contextual conditions that already exist to more fully understand how leaders might be thinking about AI’s growing role in education with a universal mandate for greater equity of opportunity for all.

Prioritization of Diversity, Equity, and Inclusion

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Today's teachers, instructors and faculty are working with more diverse student groups than ever before (Florian, 2017, p. 2). Respect for and promotion of diversity, the unending quest for real equity, and the expectation of inclusion are regarded as fundamental responsibilities of many publicly funded educational institutions and their leadership and have been for some time now:

We can, whenever and wherever we choose, successfully teach all children whose schooling is of interest to us; we already know more than we need to do that; and whether or not we do it must finally depend on how we feel about the fact that we haven't so far. (Edmonds, 1979, p. 23)

That is not to say that all schools, institutions or divisions of education have successfully embraced diversity, but standards like those of The Council for Higher Education Accreditation illustrate the imperative for local institutional action (Cumming et al., 2023). Support of diversity is valued because such attention will "improve educational outcomes for larger numbers of culturally and linguistically diverse (CLD) learners from prekindergarten to higher education" (Santamaría, 2014, p. 2). In short, educational leaders are expected to recognize and lead the response to the diversity of student contexts through culturally responsive practices, by which marginalized populations are given opportunities to excel. This expectation is not new as illustrated by Khalifa et al.'s (2016) synthesis of the literature on culturally responsive leadership. However, recognition, respect, and celebration of student (and staff) diversity is now seen as more than an educational norm; it is an institutional strength.

As student and staff bodies become increasingly diverse, it is the complex response to diversity that requires leadership. On the surface, inclusion refers to all students being

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able to access and gain equal opportunities to education and learning. But because of its association with concepts of “justice” and “democracy”, inclusion is “challenging to translate into real practice because its meanings depend on a subjective evaluation related to the time and place where inclusion is supposed to happen” (Rapp & Corral-Granados, 2024, p. 423). To understand the challenges of inclusion is to consider how to systematically dismantle educational exclusion (Slee, 2009, p. 178). Although the history of inclusive education differs from one educational jurisdiction to another, with some places engaging now for the first time while others have offered inclusive education for more than 50 years, inclusive education is a common priority of 21st Century, publicly funded schools (Graham, 2020).

If the theory of educational equity refers to the principles of fairness and justice in guaranteeing “a threshold level of education for everyone and a fair or equitable distribution of the benefits of education for all social groups” (Sahlberg & Cobbold, 2021, p. 462), then certainly the COVID-19 pandemic highlighted gaps in equity praxis. During the pandemic, pre-existing inequities involving socioeconomic backgrounds or access to technology in all divisions (i.e., elementary, secondary, post-secondary) became more visible to educators, policymakers, and the public (Czerniewicz et al., 2020). Studies like that of Llanes et al. (2023) show how the impacts of the pandemic widened pre-existing inequalities (p. 10). Similarly, Reimers' (2022) examination of the disruptions to students' educational opportunity makes clear the disparities in opportunity and experience. Giannini (2020)'s study shows that in the pandemic, 80% of Sub-Saharan Africa's children could not access their schoolwork from home because they lacked

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internet access. While still too many, the study shows that only 14% of children in Western Europe and North America had such a problem.

In summary, the context of K-20 educational leadership today is such that students are becoming more fully recognized as uniquely diverse, worthy of inclusion, and deserving of equitable educational opportunities. AI algorithms can identify where inequity manifests itself, but they “cannot provide an algorithm for what values or aims to prioritize, nor what distinctions will be most important when addressing educational equity in a particular context” (Levinson et al., 2022, p. 10). That responsibility falls to leadership. Therefore, diversity, inclusion, and equity challenges are part of the common context of educational leadership today, a context in which powerful AI and the agenda for lifelong learning for all have both arrived.

Changes in Institutional Practices and Norms

Growing clarity concerning what is needed to meet diversity, equity, and inclusion goals combined with the challenges of a global pandemic have led to more educators making changes in their institutional practices. Studies have shown that the most often mentioned change in institutional practice was modification to assessment and evaluation techniques to make them more inclusive (Jankowski, 2020; Rice, 2020). The concept of inclusive assessment is not new. Hockings defined it in 2010 as “the design and use of fair and effective assessment methods and practices that enable all students to demonstrate to their full potential what they know, understand, and can do” (p. 10). What is perhaps newer is a change in educator perspective. This change in perspective has been called “informed empathy,” or feeling with the students rather than feeling for them (Landsman & Lewis, 2023).

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de Oliveira Andreotti (2022) argues that changing assessment practices to make them more inclusive is not nearly enough as curriculum studies in their entirety will need to be reimagined (p. 4). She says that for today's diverse classrooms to be fully equitable and inclusive, there must be widespread recognition that many of the traditional pedagogical approaches, and the operational values that drive them, are no longer useful. For example, some argue that the "engine of higher ed is fueled by stories of values of individualism, competition, prestige, and distrust" (Denial, 2024, p. 1) and that such operational norms must be replaced by pedagogies of kindness and dialogue to "pull down the walls that we all build, day by day, between us" (p. 7). Such human-centered pedagogies stand in contrast with the neoliberalism of market-oriented education systems that currently prevail (Kenney, 2025). It remains to be seen whether assessment practices will continue to act as a catalyst for other changes. Nevertheless, the context in which educational leaders currently do their work is characterized by a growing emphasis on supporting diversity, working for inclusion, and promoting educational equity which are manifesting themselves in many ways, including by shifting long-held educational practices and norms. AI-enabled lifelong learning for all will surely require additional changes in educational structures, practices and norms, which will further necessitate skillful, informed and supported leadership.

Sustainability Challenges

Educational leaders may find themselves locked in the horns of a dilemma when they recognize the necessity of meaningful participation for all students but lack the physical and human resources to ensure that it happens. After all, educational leaders are charged with the responsibility to understand and articulate how funding is allocated in their

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respective jurisdictions, manage smaller budgets judiciously, and make the case for the spending that is needed using well-supported evidence. Such advocacy is essential. “If we don’t make the economic case for investing in education, policymakers will rationally choose not to invest” (Crawford, 2024, par. 15). But it seems that wherever a publicly funded educational institution exists in the world, insufficient funding is a common condition. “Leaders of colleges and universities are challenged every day with vexing fiscal choices. None of them are resolved without material pain for one constituency or another” (Guarasci, 2024, p. 16). Financial limitations are also being felt in K-12 education. For example, the Financial Accountability Office of Ontario, Canada says that annual spending gaps in K-12 education will reach \$2.9 billion by 2029-30, or a cumulative shortfall of \$12.3 billion (CBC News, 2021).

In the developing world, infrastructure costs, particularly ensuring broadband access, are a critical priority for education. Often formal and informal school fees make up the difference. For example, free secondary education is available in only half the countries of Africa (Gruijters et al., 2023). Unfortunately, low-income countries have also been affected by reductions in development assistance for education since 2019, with significant aggregate reductions to primary education (Steer & Smith, 2015). At the same time, 191 United Nations member states have signed on to the 2030 Agenda for Sustainable Development committing to all children completing “free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes” (UNESCO, 2015).

That universal commitment exists for a good reason: there is much literature to support the return on investment in formal education, particularly through the completion

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of high school and post-secondary education. Empirical research shows that each extra year of schooling delivers earning gains of approximately 9% in both high- and low-income countries (Montenegro & Patrinos, 2023). Universal primary education policies in Ethiopia, Malawi, and Uganda all increased schooling attainment, “with follow-on reductions in teenage births and marriages” (Moussa & Omoeva, 2020):

Societies where more young people – especially women – are engaged in education, employment or training have lower levels of political instability, internal conflict and suffer less from the impacts of terrorism...Quality education dramatically reduces vulnerability to death from weather-related disasters. If every child received a full secondary school education by 2030, more than 200,000 disaster-related deaths could be averted in the following two decades through improved risk awareness. (UNESCO & Global Education Cooperation Mechanism, 2024, pp. 11-12)

Despite the pressing need to ensure educational access is a global right, inadequate funding has become a common condition, even before access to public education is expanded through the agenda for lifelong learning for all. Over half of the world's children who are out of school live in sub-Saharan Africa which received “26% of basic education aid in 2015, less than half the 2002 level” (Global Campaign for Education, 2024). Although the heads of state at the United Nations Summit of 2022 called for more strategic work on education financing “and the need to end the use of austerity policies” (Archer, 2023, p. 1), the context in which educational leaders operate today continues to include challenges of financial sustainability. If AI is to support greater educational access for all, then UNESCO argues that low-cost models for AI development must be

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created and the interests of lower income countries must be considered (UNESCO, 2021, p. 5). The time has come indeed for bold leadership.

Financial limitations are not the only sustainability challenge facing educational leaders. Environmental disasters from mudslides to earthquakes, wildfires to floods mean the “schoolhouse” is increasingly unavailable as a place to gather for learning and students' well-being and success are significantly impacted. Breen et al.'s (2023) literature review reveals that several aspects of academic experience are impacted by environmental disasters (p. 11). For example, following the Fort McMurray wildfires in Canada in 2016, students at Keyano College experienced “significant rates of major depressive disorder, generalized anxiety disorder, and post-traumatic stress disorder (PTSD), even 18 months post-fire” (Breen et al., 2023, p. 10).

Sustainability challenges such as funding shortfalls, global pandemics and environmental disasters illustrate the precarious nature of the sustainability of education in the face of crisis and change at all levels. Financial and environmental sustainability challenges are another in a set of common characteristics found in all divisions of formal education today.

Rise of Polarizing Politics

Where democracy is seen as a global “good,” supporting the principles of freedom and equality, a publicly funded education system is often seen as the trademark of such democracies (Black, 2020). Philosopher, and legal scholar, Martha Nussbaum (2025), argues that public education must dedicate itself to educating for “freedom” through the development of the capacities to think critically including delving deeply into opposing points of view, to bind oneself to other humans and non-human animals through

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recognition and concern, and to imagine narratively what it is like to be in another's shoes (Nussbaum, 2025, pp. 178-181). Brezicha et al. (2023) argue that public education plays a significant role in the development of students' civic identities (p. 468) including the right to free speech, the right to be actively involved in government, and so on. As Guarasci (2024) argues higher education's prioritization of academic freedom is tightly connected to the maintenance of democratic protocols. Despite the tight connection between democratic ideals and the development of citizenship through public education as shown in both practice and theory, politics are also about power, and "power influences what happens politically in education, which has differential repercussions for citizens based on structural disparities that amplify some voices while marginalizing many voices" (Brezicha et al., 2023, p. 467).

Today, the political polarization that is occurring throughout the world has created a common challenge in educational institutions K-20, which, if left unchecked, may potentially limit "the democratic possibilities of our public education system" (Brezicha, et al., 2023, p. 470). For example, in the world's largest and most powerful democracy, 44 American states have introduced legislation since 2021 which effectively limits the curriculum and its use of resources in elementary and secondary schools (Lopez, 2021, p. 2). In Texas a state representative launched an investigation into 850 books being used in schools which pertain to race or sexuality to use political power to challenge the authority of educational leadership (Lopez, 2021, p. 2). Such widening political polarization is predicted to lead to "heightened partisan animosity across all aspects of education politics" (Houston, 2024, p. 33).

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Addressing the world's most significant sustainability challenges through an educational agenda focused on lifelong learning for all enabled by powerful AI, is made more challenging by political polarization. The risk of legislative deadlocks, political seesawing, and the lack of prioritization of long-term goals characterize political polarization and make the achievement of ambitious agendas more challenging (Huttunen, 2024, p. 8). Today the context of educational leaders K-20 is such that skillful, principled advocacy for the values of a democratic education and for the realization of AI-enabled lifelong learning for all must occur in an increasingly polarized milieu.

Pervasive Influence of Digital Technology

The reality of a planet with more than 8 billion people, where more than three quarters of the population over 10 years of age own a mobile phone (International Telecommunications Union, 2022), is that publicly funded education has become a digital experience. Like the rest of global society, K-20 public education has been infused with digital technology, the latest being AI. But according to Norton et al. (2020), digital transformation involves more than adding devices, it involves a change in the organization of work in any given sector, including education. Distance education (DE) is a case study in the power of technology to change the organization of work, with its delivery systems evolving from print, radio, telephone, television, audio and videotapes to computers (Bates, 2005). That is, the relationship of technology to education is exemplified by the history of distance education.

DE led the way in education by adopting the next technology to continue increasing the range and accessibility of learning. Specifically, as technology's capacity for range

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and accessibility grew, as affordability and ease of use improved, and as its power to teach and learn expanded, learning anytime, anywhere became universally desired (Bates, 2005). As the value of DE's "anytime, anywhere" model of learning became more apparent, "mainstream" educational institutions followed suit by providing blended and fully online learning opportunities to students at all levels. Tonbuluğlu and Tonbuluğlu's (2023) extensive bibliometric analysis of 4,059 publications shows the marked increase in blended learning research from 1965-2022 which is reflective of the increased adoption of blended learning by educators globally. Bozhurt and Sharma (2021) advocate that well planned blended learning will serve to reduce inequalities in education. Therefore, to talk of the context in which public education is delivered today is to acknowledge the inherent power and ubiquitous presence of digital technology.

The availability of innovative technology and the pressure to include it has not always resulted in better teaching or learning. Recent studies like that of Joshi et al. (2024), although limited in geographic scope, reinforce what Henderson et al. (2017) also found eight years ago, that is, more growth is needed if educators are to effectively integrate digital technologies to transform teaching and learning. Too often evaluation of the new technology is passed over in favour of moving on to the next "shiny thing".

As K-20 schools embed more digital technology into teaching and learning including AI, their relationship with the corporate world changes. With Chinese technology giant Huawei's 2023 announcement to invest \$430 million in data centres in Africa and Microsoft and G42's 2024 announcement to invest \$1 billion in Kenya's digital ecosystem, several questions are raised about whose interests such investments serve. Specifically, as users' data is monetized for profit, economic imbalances are perpetuated,

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user privacy and national sovereignty may likely be subject to other countries' surveillance laws, and local innovation may be stifled (Salami, 2024, pp. 365-367).

The influence of technology providers on K-20 education has grown remarkably. Where digital technology corporations were once kept at arm's distance from schools, they are now partnering with schools in all three divisions to deliver the learning, to design the lesson plans, to determine the assessment and evaluation techniques, and to provide professional development for educators and staff (Decuyper et al., 2021). This is particularly the case with proprietary Learning Management System (LMS) providers, which now describe their services as "comprehensive learning suites...that train teachers, write curriculum, manage learners, create courses, and integrate metacognition" (Brightspace, 2024). Some would argue that this "big tech logic" has created a change in influence and power dynamics (Williamson et al., 2022) and is "promising a new form of education based around principles of contingency, compatibility, standardisation, and consumer-led provision of 'education as a service'" (Selwyn et al., 2023, pp. 4-5). In other words, the influence of digital technology in education is not a value-free experience. "Instead, much digital automation presumes a radically reconfigured form and function" of public education (Selwyn et al., 2023, p. 5). Zalnieriute (2021) focuses attention on the "transparency washing" practiced by many large technology companies "whereby a focus on transparency acts as an obfuscation and redirection from more substantive and fundamental questions about the concentration of power, and whether a particular issue should be left to the discretion of digital behemoths in the first place" (p. 3).

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It falls to leaders to recognize and respond to the changes in educational authority, duties, and values that pervasive digital technology, including AI, will continue to bring to education. It falls to leaders to aim for balance. Educational leaders need to balance the opportunities provided by digital technology such as AI for more effective teaching and learning for more students against the reality that educators, including leaders, have little time to reflect upon and evaluate new technologies. Potentially aiming to up end that balance is global AIED with a market value of USD 5.88 billion in 2024 and which is projected to grow at an annual rate of 31.2% from 2025 until 2030 (GrandView Research, 2025). Until now, the corporate escorting of digital technology into public education has just been the tip of the iceberg. The arrival of AI, for better or worse, is the rest of the iceberg waiting for educational leaders to respond.

Section Summary

Today schools and educational institutions at all levels or divisions operate in very complex environments. Driven by the global imperatives for sustainability, a renewed focus on lifelong learning for all enabled by AI is currently seen as the grand challenge of education worldwide. I have argued that this global call for educational change binds all divisions and their leadership together. I have also identified some of the contextual conditions that are currently impacting educational leaders' work. It is into this common milieu marked by difficult challenges that AI has arrived.

The response that educational leadership will make locally to this watershed moment in education may very well depend on what they perceive as the benefits and opportunities, strengths and weaknesses of AI. Any leadership support that might be identified to help with the further integration of AI into education must first acknowledge

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the context in which educational leadership does its work. Leadership practice and perspective must be considered within its contextual setting to make sense of those practices and perspectives (Hallinger, 2018; Harris & Jones, 2023). That is, when it comes to leadership of a school or an educational institution, context is paramount (Leithwood et al., 2020, p. 5).

If context is driven by the external world, culture is driven by the internal world of an organization, and it is the development of the “culture of change” of an educational institution that is the responsibility of its leader (Fullan, 2007; Tierney, 1988). How educational leaders maintain the tension between the day-to-day work of education while implementing significant change is the process of building culture. What they do (or don't do) and how they lead defines the culture of the school or institution (Leithwood et al., 2020). Successful educational leaders set directions through expectations and goals (Leithwood et al., 2020, p. 4). This involves leaders undertaking a variety of specific duties and symbolic roles. With the pervasive use of AI in education those duties must also include implementing AI-enabled learning policy, ensuring the development of staff and faculty capabilities for AI-enabled lifelong learning for all, shifting perspectives on the role of formal education given a global agenda focused on lifelong learning for all, making decisions about the allocation of resources such as time, money, technology etc. with respect to AI and so on. Deal and Peterson (2007) say educational leaders must also be “historians, anthropological sleuths, visionaries, symbol affirmers, potters who shape symbols and values, poets whose language sustains and reinforces, and healers who oversee change and heal the wounds of conflict and loss” (p. 199). Aldridge and McLure's (2024) literature review since 2000 finds that “a shared vision, high

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expectations, positive relationships with high levels of trust, and a collaborative environment” (p. 496) are necessary for successful reform. Researchers show that without formal or positional leadership, educational change has no chance of lasting. Therefore, the agenda for educational leadership is the agenda of change (Pont, 2020, p. 160).

It almost always falls to the leader to implement innovative change without overwhelming and demotivating teachers or faculty. In short, no matter how astonishing technological innovation is, no matter how grand and worthwhile the agenda, nor how challenging the context in which they take place, change does not become part of education without the hard work of its educational leaders. It follows then that potentially the most significant educational innovation of all time, the design, development, and implementation of AI to enable more equitable lifelong learning for all, is the leader's responsibility.

Today's leaders may be no different than their predecessors in their desire to ensure the stability of their institutions, their longer-term sustainability, or their capacity to self-renew (Garza et al., 2014). However, to achieve such stability and sustainability is entirely dependent upon the recognition of this most consequential of moments in human history: a world that is unsustainable should we not all accept the responsibility to change, a mandate for education to lead us, the realization of a hopeful agenda centred on lifelong learning for all, and the potential of powerful technology such as AI to help us succeed. But such recognition must also move educational leaders beyond rhetoric to action:

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The way forward is not clear, and the potential roadmap is undefined...Decisions made within the next few years on the forward path for AI are likely to have an impact on all our lives and the lives of future generations. (Dwivedi, p. 42)

The Research Problem

Rationale

Currently, it is unclear if principals and presidents of K-20 publicly funded educational institutions understand what is meant by a new global agenda for education focused on the realization of lifelong learning for all, whether they see themselves as responsible for co-designing the use of AI in education to help realize that mandate or whether they see how they might use their positions of soft power and influence to shape such changes. It is unclear if educational leaders are preparing themselves thoroughly enough for the global educational AI revolution that has only just begun. What might AI have to offer in this challenging educational context and how might educational leadership be supported locally to realize the potential for good?

AI has made itself at home in the schoolhouse. The way educational leaders K-20, respond, or fail to respond, will define their roles moving forward. As AI adoption continues to increase, leaders may need guidance, instruction, and support if they are to adjust their own perspectives, beliefs, and practices as well as those of their respective staffs and faculties in the face of the most powerful technology that the world has ever seen, and this is where the theories and concepts underpinning this study come into play.

Theories and Concepts

A specific group of theories and concepts will be used to identify potentially helpful areas of support for educational leadership. These theories and concepts will be explored

more fully in Chapter Two. Together they form a conceptual framework to understand and discuss the problem under examination. But as Kivunja (2018) notes, when combined, these theories and concepts do more than that. They frame “the questions to be asked, the literature to be reviewed, the theories to be applied, the methodology we will use, the methods, procedures and instruments, the data analysis and interpretation of findings, recommendations and conclusions” (Kivunja, 2018, p. 47). To borrow Kivunja’s analogy, each of the concepts and theories to be considered in this study are like “rooms that serve a particular purpose” (p. 47) in the “house” or overall conceptual framework of the study. And, like rooms in a house, they lead or flow naturally from one to another. Therefore, these constructs are useful because they are connected to one another. The place to begin is with the concept of AI-enabled learning.

The Concept of AI-Enabled Learning

AI is a subfield of computer science. It is dedicated to creating intelligent systems capable of intelligent behaviour (Wang et al., 2024, p. 2). Despite such succinct definitions, to fully define the concept of AI is a complex undertaking. It is not that it is difficult to provide a definition of the words “artificial” or “intelligence.” “Artificial” generally means not natural, while the definition of “intelligence” is generally understood to be “the ability to sense the environment, to make decisions, and to control action” (Albus, 1991, p. 474). But both “artificial” and “intelligence” are words that also invoke a question of degree or range. When we discuss artificial intelligence what are we referring to? What is the range and type of artificiality? Similarly, what range and type of intelligence do we mean? Is it Thurstone’s (1938) “primary mental abilities or Spearman’s (1961) “general intelligence” or Sternberg’s (2009) “triarchic of

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intelligences” or Gardner’s “frames of mind” (2011)? Or is it all of these and more? Legg and Hutter (2007), for example, identify 71 different definitions of intelligence in their research. Despite many theories of intelligence and steady advances in neuroscience, there is much about the human mind that is still not understood (Caruso, 2023).

Educators and the general population alike are comfortable using the term “intelligence” for whatever we don’t quite understand yet about how the mind works. Wang (2012) originally argued that this same logic can be applied to the articulation of a theory of AI; that is, what we don’t quite understand about its processes justifies the absence of a common theory of AI (p. 2). To those researching and developing AI, “the techniques grown from it which at different periods may include theorem proving, heuristic search, game playing, expert systems, neural networks, Bayesian networks, data mining, agents, and recently, deep learning” (Wang, 2019, p. 7) are now used to identify the concept of AI that is being discussed. But each of these techniques also springs from different theoretical foundations and can be used for exploring different AI problems, and so a variety of research subdomains have been formulated, such as “knowledge representation, reasoning, planning, machine learning, vision, natural language processing, robotics, etc.” (Wang, 2019, p. 7).

These subdomains of AI represent different features of human intelligence and they “lead to different notions of intelligence...and the systems for them are designed differently” (Wang, 2019, p. 13). As a result, these subdomains and concepts of intelligence may be used in place of the umbrella term “Artificial Intelligence” or AI. Each of these concepts “describes the mind from a certain point of view, or at a certain level of abstraction, under the belief that it is what intelligence is really about... while

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neglecting other aspects of the human mind as irrelevant or secondary” (Wang, 2019. p. 8). Therefore, if a broadly universal theory of AI were to be formulated, it would need to describe its relationship to human intelligence while also guiding the design and development of the computer systems that generate the artificial intelligence (Wang, 2012, p. 5). Such a theoretical framework would need to define the structure of AI, the behaviour of AI, the capability of AI, the function of AI, and the fundamental principles of AI. Such a mammoth undertaking for one theory or concept therefore seems understandably elusive.

What has arisen instead of one commonly accepted, overarching or comprehensive theory of AI, and what continues to grow in popularity, are different theoretical frameworks for the implementation of AI. Specifically, several theoretical frameworks have arisen for a diversity of implementation settings, including for information systems (Collins et al., 2021), health care (Rajpurkar et al., 2022), business value decision-making (Duan et al., 2019), the adoption of autonomous cars (Lugano, 2017), robotics and increased automation (Ribeiro et al., 2021), and others. What is perhaps more pertinent to educational leadership generally are the theoretical frameworks that have emerged with respect to AI-enabled learning. Theoretical frameworks for learning have already been advanced for several disciplines “such as educational psychology (e.g., behaviourism, cognitivism and constructivism), biology (e.g., autocatalysis, evolution, emergence) and computer science (e.g., one-shot learning, deep learning, neural networks, infinite mixed membership stochastic block models) etc.” (Gibson et al., 2023, p. 1126-1127). What may be most worthwhile now is considering how AI as a new theory of learning might be useful in the quest for lifelong learning for all.

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Because leading learning is seen as a fundamental responsibility of the educational leader (Leithwood & Jantzi, 2008), it is essential that educational leaders understand what is meant when it is said that AI-enabled learning is changing what it means to “know and do” (Gibson et al., 2023, p. 1128). Awareness by leaders of specific cases becomes useful. For example, AI “rule-based information extraction approach using semantic role labeling...enables learners to solve arithmetic word problems through modeling and query processing” (Tang et al., 2023, p. 14). Similarly, the development of more sophisticated large language models (LLM) may mean most of the “knowing” and “doing” can be done by AI. So, what will it mean to “know and do” in an AI-enabled education where AI changes our assumptions about effort and learning and where the goal is more equitable lifelong learning for all? If AI is reshaping what it means to know and to do, if new theories of learning can arise because of AI-enabled learning, then educational leaders are encouraged to develop greater knowledge and understanding of how AI-enabled learning happens and what the research studies say which explore it.

Given the complexity of learning itself, researchers show that AI could be used to adapt and create new and more comprehensive theories of learning that are more applicable to an AI age (Gibson et al., 2023, p. 1127). For example, Gibson et al. (2023) ask what might happen if AI were trained on the multitude of existing learning theories from multiple disciplines? Would it be conceivable that AI could create brand new theories of learning for an AI-enabled educational age? If well-informed, involved leadership could provide meaningful input from an educational perspective about which learning theories would be most important to train AI on, such a theory may move educational change forward in more desirable ways.

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Historically, educational leadership has always been charged with the responsibility of determining who will participate in learning and to what ends. The same questions are being asked of AI-enabled learning. That is, if AI has the power to reconceive of learning in more comprehensive ways and has the power “to interact with human activity, not just mediate it, and to do so at unprecedented speed and scale” (Poquet & de Laat, 2021, p. 1696), it also provides the opportunity to reconsider more fully what is meant by lifelong learning for all (LLL). Therefore, we are led naturally to the next concepts in the framework of this study.

The Concept of Lifelong Learning for All Through the Development of Human Capability

Today, the concept of lifelong learning (LLL) references an active journey of individual and collective experiences between peer groups, within communities and across generations (UNESCO, 2020, p. 12). The hope is that prioritizing lifelong learning for all will succeed in creating “global citizens who care about each other, other communities and the planet” (UNESCO, 2020, p. 12). However, that definition of LLL was not always the accepted one.

The concept of LLL traditionally referenced the “processes and systems supporting learning throughout adulthood and work life” (Poquet & de Laat, 2021, p. 1). Historically, the primary focus was on developing adult human capital to support the economic market (Vargas, 2017). The literature review found in Chapter Two will trace this shift in focus from the development of human capital to the development of human capability. The literature review will show that based on the work of economist Amartya Sen (1984), the human capability approach provides a theoretical framework for

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understanding LLL in a new way. Sen uses human capability as a way of conceptualizing and evaluating development. He defines capabilities as what springs from freedoms, and these freedoms can be many things: “the freedom to be employed, educated, happy, to have shelter” (Boyadjieva & Ilieva-Trichkova, 2018, p. 269). Sen demonstrates that people’s capabilities are unique to them, as is their capacity to convert these capabilities into achievements.

It is somewhat self-evident to say that if AI is to enable LLL in the development of human capability for all, then universal access to technology, including connectivity, is necessary. But many lack access to such technology and connectivity and this is described as the “digital divide” (Reynolds et al., 2021). The European Union, for example, uses an assessment system comprised of four measures to see how nations are doing with respect to digital progress or closing the digital divide. Although attention to such technological disparities is essential if the gaps are to be ameliorated, Kiden et al. (2024) argue the digital divide should go beyond access to include “logics, experiences, voices, ideas, well-being, and other intersections” (p. 2). Interest by nation states and their partners in the promotion and growth of a digital transformation has come about because access to the “virtual world” is now seen as crucial to everyday life (Dunn & Dunn, 2024, p. vi). However, the universal mandate for educational transformation does not end with enabling greater digital access.

Educational leadership will need to grapple with what, besides digital access, must be prioritized if growth for all is the desired goal. That is, while the necessity for greater connectivity continues to be pursued, what new concepts and skills must be taught and practiced? What formal educational structures must be reimaged? What perspectives

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and values must shift? If the potential for AI as an enabler of greater global equity with respect to LLL is to be realized, then educational leadership needs a deep understanding of LLL.

Chapter Two will consider how reconceived lifelong learning for all changes the educational agenda, how AI-enabled learning may be of assistance, and what that will require of leadership. These considerations will be undertaken to ultimately determine what supports may be most useful to educational leadership. Any potential supports for educational leadership K-20 must be built on a clear understanding of what leaders already know, value, and do as they seek to create greater equity for the development of human capability through lifelong learning for all, enabled by a potentially powerful ally, Artificial Intelligence. The erroneous assumption is that all educational leaders will then be motivated to act which leads to the next concept in the study's framework.

The Concept of Self-Determination

The multi-nation support of the SDGs and the subsequent call for education to help lead the realization of a reimagined, more equitable, and sustainable world has made clear that it is not enough for leadership to engage only intellectually or rhetorically in the discussions of change. Educational leaders must be prepared to act, for that is the only way that this ambitious reform will occur. Such a requirement for action begs the question, why might an educational leadership of a school or post-secondary institution be motivated to help propel AI forward to help realize the greater development of human capability for all? Furthermore, why would leaders be motivated to do so for those not enrolled in their schools and institutions? If leaders are to identify goals and act upon them, then they will need to be motivated to do so, and they will need to use that

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motivation for themselves as well as for those they lead. Self-determination theory (SDT) (Deci & Ryan, 2000) becomes useful for understanding why some educational leaders may adapt and act and why others may not do so in the face of such challenging but worthwhile demands for global change. Therefore, SDT is the fourth construct to be considered in a framework that guides this study.

SDT (Deci & Ryan, 2000) provides potential support for how educational leadership can optimize their functioning and that of those they lead. SDT does so by identifying the conditions under which people can most fully realize their potential, including, in this case, the need for educational leaders to rise to this momentous time in history and its opportunity for significant change. Specifically, SDT “maintains that an understanding of human motivation requires a consideration of innate psychological needs for competence, autonomy, and relatedness” (Deci & Ryan, 2000, p. 227). Satisfaction of these basic psychological needs is the sustenance for autonomous motivation, optimal functioning, and high-quality performance (Deci & Ryan, 2000). Therefore, SDT may help leaders understand why they feel motivated to act in the face of this grand challenge, and why those they lead may or may not feel the same. Chapter Two will examine the literature on SDT to understand more fully why some leaders will more actively pursue the development of human capability for all through LLL enabled by AI.

The constructs described thus far work together to act as a framework for considering the problem described in this study. Together these constructs help answer the perplexing questions of how the grand challenge of reimagining education will be achieved (through AI-enabled learning that reimagines what it is to know and to do), what will be achieved (greater development of human capability through lifelong learning), and for whom (for

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all). But to be fully inclusive this framework must also help leaders understand when. That is, how will leaders know when an action is the right thing to do? So it is, we are led to the last connected “room” in this conceptual framework, the theory of moral intelligence.

The Theory of Moral Intelligence

The response of education and its leadership to the arrival of pervasive AI may be characterized by a problematization approach, where the focus is on anticipating the problems associated with the use of AI in education. If policies are then developed that use a problematization approach, the result may be what Rahm and Rahm-Skågeby (2023) describe as “policies frozen in silicon” (p. 1147). Like silicon that cracks and breaks when it freezes, thereby reducing its effectiveness, a problematization approach may not be able to withstand the “changes in temperature” that will surely come with the identification of ever new AI-incurred problems and solutions.

An alternative perspective may be to focus on the “imaginaries” of AI rather than the problems. Jasanoff and Kim (2015) define imaginaries as “collectively held, institutionally stabilised and publicly performed visions of desirable futures, animated by shared understandings” (p. 19). Rahm and Rahm-Skågeby, (2023) argue that such imaginaries may be useful. They may help leaders as they work with their stakeholders to consider how AI-enabled lifelong learning for all might be realized. (It may also be that such imaginaries will be provided by AI itself.) The human contribution to such imaginaries is moral intelligence. That is, before educational leaders can act on what they might do, they must first recognize when it is the right time to do it.

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In March of 2023, an Open Letter from the Future of Life Institute called for a six month pause on the training of AI systems more powerful than GPT-4 because of the “out-of-control race to develop and deploy ever more powerful digital minds that no one – not even their creators – can understand, predict, or reliably control” (Future of Life Institute, 2023). As the public discourse about the pros and cons of AI continued, tens of thousands of signatories endorsed the letter’s contents:

In the eyes of the public, AI is a vaguely but terrifyingly destructive construct, shaped by media which sensationalizes it as dystopian and anti-human. It is simultaneously a shiny new object to chat with, get homework help from, and automate basic tasks. It will someday produce such economic value that we’ll find ourselves in a utopia. Or it will kill us all. (Struckman & Kupiec, 2023, p. 10)

The desire to press pause in the development of AI is directly related to concerns about its ethical use. Those concerns are not ill-founded. Studies like that of Leib et al., (2021) show that “AI can be a force for evil” (p. 11). In response to critics of AI, researchers at the Allen Institute for AI built Delphi, named after the religious oracle of ancient Greece. Although Delphi can make ethical decrees, neither this application nor Google’s ethics-as-a service is the same as moral intelligence.

The literature, as explored more fully in Chapter Two, tells us that ethical behaviour is determined by a person’s moral reasoning. Moral reasoning can be taught, practiced, and developed (Bazerman & Gino, 2012, p. 13). The more advanced the stages of a person’s moral judgement, the more superior their moral decisions (Kohlberg, 1981). Lennick and Keil (2005) define moral intelligence as the “mental capacity to determine how universal

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principles – like those embodied by the ‘golden rule’ – should be applied to our personal values, goals, and actions” (p. 7). Tanner and Christen (2013) expand upon Lennick and Keil’s (2005) framework by integrating “moral decision-making with concepts and topics of social cognition and self-regulation theory” (Tanner and Christen, 2013, p. 2). This moral intelligence framework, which will be explored more fully in Chapter Two, uses a series of five elements and four competencies to illustrate that leaders with moral intelligence have a moral compass or a reference system containing one’s moral standards, values and convictions, which provide the basis for moral evaluation and regulation (Tanner & Christen, 2013). To foster the development of students’ individual and moral development, especially in an AI-powered education, educational leaders need a well-developed understanding of moral intelligence themselves. Chapter Two will consider how moral intelligence completes the conceptual framework.

Section Summary

Together these five constructs (AI, lifelong learning, human capability development, self-determination, moral intelligence) frame this study. They will be more fully explored individually and interconnectedly in Chapter Two.

Statement of the Problem

Pervasive AI presents both monumental opportunities and profound challenges for education and its leadership, regardless of division (elementary, secondary, post-secondary). It falls to leadership to think clearly about these opportunities and challenges in both the present moment and for the future. How can AI advance “the inclusion of underrepresented populations, reducing economic, social, gender and other inequalities”? (Cerna, 2023, p. 7). Given that we are living in a time when global educational inequities

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demand to be addressed and when powerful AI is readily available, what can educational leaders do to support learning for a lifetime in the development of everyone's human capabilities? By acting locally might these leaders become para-diplomats whose virtues, principles, purposes, and practices "have consequences on the international stage"? (Murphy, 2024). If so, how can the leaders of public education be supported so they are prepared to meet this significant moment of educational change? Ultimately "whose responsibility is it to bring the different actors together and to harmonise the principles into an acceptable and responsible AI?" (Nemorin et al., 2023, p. 49). It is the responsibility of its leaders.

Research Questions

Today's educational leaders at all levels perform their roles in extraordinarily complex environments marked by exceptional challenges. As leadership scholar Margaret Wheatley notes:

I have worked with leaders on all continents and at all levels for fifty years now and I state with full confidence that leadership has never been more difficult. The perfect storm is here, created by the coalescence of climate and human created catastrophes, insatiable greed, fear-based self-protection, escalating aggression and conflict, indifference for the well-being of others, and continuing uncertainty. In the midst of this unparalleled tsunami, yet as leaders dedicated to serving the causes and people we treasure, what are we to do? (Wheatley, 2024)

Education is being challenged by a global mandate for change to play a major role in solving educational inequities through the implementation of lifelong learning for all. AI has arrived as a tool, so powerful that it may be of tremendous assistance in the search

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for solutions, while simultaneously threatening to upend what we have come to know as teaching and learning, and even potentially replacing the leaders charged with championing and safeguarding their existence. These are the things we know with certainty.

What we do not know is whether educational leaders understand what they are being asked to do, whether they are prepared or are preparing now to address this grand challenge through the enablement of powerful AI, and what supports may be most useful in helping them to succeed. This study used Mixed Methods Research (MMR), as expanded upon in Chapter Three, to seek answers to what we do not know for certain about these perspectives and practices of educational leaders. The study asked educational leaders what they see as the benefits/risks, opportunities/challenges of enabling AI to be an ally in the pursuit of greater equity for all in lifelong learning. The study also sought to understand leaders' current level of expertise with AI and what training/education they need to implement AI to support lifelong learning for all. Finally, the study asked leaders how support might help them succeed in their local work to realize this universal mandate for change. A questionnaire was broadly distributed, and semi-structured interviews were used to delve more deeply. It was the goal to use the questionnaire to ask "what" and the interviews to ask "how."

Delimitations and Limitations of the Study

This study is concerned with K-20 educational leadership regardless of whether these schools and institutions are online, or place based. These formal roles include principals, heads of school, headmasters, school directors, presidents, chancellors, vice-chancellors, heads, rectors, senior deans. That is not to say that these are the only educational leaders

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of schools and post-secondary institutions. Rather, educational leaders and managers are numerous and can be found in every school or institution where formal and informal leadership is encouraged; however, this study is confined to formal, senior leadership roles for without the active participation of these individuals, educational change will not be sustained. Further, although boards of trustees and boards of governors are often an essential leadership element in the governance of educational institutions, they are not the subjects of this study. Boards of trustees and governors, along with institutional leaders, are responsible for governance of the institution, but educational leadership has a further responsibility for governance-in-practice (Wilkins & Gobby, 2021, p. 14). School and institution-based educational leadership must do more than realize in practice the governance requirements, they have a responsibility for the people in their charge to ensure that they flourish.

Further, this study is focused on educational leaders of publicly funded schools and post-secondary institutions, as opposed to the leadership of private educational institutions or the corporate and publicly funded organizations that provide services and products to education. Certainly, educational leadership can also be found in these arenas. However, public education is supported by taxes, and now, especially in developed countries such as the United Kingdom, China, Israel, Canada, the Netherlands, South Korea, and Germany (Ozkaya & Demirhan, 2023), the development of AI is subsidized by taxes. Therefore, the public has a vested interest in both its educational institutions and the leadership of those institutions whose responsibility is to ensure the success of their schools in the face of significant challenge and change. Just as this study is focused on public rather than private education, it is similarly focused on formal

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models of learning, as opposed to nonformal learning which takes place outside the school system, and informal learning, which takes place outside the educational curriculum (Schugurensky, 2000, p. 2).

Finally, though a vigorous effort was made to gather perspectives from educational leaders from around the world, the study depended on their willingness to participate. With 191 countries as signatories to the SDGs, the hope was that some of their school and institution-based leaders would find the study to be potentially useful in their quest to assist with the realization of lifelong learning for all and therefore would offer to participate. This turned out to be case.

Chapter Summary

In 2015 Beaudoin identified three challenges that people-oriented educational leadership must be prepared to address. These challenges included managing change, institutionalizing innovations with a minimum of disorder, and bridging the global digital divide through universal access to education (pp. 36-39). Ten years later, the necessity to manage change, institutionalize innovation and bridge global divides is connected to the sustainability of education and perhaps even the planet. AI is being institutionalized and positioned to help solve the world's most pressing problems including the realization of lifelong learning for all. But with AI comes the disruption of the ordered structures of public education. AI will become more powerful and pervasive, more nuanced and ubiquitous, more technically robust and more human. How is the educational leader to proceed with respect to managing this change and institutionalizing this innovation? Well-reasoned policy guidance and advice is available (Ally & Mishra, 2024; UNESCO, 2021; UNESCO, 2023 a), but moving AI educational policy into practice for the greater

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good is the next most critical step. Even though the world is far from certain about what should be acceptable for the development and deployment of AI, educational leaders must not sit idly by.

In some ways, public education stands at the precipice of the most significant moment in the history of its leadership. If greater global equity with respect to reimagined learning for life is to finally be realized with the assistance of AI, then educational leaders of publicly funded schools and institutions must take responsibility to act locally. These leaders must be prepared to engage in the continued design, development, and implementation of AI in educational settings for the greater good. But they must be supported in doing so. This study aims to understand if leaders are preparing and what additional support might be provided. For not examining the question of what we want our school leaders to be and to do and how they can be supported to succeed is to “risk sleepwalking into an unexamined reality and failing to adjust in time” (Quaquebeke & Gerpott, 2023, p. 266).

Definition of Terms

Artificial Intelligence (AI) is a set of sciences, theories and techniques whose purpose is to reproduce by a machine the cognitive abilities of a human being (Council of Europe, 2024).

Artificial Intelligence in Education (AIED) is a field of research which explores the use of artificial intelligence to enhance and transform the learning experience using tools for personalizing learning (Luckin, 2016).

AI Literacy is the knowledge, critical thinking, and technical skills that enable individuals to question outputs, recognize limitations and make informed decisions (Chiu et al, 2024, Chiu, 2025).

Artificial Neural Network (ANN) is a computer model or machine learning program based on the organizational neural networks found in animal brains. The goal of these networks is to simulate human brain functions such as image recognition. They require large sets of data to be trained on and can recognize complex patterns in large sets of data, making it difficult to understand why the ANN made a specific decision (Kar, 2016).

Blended Learning provides opportunities for both face-to-face and online learning for one group of students where online learning replaces some of the face-to-face learning time (Graham et al, 2013).

Big Tech is a term used to refer to the world's largest corporations which are also digital technology firms (i.e. Apple, Amazon, Microsoft, etc.). These corporations should not be confused with digital platforms; rather they are referred to as ecosystems which

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combine “technical devices, platforms, users, developers, payment systems, etc. as well as legal contracts, rights, claims, standards, etc.” (Birch & Cochrane, 2024).

Deep Learning (DL) is a form of machine learning that enables computers to learn from experience and understand the world in terms of a hierarchy of concepts. The hierarchy of concepts allows the computer to learn complicated concepts by building them from simpler ones (Bengio et al, 2017, p.351).

Digital Divide is a term which refers to the gaps in access to hardware and connectivity in information and communication technology (ICT). The term also encompasses socioeconomic and cultural factors that impact ICT adoption and usage and how those gaps and factors are revealed in skills and abilities of a population (Raihan et al., 2025).

Distance Education (DE) is a generic term that originally referred to “home study” or “correspondence study”. Educational lessons were originally delivered by mail but with advancements in technology, the delivery method kept changing leading to a renewed definition of DE (Bozhurt, 2019). “Distance education is any educational process in which all or most of the teaching is conducted by someone removed in space and/or time from the learner, with the effect that all or most of the communication between teachers and learners is through an artificial medium, either electronic or print” (UNESCO, 2002, p. 22).

Electronic Learning (e-learning) is learning via digital technology in an online environment and can encompass mobile learning (m-learning) or learning on a mobile device. Increasingly, the term “e-learning” has been replaced by the term “online

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learning” and given how much learning is enabled by digital technology, today it may be referred to as simply “learning”.

Educational Data Mining (EDM) refers to the analysis of various types of educational data by using statistical, Machine Learning, and Data Mining algorithms. The major concern with EDM lies with the protection of privacy of student information (Romero, C., & Ventura, S. (2010).

Expert Systems is the name used for AI software that mimics human experts solving complex problems such as diagnosing equipment failures or designing new equipment. An example of an Expert System is the Dipmeter Advisor system which assists petroleum engineers to determine geological strata (Buchanan & Smith, 1988).

Generative Artificial Intelligence (GAI) is the entire infrastructure, user interface, and data sets that when combined can create new data and content, improve the accuracy of analytics, and create virtual experiences (Gupta et al, 2024). The two GAI models are the Generative Adversarial Network and the Generative Pre-trained Transformer (Dwivedi, et al., 2021).

Generative Adversarial Network (GAN) is a type of Generative AI that employs two competing neural models: a generator and a discriminator. The generator produces new data that resembles the original data, while the discriminator differentiates between genuine and fake data. GANs can create both realistic images that are practically indistinguishable from real images and grammatically correct texts (Lin et al., 2024).

Generative Pre-trained Transformer (GPT) is a type of Generative AI that is pre-trained on multilayer deep neural networks (Kar et al., 2023).

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Intelligent Decision Support Systems (IDSS) is a user-driven, interactive, adaptable computer system that uses data integration and analytical tools. When AI is integrated into the system it becomes “intelligent” because it can employ predictive analytics for forecasting future trends and outcomes based on historical data by identifying complex patterns and anomalies using large data sets. Because IDSS can learn from past decisions it continuously improves its recommendations and insights (Phillips-Ren, 2013).

Intelligent Tutoring System is a computer system designed to provide cost-effective instruction where the computer is used to tutor or instruct a student one-on-one instead of a human tutor (Tsiriga, & Virvou, 2004).

Large Language Models (LLMs) is a class of models that are trained on a broad set of unlabeled data that can be used for different tasks. LLMs are designed to understand and generate text like a human would (Brown et al., 2020). “They have the ability to infer from context, generate coherent and contextually relevant responses, translate to languages other than English, summarize text, answer questions (general conversation and FAQs) and even assist in creative writing or code generation tasks (IBM, 2025).

Learning Analytics is the systematic measurement, collection, analysis, and reporting of data about learners and their contexts to understand patterns in the learning. Today technology is used to generate learning analytics (Romero et al., 2008).

Leadership Theories are different approaches that leaders use to exercise their power and influence. These approaches have evolved over time in response to changes in context and the continuous search for effectiveness. In general, over time, leadership theories have moved away from personality-based or trait theories of leadership to more

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nurturing, distributed, inclusive, values-oriented leadership that include recognition of the complex environments in which leaders work.

Learning Theories are dominant approaches to learning that guide both policy and praxis in different historical time periods. They include behaviourism (learning is a set of observable and measurable behaviours), cognitivism (learning is a set of internal processes where information can be stored and retrieved), constructivism (learning is a set of experiences where knowledge is discovered through personal experiences), and connectivism (learning is a set of interactions with the internet to create a network of connections).

Machine Learning Programs (MLP) is a series of computer systems that automatically improve with experience and implement a learning process (Ayodele, 2010).

Natural Language Processing (NLP) enables computers to understand and interact with human language naturally. NLP is used for tasks such as machine translation and voice assistance (Chowdhary & Chowdhary, 2020).

Pedagogy is a series of practices that encompass the art and science of teaching.

Polarization can be both a state and a process that divides people along lines of politics, religion, and even geography and which can threaten to destabilize a nation (Gu & Wang, 2022).

Professional Learning is on-the-job learning and training sessions that are undertaken by educators in a variety of ways to help them improve their practice.

Sustainability is the umbrella term used for how humanity can meet its needs today without compromising the needs of future generations (Mota & Oliveira, 2014).

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Universal Design for Learning (UDL) is a flexible approach to the design of learning that works to accommodate all learners' needs and abilities and aims to eliminate barriers in the learning process.

Chapter 2. Review of the Literature

This literature review explores a conceptual framework comprised of both theories and concepts to better understand the intersection of educational leadership and artificial intelligence (AI) in support of lifelong learning (LLL) for all. Much can be found in the literature about theories of educational leadership (Amanchukwu et al., 2015; Bush, 2020; Gumus et al., 2018), but this literature review takes a different approach. Specifically, a combination of constructs will be considered, the understanding of which may be of support to educational leadership in this unique moment in time.

The conceptual framework of this study is comprised of five elements. Three theories were selected for this study: human capability theory, self-determination theory, and moral intelligence theory. In addition, the two concepts of Artificial Intelligence (AI) and lifelong learning (LLL) were also chosen. Collectively, these five constructs form a conceptual framework for an investigation into whether educational leaders are unintentionally overlooking this consequential moment in public education, as described in Chapter 1. Individually, these five constructs were chosen because they may each provide educational leadership with necessary support for action as they confront the question of whether they are preparing themselves thoroughly enough for the global educational AI-enabled revolution that has only just begun. These constructs were also chosen because there are a natural connection and progression from one construct to another as will be explained in this chapter.

The benefits of employing conceptual frameworks to guide a research study such as this one are described in the literature. When considering the applicability of conceptual frameworks Greene (2022) identifies the importance of connecting to the larger

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environment and the forces of change in it. In the case of this study, the larger environment includes both a universal mandate for increased equity of opportunity for lifelong learning for all and the arrival of the world's most powerful technology in the form of AI. Both are key drivers of change found in the larger environment in which education takes place, and therefore, as per Greene (2022), they are necessary constructs of this literature review and study.

Further, Miles (1994) explains that the constructs of a conceptual framework exist because there are relationships among them (p. 440). Kiyunja (2018) illuminates this idea by explaining that the concepts and theories of a conceptual framework must flow naturally from one to another like the rooms of a house. In the case of this study, to understand lifelong learning for all in today's context necessitates an understanding of human capability theory. Thus, these two constructs, like the five constructs, flow naturally from one to the other as will be described in this chapter.

Finally, Kivunja (2018) also identifies that the value of a conceptual framework lies in how it frames the entire study. That is, the conceptual framework has the potential to provide "the questions to be asked, the literature to be reviewed, the theories to be applied, the methodology [I] will use, the methods, procedures and instruments, the data analysis and interpretation of findings, recommendations and conclusions" (Kivunja, 2018, p. 47). The conceptual framework identified for this study fulfils these purposes as well. The result is that this conceptual framework, as described in this literature review, provides guidance on how best to undertake an exploration of educational leaders' preparedness to co-design and use AI to enable lifelong learning for all. The findings of this literature review were also used to discover what these constructs mean to K-20

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leaders of schools and educational institutions and how better understanding of them may be useful supports as leaders make this complex agenda meaningful for themselves and those they lead.

Framing Constructs as Leadership Supports

The following literature review is organized by framing each of the five constructs as potential “leadership supports”. The first “leadership support” to be examined is the concept of lifelong learning. The review of the literature will briefly trace how this concept has been understood historically up to the present day, and which elements of lifelong learning will be considered in this study. This concept is relevant to this study because educational leaders’ understanding of today’s interpretation of lifelong learning may influence how leaders think about and guide the design and implementation of AI for reconceived teaching and learning and vice-versa.

The second construct or potential leadership support to be considered will be human capability theory. It is generally accepted that educational leaders will be lifelong leaders themselves, but they must also take responsibility for ensuring that all those in their charge also develop their own capabilities. As the literature review will reveal, it is the development of human capability over a lifetime that holds the greatest promise for addressing the grand challenge of increased equity for lifelong learning for all. The literature study will identify the key elements of human capability theory that were considered in this study. The review makes clear that human capability theory and related frameworks give meaning to lifelong learning for all and purpose to the design and implementation of AI in education.

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The third construct or “leadership support” explored is AI. This literature review identifies that AI in education has the potential to be more than another technological tool. Rather, the literature review will explore the potential of AI to be a critical ally in the realization of greater equity of opportunity for lifelong learning for all learners. By understanding how AI is being framed for education today and by recognizing the necessity for global change, educational leaders will be better prepared to consider where the development and implementation of AI for education needs to go. Once again key elements of this construct will be considered.

As the literature shows, leadership in the public sector will be essential in the successful integration of AI (Schwab, 2016). Vallee-Cruz et al. (2024) argue that leaders' insights and involvement are imperative “in supporting, preparing, and innovating, recognising their central role in optimizing AI efficiency” (p. 802). Therefore, it is worth considering why some K-20 educational leaders are, or may become, active participants in the development and implementation of AI for lifelong learning for all when others may not. Thus, the fourth construct or “leadership support” to be considered in this literature review is self-determination theory. The elements of self-determination theory may aid in explaining why some leaders are choosing to act in the face of this significant global challenge to reimagine education. However, being motivated to act requires understanding of what the right action is.

Therefore, the final construct or “leadership support” explored in the literature review is that of moral intelligence theory. The literature review will show how the gap between what people can do and what AI can do is narrowing. As the gap narrows, the value that leadership brings is their human understanding of what is the right thing to do and why.

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The literature will be reviewed to understand how ethical behaviour is connected to moral intelligence and how the development of moral intelligence might be another educational leadership support.

Critique of the Validity of Appropriate Theory and Research Literature

The Concept of Lifelong Learning as a Leadership Support

The concept of lifelong learning (LLL) has been strongly evident in international political policy and formal education praxis since at least the late 1940s (Nuissl & Przybylska, 2016, p. 36). After the end of World War Two in 1945, governments and NGOs such as UNESCO expanded adult literacy programs. The intention was to help adults whose education had been impacted by the war. (Elfert, 2018). The goal was primarily to support adults as they made the transition back to the workforce while ensuring they had the necessary skills to succeed in life over the longer term. UNESCO's first program, established in 1946, is therefore regarded as the predecessor of lifelong and life-wide education (Elfert, 2018).

At about this same time, both the World Bank and the Organization for European Economic Co-operation (OEEC), which eventually became the Organization for Economic Cooperation and Development (OECD), were also created. As international organizations like these realized that education was increasingly important for their economic agendas, they, too, laid out visions for lifelong learning (Niemann et al., 2022, p. 193). By the middle of the 20th century, adult education was well-supported by educational policy and funding and had become synonymous with the concept of lifelong learning (Niemann et al., 2022, p. 193).

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However, by the 1950s the American “space race” with Russia meant that Western education in general, including adult education as lifelong learning, was under the microscope. Herold (1974) traces the American public’s criticism of the education system in reaction to Sputnik. He identifies that the public believed that “life-adjustment” education had, to the detriment of the nation, replaced rigorous education particularly in science and mathematics (p. 144). This societal challenge of the priorities of lifelong learning was only the first in a series of social and economic pressures that would result in an examination of the purposes of lifelong learning.

By the 1970s, the rise of technology, the increased disappearance of traditional occupations, and the forces of globalization all contributed to the expansion of the purpose of adult education to “one overriding objective: enabling individuals and social groups to learn throughout life” (Nuissl & Przybylska, 2016, p. 41). For example, in 1972, UNESCO published a report written by the International Commission on the Development of Education entitled “Learning to Be: The World of Education Today and Tomorrow”. Under the chairmanship of Edgar Faure, the Commission advocated for a learning society where all people engaged in learning for a whole lifetime (Faure, 1972, p. vi). Faure’s report also highlighted the need for learning throughout one’s lifetime to serve more than oneself but rather to serve the greater good of global democracy. Faure’s report acknowledged that nations “now aspire to democracy quite independently of their GNP and their rates of school enrolment” (Faure, 1972, p. xxiv). As the report pointed out, achieving such active citizenship required continuous learning, not just as a young person, but over a lifetime (Faure, 1972). However, the social democratic disposition of

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Faure's report was not to last as lifelong learning became a political tool too attractive to ignore.

Moving into the 1990s, the concept of lifelong learning took centre stage as a political concept globally when it became a tool in the modernization of national education and training programs to meet economic needs (Field, 2001, p. 3). The rise of the global economy brought economic changes, including the shift from manufacturing industries to service industries, widespread uptake of information and communications technologies, and a prioritization of more sophisticated knowledge and skills in production and services. Lifelong learning was now being emphasized because of its potential to create human capital for the economic realities of the day. For example, the OECD's 1997 report, "Lifelong Learning for All", noted that lifelong learning from early childhood education to active learning in retirement would be increasingly important for both employment and economic development (Tuijnman, 1996). The economic rationale for lifelong learning came from two sources: the increased expectations of employees in a knowledge-based economy and second, the technological skills gap between low skilled employees that transferred to income disparities (Johnston, 1998).

By 2000, western governments were creating policies that supported skill renewal for their citizens, particularly those in the information and technology sector. For example, in 2001 the European Union identified lifelong learning as the means for addressing the mismatch between supply and demand of labour which cost the European Union 100 billion Euros each year (Biesta, 2006, p. 12). Although the report "Re-thinking Human Capital" (OECD, 2002) made the connection between being a productive lifelong learner and a productive member of society, the emphasis was still on lifelong learning as the

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development of human capital; “a good citizen is compassionate, understands democracy and has skills that relate directly to improving firm and country productivity” (OECD, 2002, p. 122).

By the 20th century, criticism of the continued emphasis on human capital development began to arise in the research literature. Lifelong learning as the development of human capital was being described as a new form of oppression rather than opportunity. In 2002 Tuijnman and Boström criticized the ceaseless demand for compulsory and continuous training driven by the agendas of others and the increased demand for self-funded credentials that serve the “new economy.” Serving someone other than the learner himself was seen by Biesta (2012a) as the fundamental problem (pp. 176-177). Meanwhile, Billett (2014) argued that formal education, including adult education, was but one component of lifelong learning (p. 6). However, this scholarly criticism and demand for something different stood in sharp contrast to what was happening at the time in industry, where technology-driven employee training predominated and where the need to use lifelong learning to maintain a skilled workforce was seen as paramount (Nuissl & Przybylska, 2016, p. 39). Becker (2019) identified that, in Germany from 1970-2008, activating human capital through training was seen by employers as necessary for increased productivity and as a response to the changes to work processes brought about by technology (p. 2). Therefore, while a re-emphasis on the development of human capability for a lifetime was being advocated in the literature, in practice the idea of human capital development for the economy persisted. Through the formulation of the United Nations Sustainability Development Goals (SDGs) came

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the opportunity to marry human capacity development with human capability development.

With the publication of the Sustainability Development Goals (SDGs) in 2015, the pursuit of holistic lifelong learning was heralded as the way to achieve not only educational goals but also economic goals as well. Prieto-Jiménez et al.'s (2021) bibliometric mapping analysis of higher education publications focusses on strategies for achieving the SDGs. These researchers conclude that lifelong learning is one of the most recommended strategies for achieving the global sustainability agenda (p. 12).

Although research like Prieto-Jiménez et al.'s (2021) recommends lifelong learning as the strategy to use for the realization of the SDGs, the literature also reveals criticism about how the goals are being conveyed. Specifically, Rosa-Maria Torres Del Castillo, international education advisor and member of the UNESCO Senior Expert Group that wrote UNESCO's, 2013 report "Rethinking Education in a Changing World", argues that the United Nations' six international education goals, as identified in Thailand (2000), are fundamentally flawed. She says they "replicate the conventional education mentality and do not facilitate a holistic understanding of education and of learning throughout life" (Torres, 2011, p. 42). She cites five difficulties with what is presented as the international agenda for education. Specifically, Torres (2011) argues that the goals are presented as an itemized list where "linkages between them are not apparent (e.g., between child and adult education, school and out-of-school education, and so on)" (p. 42). She also notes that segmentation by age reflects formal education policies, goals and institutions; however, discounts or ignores social learning organizations like the family and the community (p. 42). Education's adherence to the traditional formal/non-formal

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dichotomy is also identified as problematic because it does not make room for informal learning (p. 43). Further, Torres finds the continued identification of literacy as an isolated area or as a period in a learner's life, highly problematic (p. 43). In short, Torres makes the case that the articulation of "basic education for all" should be replaced with the "pursuit of lifelong learning" (p. 43). The challenge is that adoption of and dedication to the lifelong learning paradigm "is not just about introducing minor adjustments to education structures, systems and policies. It implies a major revolution of traditional education and learning cultures" (Torres, 2011, p. 47).

Torres is not alone in her criticism. As Collins (2009) points out, more is involved than simply setting the proper agenda for lifelong learning, noting that it also has to do with how we "understand the very idea of learning itself." (p. 620). Elfert (2024) criticizes "magic bullet" solutions that do not address the underlying inequalities and injustices within global education systems (pp. 1-2), while Mochizuki et al. (2022) object to efforts that might mask the more uncomfortable realities of those in the world who are barely surviving and instead they advocate for system-wide changes (p. 709). What is interesting to note is that all these scholars agree that lifelong learning, as the fulsome development of a person's capability through formal and informal learning, is indeed the new educational agenda. Their concerns are focused on how it will be achieved.

The priorities of lifelong learning have therefore evolved over time originally focusing on lifelong learning as a holistic goal for the betterment of adults, both in their roles as employees and as citizens (Faure, 1972). Then the priorities of lifelong learning shifted to the development of human capacity to better serve the interests of the economy (OECD, 1997). That shift in purpose and tone, as revealed by the literature, was seen as

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overlooking or subordinating the needs of the individual (Biesta, 2012, Billett, 2014). The development of the SDGs (UNESCO, 2015) provides a way of marrying the two historic priorities of lifelong learning: the development of human capacity and the development of human capability or learning for economic reasons and learning for individual development reasons. That is, the signatories of the SDGs confirmed that universal sustainability on this planet depends on developing human capability over a lifetime for all people; “our planet won’t survive, if it is not a learning planet, and sustainable development will be achieved by learning through life” (Akther, 2020, p. 108). Therefore, this ambitious goal is supported in the literature as today’s collective purpose of K-20 education and its leaders (Prieto-Jiménez et al., 2021; Pradhan et al., 2017; Nazar, 2018).

As the priorities of LLL have shifted the key elements of LLL have also been reorganized to include three key elements. The first element of today’s reimagined LLL includes the recognition of informal and non-formal learning which support inclusiveness, access, and the pursuit of equity. That is, LLL is an empowerment tool for marginalized learners. OECD has been prominent in the promotion of skills and competencies acquired through informal and non-formal learning (Singh, 2014, p. 91). Singh (2014) points out that other researchers have criticized the equating of formal, informal, and non-formal learning as it devalues all three (p. 92). He points to the traditional and indigenous knowledge of communities as an example of how different these three kinds of learning can be (p. 93). Singh (2014)’s study of National Qualifications Frameworks in 34 countries shows that over 10 years ago many places in the world were already incorporating LLL processes that already occur in informal and

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non-formal ways into the formal education. One of the key elements of today's conception of LLL then is the recognition that formal education is only one component of LLL. Learning that happens informally and nonnormally must also be prioritized, valued, evaluated, and accredited.

Singh's study also "support[s] and reinforce[s] the necessity of initial education to provide a sound foundation for further learning throughout life" (p. 119). The importance of initial education, particularly literacy and numeracy development, is a second key element of today's interpretation of LLL. Today literacy development is seen as a continuum of different proficiency levels. Hanemann and Robinson's (2022) postulate that "there is no definite line between a "literate" and "non-literate" person" (p. 237). Rather, literacy is a lifelong process which occurs "before, during and after school education, in and out of school, and through formal, non-formal and informal learning" (Hanemann & Robinson, 2022, p. 238). Literacy development then is a life-wide process which makes use of the skills of literacy in many settings of a person's life. Hanemann and Robinson's (2022) study analyzes literacy policies and approaches and demonstrates how literacy as a lifelong and life-wide process is taking shape globally. Their study highlights the importance of relevance, resources, motivation, and multiple learning pathways to literacy development (p. 249). Therefore, a second element of today's concept of LLL for all is that of the lifelong and life-wide development of literacy which is strengthened by initial formal education experiences.

In addition to the valuation of formal and nonformal learning alongside formal education and the re-conception of literacy development as a lifetime journey, today LLL is seen as embracing more than knowledge and skills. LLL today prioritizes the

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development of perspectives and values, enabling greater participation in modern society.

The development of personal qualities such as honesty, integrity, and consideration of others is now seen as a third key element of today's interpretation of LLL. (Singh, 2014, p. 122). Today LLL is seen as a means for developing curiosity, imagination, resilience, and self-regulation, appreciation of the ideas, perspectives and values of others, the ability to move forward in the face of adversity, the ability to think for oneself "with a robust moral compass" (Schleicher, 2018). Such perspectives and values are seen as a key element of today's conception of LLL. They have emerged as a response to the need for societies and cultural life, including education systems, to rapidly evolve and change.

As mentioned previously, UNESCO has played a significant role in shaping the world's value and expansion of the concept of LLL. UNESCO (2016) identified school leadership as essential for ensuring inclusive and equitable quality education and promoting lifelong learning opportunities for all. This prioritization on the role of educational leadership follows naturally from the literature on the role of leaders on educational reform (Carrington et al., 2022; Guthrie et al, 2022). Taşçı and Titrek,'s (2019) descriptive phenomenology study focuses on the perceptions of educational leadership in terms of lifelong learning in higher education in Turkey and of "the strategies applied, the difficulties faced, the experiences shared, and the sustainability practiced" (p. 1). These researchers find that higher education leaders have a strong awareness of LLL, but their efforts are limited by economics as they see lifelong learning as a "training centre." Such perspectives are not reflective of today's vision of LLL and emphasis on its three key elements. Zhang's 2024 study of principals and teachers K-12 through semi-structured interviews also found the most significant challenges of

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implementing lifelong learning to be a lack of resources including funding. Zhang (2024) also identified implicit bias and limited professional development (p. 36) as barriers to educational leaders realizing lifelong learning for all. Assefa et al.'s (2024) meta-synthesis of the literature on higher education's role in promoting lifelong learning reveals that moving beyond a rhetorical commitment is a challenging process for leadership (sect.5). Their study reveals that lifelong learning changes can be optimized in higher education institutions through responsive leadership including goal setting, funding packages, and stakeholder partnerships. Lan Nguyen and Zarra-Nezhad's (2023) study uses a mixed methods approach to explore post-secondary students' readiness for lifelong learning where future unpredictability is common (p. 390). This study shows that traditional educational techniques where existing knowledge is applied to problems are not helpful in the longer term with respect to developing students' dispositions towards LLL. "Although cognitive practices such as understanding, learning, and remembering determine academically effective learners (McMillan, 2010), this study proves that these cognitive approaches do not provide students with many advantages for learning in the future, particularly when they face newly emerging problems" (Lan Nguyen & Zarra-Nezhad, 2023, p. 399).

Such studies illustrate that given the critical role of leadership in realizing agendas for change, educational leadership may need further support to understand and to implement the three key elements of today's vision of LLL. Transformation of formal education structures, systems, and policies (Torres, 2011; Elfert, 2024; Mochizuki et al., 2022) will be needed as will support of leadership to do so. One such support may be a deeper understanding of what LLL for all is aiming to achieve in the present day.

The Theory of Human Capability as a Leadership Support

Much support exists in the literature for using Sen's (1984) theory of human capability to help reconceive of what is meant by lifelong learning for all. Sen's (1984) theory connects the development of human capability and an individual's agency to choose which goals to pursue and which values to regard as important. (Sen, 1985, p. 203). At its most elemental level, Sen's theory says that a person's capability has to do with "the various things that he or she manages to do or be in leading a life" (Sen, 1984 p. 271). He refers to these various things as "agency" or "what a person is free to do and achieve in pursuit of whatever goals and values he or she regards as important" (p. 203). Some people's agencies may manifest themselves in ways that are as elementary as being adequately nourished while others may be more complex, such as achieving self-respect (Sen, 1984, p. 271).

Sen's human capability theory explains that people's unique capabilities and individual agency to achieve them spring from freedoms, or the lack of them. These freedoms can include many things including the freedom to be educated and employed, or to be happy or have shelter (Boyadjieva & Ilieva-Trichkova, 2018, p. 269). Similarly, the ability of an individual to convert these capabilities into achievements is also defined in Sen's (1984) human capability theory as unique to each person. Sen notes that the motivation for his development of the human capability theory was a response to the question "equality of what?" (Sen, 2013). Sen uses human capability as a way of "conceptualizing and evaluating phenomena such as inequalities, well-being and human development" (Boyadjieva & Ilieva-Trichkova, 2018, p. 269).

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Scholars such as Rubenson (2019), Boyadjieva & Ilieva-Trichkova (2018), Poquet & Laat (2021), and Arar et al. (2021) have argued that the vision for lifelong learning must embrace a paradigm of human capability development as described by Sen. Arar et al. (2021) point out that the disregard of human diversity has led to the “educational ineffectiveness and inequality that prevail almost everywhere” (p. 19). Boyadjieva & Ilieva-Trichkova (2018) go a step further by providing a theoretical framework for lifelong learning as an emancipation process centred on developing human capability. They support Sen’s requirement to see each person as “a dignified and responsible human being who shares his/her own life in the light of goals that he/she has reason to value” (Boyadjieva & Ilieva-Trichkova, 2018, p. 274). They argue that the capability approach “provides a theoretical framework for the understanding of lifelong learning as an agency process which is embedded in different social and institutional contexts, for grasping its different meanings for individuals and society, and for its critical evaluation against the background of important values, such as justice, freedom, and identity development” (p. 267). The pursuit of lifelong learning for all through the development of human capability provides a new vision for education and prioritization of the three elements of LLL previously identified: valuation of informal, nonformal and formal learning, literacy development as a lifetime journey, and the development of perspectives and values that support democratic action. The question that follows is which capabilities does the research literature identify as most important to develop in a modern world and what is the role of educational leaders in doing so?

Many frameworks have emerged in the literature that have identified competencies and skills for the 21st century learner (Scott, 2015). However, capabilities are more

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encompassing than competencies or skills. Capability development might be best thought of as an enabler. Cairns and Malloch (2024) provide a vision of capability development as a life course and lifespan holistic journey. While a recent mixed methods study from Pakistan (2024) shows that schools are not prioritizing the development of social or human capability skills and that the “holistic development of students is generally a neglected aspect” (p.1), Markauskaite et al.’s (2022), an orchestrated discussion or dialogical knowledge-making approach contributes ideas about what specific capabilities will be most essential to develop in today’s world, a world infused with AI. Although not a peer reviewed study, “this polychronic and polyphonic research approach, similar to those used for collective knowledge-making in experimental post digital dialogues” (p. 2) references Sen’s (1984) human capability theory as essential in providing guidance for which principles individuals should focus on when working with AI (p. 6). The authors conclude that the development of human capability over a lifetime in an AI-infused world is fundamentally a quest to develop perspectives, values, (p. 9) and skills (p. 12). They contend that these include “cognitively oriented, humanistically oriented, and socially oriented” perspectives, values and skills (p. 12). Markauskaite et al. (2022) provide examples of how these orientations might be translated into skill development in education including teaching for the development of self-regulated learning skills, human-centred design skills, ethics and philosophical skills, and networked learning skills (p. 10). Markauskaite et al. (2022) imply that the development of such perspectives by all learners will not occur by accident but must be planned for in the curriculum at all levels of education while the necessary changes to traditional educational structures and paradigms must be skillfully led.

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In summary, the second construct of the conceptual framework for this study is that of human capability theory. The literature illustrates the value of viewing LLL for all through the lens of human capability development. The key elements of human capability theory are necessary for educational leaders to consider as they reach for greater equity of opportunity for LLL for all enabled by AI. Those elements include the role of individual agency or what a person is free to do and to achieve in pursuit of whatever goals matter most to them and what cognitive, humanistic, and social values and perspectives will be most helpful to carry forward on the lifelong journey of learning. Such understanding of human capability theory, as discussed in the literature and as initiated by Sen (1984) and expanded upon by others including Markauskaite et al. (2022), may become a useful support for educational leaders because such understanding expands and enriches the concept of lifelong learning for all. As that understanding grows it becomes increasingly clear that a significant educational redirection and reorganization is required. How such change might be enabled is the work of educational leadership and is the next construct of the study's conceptual framework.

The Concept of Artificial Intelligence as a Leadership Support

As noted in Chapter One, Artificial Intelligence (AI)enabled learning, the next form of digital learning, is already beginning to affect the culture and context of public education. This is not the first time a new kind of technology has changed teaching and learning. Historically, Distance Education (DE) has made practical use of technology to reduce the limitations of access and resources to enrich learning (Bozkurt, 2019). DE uses technologies to deliver instruction to students who are separated from the instructor. The goal is to use technologies “to support regular and substantive interaction between

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the students and the instructor synchronously or asynchronously” (Williamson et al., 2020, p. 6). Further DE’s perennial goal of equity of access, regardless of the student’s personal circumstances (age, location, employability status, economic status, family status, etc.), makes learning more accessible and, therefore, more democratic (Fidalgo & Thormann, 2024). Such equity of access has been the trademark of DE since its inception (Kentnor, 2015, p. 30) and is clearly supportive of lifelong learning. Therefore, as Sharma et al. (2019) identify, technology for distance education has been treated as a means, rather than an end unto itself (p. 2).

When the Coronavirus-19 pandemic made in-person learning impossible, the inherent benefits of DE were realized by many more people. Today, the literature identifies how the long-time purposes of distance education, combined with the power of AI, can transform learning for all. For example, Ally & Mishra (2024) identify how AI, as a means of learning, may open pathways for remote learners, non-English speakers, and students who cannot afford the learning materials to meet their needs (p. 10). “As students interact with the AI system, it will learn about them and suggest learning activities and strategies to use in the learning process” (Ally & Mishra, 2024, p. 10). Ally & Mishra (2024) also point to the concept of AI’s metaverse which, although in need of further development, supports learners in real time, allowing for “high social presence, which is important for developing human skills in the learning process” (p. 10). The notion of social presence is one of the three “presences” of the community of inquiry framework (Garrison et al., (1999) that has formed the heart of distance education praxis in this century. Social presence is defined as “the ability of participants in a community of inquiry to project themselves socially and emotionally, as “real” people (i.e., their full

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personality), through the medium of communication being used” (Garrison et al., 1999, p. 94). These historically successful approaches to DE, whereby technology is seen as a pragmatic means to an end, provide guidance for educational leadership today as it considers the relationship of AI technology to the quest for greater equity of learning for all.

Given the enormity of the challenge to reimagine LLL through human capability development for all, educational leaders will need all the help they can muster. They will need more than a tool. They will require a helping hand, in the form of a powerful alliance. AI very well may be such an ally. The use of the word “ally” is reflective of the term “AI agent” which has appeared in the literature regularly since at least 2004 (Floridi & Sanders, 2004). Although using the term “agent” or “ally” to refer to AI may imply anthropomorphizing a piece of technology, that is not the intention. Rather, allies, according to the Merriam-Webster dictionary, bind to others in support of those other entities. In the case of AI as an ally of educational leadership in the quest for lifelong learning for all, the question becomes, what will it take for AI to be such a leadership ally? It will require that educational leaders understand how AI development is currently undertaken and how it might be undertaken in the pursuit of lifelong learning for all. Such an alliance presupposes that leaders will then provide guidance for AI’s development and implementation. This theme has recently been introduced in the literature.

Quaquebeke and Gerpott (2023) argue that leaders must understand how both humans and AI operate because it is the stewardship of such powerful technology that will determine the future fate of their “business” and of the people within it (p. 266).

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Similarly, Ransbotham et al.'s (2022) sixth annual Massachusetts Institute of Technology's global research study on AI and business strategy surveyed 3,000 executives, analyzed records from 1,741 respondents and surveyed 17 executives who were either researching or leading AI initiatives (p. 4). The mixed methods research found that the most successful AI leaders encouraged their employees to see AI as a co-worker rather than as a tool, like a stapler (p. 4). This study emphasizes that AI must be understood by leadership in much deeper ways (p. 4). Although Ransbotham et al.'s (2022) call for leadership involvement is not focused on education, the crossover is apparent. Lewis et al. (2018) propose that by treating AI "respectfully and reciprocally—and not as mere tools, or worse, slaves to their creators" (p. 2) will help avoid "baking in" the same assumptions that "fostered genocide against indigenous people worldwide and brought us all to the brink of environmental collapse" (pp. 8-9). Educational leadership must develop greater understanding of AI as a co-worker or ally in the quest for greater lifelong learning for all. The CEO of Microsoft AI calls AI the "harbinger of something entirely new" (Suleyman, 2024). The necessity of educational leadership understanding what he means cannot be understated. If leadership's alliance with AI is to be a means to a global reimagining of education to save the planet, then both parties must rise to the occasion.

Poquet and de Laat (2021) propose that leadership's support of the development and use of AI in a capability-building framework for learning helps to solve the meaningful problems of education. They defend their position by saying that the data about learners that AI can find and disaggregate can be used to identify differences that learners bring to learning. These differences may limit learners' abilities to convert what education has to

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offer into the development of their own human capability (Poquet & de Laat, 2021, p. 8). Although Poquet & de Laat (2021) see such potential in AI to ameliorate this problem, they did not describe the details of such equity-generating applications. Fidalgo & Thormann (2024) begin to address that gap by itemizing the ways that AI may impact lifelong learning. Their explanation includes examples like AI-driven lifelong learning companions and AI-enabled records of lifelong learning achievements and others (see Appendix A). Today many such examples have become reality. Abassi et al.'s (2024) study illustrates that using AI in education has affected both learners with special needs as well as the schools and institutions facilitating inclusive education (p. 73). Adaptive learning technologies, which are underpinned by AI, have the capacity “to introduce unparalleled customisation to the process of learning” (p. 74). Google’s Voice Access, Microsoft’s Immersive Reader and Assistiveware’s Proloqu2Go all provide support for special needs students while robots such as Milo and NAO function as interactive social and learning companions” (p. 74-75). In a blog post from 2023, Sam Altman, the CEO of OpenAI, a prominent AI research organization, appears to confirm these scholars’ observations when he describes virtual tutors providing “personalized instruction in any subject, in any language, and at whatever pace they need” (Altman, 2023, par. 4). What is being described are AI applications that have the potential to improve equity of learning for all.

Wang and Jiang (2025) examine advancements in AI for education that are reshaping educational paradigms to address perennial educational challenges including the transition from perception-based to cognitive-driven challenges where new AI models like that of DeepSeek can “understand complex contexts, perform multi-step reasoning,

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and analyze student queries in depth rather than simply providing straightforward answers [and] transforms AI from a basic informational tool into an intelligent mentor, fostering independent thinking and creative problem-solving skills” (Wang & Jiang, 2025, p.1) and where innovations like GPT-4 Vision and Meta’s multimodal data integration provide more immersive learning by combining text, audio, video, and images ((Wang & Jiang, 2025, p.2).

UNESCO’s “AI and Education: guidance for policymakers” (2021) aids educational policymakers in assessing benefits and mitigating risks while emphasizing the importance of leadership planning for the use of AI for learning guided by the core principles of inclusion and equity (Miao et al., 2021, p. 1). More recently, “Governing for Humanity” (AI Advisory Board, 2024) recognizes that AI is “too important, and the stakes are too high, to rely only on market forces and a fragmented patchwork of national and multilateral action” (AI Advisory Body, 2024, p. 21). The report recognizes and provides a plan for greater global governance so AI solutions can be inclusive and equitable (p. 14). The report makes a case for framing the risks of AI based on vulnerabilities particularly of children who “generate one third of the data and will grow up to an AI-infused economy and world accustomed to the use of AI” (p. 32).

Given the legal and moral duty of care that public education has for children and young people, it seems evident that educational leadership must be an essential part of the stakeholder group that coordinates such AI policy and governance designs. Expert feedback to the AI Advisory Body’s report (2024) references the importance of stakeholders being aware of their AI responsibilities (Kiden et al., 2024, p. 1). Professional bodies are encouraged to provide clear guidelines on the use of AI in their respective areas

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of work citing standards institutes, telecommunications and engineering bodies (Kiden et al., 2024, p. 3). However, professional bodies of educators and its leadership are noticeably absent from the list of professionals and professional organizations encouraged to participate actively.

Unfortunately, it is often the case that educational leadership is not cited in the research as an essential member of the AI development stakeholder group. Eyon and Young (2021) analyzed documents and 34 in-depth interviews with a variety of AI stakeholders to disaggregate their different perspectives (p. 166). They conclude that there would be great value in the AI commercial sector, academia, and policy makers working together for improved “development and dissemination of AI-enabled lifelong learning opportunities” (p. 183). Despite recognizing this significant moment in how AI and lifelong learning will be framed and the necessity of stakeholder involvement in it, their study does not cite educational leaders as part of the necessary collaborative mix of expertise.

Educational leadership's potential involvement in the creation of consensus on clear guidelines and frameworks for how and why AI is to be used in education, presupposes that leaders understand how and what to contribute to such a collaboration. The research does provide guidance in this area for educational leaders. Dwivedi et al.'s (2021) comprehensive study of the literature highlights that it will be necessary for leaders to understand “when AI will be enough” working on its own and when it will need other supports (pp. 9-10). Unfortunately, Dwivedi et al.'s (2021) study does not identify the value of educational leadership's soft diplomacy skills that could be accessed for greater coordination of AI development. Carvalho et al.'s study (2022) does assume the value of educational leadership's involvement because they do provide guidance for educational

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leadership's involvement in the co-design of AI. They propose a framework for how educators might help with the co-design of AI and for the learning that will come from such a partnership (p. 1). Interestingly, they see the human capability approach, as conceived by Sen (1984), as the foundation of the work (Carvalho et al., 2022, pp. 3-6); "The capability approach brings the underlying humanistic principles to underpin design in a world of AI – principles that emphasize the importance of people's agency, inclusion, and co-creation (philosophy)" (Carvalho et al., 2022, p. 8).

To engage more deeply in the work, educational leaders must also recognize that the development of AI applications is proceeding in siloes, which at different periods may include "theorem proving, heuristic search, game playing, expert systems, neural networks, Bayesian networks, data mining, agents, and recently, deep learning" (Wang, 2019, p.7) as addressed in Chapter One. Each of these techniques spring from different theoretical foundations and can be used for exploring different AI problems, and so various subdomains have been formed within AI, such as knowledge representation, reasoning, and planning (Wang, 2019, p. 7). Educational leaders will surely recognize these subdomains of learning (reasoning, planning, knowledge) as the same cognitive skills taught in a variety of subjects and disciplines and that have long been a part of traditional formal education at all levels. As such, these AI applications, being led by the designers of AI, are not so much reconceiving of learning as they are providing support for the existing functions and paradigms of K-20 education. The research literature does identify this is a problem and how it might be fixed.

Bates et al's (2020) work shows that the reason for AI development currently reinforcing existing functions and paradigms of K-20 education is due to the lack of

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connection between AI developers and educators. Bates et al. (2020) argue that educators are not paying enough attention to the potential of AI and, as a result, computer scientists are doing most of the imagining about how AI can be used in education. As opposed to educational leaders, Bates et al. (2020) see the role of educational researchers as pivotal in the collaboration with computer scientists and urge them “to focus research upon the potential improvements to learning and pedagogy that AI may be able to offer” (Bates et al., 2020, p. 7). However, this current disconnect between AI research and education was not always the case as Doroudi’s (2023) study reveals.

Doroudi (2023) constructs a historical narrative using a combination of publications, unpublished grey literature, historical sources, and archival material (p. 888) to show that historically, AI and education research were “intertwined in more principled and mutually reinforcing ways than thinking of education as just another application area of artificial intelligence would suggest” (p. 886). Doroudi explains that the earliest AI pioneers were cognitive scientists who, through thinking about learning in both machines and humans, were heavily invested in educational research (p. 888). In 1980, Papert, one of these key cognitive scientists and AI pioneers, explained why he moved from studying children with Piaget to studying AI at the Massachusetts Institute of Technology:

Two worlds could hardly be more different. But I made the transition because I believed that my new world of machines could provide a perspective that might lead to solutions to problems that had eluded us in the old world of children.

Looking back, I see that the cross-fertilization has brought benefits in both directions...which has emerged from a strategy of thinking simultaneously about how children do and how computers might think. (Papert, 2020, p. 208)

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As Doroudi's (2023) study demonstrates there was a move away from such collaboration around 1987 when modelling the kind of learning that takes place in education was not possible given the current limitations of the technology of AI at that time (p. 918). But, although the technology of AI has advanced since 1987, that separation between AI and sociocultural theories of learning continues today (p. 920). Doroudi (2023) concludes that returning to that tight connection between leaders in education and AI developers would be mutually beneficial (Doroudi, 2023, p. 921).

Because "AI Systems are only as smart as the data used to train them" (Kaplan & Haenlein, 2019, p. 25), studies have begun to emerge that propose what AI might be taught to do if educational leadership was working more closely with AI designers and developers. For example, Gibson et al. (2023) provide specific examples to show how AI might be trained to reimagine learning. They advocate that AI be immediately trained on the multitude of current learning theories from a multitude of disciplines including "developmental psychology, computational biology, instructional design, cognitive science, complexity and sociocultural theory" (p. 1125). Then, armed with knowledge of so many learning theories, AI with its improved capacity to synthesize vast amounts of data quickly, could create brand new theories AI-enabled learning. Relying on "the lessons of evolution and complexity, which demand continuous coadaptation of theory to reality" AI becomes an ally or a "coagent enhancing human potential" (pp. 1127-1128).

Gibson et al. (2023) do provide specifics of how this reimagined AI-enabled learning might unfold when it is trained on the vast number of existing learning theories. For example, at the micro or individual level of learning, an existing model for computer-assisted instruction, like that of Song and Keller (1999), would get the learning started.

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Then four roles, as outlined by Gibson et al. (2023), would be assigned for AI to assist the learning including making personal recommendations to stretch a learner's knowledge and capability, providing analysis that will direct next learning steps, building confidence through timely interventions, and making the learning explainable and evident to the learner themselves (pp. 1134-5).

Although a novel approach to portraying how the partnership between educational leaders and AI might unfold, the specific examples provided by Gibson et al. (2023) rely on what the literature has previously categorized for potential AI applications. For example, Luckin et al. (2019) delineate three categories of AI applications: personal tutors, intelligent support for collaborative learning, and intelligent virtual reality. Goksel and Bozkurt's (2019) categorization includes adaptive and personalized learning and expert and intelligent tutoring systems (p. 224). Zawacki-Richter et al.'s (2019) systematic review of the applications of AI in higher education identify four similar kinds of applications (p. 1). Regardless of the categorization of applications in reshaping the vision of education for all, it will be necessary to avoid what Baker (2021) refers to as the problem of "a fragmented learning ecosystem" (p. 51) when several or even multiple AI technologies are used in any one school. He observes that these different applications have "emerged one by one, brought about by different stakeholders, with different goals, sometimes even in opposition to each other ... rather than trying to find ways to work in concert" (Baker, 2021, p. 51). Once again, a role for leadership in the implementation of AI-enabled learning is made clear. If leaders are actively involved intellectually and practically in the design and implementation of AI for lifelong learning for all, their influence might be able to help turn AI toward new "imaginings" for learning while

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avoiding potentially fragmented learning ecosystems. The goal would be to have more purpose-driven, humancentric AI for use in education.

Although not used in reference to AI in education, being “purpose-driven” did become very popular in research in the last several years to describe business, leadership, and innovation. For example, in an editorial written by Abbas et al, (2021) the need for purpose-driven technology design and development is identified (p. 112). These authors go on to ask an important question that has relevancy to AI technology in education. They say that when it comes to technological design and development that is purpose-driven, we must first ask ourselves, “what constitutes ‘purposeful’ and purposeful for whom?” (p. 112). A response by educators would highlight which values they wish to have incorporated into the design and development of AI for education. The assumption is that those using technology will want to help design and develop it. In the case of this study that means educational leadership. As How et al. (2020) pointed out that means AI design and development must be accessible to a wide variety of people, including educational leaders, who are often not computer scientists. The result of such a call for the democratization of AI design and development has been a movement described as humancentric (Taylor et al., 2024, p. 2417).

Shneiderman (2022) first identified the objective of humancentric AI through the alignment of developer and end user values as the mitigation of harm and the promotion of human well-being. Taylor et al. (2024) make the contrast between such values starker when they write:

It is important to highlight that when organizations choose to develop and deploy AI, whether their focus is on maximizing profits (i.e., their "bottom line") or

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promoting community well-being, each decision reflects a specific set of human values...Ultimately, the choice of which values to prioritize when deploying AI depends on the organization's goals and priorities, as well as the ethical considerations that guide their decision-making process. (p. 2422)

So, for the “community” of education, the question becomes who will ensure that those goals, priorities, values, and ethical considerations are considered? The need for the educational leader to involve themselves in the design and development of AI for education seems essential. But such involvement cannot be token if humancentric, purpose-driven design and development are to be achieved. As Murphy and Taylor (2023) contend such design and development of AI will only happen if the expertise and realities of these leaders are acknowledged as essential to the design and development of AI for educational use and when “the realities of the individuals most-immediately impacted by AI in a domain are elevated and revered, rather than being seen as trivial, low-value, and tainted” (Murphy et al., 2024, p. 3). That is, the involvement of educational leadership in the design and development of AI must be more than symbolic. And such involvement must go beyond concerns about data privacy (Murphy et al., 2024, p. 4). Such involvement by leaders in the purpose-driven, humancentric design and development of AI must be principle-based.

Frenette (2022) provides some more specific advice about how humancentric AI design and development might add value to the human activities of education. Frenette identifies four principles that should be followed:

1. Human Augmentation Over Automation: Human-centric AI does not substitute human workers but empowers them instead.

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2. **User Control and Transparency:** Human-centric AI is designed to be interpretable and transparent. The end users must have the ability to know how the AI is making decisions, have explanations available as well as be able to veto automated suggestions when there is a need to do so.
3. **Ethical and Fair AI Design:** Reduction of bias, protection of privacy, and ethical considerations are the essential features of human-centric AI. It is a pro-active procedure of trying to reduce the biases in the algorithms that might harm some group of users.
4. **Contextual Awareness:** Human-centric AI takes into consideration the context in which it is operating and will behave, recommend and act according to user preferences, real-time data and situation variables. This renders the AI adaptive, flexible, and more humankind relevant. (sect. 1.1.1)

Such scholarship on humancentric design and development of AI has recently increased substantially (Ryan, 2025, p. 1303). By way of example, Ryan points to the European Commission's 2023 AI Act which says, "Our AI Act will make a substantial contribution to the development of global rules and principles for humancentric AI" (Ryan, 2025, p. 1304). But greater control by educators will not, by itself, be enough as Ryan points out (p. 1315). Rather, it will be essential that leadership of education use all the skills and knowledge of education at their disposal to ensure that it is the values and priorities of an educational system focused on greater equity of opportunity in the pursuit of lifelong learning for all that becomes the measuring stick of what purpose-driven, humancentric design and development of AI for education will be.

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In short, there are many reasons for educational leadership to become more actively involved in the design and development of AI for learning including the necessity to use the power of AI to do more than reinforce current learning paradigms. The creation of fresh ideas for how AI could support learning for a lifetime and the avoidance of duplication in the design of those applications provides further justification for the involvement of educational leadership. However, there is much to be understood by educational leaders if they are to realize their potential as expert stakeholders. One such requirement for leadership must be the application of their deep understanding of the value of evidence to the application of AI. For without evidence of the benefits of AI to reconceive of learning for all, the risks or harms may outweigh the value that AI brings to the expanded development of human capability through lifelong learning. To that end, educational leadership must be aware that some of the literature reviewing AI applications to date identifies only the benefits of AI applications for education and not the challenges.

Chen, Chen and Lin's (2020) qualitative study considered 250 articles published after 2009 discussing the impact of AI on administration, teaching, and learning. Their review identifies many positive outcomes resulting from the use of AI including improved personalized learning and decreases in barriers to global learning (Chen, Chen & Lin, 2020). The study was thorough in that it reviewed more than 200 articles, and so, based on such a comprehensive review, it would be reasonable to assume that AI for education is a purely winning proposition. However, other literature shows that by 2020 many articles about the application of AI to education were not research papers but position papers in which authors expressed their personal understanding and opinions. Holmes

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and Tuomi (2022) identify that only a few of the metareviews and analyses of AI use in education were conducted independently and/or on a large scale.

In a separate literature review from 2020, Chen, Xie, Zou, & Hwang uncover the “lack of studies that both employ AI technologies and engage deeply with educational theories” (p. 1). The theories and frameworks identified in this review include only six learning theories (learning styles, situated learning, bi-directional theory, collaborative theory, personalized learning, adapted learning theory) in comparison to 26 proposed frameworks found in computing research journals. This failure to explore more educational theories in relation to AI may result from a lack of educational perspective, a missing piece that leadership could provide. In other words, there is a need for leadership to ensure the availability, reliability, and validity of empirical educational research of AI applications for schools and post-secondary institutions.

These findings support those of Zawacki-Richter et al. (2019). Their systematic review of research on AI applications used in higher education includes the examination of 104 journal articles. “The greatest number of articles were published in the *International Journal of Artificial Intelligence in Education* (n = 11), followed by *Computers & Education* (n = 8), and the *International Journal of Emerging Technologies in Learning* (n = 5)” (Zawacki-Richter et al., 2019, p. 7). It is noteworthy that none of the influential articles about AI in education examined by these researchers were found in educational leadership journals. Zawacki-Richter et al. (2019) conclude that “there is still substantial room for educators to aim at innovative and meaningful research and practice with AIED that could have learning impact” (p. 20). Further, Nemorin et al.'s (2023) more recent study uses text mining and thematic analysis to identify the primary trends

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currently guiding investment in education, one of which is the growing role of the private sector, and its potential for profits (p. 48). However, like the research that preceded it, Nemorin et al. (2023) make clear that empirical evidence of the overall impact of the contributions of AI in education is limited (p. 47). They caution that the credit being given to AI in the recent past, too often based on positive position papers as opposed to empirical research, should be a cautionary lesson for educational leaders. These researchers finish their study by asking “whose responsibility is it to bring the different actors together and to harmonise the principles into an acceptable and responsible AI?” (p. 49). The answer must include educational leadership.

In summary, such studies confirm that without the direct involvement of educational leaders, the discourse on how AI can be applied in education for the betterment of all will continue to be dominated by stakeholders from technology and business (Bates et al., 2020). This will occur despite the history of the development of AI that tightly connects education with AI development (Doroudi, 2023). If the lack of direct involvement by educational leaders in the development of AI continues, a potentially dangerous door is opened. Without clear evidence to prove the validity of claims about the benefits and risks of AI applications in education, the use of AI in education becomes not a means but an end. It is through this lens of seeing AI as more than a tool (Ransbotham et al., 2022) but as a supportive ally (Floridi & Sanders, 2004) that educational leadership can ask new questions concerning the AI design and development process (Bates et al., 2020; Carvalho et al., 2022; Dwivedi, 2021). There is a need to better understand what collaboration between educational leadership and AI would be like when the goal of learning with AI is to increase human capability for all.

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To summarize, the third construct of this study's conceptual framework is that of AI as an ally or co-worker in the enablement of lifelong learning. The elements of this construct that have been considered include the potential of AI to change what a person knows or can do, the potential of AI to improve equity of learning, and the opportunity that AI provides to build new theories of learning. Such elements are dependent upon educational leadership playing an active role in the co-design and development of AI as an enabler of learning. Such involvement by educational leadership in the design and development of AI for the development of human capability through lifelong learning for all may benefit from greater understanding of some of the pertinent topics identified in this section of the literature review. Such topics include AI as a pragmatic means to an end as exemplified by distance education's treatment of technology over time, the current AI applications that support lifelong learning for all (Appendix 1), the recognition of how AI development has taken place and been reported on, and what questions educational leadership should ask when they retake their place at the AI stakeholder table.

As AI is designed and developed for education, mistakes will be made, failure will happen, but it is experimentation, failure, and learning from it that is needed. The purpose of this study, as mentioned in Chapter One is to consider what supports may be needed to ensure that educational leadership avoids "sleepwalking into an unexamined reality and failing to adjust in time" (Quaquebeke & Gerpott, 2023, p. 266). Understanding what the literature tells us about why some educational leaders will step into the fray when others may not, leads to the next construct of this literature review's conceptual framework. If AI is to be embraced as a promising means for improving LLL for all through the development of human capability, then it will need motivated leaders

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to help lead the design, development and implementation in K-20 education. For it is leadership that is responsible for encouraging imaginative possibilities and, through collaboration with others, turning imaginings into realities (Kouzes & Posner, 2012).

Valle-Cruz et al. (2024) argue that leadership in the public sector will be the “linchpin in successful AI integration during the 4IR...these insights stress leaders’ imperative engagement in supporting, preparing, and innovating, recognising their central role in optimizing AI efficiency” (p. 802). If educational leaders are to succeed in their role as the “linchpin” of successful AI integration for lifelong learning, they will need to be highly committed and motivated. Leadership, by virtue of the requirement to lead, is a role where motivation is assumed. But the challenges of implementing lifelong learning for all through the development of human capability and enabled by powerful AI may very well require leaders to have a deeper level and understanding of motivation both for themselves and for those they lead. Fortunately, the research can be of assistance which leads to the fourth construct of the conceptual framework of this study.

The Theory of Self-Determination as a Leadership Support

Self-determination theory (SDT), a highly influential theoretical framework with much attendant research (Vallerand et al., 2008), explores forms of motivation. In this theoretical framework, autonomous motivation or “acting with a full sense of volition, endorsement, and choice” (Ryan & Deci, 2024, p. 1) is on one end of the spectrum and controlled motivation or “feeling externally pressured or compelled to behave whether by the promise of a contingent reward, fear of punishment, ego involvement, or other external factors” (Ryan & Deci, 2024, p.1) is on the other end. Media headlines about AI or the emergence of AI policy development in education may act as extrinsic motivation

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for leaders to learn more, to adapt practices and beliefs, and to lead others to do the same. But such motivation may be short-lived. According to SDT, extrinsic motivation is the least autonomous type of motivation (Ryan & Deci, 2024, p. 3). Rather, the goal must be to have leaders internalize and personally identify the need for education to change in the face of the new global agenda for LLL for all through the development of human capability and to involve themselves actively to help realize the potential of using AI in positive ways to enable those changes.

Deci, Koestner, and Ryan's (1999) meta-analysis of 128 studies examines the effects of extrinsic rewards on internal motivation (p. 627). They find that deadlines or close supervision will diminish people's intrinsic motivation for an activity while intrinsic motivation benefits from "supports for autonomy and competence for motivated persistence" (p. 659). Hundreds of studies of SDT illustrate that autonomously motivated people "display higher interest, excitement, vitality, and confidence, resulting in better performance, creativity, persistence, and overall well-being" (Ryan & Deci, 2024, p. 1). The research literature on SDT points out that people, educational leaders included, are naturally inclined to act, engaging in activities that interest them without waiting to be invited or directed to do so. SDT tells us that people's natural inclination to act is not about satisfying needs but about doing what people find interesting or important (Deci & Ryan, 2000, p. 229). That is, people, including educational leaders, take such action when they are intrinsically motivated. To extrapolate, educational leaders who believe that support of improved human capability development through lifelong learning for all is the most important goal of education today, and who believe that AI can be a useful ally in that quest, may seek to influence how AI is designed, developed and implemented

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for learning. SDT tells us that whether they do so will depend on whether they feel competent, believe they are acting in self-determined ways, and feel supported.

One of the most significant contributions that SDT makes to understanding autonomous motivation is the empirical identification of three conditions under which people are more autonomously motivated. That is, “competence, autonomy, and relatedness---which when satisfied promote autonomous motivation, wellness, and effective performance” (Deci, Olafsen, & Ryan, 2017, p. 39). That is, SDT shows us that educational leaders are likely to feel greater motivation, and function and perform at a higher level, if they have some degree of control with respect to how AI is designed, developed, and implemented in educational institutions (Ryan & Deci, 2000, p. 229). The opposite then must also be true. If the implementation of AI in education is driven by others, such as commercial parties, or is heavily regulated and directed by government, or is overchallenging in its complexity, even the most empathetic and talented of educational leaders may withdraw their concern for others, as the new universal mandate for educational change requires, and focus only on themselves and their schools or institutions (Deci & Ryan, 2000, p. 229). Ryan, Robinson and Hausmann (2004) also found that groups are influential in shaping individuals' beliefs. Specifically, employees such as teachers, faculty and support staff are likely to feel greater satisfaction if their leader takes a genuine interest in their well-being (Niemic et al., 2009). Educational leaders not only value their relationships with their staff and faculty, but they often have strong relationships with fellow leaders whom they trust (Tschannen-Moran, 2014). How might educational leaders benefit from working with their positional peers to find the motivation to pursue such a challenging agenda for educational change empowered by

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AI? Does SDT help us see the value of those relationships as motivational support?

Leaders may adopt avoidance behaviours if no practical approaches readily present themselves concerning how to co-manage the development and implementation of AI for the improvement of educational equity. They may wish to avoid the fallout that will inevitably occur when the traditional structures and paradigms of education are reimagined and redesigned in face of a new global agenda for change. The goal must be to have educational leaders become autonomously motivated to pursue this urgent work. Understanding how and why leaders' motivation might be impacted is the contribution of SDT to this study.

Although historically there has been a lack of research on how SDT connects to educational leadership (Eyal & Roth 2011), Kaur and Noman (2020) aim to begin to address that research gap. Their study examines how leaders in collectivist school settings can benefit from SDT in their leadership practices. Similarly, Hocine and Zhang (2014) introduce autonomy-supportive leadership, a framework for understanding effective leadership through SDT (p. 135). The authors claim that empirical evidence shows that autonomy support is “a model that could contribute to overcoming many of the leadership challenges faced by today's leaders” (p. 143). These scholars fall short of identifying what specifically that support might be for leaders, and whether they are referring to their own empirical evidence or the research of others (i.e., SDT). Tafvelin et al.'s 2019 mixed methods research study identifies important factors to be considered in implementing need supportive leadership development. They find that such training succeeds when individualization and program flexibility are considered first through a focus on leaders' personal goals, needs, and congruence of these with the training

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program (p. 10). Such mixed methods research illustrates the importance of autonomy, coherence, and relatedness, to leadership, the three key elements of SDT.

This paper has been referencing all K-20 educational leaders in publicly funded institutions regardless of where these leaders do their work. One of the criticisms of SDT is that it is based on a Western perspective of autonomy reflective of individualistic cultures (Iyengar & Lepper, 1999). However, Chirkov et al.'s (2003) study of 559 participants from four distinct cultures refutes that criticism by saying that the concept of autonomy as presented by SDT is not being used in the sense of individualism or detachment but rather as representative of volition or choice.

In summary, the fourth construct of this study's conceptual framework considers the motivation of leaders to take action to help realize greater equity of opportunity for LLL for all as enabled by AI. The research literature provides much depth with respect to understanding the theoretical framework of SDT. From this literature three elements emerge for consideration in this study: the leaders' feelings of competence, autonomy, and relatedness. Understanding of SDT provides potential support for educational leaders' own understanding of their motivation for action as well as for understanding the motivations of those they lead. That is, if these leaders wish to involve themselves deeply in addressing the challenges that AI presents to educational paradigms and structures and seek to shape AI as an ally in support of lifelong learning for all, then SDT explains that basic psychological needs for competence, autonomy, and relatedness must be met (Ryan & Deci, 2000, p. 227). Meeting these needs is considered essential (p. 228). If the introduction of AI into K-20 public education makes leaders or those they lead feel incompetent, isolated or non-autonomous, then they very well may struggle to

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successfully lead the integration of AI for the betterment of human capability worldwide. Recognizing the need to lead their institutions to act locally with respect to the pursuit of a global mandate for educational change and realizing the potential of AI to be a potential ally in that change, the assumption is easily made that educational leaders will want to get involved. They will want to act. However, understanding of self-determination theory becomes a potential support for leadership in helping understand why some educational leaders may be willing to act when others may not and what conditions might need to change to make that happen.

When leaders do take such action, they may wonder what the right thing to do might be. Thus, the next and final construct in this conceptual framework follows naturally.

The Theory of Moral Intelligence as a Leadership Support

The design, development, and implementation of AI for greater educational equity is a complex undertaking. One of the reasons for this is that “[a]ny shortcomings in humanity will transfer to shortcomings in artificial intelligence” (Tuggle, 2021, p. 33). The “shortcomings” in the use of AI that have caused the most global alarm to date have been ethical ones. Ashok et al.’s (2022) study summarizes some of the recent examples, including:

[T]he unjust acquisition of millions of Facebook users’ data by Cambridge Analytica (Venturini & Rogers, 2019); use of social media and Twitter bots to influence votes outcome in Brexit and the 2016 US presidential elections (Gorodnichenko et al., 2021); impact of misinformation and fake news, aggravated by the use of social media, on violence, lynching, riots in India (Khan et al., 2019); an explosion of cybercrime related to data hacking and breaches,

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affecting millions of consumers (personal, payment, behavioural data) (Janakiraman et al., 2018); bias against certain groups of gender, ethnicity, race, etc. by facial analysis software and algorithms (Khalil et al., 2020); gender based discrimination (by algorithms) in the online display of STEM career advertisements (Lambrecht & Tucker, 2019); and, use of cryptocurrency in fraud and malware (Conti et al., 2018). (Ashok et al., 2022, pp. 2-3)

In addition, the ethics of using AI also include an examination of the sustainability costs. Large Language Models' (LLMs) computational power consumes significant energy, and the powerful hardware requires cooling which consumes energy. The quiet shift to Frugal AI that is happening, with the emergence of sophisticated offline LLMs has a potential for use in education where issues of sustainability, privacy, equity, and the digital divide are prevalent. For example, an indigenous-led AI non-profit in Canada is developing container-sized modular data centres on indigenous lands in Canada. These smaller scale infrastructures are designed to be more ecologically sound and governed according to the principles of sovereign land, sovereign data, and sovereign governance (Nadlii, 2025). Open source LLMs, like other open-source software, are licensed to be used and modified freely, while deployed on the private infrastructure of a school or HE institution. For example, when using Anything LLM, nothing is shared unless the user permits it. The implications of Frugal AI for developing nations are significant. No longer is it necessary to have significant cloud computing budgets or reliable high-speed internet to have access to data-secure AI. However, at present the need for investment in hardware remains. Advocacy for user control, decreased energy costs, the challenges of digital sovereignty and privacy protection, and the transparency affordances may mean

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local installations may represent a significant turning point in the search for greater equity of opportunity for lifelong learning for all. Such innovations are made in response to the need for diligent attention to the potential for ethical misuses of AI.

A recent paper by researchers and practitioners from Africa identifies the high-risk profile of the continent with respect to the ethical challenges presented by AI including the “deep-fake-fuelled electoral interference and data colonial dependency...to disproportionate exposure to climate-driven environmental costs” (Segun et al., 2025, p. 1). As a result, the authors call for a five-part AI Safety action plan. AI safety has been identified as a field of research “dedicated to ensuring that AI systems behave safely and reliably, with minimal risk of unintended consequences or harm to humanity” (Baldrige et al, 2024). Using AI in education is not a simplistic, harm-free, bias-free, risk-free endeavour. In fact, it is quite the opposite. As a result of the real and potential misuse of AI applications, calls have arisen globally for a worldwide commitment to ethical guidelines in the design and development of AI (Ashok et al., 2022, p. 22). Nemorin et al. (2023) identify “regulations” as the answer to “repairing the already damaged public perception while ensuring greater oversight over tech giants in a culturally acceptable form” (p. 47). However, the research is mixed on the value of providing ethical regulations to control behaviour.

The literature reveals that ethical guidelines concerning AI, which have become increasingly more common, have not actually had an impact on human decision-making in the field of AI and machine learning (Hagendorff, 2020, p. 99). McNamara et al. (2018) studied 105 software engineering students and 63 professional software developers to see if explicitly instructing them to consider ethical guidelines in their

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programming resulted in different behaviours. It did not (p. 4). Similarly, Pink's (2015) analysis of policies shows that corporate ethical guidelines do not improve ethical behavior. Hagendorff (2020) warns against the risk that ethical guidelines and regulations may calm the criticism coming from the public "while simultaneously the criticized practices are maintained within the organization" (Hagendorff, 2020, pp. 99-100). Levinson et al. (2022) point out that no algorithm can determine which "values or aims to prioritize, nor what distinctions will be most important when assessing educational equity in a particular context" (p. 10) while some say we are missing a moral framework entirely when it comes to evaluating AI practices (Dubber et al., 2020, p. 163).

Other researchers have deconstructed the elements of these ethical issues in hopes of greater recognition of why they pose such risks. Ashok et al.'s (2022) systematic literature review of the ethical use of AI identifies 14 areas of ethical implication in AI development with intelligibility, accountability, fairness, autonomy and privacy being most often discussed in the literature (p. 1), while Dieterle et al.'s (2024) review of the literature on the ethical effects of algorithms identifies five ethical divides (algorithmic, interpretation, representation, access, citizenship), which together perpetuate the structural biases that exist in teaching and learning (p. 633). Dieterle et al.'s (2024) study highlights the necessity of educational leaders understanding what these divides are so they can prepare themselves to act. Their study models the ethical questions that must be asked by educational leadership of those designing the algorithms that will inform teaching and learning, including issues of representation and bias in data and the lack of educator training to ethically interpret data. These researchers ask if it is ethical that "without intervention, each cohort of learners is poised to perpetuate structural stigmas

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associated with access, achievement, identity, and power and thereby preserve the trends of the past, with some subgroups unduly benefiting and others not?" (Dieterle et al., 2024, pp. 635-638). But if ethical missteps, guidelines, and question modelling, as well as the highlighting of various ethical implications do not bring about the behaviours they are intended to, that is, the consistent adoption of and adherence to ethical standards and behaviour, what will? What, specifically, does the literature identify that may support educational leaders' ethical decision-making as they seek to influence the development and implementation of AI for greater educational equity?

In 2018, Floridi and his expert colleagues responded to that question as they sought to influence the development and implementation of AI for greater educational equity. Their seminal work advocates for a collective vision of AI that precedes development and highlights what ought to be done to create a "Good AI Society" (Floridi et al., 2018, p. 689). They argue that there are four opportunities provided by AI which should not be squandered (p. 690). These opportunities are highly reflective of human capability development for a lifetime and the creation of a "good" society:

They are four because they address the four fundamental points in the understanding of human dignity and flourishing: who we can become (autonomous self-realisation); what we can do (human agency); what we can achieve (individual and societal capabilities); and how we can interact with each other and the world (societal cohesion). In each case, AI can be used to foster human nature and its potentialities, thus creating opportunities; underused, thus creating opportunity costs; or over-used and misused, thus creating risks. (Floridi et al., 2018, p. 690)

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Despite the practical challenges of pausing design and development of AI as Floridi et al. (2018) request, their guidance does succeed in aiming “to nudge the tiller in the direction of ethically and socially preferable outcomes from the development, design and deployment of AI technologies” (p. 706). Unfortunately, Floridi et al. (2018) stop short of identifying the moral intelligence of educational leadership as essential in the realization of what ought to be done.

Iqbal and Piwowar-Sulej, (2022) study the impact of educational leadership on social innovation. This mixed methods study focuses on sustainable leadership in primary education where people’s ability to successfully adapt to a complex world is seen as a fundamental leadership responsibility. 385 teacher respondents completed the questionnaire, and 20 semi structured interviews were conducted with school principals. The study found that school principals who exhibit sustainability behaviours, that is, who are sensitive to the demands and requirements of the current environment and social responsibilities base their work on a moral purpose (p. 720).

Shapiro and Stefkovich (2021) identify that at its core leadership is an exercise in solving moral dilemmas (p. 15). They propose that leaders “try out” different ethical paradigms including the ethics of justice (e.g., fairness, equity, due process, and responsibility for the common good), the ethics of care (e.g., empathy, compassion, and treating people as ends but not means), the ethics of critique (e.g., moral concerns over institutionalized injustice that disproportionately benefit some groups over others as a result of political, economic, and judicial power shaped by history), the ethics of community (e.g., taking into consideration the values, beliefs, history, and desire of the community), and the ethics of profession (e.g., professional practices and standards)

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(Shapiro & Stefkovich, 2021). However, as the literature reveals, there is a difference between “trying out” different ethical paradigms and the underlying value of well-developed moral intelligence.

Kohlberg's (1981) seminal research demonstrates that ethical behaviour is determined by a person's moral reasoning. The more advanced the stages of a person's moral judgement, the more superior their moral decisions. Gilligan (1983) builds on Kohlberg's (1981) work by highlighting the importance of a person's relationship with other human beings when it comes to moral judgment. In the case of the educational leader, that would certainly refer to students, not only in one's own institution but more globally. Gilligan supports the development of human capability through lifelong learning for all through ethical action supported by moral judgment. She reinforces the need to see others as different from oneself, existing legitimately in their own right. (Blum, 1978, pp. 473-475).

Fullan (2003) extends these notions of the value of the leader's moral reasoning and decision-making to include the moral imperative of school principals to act to affect significant change. Although written more than 20 years ago, Fullan is convinced of the need for large-scale, sustainable reform, and system transformation. He argues that unless the conditions surrounding the leader's role are changed, including how one educational institution relates to another, the moral purpose of educational leadership cannot be pursued (p. xiv). The imperative of education and its leadership to act globally to affect change is reinforced by this scholarship.

Yinying Wang (2021)'s research cites the lurking biases and the lack of moral emotions in AI programs. Wang (2021) does not see AI as a substitute for an educational

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leader's moral decision-making. Rather, Wang (2021) acknowledges the “fog of uncertainty” in which school leaders do their work and how they must rely on their moral values to guide them which is quite different from how AI decides. School leaders ask, “What is the right thing to do?” AI programs, on the other hand, ask, “Based on the patterns in data and the probability of options, what are [sic] the 15 most appropriate next actions [sic]?” (Wang, 2021, pp. 12-15).

As mentioned in Chapter One, more recent research has shown that morality is dynamic and malleable. It can be taught, practiced, and developed (Bazerman & Gino, 2012, p. 13) and it can have a positive effect on strategic leadership (Fadhil et al., 2021, p. 76), principled leadership, and trust in leadership (Engelbrecht & Hendrikz, 2020, p. 6). In short, an educational leader's ethical decision-making with respect to AI as an ally in educational reform may be more successful with a well-developed set of moral foundational skills.

Although scholars like Kohlberg (1994), Gilligan (1983), Fullan (2003), Wang (2023), and others have referenced the attributes of moral intelligence, none of them use this terminology. Rather, Lennick and Keil (2005) are credited as being the first to combine these elements of moral reasoning, moral judgement, moral decision-making, moral values and so on into one theory. Despite being written from the perspective of commerce and the potential return on investment that moral intelligence might bring to business leaders, their concept has echoes of Gilligan's (1983) work and of Borba's (2001) seven virtues of empathy, conscience, self-control, respect, kindness, tolerance and fairness. Lennick and Keil's (2005) definition of moral intelligence makes it unique

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from cognitive, technical, and emotional intelligence, all of which may be intelligence that AI does now or eventually will employ:

Moral intelligence is our mental capacity to determine how universal human principles (such as integrity, responsibility, compassion, and forgiveness—universal human principles that cut across the globe and are not gender, ethnic, culture, or religion specific) should be applied to our personal values, goals, and actions. (Lennick and Keil, 2006, p. 13)

Tanner & Christen (2013) build upon Lennick and Kiel's (2005) moral intelligence for leadership by explaining the processes and mechanisms that individuals employ when acting in morally intelligent ways (p. 121). Tanner & Christen's (2013) framework uses a series of five elements and four competencies to illustrate that morally intelligent leaders have a moral compass, or a reference system, containing their existing or newly formulated moral standards, values or convictions. Such a moral compass provides the basis for moral evaluation and regulation (p. 127). This moral compass, in combination with basic moral competencies such as moral commitment, moral sensitivity, moral problem solving, and moral assertiveness, form Tanner & Christen's (2013) framework that leaders might employ when learning the skills of moral intelligence.

The framework identifies the importance of moral courage. Moral courage is defined as persistently pursuing morally valuable goals despite encountering risks and opposition (Morales-Sánchez & Cabello-Medina, 2013; Peterson & Seligman, 2004; Sekerka & Bagozzi, 2007). Tanner and Witt (2023) developed a moral courage scale to validate and explore its diverse manifestations such as taking responsibility for one's mistakes or actively pursuing innovative ideas (p. 15). Using 25 specific workplace scenarios (p. 9)

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and involving more than 900 participants (p. 8), their study makes clear that moral courage manifests itself in many ways and can promote ethical behaviour (p. 15).

Despite the theory of moral intelligence being well researched in the literature, it is not apparent whether educational leaders are familiar with the theory of moral intelligence including moral courage to act in the face of global agenda for change enabled by AI or whether greater understanding might act as a leadership support. If leaders need more convincing of the value of moral intelligence to ethical behaviour in this challenging time, then the literature provides convincing evidence.

Aras's (2022) work is thought to be the first quantitative study examining the effects of moral intelligence on ethical leadership behavior among academic leaders (p. 3311). The study explores the relationship between ethical behaviours of leaders and moral intelligence levels and determines that a strong relationship exists (p. 3309). That is, the study explores whether educational leaders are more likely to engage in ethical behaviour if their moral intelligence is high. The study reveals that a relationship does exist between consistent ethical behaviour by leaders and high moral intelligence (p. 3321). This study is significant because it tells us that it is worth ensuring that leaders have the moral intelligence needed to make ethical decisions regarding the development and implementation of AI for greater equity for all.

In summary, before acting on what is right, that is, before engaging in ethical decision-making and ethical behaviour themselves, educational leaders must first recognize when a moral issue is at stake. The fifth and final construct of this study's conceptual framework then is that of moral intelligence (Gilligan, 1983; Kohlberg, 1981; Kohlberg, 1994). The two elements of moral intelligence theory that are important to this

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study are the relationship between moral intelligence and ethical behaviour and the relationship between moral intelligence and moral competencies such as moral evaluation and moral regulation. Leaders are expected, by virtue of their formal role, to act ethically. The literature has shown that more is needed than ethical regulations and guidelines to ensure ethical behaviour (Hagendorff, 2020; McNamara et al., 2018; Pink, 2015). Given the potentially consequential nature of what leadership allied with AI might be able to accomplish, including the pursuit of human capability development through lifelong learning for all, then a greater understanding of moral intelligence and what it involves may be a worthwhile leadership support. A suitable comparison might be the quest to preserve world peace. Some leaders may find it hard to gather the moral resources to do so: “Even when modern democratic countries have the material resources to do what is needed to keep the peace, they find it hard to rally the spiritual resources that are at least as necessary” (Kagan, 1996, p. 572). The literature on moral intelligence and the significance of it, along with useful theoretical frameworks to help leaders practice ethical decision-making based on moral intelligence, becomes an additional, potentially worthwhile, leadership support.

Summary of What is Known and Unknown About the Thesis Topic

This review of the literature chronicles how the priorities of lifelong learning changed over time. Lifelong learning was originally synonymous with adult education (Elfert, 2018) but was expanded in its outlook by the influential writings of world organizations (Niemann et al., 2022, p. 193), as well as research scholars (Biesta, 2012a; Billett, 2013; Nuisl & Przybylska; 2016). But, as the literature reveals, by the 1990s human capacity development, as it relates to national economic needs, was viewed as more essential

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(OECD, 1997, p. 13). With the introduction of the SDGs (UNESCO, 2015) and their emphasis on global sustainability, the two priorities of lifelong learning are joined in a newly meaningful way. Lifelong learning becomes the means for achieving such a globally imperative agenda. However, the literature also illustrates that achievement of these worthy education goals cannot be oversimplified. For if these goals are ever to be achieved, they must be accompanied by changes in the traditional structures and paradigms of education (Collins, 2012; Elfert, 2024; Mochizuki et al., 2022; Torres, 2011).

Scholars use Sen's human capability theory (1984-1985) to argue that today's vision for lifelong learning for all is best illustrated through human capability development (Arar, 2021; Poquet & Laat, 2021; Rubenson, 2019) and researchers provide some samples of frameworks for doing so (Boyadjieva & Ilieva-Trichkova, 2018). Others consider the individual capabilities that will be most essential to develop in a world infused with AI (Markauskaite et al., 2022). However, such an ambitious agenda for the reimagining of education expects much of educational leadership which makes a worthy ally or alliance potentially beneficial. AI's capacity to change the essence of learning, identifies it as a leadership ally (Poquet & Laat, 2021). However, without the direct involvement of educational leadership, the use of AI in education may become an end unto itself.

The literature actively traces how AI is being used in education. Scholars do see this as a significant moment in how AI and lifelong learning will be framed, but studies do not cite educational leaders as part of the necessary collaborative mix of stakeholder expertise. Ironically, the historic development of AI was by educational leaders who first

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viewed AI as a tool for thinking about human learning (Doroudi, 2024). If educational leadership were to re-engage in actively leading the design and development of AI, the literature does provide frameworks for what questions educational leaders should ask about how AI applications for education are designed (Carvalho et al., 2022; Dwivedi et al., 2021).

The literature illustrates that this failure to recognize the value of the active role of educational leadership in the development and implementation of AI has had consequences. AI applications for education are being built by computer scientists in separate siloes (Bates et al., 2020). The literature also reveals that the usefulness of AI educational applications was recorded primarily in position papers and not empirical studies while the challenges and achievements of AI development to date are primarily researched and reported in computer science journals, and marketed to education by commercial vendors (Chen, Xie, Zou, & Hwang, 2020). Further, the separation of development into silos, and the absence of a more global perspective for development, may result in unnecessary fragmentation (Baker, 2021). The role and perspective of the educational leader who understands the value of empirical educational research and the necessity to implement technology innovations cohesively is decidedly absent in the reporting of this progress. As a result, AI applications are not reconceiving learning as much as they are providing support for the existing functions and paradigms of K-20 education (Bates et al., 2020).

Studies can be found in the literature that propose what AI might be taught to do if educational leadership were to work more closely with AI designers and developers (Gibson et al., 2023). Such frameworks can be categorized (Goksel and Bozkurt; 2019;

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Lucking et al., 2016; Zawacki-Richter et al. 2019). The literature does ask whose responsibility it is to get the “agenda right” for AI in education for the greater good (Nemorin et al., 2023) but the question largely remains unanswered.

Educational leaders can play a new role in the development of significant technology for global sustainability and, in so doing, they can ask new questions about the design and development process, but they must understand something of the domains of research currently underway (Dwivedi et al., 2021, pp. 9-10). The literature does not indicate whether leaders of educational institutions are asking these questions or whether they are acquiring knowledge of the domain-specific research agenda and its challenges and opportunities.

Such knowledge-seeking requires leaders who are motivated to do so. Self-determination theory (SDT) explains why some leaders may be motivated to involve themselves actively in the universal mandate for change and in working to ensure AI is an appropriate ally in that quest. SDT explains that if educational leaders are to function coherently, if they wish to involve themselves deeply in this profound educational challenge and seek to shape AI as an ally in support of lifelong learning for all, then basic psychological needs for competence, autonomy, and relatedness must be met (Ryan & Deci, 2000, p.227). Studies show that this is true regardless of cultural orientation towards autonomy (Chirkov et al., 2003). Although SDT explores the value of partner relationships in general (Ryan & Deci, 2024), the literature does not explore how educational leaders may benefit from working with their positional peers to find the motivation to pursue such a challenging agenda for educational change.

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Finally, leaders may be reluctant to involve themselves directly in the co-design of AI for more effective teaching and learning because of what the literature reveals as AI ethical missteps. These missteps are well documented (Ashok et al., 2022). As a result of such misuse of AI applications, calls have arisen globally for a worldwide commitment to ethical guidelines in the design and development of AI (Ashok et al., 2022, p. 22). Researchers have categorized the kinds of ethical risks that are occurring (Ashok et al., 2022) and the ethical effects they have (Dieterle et al., 2024). But if poor ethical decision-making is to be avoided, studies show that ethical guidelines alone are inadequate (McNamara et al., 2018; Pink, 2015). Leaders will need more support if they are to help ensure the development and implementation of AI does not result in a series of further missteps.

The literature has already shown educational leadership to be a moral exercise (Shapiro & Stefkovich, 2021), so a role for moral intelligence to support ethical decision-making is apparent. Aras's (2022) study confirms that there is a significant relationship between the ethical leadership behavior of academic leaders and moral intelligence. Scholars like Kohlberg (1981, 1994), Gilligan (1983), Fullan (2003), and Wang (2021) reference the attributes of moral intelligence, and Lennick and Keil (2005) define what it is. However, it is frameworks like Tanner and Christen's (2013) that potentially provide a resource that can be used by educational leaders if they want to understand more deeply whether their ethical decision-making is firmly grounded in their own moral intelligence. The literature does not explore whether or how educational leaders might employ such a framework for decision-making. Further research is needed to understand what learning and development programs might be beneficial for educational leaders and how that

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might “contribute to building resilient leadership capabilities” (Valle-Cruz et al., 2024, p. 804) for the sustainability agenda.

This literature review is unique in that it has explored a set of constructs that may not typically be combined into a conceptual framework of support for educational leadership. The set of constructs includes three theoretical frameworks and two relevant concepts reflective of today's leadership environment. These constructs are explored individually and shown to be connected to one another to illustrate how such a conceptual framework illuminates the complex layers of this study's research questions. However, most significantly, these concepts are used in this study to discover what these concepts mean to K-20 leaders in charge of educational institutions, how these individuals make this complex agenda for change meaningful for themselves and those they lead, and whether these concepts may act as support in doing so.

Contribution to the Research Literature

This study seeks to contribute to the literature by understanding whether the leaders of publicly funded K-20 educational institutions are or are preparing to become involved in the design and development of AI to promote greater equity of opportunity for all in the pursuit of lifelong learning. Specifically, this literature review identifies what supports leadership might find beneficial to do so.

This literature review began by showing that reconceived lifelong learning is the educational agenda for the 21st century and such a far reaching and ambitious agenda for the world begs for leadership. This literature review considers five constructs that might act as potential support for leaders in tackling this agenda. These five constructs are naturally connected to one another as shown in the literature review. This approach to

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today's educational leadership that is facing enormous challenges is unique for the four reasons described below.

First, traditionally studies of educational leadership and change examine theories of leadership. For example, Hallinger's (2003) seminal work considers instructional and transformational leadership of school principals when leading change. Hallinger concludes that the external environment and local context of a school affect the leader's ability to sustain a particular leadership model (p. 329) while Bryman's (2007) study examines what forms of leadership are most effective in higher education. Amanchukwu et al.'s (2015) article concludes that "success is certain if the application of the leadership styles, principles and methods is properly and fully applied" (p. 6). This literature review does not examine leadership styles, characteristics, or methods in the face of change; rather, it examines the literature on five specific constructs, the connections between them and how together they might support leadership K-12, five constructs that were chosen for their interconnectedness and for their relevancy to the challenge presented to educational leadership in this unique moment in time. Further, this study has both an intellectual and a practical focus. It aims to give something for leaders to think about as well as something for leaders to do. All five constructs examined in the literature review provide potential for both.

Second, oftentimes, educational leadership studies are undertaken by division. For example, Fullan's (2007) influential work on leading educational change focuses on K-12. While studies like Filho et al.'s (2020) consider the essential characteristics of sustainability leadership in higher education. Although such studies of leadership choose to prioritize one division over another, this literature review makes a different

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contribution to the literature. By focusing on constructs as opposed to divisions, this literature review prioritizes the potential value of the support over the division in which the leader does their work.

Just as this literature review is not about leadership style and it is also not about leadership for change in just one educational division, this literature review is also unique in its treatment of the five constructs of this study. The five constructs have already been examined in the research literature, as this review points out. But these studies usually treat these five constructs discreetly and they may or may not connect educational leadership with the construct. For example, hundreds of studies exist about self-determination theory (SDT) as a theoretical construct but studies of educational leadership and SDT are much rarer, let alone studies of educational leadership in this unique moment in time and how SDT may be of benefit. Similarly, although the need for engaged stakeholders to guide the design and implementation of AI is often identified in the research literature, rarely do such studies identify educational leaders as key stakeholders. This literature review is unique in identifying that gap. Therefore, a third contribution of this literature review comes from the combination of constructs and their connectedness to educational leadership today.

Finally, by focusing on the most current perspectives of each construct of this literature review and today's key elements of each, the hope is that understanding will be enabled for leaders about why this moment in educational history is unique. That is, the concept of lifelong learning today embraces human capability development after much time emphasizing the development of human capacity through lifelong learning. Understanding of human capability development enriches understanding of lifelong

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learning for all and vice versa. Similarly, AI is presented in this literature review as a co-worker and ally, that, with the active involvement of educational leadership, changes what is meant by what we can know and do in education. AI is also explored in the literature review for its potential to achieve greater equity of opportunity for lifelong learning for all, and as the enabler of new theories of learning reflective of an AI age. The literature review has highlighted these three elements of AI as a means of connecting to the previous two concepts of lifelong learning for all and human capability development while making the case for active, senior leadership involvement. As this literature review reveals, this is not the historic approach to examining AI but is a current perspective that would potentially benefit leaders in this global challenge. Further, this literature review considers that educational leaders may not be motivated to act and so drills deeper into the construct of SDT to consider why. Finally, motivation to act is considered through the construct of moral intelligence. Faced with a world with pervasive AI and a global challenge to consider more than the learners in one's school, requires ethical leadership behaviour. This literature review highlights the relationship between ethical behaviour and moral intelligence and the necessity of moral courage because the context in which leaders work today requires understanding of both. The relevance of the constructs to today's educational context is solidified through the identification of some of the key elements of each construct which is the fourth contribution of this literature review.

In summary, this literature review is unique for four reasons: This study is not concerned with which leadership theory might be employed at this significant moment in time but, rather, what understanding and support might help leaders to act. Nor does this

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literature review examine educational leadership discretely by division which is another traditional approach. Instead, this literature review focuses on five constructs that are interconnected. The five constructs have been chosen for their potential to support leaders to reflect and to act locally regardless of division. Lastly, this literature review is unique because it highlights which elements of the constructs are essential to understand in today's educational milieu. These four reasons in combination make a unique contribution to the research.

This study considers the fact that a universal challenge has presented itself to educational leadership across all divisions in a time in history when contextual challenges to education are already both common and significant. This study identifies that universal challenge as the improvement of equity of opportunity for lifelong learning for all. This global challenge is not inconsequential. It is seen as the potential solution to global threats to our planet's sustainability. This study identifies AI as an educational leadership ally in the search for solutions. This study contributes by identifying a framework of constructs that when fully understood may act as support in leaders' quest for success. Which constructs may be of greatest support may very well depend on leaders' current level of understanding of lifelong learning for all and of AI-enabled learning. This study will seek to find out about leaders' understanding of both lifelong learning for all AI-enabled learning, whether they are already or planning to act, and what support might be of most benefit in doing so.

This study contributes to the literature by showing that without the proper involvement of educational leaders in the design, development, and implementation of AI in education, the risk is that AI becomes an end unto itself reinforcing old paradigms,

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structures, and approaches to education and, thereby, failing to realize the grand challenge of lifelong learning for all through the development of human capability. Such existing paradigms, structures, and approaches to the delivery of education may also include educational leadership itself as it has come to be known. As a result, there is an urgency to the challenge of preparing educational leaders to act locally which this literature review emphasizes. Empowering leadership is not a new idea. Identifying five specific leadership supports to do new things is. To that end this is not just a study about leadership preparedness, it is also a study for leadership preparedness. Drucker (2018) famously said that leadership is the quality of examining work to ensure that effort is not placed where there are no results. This study helps to ensure that the effort of educational leaders in this remarkable age of AI is not wrongly placed.

Chapter 3. Methodology

This chapter begins by reviewing the research questions as they have driven the methodology of this project. An overview of the research outcomes of this study is then provided followed by a description of the methodology. As part of the methodology discussion, ontological and epistemological perspectives underlying this study are outlined. Finally, the research design is described in detail.

Research Questions and Outcomes

This study sought to determine how leaders are making sense of the further integration of Artificial Intelligence (AI) into their school/institution and education more generally and whether they saw or have undertaken a role for AI as an ally in their local pursuit of the global mandate to foster greater educational equity in the local pursuit of lifelong learning for all. The main questions of this research study were:

- What do educational leaders K-20 see as the benefits/risks, opportunities/challenges of AI as a means for achieving greater equity for all in the pursuit of lifelong learning?
- What is the current level of expertise of educational leaders K-20 with respect to AI and what training/education is needed to implement AI in support of lifelong learning for all?
- How will specific supports help educational leaders K-20 to realize this universal mandate for change?

The outcomes of the study fall naturally from the research questions with one set of outcomes being practical and the other intellectual (Cohen et al., 2018, p. 304). That is,

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on a practical level this project aimed to affect or transform the action of educational leaders for how they guide the deployment of AI for lifelong learning. Greene and Caracelli (1997) call this the “transformation dimension” of research. In addition, the study was designed to influence the thinking of leadership by identifying the supports that leaders may use to engage more actively in the design and implementation of AI-powered education for lifelong learning. Therefore, this study was designed to produce both practical and intellectual outcomes through influencing leadership activity as well as thinking.

In answering the research questions, collective knowledge has been created about what educational leaders currently think about the role of AI in education generally and in the pursuit of lifelong learning more specifically. Collective knowledge was created by asking educational leaders to identify their current understanding of AI and how their skills and understanding might be improved. Finally, collective knowledge was identified about what supports leaders might rely upon to engage more actively themselves and with those they lead in the design and implementation of AI-powered education for lifelong learning. In other words, it is the collective picture that this study has sought and that is considered most helpful. The creation of such collective knowledge matters because it is from such collective knowledge that reflection by individual leaders may be enabled. The value of reflection is that it leads to a sense of agency. “How can actors change institutions if their actions, intentions, and rationality are all conditioned by the very institution they wish to change?” (Holm, 1995, p. 398). In the case of this study, these “actors” are the school and institution’s leaders, and they can change their schools

and institutions through their own willingness to reflect and to act. It is such willingness that leads to the activity that will drive change (Seo & Creed, 2002).

Methodology Description

The questions of this study ask “what” and “how.” Therefore, this study employed Mixed Methods Research (MMR) as its methodology. MMR is defined as a method of research in which data is gathered and analyzed using both quantitative and qualitative approaches or methods in a single study (Clark & Ivankova, 2015, p. 4). MMR relies on both numeric and narrative approaches (Cohen et al., 2018, p. 35). For the purposes of this study, answers to the “what” research questions were captured through numeric approaches that were quantified and the “how” research question were captured through narrative approaches. “MMR recognizes, and works with, the fact that the world is not exclusively quantitative or qualitative; it is not an either/or world, but a mixed world” (Cohen et al., 2018, p. 31). Identified as the third methodological approach, MMR arose in response to what were identified as limitations of the first two methodological approaches: purely quantitative or qualitative research. That is, MMR is a response to what is now seen “as the false dichotomy that had been set up in the literature between positivists and non-positivists” (Doyle et al., 2009, p. 175). The distinctions between positivists, or those who wish to identify the universal laws and objective structures, and non-positivists, who prioritize contextual validity, are no longer as stark as they were once believed to be.

The essential characteristics and practices of MMR have been identified in the work of scholars such as Creswell (2003), Creswell and Plano-Clark (2007), Creswell and Tashakkori (2007) and others. As these scholars point out, MMR is not only about

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mixing methods of inquiry but also employing different paradigms or approaches to systematic inquiry in the same study (Mertens, 2012, p. 10). In MMR these different paradigms or approaches work together to solve a research problem (Cohen et al., 2018, p. 37). Therefore, for some scholars, MMR is less about the methods and more about the philosophical assumptions of a study's researcher and how these may be different for the quantitative data gathering and the qualitative data gathering (Creswell & Tashakkori, 2007, p. 306). These philosophical perspectives are important because they affect the choices that a researcher makes.

Underlying Perspectives of this Study

MMR is based on an ontology that recognizes that the subjects being examined are complex by nature such that a single methods approach might create incomplete understanding (Cohen et al., 2018, p. 175) which is also the underlying assumption of this study. In this study the subjects were educational leaders of schools and post-secondary institutions. As was identified in Chapter One, educational leaders have a complex and challenging set of responsibilities and pressures from local and global contexts. It is these individuals' perspectives about AI and its potential to act as an ally in the quest for greater equity for lifelong learning for all that was being sought in this study. AI and lifelong learning are also complex topics as has been previously described in Chapter Two. Therefore, the complexity of the subjects of this study aligns well with MMR which recognizes the inherent complexity through its use of more than one method of data gathering and analysis to reach its conclusions.

In addition, in this MMR study there is also an underlying social constructivist epistemology. Social constructivism is predicated on constructivism. Constructivism is

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an epistemology or theory of knowledge that says that meaning is generated from an interaction between experience and ideas (Duffy, 2006, p. 3). Social constructivism provides additional emphasis. Specifically, as Kim (2006) points out, social constructivism emphasizes culture and context (p. 33). Both are the domains of leadership as has been previously identified in Chapter One. Anderson (2009) points out that knowledge is an interactive social and creative process, and language is the medium by which knowledge is created. (p. 5). Holding a questioning attitude is critical to that knowledge construction (p. 5).

The individuals who were studied are assumed to be meaning-making beings who make sense of their world by interpreting it for themselves (Cohen et al., 2018, p. 288). Educational leaders, the subjects of this study, clearly have agency and operate within social contexts to do their work. From a social constructivist perspective, then, leaders will continue to build their knowledge as they make sense of the further integration of AI into their school/institution and education more generally and whether they wish to use AI as an ally in their local pursuit of the global mandate to foster greater educational equity in the local pursuit of lifelong learning for all. So too, this study assumed that leaders would make sense of and build knowledge for themselves individually and collectively about AI as a potentially powerful ally in this quest. This approach to the construction of knowledge by leaders was also used by this researcher as the study was undertaken. That is, I acted on my understanding of the findings to identify themes from the data, construct conclusions and make recommendations for the problem at hand. Therefore, there is an underlying social constructivist epistemology to this study.

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Dewey (1905) explained that learning is an experiential process through which people acquire “a complex and flexible set of predispositions for action” (Biesta, 2010, p. 107). The implication is that one’s experience is real, and another person’s is equally real which means “things are what they are experienced to be” (Dewey, 1905, p. 394). Therefore, not only are the leaders of educational institutions constructing their understanding of the five constructs of the study as described in Chapter Two (i.e., lifelong learning through human capability development; AI as an ally in the pursuit of greater equity in lifelong learning for all; self-determination theory as a tool for understanding one’s own motivation to act; moral intelligence for understanding what is right and what is not with respect to thinking about and taking action for change), but their personal experience becomes knowledge when they attach meaning to it and can then act on that meaning. In short, knowledge is both constructed and real (Biesta, 2010, p. 111). Given that research is a learning process and given that this research study set out to provide both practical and intellectual outcomes of worth to educational leaders and other stakeholders, then social constructivism underpinned this study as did Dewey’s pragmatic approach.

Underlying pragmatism is the notion that research will not only help us to understand what is happening, it will also help us to solve a problem and thereby make a difference (Ulysse and Lukenchuk, 2013, p. 18). Pragmatism endorses the construction of knowledge, supports fallibilism, that is research conclusions that may not be perfect or that may change over time, and values theory that endorses practice (Elder-Vass, 2022, p. 263). The knowledge and perspectives of the leaders are social constructs, the conclusions of this study may not be perfect and may be subject to changes over time,

and the hope is that the theory created by the outcomes of this study will endorse leadership practices. As such, pragmatism aligns well with both the research questions and with the methodological approach of this study

In summary, there is a combination of three underlying perspectives in this study: an ontology that views the subjects of this study as complex, an epistemology of social constructivism, and a pragmatic orientation which assumes reflection is occurring both by the participants and the researcher. Reflection matters in learning, as Rose (2013) points out, because it supports drawing on the connections between seemingly disparate ideas (p. x). It is such reflection that is enabled and valued when mixing methods. As a result, this study began from the underlying assumptions that a social constructivist approach to knowledge construction supported by individual reflection underpinned the participants' understanding of and response to the research question while a pragmatic paradigm supported analyzing and acting on the results.

Strengths of MMR Research

The number of studies employing MMR has grown since the 1990s (Denscombe, 2008, p. 271); however, this is not because it is easier to do. In fact, collecting and analyzing data both quantitatively and qualitatively may be seen as a greater challenge than collecting data using only one of these means, for it requires competence in two different methods of research. The research demonstrates that the additional burden is worth the effort. For example, Hurmerinta-Peltomaki and Nummela (2006) identify the increased validity of the findings, and the creation of knowledge as two benefits of MMR. Similarly, McKim (2006) studied the perceived value of MMR for graduate students and discovered greater breadth and depth with MMR as compared to

quantitative or qualitative methods. MMR has been used successfully for previous studies about leadership and the constructs of this study as noted in Chapter Two which strengthens the selection of MMR as the methodology for this study. In short, MMR is valued for its potential to draw from the strengths of quantitative and qualitative data while minimizing their respective weaknesses and, in that regard, it is seen as an expansive or inclusive form of research (Cohen et al., 2018, pp. 14-18).

MMR has been chosen for this study over other potential research methodologies because it will create stronger research outcomes than if qualitative data alone were gathered. As Spicer (2004) points out, different findings are likely to emerge from each method (p. 298) and as Bryman (1992) argues, "it is highly questionable whether qualitative and quantitative research are tapping the same things even when they are examining apparently similar issues" (p. 64). In addition, the strengths of both quantitative and qualitative research were carried forward into this study.

The strengths of qualitative research as realized in this study include the opportunity to capture an in-depth, detailed understanding of what those being interviewed thought, what they said, what they meant, and their attitudes and intentions. All this data was captured through description, which is the key advantage of qualitative research (Cohen et al., 2018, p. 289). Because it is essential to capture the language of educational leaders, qualitative data gathering was critical to this study because it revealed new insights or ideas and even new theories (Taherdoost, 2022, p. 54). The qualitative data gathering in this study also helped to bring the relevance of the leader's context to the foreground (Bryman et al., 1996, p. 366).

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Quantitative data is useful because it presents information numerically enabling researchers to more easily discern patterns and trends from a larger sample which has been randomly selected (Carr, 1994). In this study, quantitative data revealed what leaders saw as benefits, risks, challenges, and opportunities with respect to AI and leaders' perception of their own AI understanding and skills. Another strength of quantitative data is that it can then be arranged in tables and charts or other non-textual forms for ease of understanding. Quantitative data analysis is assisted by software that can tabulate results.

In short, the problem of this study was better understood through the integration of the numeric trends from the quantitative data with the specific narrative details of the qualitative data. By not relying on a single way of gathering data for this study, a more complete understanding was achieved. That is, if this study has been confined to either a quantitative or qualitative approach alone what was found may have been less clear. By using both approaches to data gathering and analysis, a clearer picture was created (Cohen et al., 2018, p. 37). Further, given that validity arises from corroborating evidence, having two approaches to data gathering increased the potential for validity in the analysis stage.

MMR Limitations

One of the limitations of using MMR for this study may be the desire on the part of stakeholders for more data of each type, that is, more numeric data, and more descriptive data. A second limitation of MMR is identified by Biesta (2012b) who questions whether it is even possible to produce both solutions or techniques and critical understanding in the same study; that is, he asks if numeric and narrative approaches can ever be

combined in meaningful ways (p. 148). Cohen et al. (2018) respond to the question by saying that it is less about mixing two distinct approaches and more about the potential of two approaches to work together to solve the problem (p. 37) which was the case in this study.

Further, the limitations of both quantitative and qualitative approaches to data gathering are carried on in MMR. Specifically, the challenge of using quantitative data to expose underlying reasons or detailed explanations for how a line of reasoning was reached is automatically carried forward by virtue of using quantitative data gathering. Similarly, there may be difficulty making generalizable findings from a small sample size in qualitative research (Taherdoost, 2022, p. 59). It is worth noting that the limitations of each data method are ameliorated by the presence of the opposite data gathering approach (Cohen et al., 2018, p. 14).

Further, as Ivankova et al. (2006) explain mixed methods researchers must make decisions about whether they will prioritize quantitative or qualitative approaches or both, how to connect the quantitative or qualitative data, and how to integrate them both (Ivankova et al., 2006, p. 17). In the case of this study, the qualitative data is prioritized as explained more fully in the following section. These next sections specify the research procedures, including the identification of the target population, the methods of data collection, the process of participant recruitment and data analysis methods.

Research Design

This study employed parallel mixed methods research design (Creswell, 1995). In this design the quantitative and qualitative data gathering took place simultaneously and independently in parallel fashion (Teddlie & Tashakkori, 2009, p. 439). In parallel mixed

method studies, the collection and analysis of data using both quantitative and qualitative approaches are undertaken independently of one another (Creswell, 1995). Then the findings and inferences are integrated to answer the multi-part research questions.

Schoonenboom and Johnson (2017) refer to this as an analytical point of integration (p. 115). It is possible then to use the qualitative data to illustrate a quantitative result and vice-versa (Schoonenboom & Johnson, 2017 p .116).

Research Design Procedure

1. The questionnaire and interview questions were designed.
2. The draft questionnaire and interview questions were then piloted by two leaders for each.
3. The questionnaire and interview questions were then adjusted as needed based on the feedback from the four leaders who piloted the questionnaire and interview.
4. Email addresses for leaders were compiled. (See Recruitment of participants below)
5. The invitation letters for the questionnaire and the interview were composed.
6. The invitation to complete the questionnaire was sent to approximately 400 potential respondents.
7. The invitation to participate in the interview was sent to approximately 200 potential participants.
8. The interviews were scheduled by email.
9. The formal consent letter for the interviews was read and agreed to by the interview participants and the interview was conducted and recorded in Zoom.
10. The interviews were transcribed in TurboScribeAI.

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11. The data was compiled by research questions.
12. The data was used to identify themes.
13. The data was used by another research to identify themes.
14. Themes were then compared to see and findings were formulated.
15. The questionnaire was completed by different people than the interview.
16. The results of the questionnaire were tabulated and analyzed.
17. The quantitative and qualitative data were then mixed and described. That is, the quantitative and qualitative data was combined by sub-topics for each research question. For example, research question one was examined using two sub-topics. In each of those two sub-topics quantitative data was used and qualitative data was used. The quantitative data was described narratively, and the qualitative data was described numerically. thereby mixing the data.

Population

This study targeted senior educational leaders who report to work inside a school or higher education institution that is publicly funded where education is a part of the country's GDP. These individuals had many different job titles as outlined in Chapter Four. Some leaders who were interviewed had titles that this researcher did not necessarily associate with their responsibility level, so titles alone sometimes provided limited information. These senior leaders were at the top or near the top of the school or institution's organizational chart. This study defined a "senior leader" as someone who has a formal leadership role with responsibility for leading the teaching and learning of the academic program in a school or post-secondary institution and the individuals that, without their involvement, research tells us, change does not happen (Fullan (2007));

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Leithwood et al. (2004, 2008, 2020). This definition was shared in the invitation to participate letters. Senior leaders were invited to participate with the assumption that they would self-identify.

Often studies of educational leadership are undertaken for one leadership role or another, or within individual educational systems, geographic areas, (e.g. Province of Ontario), or within one division (elementary, secondary, post-secondary). However, the goal of this study was to understand the experience and perspective of leaders regardless of their title, division, educational jurisdiction or geographic location. Therefore, global participation was invited.

Methods of Data Collection

Two methods of data collection were used: a questionnaire and a semi-structured individual interview. Parallel mixed design was used for data collection, that is, the quantitative and qualitative data was collected independently and in a parallel time frame.

Table 1 identifies how data on each of the research questions was collected and which of the five constructs of the conceptual framework was being considered. Table 1 illustrates that all three of the research questions and all five of the constructs of the conceptual framework were considered and, therefore, data was collected on them.

Table 1

Collection of Data by Theoretical Constructs

Research Question # 1	How was the data collected?	Which concept was being considered?
What do educational leaders K-20 see as the benefits/risks, opportunities/challenges of AI	Questionnaire #8c Questionnaire #9	Artificial Intelligence as an ally

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<p>as a means for achieving greater equity for all in the pursuit of lifelong learning?</p>	<p>Questionnaire #12</p> <p>Questionnaire #13</p> <p>Interview question #2</p> <p>Interview question #4</p>	<p>Artificial Intelligence as an ally</p> <p>Lifelong learning Human capability</p>
<p>Research Question # 2</p>	<p>How was the data collected?</p>	<p>Which concept was being considered?</p>
<p>What is the current level of expertise of educational leaders K-20 with respect to AI and what training/education is needed to implement AI in support of lifelong learning for all?</p>	<p>Questionnaire #5</p> <p>Questionnaire #6</p> <p>Questionnaire #10</p> <p>Questionnaire #11</p>	<p>Lifelong learning Human capability development theory</p> <p>Self-determination theory Lifelong learning Human capability development theory</p> <p>Lifelong learning Human capability development theory Artificial Intelligence as an ally</p> <p>Self-determination theory Moral intelligence</p> <p>Lifelong learning Human capability development theory</p>

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	<p>Questionnaire #14</p> <p>Interview Question #1</p> <p>Interview Question # 5</p> <p>Interview Question # 6</p>	<p>Artificial Intelligence as an ally</p> <p>Self-determination theory Moral intelligence</p> <p>Artificial Intelligence as an ally</p> <p>Self-determination theory</p> <p>Human capability Self-determination theory</p>
Research Question # 2	How was the data collected?	Which concept was being considered?
How will supports help educational leaders K-20 to realize this universal mandate for change?	<p>Questionnaire #7</p> <p>Interview Question #3</p> <p>Interview Question #5</p> <p>Interview Question #6</p> <p>Interview Question #8</p> <p>Interview Question #9</p> <p>Interview Question #10</p>	<p>Self-determination theory</p> <p>Self-determination theory</p> <p>Lifelong learning Human capability</p> <p>Artificial Intelligence as an ally</p> <p>Artificial Intelligence as an ally</p> <p>Lifelong learning Human capability Self-determination theory</p>

		Moral intelligence
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Questionnaire. An online questionnaire tool (Appendix C) was used to conduct the questionnaire which employed dichotomous questions, rank ordering, and multiple choice. The benefits of using a questionnaire include that it is cost-effective, reliable, valid, quick and easy to complete, and often can be analyzed in a straightforward manner (Cohen et al., 2018, p. 471). The challenges include the time it takes to develop, pilot, and refine the questionnaire and limits with respect to the kind of data that can be gathered (Cohen et al., 2018, p. 471). The questionnaire adhered to guidance in the literature on sequencing questions and avoiding pitfalls such as those described in Cohen et al., 2018. Potential pitfalls (Cohen et al., 2018, pp. 490-491) such as assuming respondents understand technical terms were avoided by providing succinct definitions and their source. Similarly, no highbrow, complex, multipart, or ambiguous questions were used and only one open-ended question was employed.

Interview. The reason for choosing semi-structured interviews was that they had the benefit of providing structure through the creation of an interview guide of pre-determined questions ahead of the interview while also making room for free responses from the interviewee during the interview or for participants to answer more than one of the questions at a time. Further, the semi-structured interview was a good match for my goal of understanding leaders' unique perspectives and contexts (Adeoye-Olatunde & Olenik, 2021, p. 3). The purpose of the interview was to engage participants in an in-depth conversation about their experiences and their perspectives on the research

questions. As Kvale (1996) says, the interview is a social encounter where knowledge is generated through conversation (p. 11). Finally, the interviews provided insight into why the participants' perspectives are what they are. Like the questionnaire, the interview questions (Appendix E) were piloted and refined prior to administration. The downside of the interview process was that it was time consuming to find willing participants, schedule the interview time, reschedule when necessary, and conduct interviews lasting up to one hour. The interviews were scheduled by email in advance and conducted online via Zoom technology at times suitable for the participants in their various time zones. The interviews were recorded with the explicit verbal permission of the participants as per the formal consent letter (Appendix D) and then transcribed using the online software TurboScribeAI.

Protection of Respondents' Privacy

Questionnaire. The questionnaire was administered online using REDCap a secure web application for building and managing online surveys and databases. REDCap was selected for use in this study because it is specifically geared to support online and offline data capture for research studies. Created by a consortium of non-profit institutional partners, this secure, web-based, software platform allows for data downloads to Excel, PDF and statistical packages such as SPSS. This software was also chosen because Athabasca University has access to REDCap which is operated from a web server behind a firewall and, therefore, not accessible to the Web. Cookies for IP addresses are not stored in such a way that they could be accessed by others, thereby protecting the privacy of survey respondents. "REDCap implements authentication to validate the identity of end-users that log in to the system. For security reasons, the

password database table is not stored as plain text, but it is first salted and then hashed using a SHA-512 cryptographic hash function before being stored in the database table"... "Users are automatically logged out of the system using a default of 30 minutes preventing someone else from accessing their account and their project data if they leave a workstation without properly logging out or closing their browser window" (REDCap Technical Overview pp. 2-4). With respect to the issue of bots being used to complete the survey, "REDCap employs "rate limiting" on its web pages, in which there is a set maximum number of web requests per minute that are allowed from a single IP address, and after that maximum is hit, the IP address of that user is permanently banned from REDCap. Rate limiting prevents denial of service attacks by bots as well as preventing other types of hacker attacks that require making many requests to the server in a short amount of time" (REDCap Technical Overview p. 5). In addition, respondents' privacy was secured in the questionnaire because the survey did not ask for or collect names of respondents, schools, institutions, or countries.

Interview. The interviews were conducted using ZOOM. The camera feature was only used if the participant chose to do so. Once a transcript was made of the interview, the audio recording of the interview was deleted. Participants' school/institution name and country if referenced by the respondent were deleted from the transcript and, therefore, do not appear in the study. A study ID number is used in all study records. The study data is stored on an encrypted file, where it will remain for five years after which the de-identified data will be destroyed.

Recruitment of Participants

Recruitment strategies were unique to each type of data gathering.

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Questionnaire. To recruit participants for the questionnaire, I emailed the invitation letter (Appendix B) to educational leaders. To find the email addresses of these potential participants, I used the Times World University Rankings (2025) of 2000 universities across 115 countries to create a randomly generated list of universities. Then I used the university website to find email addresses for the offices of senior leaders. I also contacted key professional associations (e.g., Canadian Network of Innovation in Education, International Association of Universities, International Council for Open and Distance Education, provincial or national principal councils) and asked them to post the invitation letter and link to the survey on their websites. Although most of these organizations responded to me, none of them agreed to post the invitation to their membership as they receive many requests to do so.

The potential population of K-20 educational leaders worldwide is large and widely dispersed. Therefore, some cluster sampling was used to mitigate bias. For example, if more leaders are chosen from one country than others, there may be bias in the data. One of the goals of the research is to achieve a widely representative sample of leaders. Therefore, an effort was made to contact leaders from more than 30 countries.

Although it is relatively easy to get the total number of universities in the world (i.e. Times World University Rankings (2025) list of 2000 universities), it is much harder to access the total number of publicly funded elementary and secondary schools. However, the email contact of elementary and secondary schools is often readily available on the Web. Therefore, it is nearly impossible to calculate the total population of educational institution leaders. I began this study hoping that 400 educational leaders would respond to the survey. 400 was chosen as a manageable total target population from 25+ countries

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of the 194 countries of the world where education is a percentage of the Gross Domestic Product (GDP), exclusive of private expenditure on education. The Krejcie and Morgan Table (Krejcie & Morgan, 1970) is well known for sample size determination. For a total population size as low as 100,000 or as high as one million, 384 respondents to a questionnaire will have a margin of error +/- 5 and a 95% confidence level. Confidence level and margin of error also depend on how the data will be used. In the case of this study, 200 participants would not be enough to speak confidently of the results as there is a decrease of 2 per cent in the margin of error when moving from 200 to 400 responses. Collecting more than 400 responses would not have been prudent given limitations of time and energy on the part of this researcher. However, it became clear early on that this target was not achievable. I believe there were a few reasons for this. Some leaders made it clear that their limited knowledge of AI meant that they didn't believe they had anything useful to contribute so they chose not to participate. Also, there is a proliferation of AI-related surveys and questionnaires happening globally right now which may have impacted the response rate. In addition, the questionnaire was administered in the summer months in the global north which may have impacted response rates due to holidays. However, given the demands of senior leaders' schedules, it is difficult to know what the best time of year might be. As a result of the few responses to the questionnaire, the interview data was held in higher estimation during the data analysis.

Interviews. Given that the population of educational leaders is large and widely dispersed, I was hopeful that both snowball sampling and stage sampling could be used to generate the potential list of contacts for the interviews. In snowball sampling

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participants would recommend and/or put me in contact with other leaders to interview (Cohen et al., 2018, p. 220). Although very worthwhile in terms of who was recommended, this only happened once during the data gathering. In stage sampling, the questionnaires would have been used to identify those who answered the self-volunteering question affirmatively on the questionnaire as a second stage in the sampling. This did not happen.

In the end, 20 respondents completed the questionnaire, 16 from the Global North and 4 from the Global South and 45 participants volunteered to complete the interview from 25 different countries. Hundreds of emails were sent to find these participants.

The goal was to only interview school or institution-based leaders and this was the case in 64 of the 65 research participants. One leader from one country in the global south works in K-12 schools every day in a leadership role but is not the leader in charge of any one school. I chose to interview this person anyway because they had a rich perspective on K-12 schools in that developing nation and I could not find an English-speaking person from that country with internet connectivity. I thought it was important to include perspectives of leaders from that nation, even if the individual was not based in just one school. Otherwise, all leaders were school or institution based. Lastly, one school leader from the Global South was head of a school that does not receive government funding as a percentage of the GDP. Once again, I thought it was better to include this leader from this global south nation than not have that nation represented in the study.

Data Analysis

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The goal of the data analysis was to make sense of the data by finding the patterns within it. In this parallel mixed design approach (Cohen et al., 2018, p. 40), the quantitative and qualitative data are kept separate until the data analysis stage. Therefore, initially the analysis of the data for this study was undertaken separately for each data collection method.

Table 2

Statistical Analysis by Method and Question

Location	Question Number	Type of statistical analysis
Questionnaire	1	Nominal
Questionnaire	2	Categorical Descriptive and inferential statistics (mode, mean, median)
Questionnaire	3	Nominal
Questionnaire	4	Nominal
Questionnaire	5-14	Percentage and frequencies

Questionnaire. The goal of the data analysis of the questionnaire was to make sense of the data by finding the patterns within it. The data was sorted into categories based on the questions. Statistical techniques were employed to analyze the data.

- a. In the first step, nominal and ordinal analysis was undertaken. For example, answers to Question 2: What is your school or institution's educational level? Select all that apply, was counted by education level. It should be noted that the software chosen to administer the online questionnaire had the capability to do this categorizing.

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- b. In the second step, the data was described using percentages and frequencies of responses. Once again, the software chosen to administer the online questionnaire had the capability to this categorizing.
- c. Then the data was then graphed and described narratively.

Interviews. The goal of the data analysis of the interview responses was to make sense of the data by finding the patterns within it. Wellington (2015) provides a useful approach to achieving that goal so that was the strategy undertaken:

- a. I copied and pasted the answers to each of the questions into one document for each question which included all the responses from the interview divided by question. These are, what Wellington (2015) calls, “units of meaning” (p. 263). Cohen et al. (2018) identify the risk of “stripping out important contexts from the study and fragmenting holistic data into small segments” (p. 673). As mentioned previously, this connection between a leader’s context and their perspectives on the study questions was critical to retain. Therefore, when I separated the data into question sets, I attached the leader’s title, whether they were from the Global North or the Global South, and whether they were from K-12 or HE to each answer to provide contextual information and to ensure that the context “travelled with” the responses.
- b. I then read, re-read, and reflected on the data set for each question. I open-coded the transcripts by identifying meaningful quotations and describing them with a single word or short phrase which allowed me to identify and develop themes (Strauss & Corbin, 1990). The purpose in doing so was to develop interpretations of the data to derive “themes, concepts, theories, explanations, understandings,

summaries” (Cohen et al., 2018, p. 645). I created an audit trail of my thinking over several weeks to make transparent how the categories were determined.

- c. I then stepped back to see if the “categories” that were identified might be combined or merged into a single theme. These themes became the “codes” for this data analysis.
- d. I then checked on the accuracy of the categories/codes by giving another researcher the raw answer set documents as uncoded data and asked them to identify what they saw as the themes.
- e. I then looked for any discrepancies between my themes and the second researcher’s themes as suggested by Cohen et al. (2018) as a means for ensuring consistency and validity of the codes. Sometimes phrasing was different, but the common ideas were remarkably alike.

Once the questionnaire data and the interview data had been analyzed separately, this quantitative and qualitative data was combined and attached to the three research study questions. Because the study questions had already been attached to questions in the questionnaire and interview script, this step was not onerous (see Table 1).

As part of this final data analysis step, the quantitative and qualitative data was transformed, compared, correlated and integrated using the steps recommended by Onwuegbuzie & Teddlie (2003):

1. Data transformation: quantitative data was summarized statistically, and qualitative data was summarized narratively.

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2. Data comparison and correlation: then quantitative data was summarized narratively, and qualitative data was summarized statistically. This data was then compared to seek correlations between them.
3. Data integration: data was integrated into a coherent whole.

(Onwuegbuzie & Teddlie, 2003)

Practicalities and Feasibility

The choice of MMR for this research study was primarily driven by the research questions but I also considered the interests and needs of the stakeholders who might see value in this study (i.e., educational leaders who did not participate, those aspiring to leadership roles, educational and institutional governance boards, staff and faculty, policymakers, UNESCO, etc.). The use of online technology for generating participant lists, contacting and inviting participants, ensuring wide international representation of participants, designing and conducting questionnaires, tabulating results, conducting interviews, recording and transcribing those interviews, and identifying themes were all enabled by using current online technology. Although it required effort, persistence, and patience in explaining purposes and methods and in seeking involvement and ethical permissions, my experience has been that it was worth the effort. It is the belief of this researcher that there is a vested interest on the part of K-20 educational institution leaders in the research question of this study, and that vested interest has prompted these individuals to participate.

Role of the Researcher and Prevention of Bias

Besides bringing a philosophical stance to this research, I also bring experience designing and administering questionnaires and semi-structured interviews. It was

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through these experiences that I gained perspective on the role of the researcher in guiding the interview. It has been my experience that the semi-structured interviews feel like a conversation between two interested colleagues on a topic of mutual interest. As Cohen et al. (2018) point out, as the researcher I am also part of the world I am researching. Therefore, I recognized that my own values and views on the research questions had to be kept in check during the interview process.

As mentioned in Chapter 1, I value public education and its leaders, and I believe it is important to help both to succeed. I am interested in how AI can be used as an educational ally in the pursuit of lifelong learning for all. Many years ago, Guba and Lincoln (1989) drew attention to the fact that values and perspectives are an inherent part of a constructivist epistemology like that underpinning this study. Therefore, I anticipated that the problem was not so much that I had personal values and perspectives about the questions of this study but, rather, that I needed to constantly be aware of not sharing them and thereby biasing the research. Because I was so aware of this risk, I strongly avoided losing myself in the conversation of the semi-structured interviews and sharing my own perspectives. I formulated a script of questions in advance of the interviews, and familiarity with this script allowed me to skip a question, if it had already been answered. Also, the script became clearer and more succinct as further interviews were undertaken. One of the advantages of semi-structured interviews is the benefit of a structured interview while embracing the flexibility of asking open-ended questions based on the participant's responses. Requesting clarity through follow-up questions and providing general encouragement were strategies that demonstrated to the interview participants that I was actively listening to their responses. Because the interviews were

spread over 3.5 months, I had the opportunity to reflect between interviews as well which helped me to be “rigorously attentive to important details...without uncritically endorsing or unconditionally prioritizing” (Bard, 2007, p. 93 as reported in Roulston and Shelton, 2015) one set of ideas over another. I assumed the posture of inquirer.

Selection bias was avoided by interviewing leaders from both K-12 and HE, by interviewing leaders from 25 different countries, and by interviewing leaders from both the global north and the global south in approximately equal numbers. Reactive bias was mitigated by designing the questionnaire through the eyes of the respondents (Cohen et al., 2018, p. 501). A pilot was used to increase the reliability and practicality of the questionnaire and the interview (Cohen et al., 2018, p. 496) and changes were made to both following the pilot including changing questions that might be perceived as leading questions, pressuring questions, or skewed questions that introduce bias (Cohen et al., 2018, pp. 490-491).

The data analysis stage was also considered in relationship to potential bias. Two strategies were used. First, the conceptual framework of this study employs five constructs that were thoroughly reviewed and well-supported in Chapter 2. Second, the analysis of the data used evidence from the data collection to support the identified conclusions. Structural bias was avoided through academic diligence and integrity.

Ethical Considerations

Ethical considerations have to do with doing good and avoiding harm (Cohen et al., 2018, p. 111). Therefore, the principles of respect, beneficence and nonmaleficence guided this research. The study was conducted in such a way as to respect the views of the participants, while being indirectly beneficial to the participants of the study through

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its opportunity for leaders to consider the questions of the day raised by the study and through the subsequent public sharing of study results. The research has done no harm to the participants because of the anonymous nature of the results.

Ethics also has to do with research design as well as the research itself by asking worthwhile questions that make a relevant contribution to knowledge. The next important ethical consideration is that of informed consent, which was built into recruitment and data collection. The invitation letter was emailed to potential questionnaire participants. To access the link to the questionnaire, potential respondents had to receive a letter of informed consent. Once a leader had responded by email that they were willing to be interviewed, the informed consent letter was sent to them. At the beginning of the interview, the consent clauses were reviewed, and verbal consent was given. Letter details included the following information for both the questionnaire and the interview:

- The purpose of this study and how the results will be shared.
- The topic area.
- A statement that participation is voluntary, and participants may decline to participate in the research or any aspect of the research at any time without penalty/loss of benefits.
- A statement that no personal information will be collected.

In the case of the interviews, the invitation letter also included the following information:

- Request for permission to record the interview.
- Participant names will be replaced with a pseudonym in all publications and a study ID number in all study records.

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- The study data will be stored on an encrypted file, where it will remain for five years after which the de-identified data will be destroyed.

Chapter Summary

The research questions, methodology, underlying assumptions, and planned research design of this MMR study were described in this chapter. They formed the framework for the study's planning and permissions. The findings of this study are shared in the next chapter.

Chapter 4. Results

As outlined in the previous chapter, the overarching research question and the three sub-questions of this study were explored using two data collection methods. This chapter presents the findings of that data collection. Semi-structured interviews were held with 45 leaders from 25 different countries. Questionnaires were completed by a separate group of 20 leaders, four from the Global South and 16 from the Global North. The terms Global North and Global South are used in this study because they do not imply a hierarchy that terms like developed and developing do. Over time, a combination of various criteria has been used to determine whether a country is developed or not. Some of these include economic indicators such as Gross Domestic Product (GDP) per capita, infrastructure, education levels, healthcare, and innovation. More recently, the United Nations has adopted the Human Development Index (HDI) “to emphasize that people and their capabilities should be the ultimate criteria for assessing the development of a country, not economic growth alone” (United Nations Development Programme, 2026). The HDI is a composite index measuring average achievement in three basic dimensions of human development: a long and healthy life, knowledge and a decent standard of living. HDI has been used in this study to identify countries from the Global South or the Global North. The countries listed on the HDI as having “very high” human development, that have representation in this study’s population, have been classified for the purposes of this study as being in the Global North. All other countries represented by this study’s population have been classified as being in the Global South.

Qualitative inquiry through interviews provided the primary strategy for the study. The quantitative inquiry conducted through questionnaires provided supplemental insights.

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This study used three organizing questions to guide the investigation:

- What do educational leaders in K-20 see as the benefits/risks, opportunities/challenges of AI as a means for achieving greater equity for all in the pursuit of lifelong learning?
- What is the current level of expertise of educational leaders in K-20 with respect to AI in support of lifelong learning for all?
- How will specific supports help educational leaders in K-20 to realize this universal mandate for change?

In this chapter the findings are grouped by subtopics. Under each subtopic quantitative data, primarily taken from the questionnaires, is shared numerically and summarized narratively. Qualitative data taken from the interviews is shared narratively and summarized numerically. The data is mixed by connecting these two sets of data by common themes for each research question. Quotations are used in this chapter verbatim and have only been changed to protect the identify of participants (i.e. names of schools, institutions and countries have been removed from quotations) and for ease of reading (i.e. removal of repeated words and phrases, reordering of subject-verbs for non-English speakers, etc.). All quotations from the interview participants have been italicized.

Participants' demographic data is identified in this chapter in three ways: Global South versus Global North, K-12 versus HE, and job role title. This differentiation is used to identify patterns of differences as well as similarities in leaders' perspectives where relevant. The interview number is used to help differentiate between participants whose demographic data may be otherwise identical.

Demographics of Participants and Respondents

Interview participants came from 25 different countries, 12 of which are from the global south and 13 of which are from the global north. Table 3 illustrates the representation by country. Tables 4 and 5 identify the role titles of interview and questionnaire participants.

Table 3

Country Representation in the Interviews

Global South (12)	Global North (13)
Brazil	Australia
Chile	Canada
China	Croatia
Ecuador	Denmark
Egypt	England
Ghana	Finland
Grenada	Greece
Indonesia	Ireland
Philippines	Israel
Thailand	New Zealand
United Republic of Tanzania	Netherlands
Ukraine	Scotland
—	United States

Table 4

Interview Participant Job Role Titles (in alpha order)

Dean
 Director (Senior, Academic, of Educational Leadership, of Advanced Technologies, of Innovation, of Student Research, of Teaching and Learning)
 Head (of Learning Sciences, of the Department of Learning Analytics, of Technology)
 President
 Professorial Chair
 Professorial Head of Technology
 Professor of Practice for Teaching and Learning,
 Pro-Rector, Vice-Rector

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Pro Vice-Chancellor, Vice-Chancellor
Rector
Special Advisor to the President,
Vice-Dean
Vice-Principal Learning and Teaching (HE)
Vice-Principal

Table 5

Questionnaire Respondents' Job Roles (in alpha order)

Assistant Director for Assessment and Accreditation
Assistant Principal
Dean
Dean of Learning, Teaching & Student Experience
Dean of Sustainability, Diversity, Inclusion, and Talent Development
Dean and Vice Provost for Graduate Education
Director Center for Executive Education
Director of Education
Director Teaching and Innovation
Head of School
Principal
Professor
Senior or Vice-Dean
Vice-Principal

Presentation of Findings by Research Question

As noted above, the three research questions act as organizational umbrellas. For each research question, subtopics are used as different approaches to the research question. Questions were formulated for both the interview and the questionnaire by subtopic. The results of this data gathering are shared below.

Research Question One Findings: What do educational leaders in K-20 see as the benefits/risks, opportunities/challenges of AI?

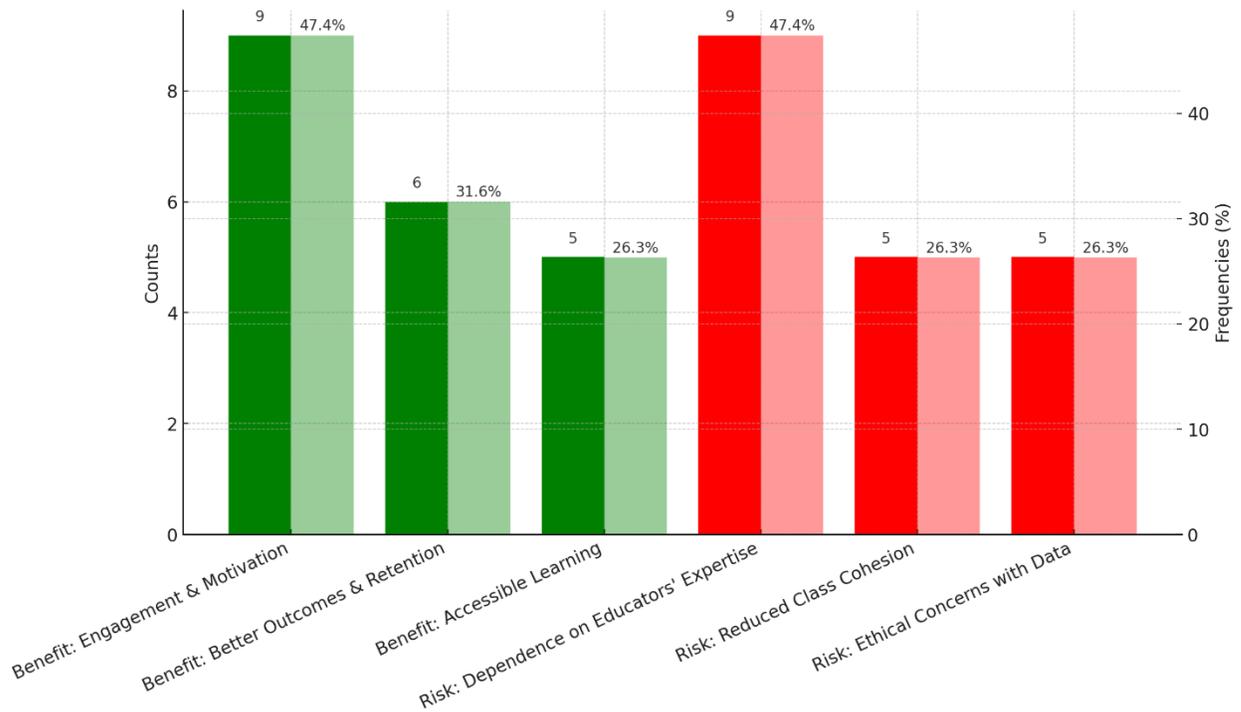
This data has been subdivided into two subtopics. Under each subtopic are findings from both the questionnaire responses and the interviews.

Subtopic 1: Positioning Leaders' Perspectives on AI, Its Benefits and Challenges

Questionnaire Findings. Educational capabilities of AI were identified and defined in the questionnaire. For each of these capabilities of AI, respondents were then asked to select what they saw as the greatest benefit and the greatest risk from three commonly identified risks and three commonly identified benefits. If the respondent had no opinion on a benefit and/or risk, they were asked to leave the response area blank; however, no respondent did. Respondents chose most often benefits that provided the opportunity to serve learners in more individualized, effective ways. Respondents chose most often risks that highlighted the limitations of human and technological expertise. The responses for each of the identified capabilities of AI are shared below. The data is displayed numerically first followed by a narrative summation of the pattern of responses. Benefits are noted in green bar columns and risks are noted in red bar columns.

Figure 1

Leaders' Perceptions of Benefits and Risks of AI-enabled Personalized, Adaptive Learning

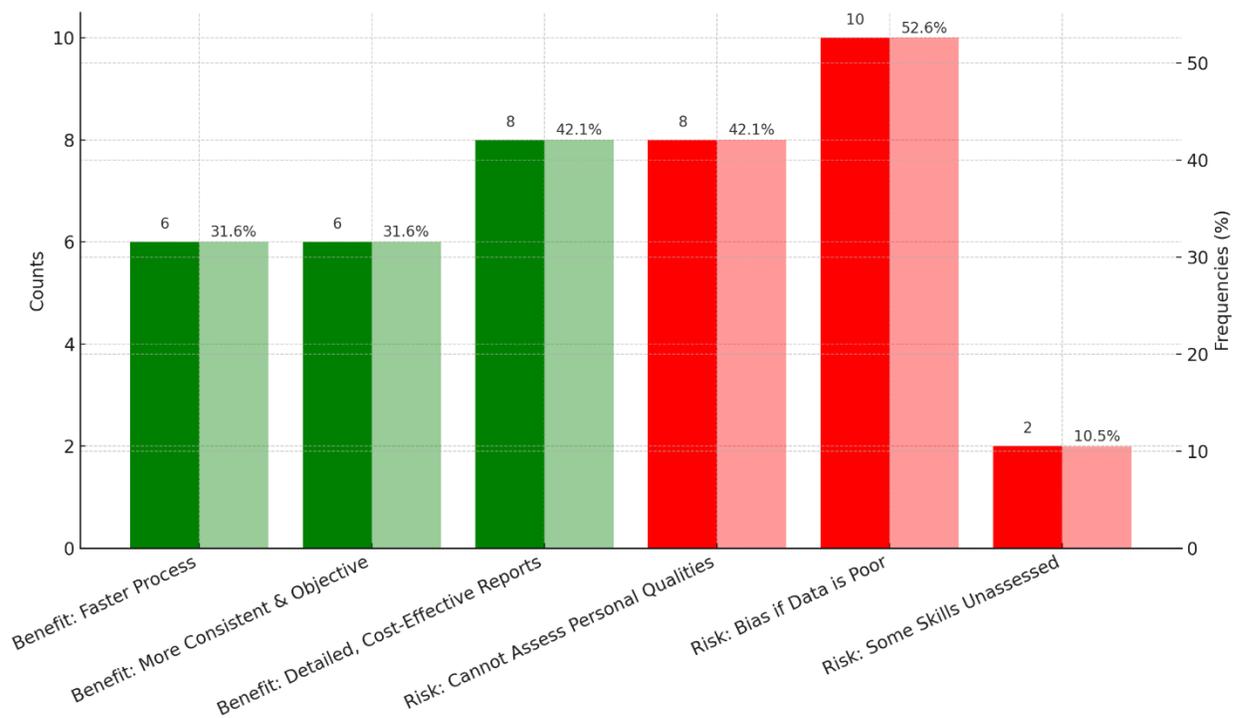


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Note: Figure 1 shows that with respect to AI's capacity to assess individual learning preferences and strengths and continuously adjust the difficulty and pace of learning materials based on a learner's progress, almost half of the respondents (i.e. 47.7%) identified that the greatest benefit is the improvement in a learners' engagement and motivation. The same frequency of response (47.7%) was found for what leaders identified as the greatest risk, which was that personalized, adaptive learning enabled by AI depends heavily on educators' technical expertise.

Figure 2

Leaders' Perceptions of Benefits and Risks of AI-enabled Skill Assessment and Gap Analysis



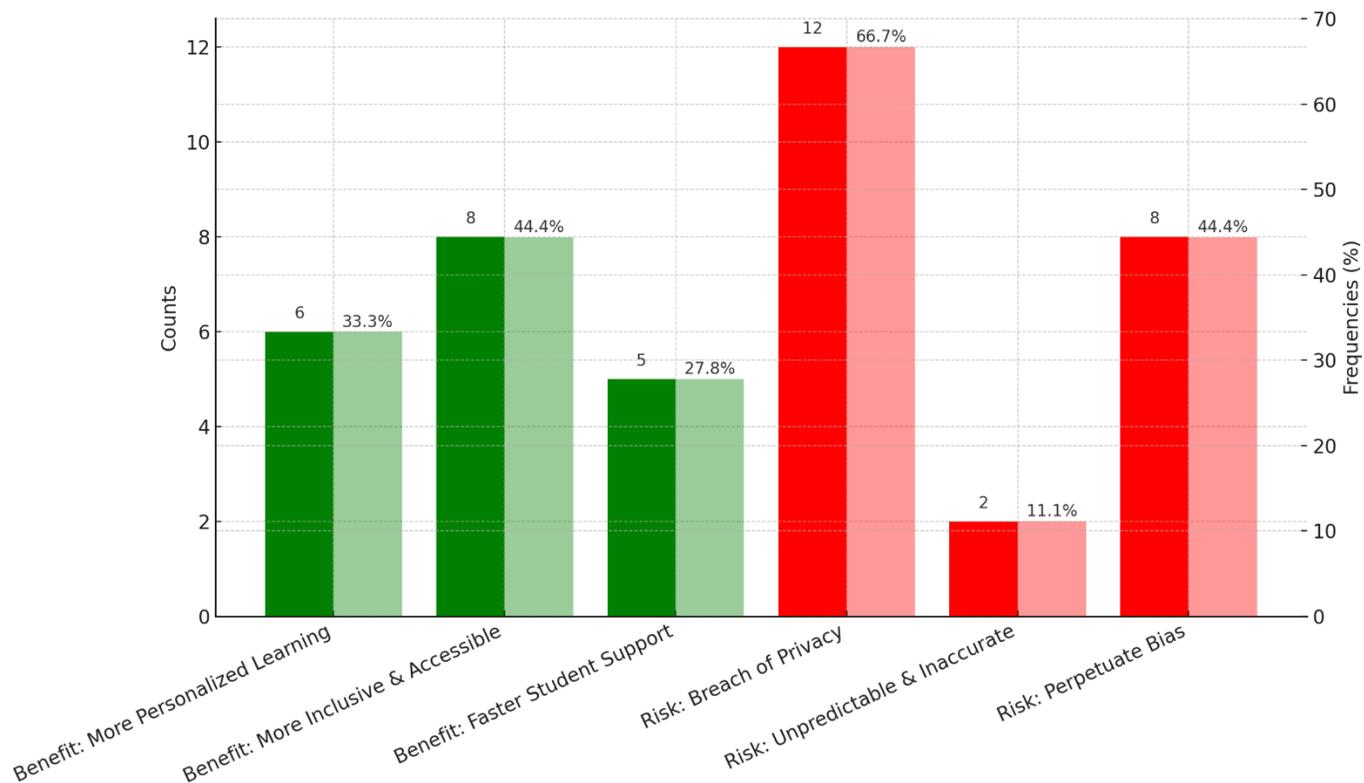
Note: Figure 2 shows that with respect to AI's capacity to assess a learner's existing skills and knowledge, identify gaps, and recommend specific courses or modules to address those gaps, respondents chose most often the faster, more consistent and objective

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process when completed by AI as the key benefit. Half the respondents (i.e. 52.6%) did choose AI's dependency on good data without which bias may be replicated and amplified as the greatest risk of AI's skill assessment and gap analysis capability.

Figure 3

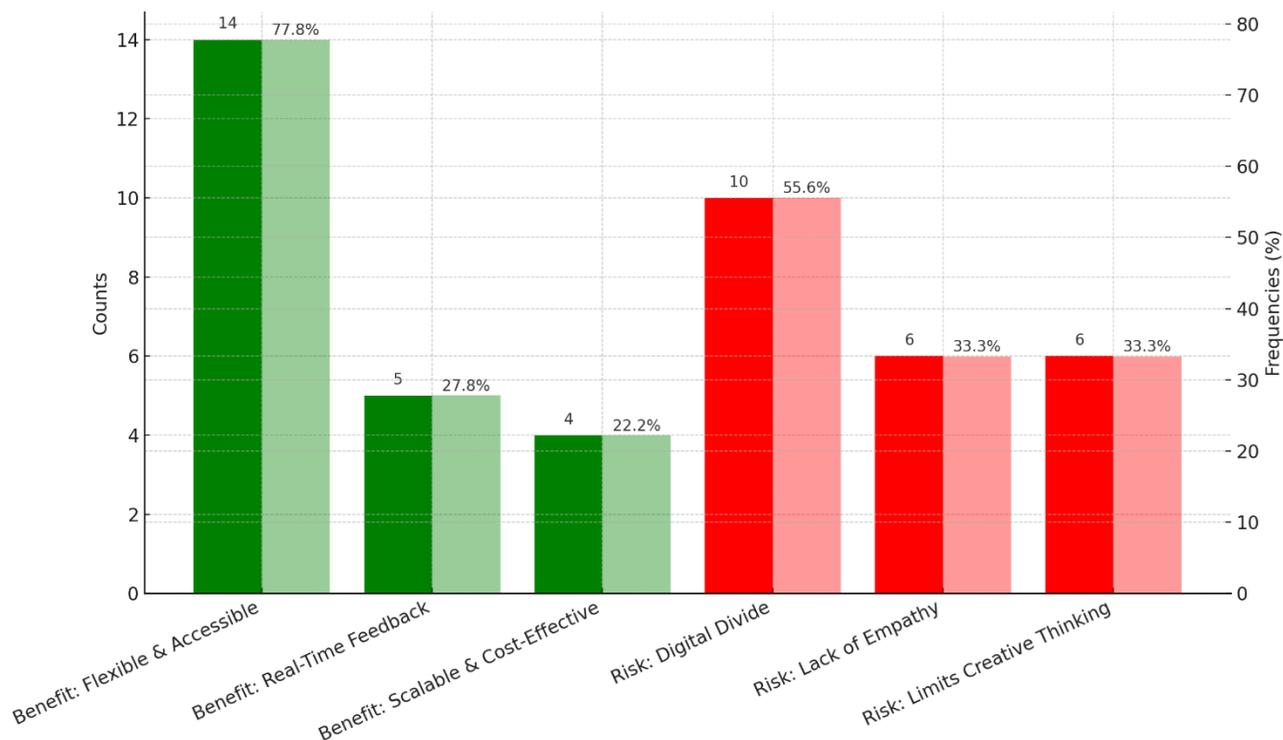
Leaders' Perceptions of Benefits and Risks of Using Student Data to Train AI



Note: Figure 3 shows that with respect to the use of student data to train the algorithms of AI to become more intelligent to provide insights into learner behavior and performance, not quite half (i.e.,44%) of respondents identified more personalized, inclusive and accessible learning as the key benefit. More than half of respondents (i.e. 66.7%) identified the potential breach of student privacy with respect to personal information as the greatest risk of the use of student data to train AI.

Figure 4

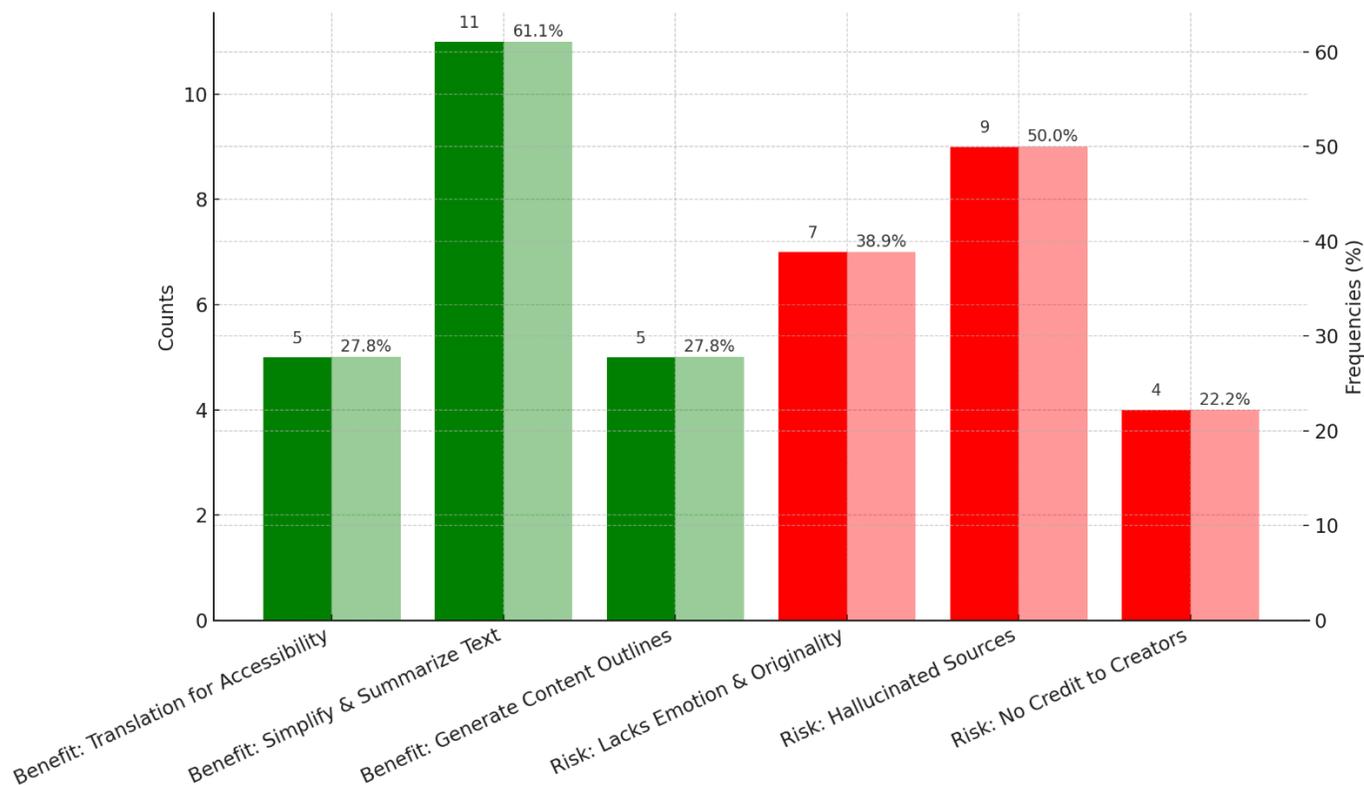
Leaders' Perceptions of Benefits and Risks of AI Tutors and Virtual Educational Assistants



Note: Figure 4 shows that with respect to AI's capacity to enable AI-driven virtual tutors and educational assistants that can provide instant feedback, answer questions, and offer guidance to students "24/7", three quarters of respondents (i.e. 77.8%) identified that the greatest benefit is that, unlike human teachers, AI tutors are available anytime, making learning more flexible and accessible. Because not all students have access to high-speed internet and advanced devices and, therefore, AI-driven virtual tutors and educational assistants, half of respondents (i.e. 55.6%) identified the greatest risk as the potential perpetuation of the digital divide.

Figure 5

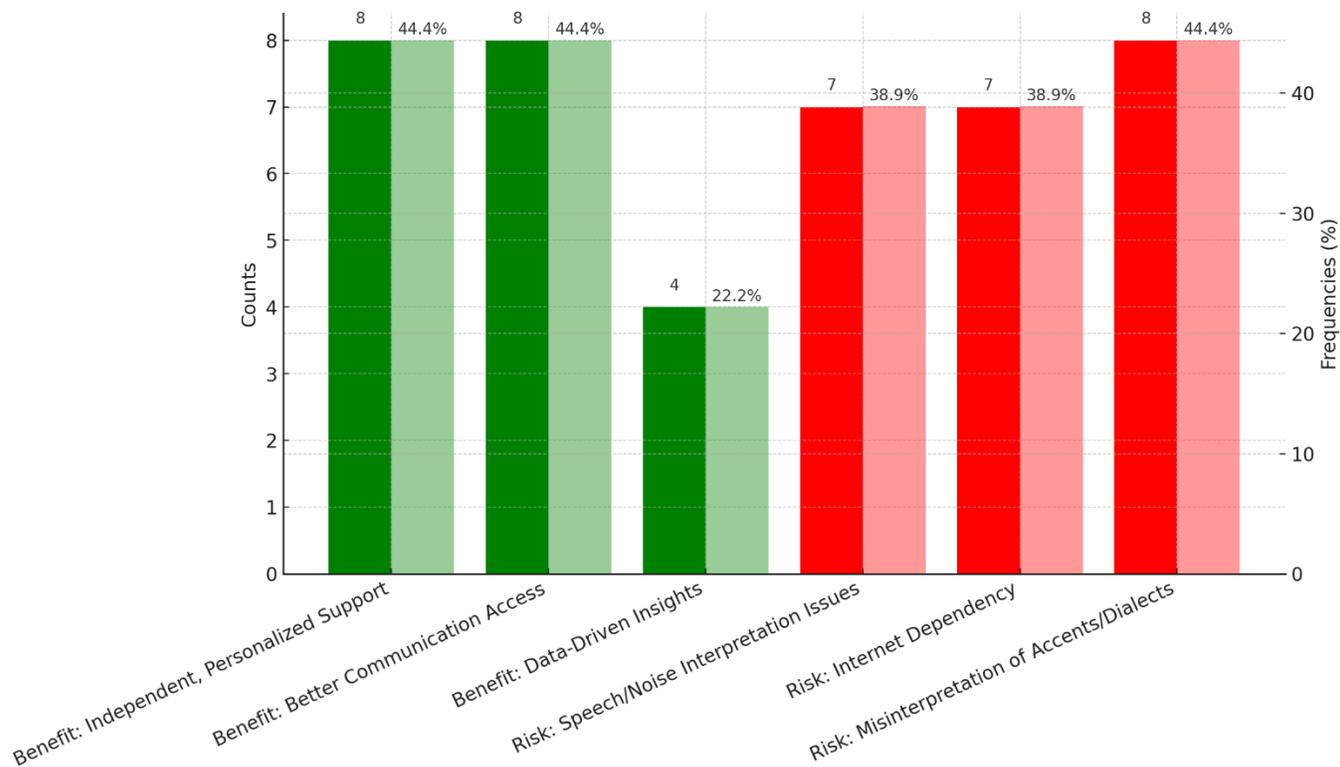
Leaders' Perceptions of Benefits and Risks of AI Content Generation and Curation



Note: Figure 5 shows that more than half of respondents (i.e., 61.1%) identified that the greatest benefit of AI's capacity to generate educational content like quizzes, practice problems, and textbooks and curate and recommend relevant learning resources from a vast pool of online content is that text can be simplified or summarized making difficult content more accessible. The greatest risk identified by half of respondents (i.e. 50%) was that AI may hallucinate sources, that is, it might state the name of a report and who published it, but that does not mean the report exists.

Figure 6

Leaders' Perceptions of Benefits and Risks of AI-enabled Support of Accessibility and Inclusivity



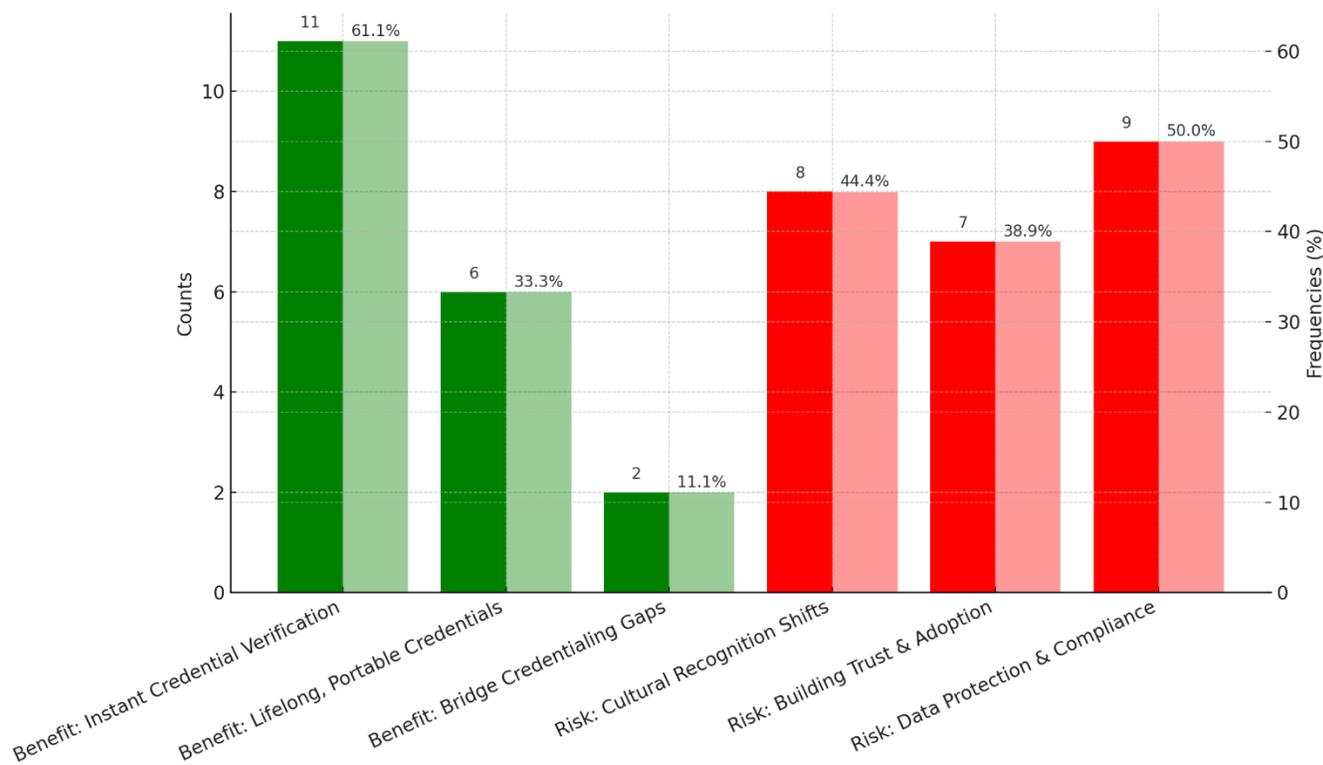
Note: Figure 6 shows that respondents identified equally (i.e., 44.4%) two important benefits of AI's capacity to use speech recognition, text-to-speech conversion, and adaptive interfaces to accommodate student learning needs in inclusive ways, one being students with disabilities can navigate their educational journey more independently and with more personalized support and the other is that students with communication disabilities can express themselves more effectively and comprehend written materials more easily. The three identified risks were all seen as almost equally challenging, those being that accents, dialects, speech impediments, and background noise (i.e. 38.9%) can all affect the system's ability to accurately interpret commands and may feed inaccurate data back into the algorithm. With the same frequency (i.e., 38.9%) respondents

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identified that dependency on internet access for AI technology to work limits its usability in situations where connectivity is unreliable or unavailable. Slightly more respondents (i.e., 44.4%) selected the greatest risk was that the technology may misinterpret non-native speakers or individuals with strong regional accents which can lead to errors in student's task completion or search for information. This creates an accessibility barrier for individuals who rely on voice recognition but do not speak in the system's preferred accent or dialect.

Figure 7

Leaders' Perceptions of Benefits and Risks of AI-enabled Credentialing Systems



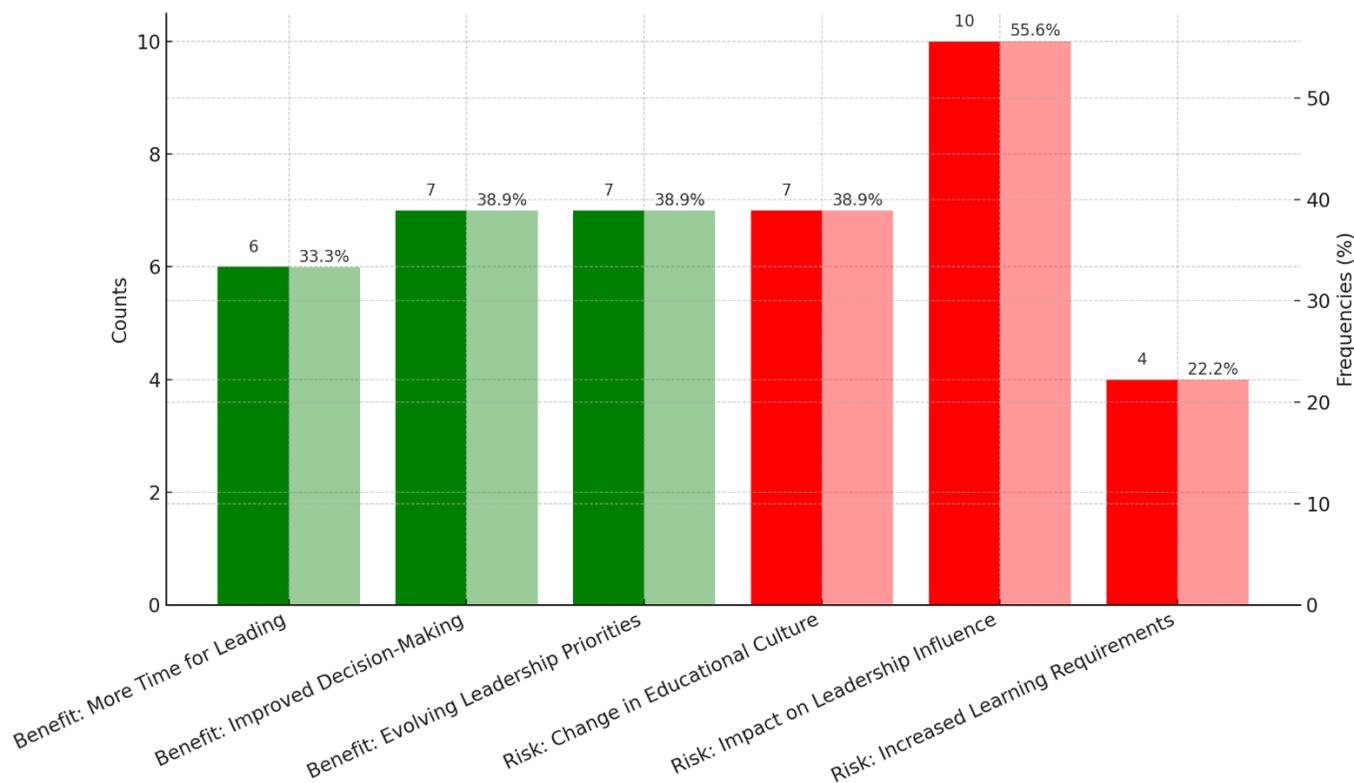
Note: Figure 7 shows that more than half of the respondents (i.e. 61.1%) identified that the greatest benefit of AI's capacity to use Blockchain and AI technologies to enable the secure verification of lifelong learning achievements and credentials including the identification of relevant training opportunities and the tracking professional learning

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progress, is the capability of AI to instantly verify the authenticity of credentials by cross-referencing them with issuing institutions, ensuring a faster and more transparent process than if completed by humans. Half of respondents (i.e. 50%) identified the greatest risk as ensuring the protection of sensitive credential data through robust encryption and the necessity of compliance with regulations.

Figure 8

Leaders' Perceptions of Benefits and Risks of AI's Capability to Mimic Leadership Functions



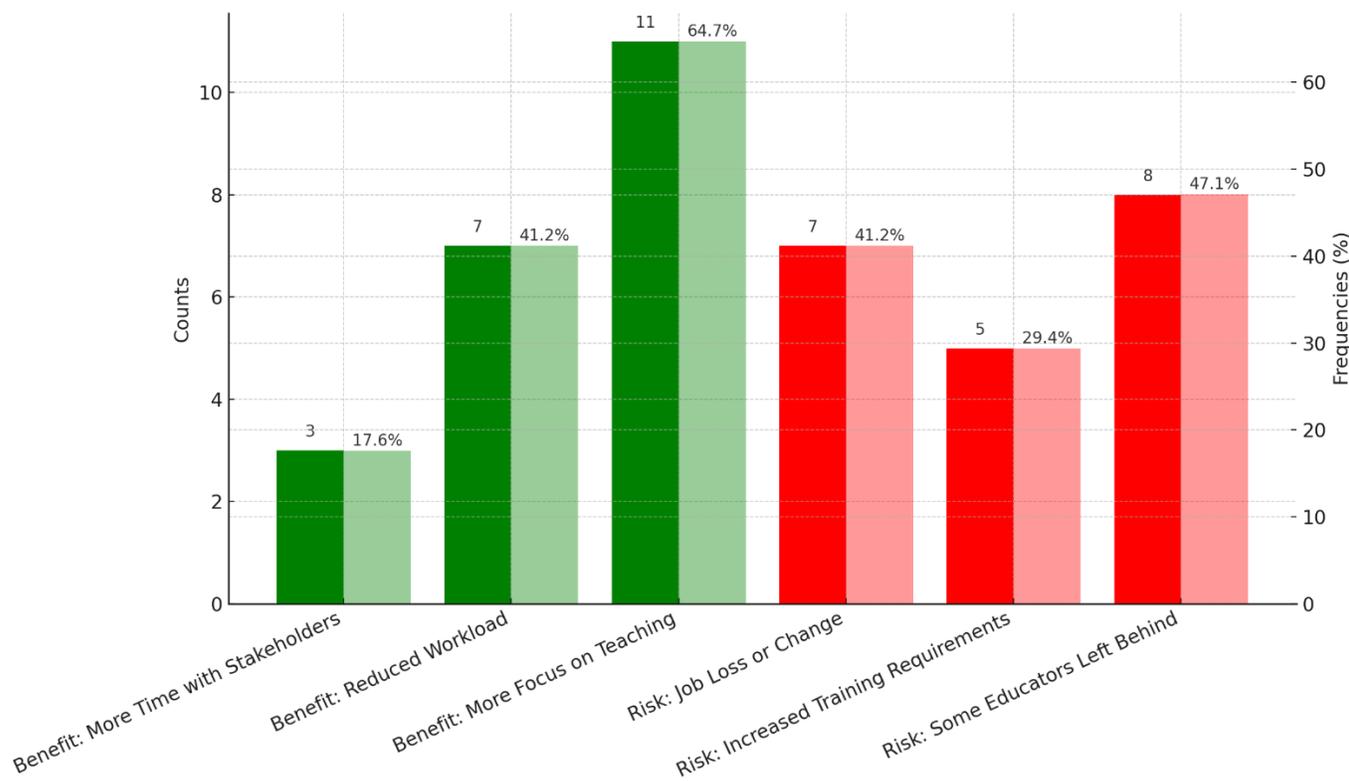
Note: AI can mimic many leadership functions including but not limited to developing conclusions, making decisions, offering empathetic and compassionate responses, providing strategic planning advice, writing documents and emails, and assisting with hiring. Figure 8 shows that these leadership functions were identified by respondents as

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almost equally beneficial (i.e. time for leading 33.3%; improved decision-making 38.9%; evolving leadership priorities 38.9%). That is leaders identified that it would be worthwhile if AI could enable leaders to spend more time leading teaching and learning, improve leadership decision-making through more data being made available more quickly, and evolve the priorities of leadership. Half the respondents (i.e., 55.6%) identified the greatest risk of having AI exercise leadership functions as the limitations that may ensue on a leader's influence, relationships, creativity, and skill set.

Figure 9

Leaders' Perceptions of Benefits and Risks of AI's Automation of Routine Administrative Tasks



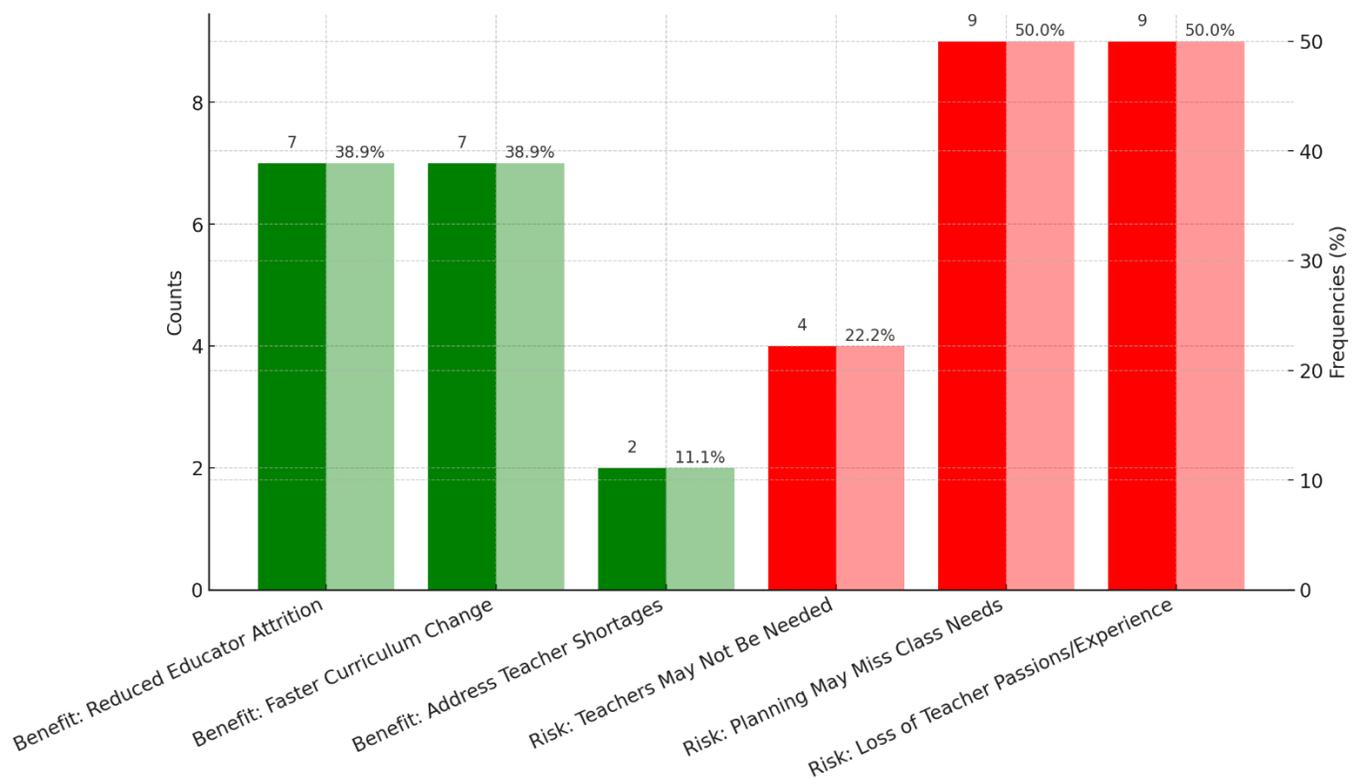
Note: Figure 9 shows that more than half of respondents (i.e., 64.7%) identified that the greatest benefit of AI's capacity to automate routine administrative tasks such as grading

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student assignments, scheduling student and staff timetables, managing student records, assessing prior learning, streamlining recruitment, and communicating with stakeholders was that more time may be available to focus on teaching and learning. The most identified risk by respondents (i.e., 47.1%) was that AI technology may leave some educators behind.

Figure 10

Leaders' Perceptions of Benefits and Risks of AI's Capacity to Design Curriculum



Note: Figure 10 shows that respondents identified two benefits of AI's capacity to create curriculum plans, design assessment tasks, suggest resources, and assess student learning as equally important those being that less educator attrition from workload pressures may occur (i.e. 38.9%) and curriculum change may occur more rapidly (i.e., 38.9%).

Similarly, two risks were identified as being equally important, those being curriculum

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and assessment planning may not reflect the needs of the class (i.e., 50%) and the unique passions, interests, experiences, emphases of the teacher/instructor may no longer be shared (i.e., 50%).

Interview Findings. One of the interview questions described an imaginary continuum of perspectives and asked leaders to position themselves and their staff/faculty along that continuum. This interview question was used to find out what leaders see as the benefits/risks, opportunities/challenges of AI. Interview participants were told that with respect to the conversations being had around the use of AI in education some of the focus has been on a “problematization” approach. That is, the focus is on anticipating the problems, risks, and challenges associated with the use of AI in education. Other conversations being had might be characterized by an “imaginaries” approach where imaginaries are defined as shared visions of desirable futures. If that is a continuum with well-articulated problematization perspectives of AI on one end and highly developed imaginaries on the other, leaders were asked where they thought their school/institution was along that continuum.

Participants found this question easy to respond to as they provided detailed answers about the perspectives of both their staff/faculty as well as themselves. Several themes emerged as a result. Leaders identified that both ends of the continuum were generally present in the perspectives of their staff/faculty, with more staff/faculty being at the problematization end of the continuum. Leaders most often positioned themselves in the middle of that continuum. Many times, leaders' reflections on this question went beyond identifying staff, faculty and their own perspectives on AI. They provided detail on the influence of geopolitics in shaping such perspectives, the concern leaders have with

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respect to the perspectives on AI that are held by some staff/faculty and what leaders described as the need to focus on more significant issues such as the potential loss of critical thinking skills, the redefinition of knowledge, and students' engagement with learning. The common themes of their responses are shared below.

Theme 1: All but two of the 45 interview participants seem unperturbed by the fact that they have observed a wide range of staff/faculty perspectives on AI. Many participants referenced an 80-20 or 70-30 split with 70% to 80% of staff/faculty being at the problemization end of the continuum and 20% to 30% at the imaginaries end. Leaders said that faculty embracing AI use in HE could be found most often in research, science and technology, medicine, and business. In K-12 this group embracing AI use were identified by participants as "early adopters". Leaders of both HE and K-12 described other individuals as having strong concerns. In HE this group was described by leaders as often coming from the humanities or other fields where AI is overturning the core work.

I would put us at 90-10 in terms of negative perceptions of AI. 90% didn't want anything to do with it, didn't want kids to use it, didn't want anything. (#40, Global North, K-12, Principal)

With respect to the school of business, much more over on the imaginary side, really looking at it. It is a tool, and it is up to us to teach our students how to use it and how to use it appropriately... I think humanities faculty generally seem to be a little more like nope, not happening in my classroom. (#10, Global North, HE, Dean)

It's my impression that the closer you are to hard empirical work or natural sciences, the more positive people are. I think humanities are the most skeptical, because it's both their teaching, their research, and their worldview, which is being radically disrupted by this. Not alone are they worried about all the societal stuff that we can all be worried about, but they also have what we call academic grief. (#12, Global North, HE, Dean)

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There will be people that say, it's not for me, its environmental impact is too big or the potentially baked in racism or the baked in sexism or misogyny or whatever into the data sets is unacceptable to my level of tolerance. I think as an institution, we have to respect that...right through to the people who are at the sharp end, trying to find boundaries to push, trying to find things that they can do that's novel and interesting and writing scripts and using it for all sorts of weird and wonderful new things. I think all of that is healthy in a community. (#7, Global North, HE, Associate Pro-Vice-Chancellor)

Leaders themselves often position themselves somewhere in the middle of that continuum of perspectives.

I'm really optimistic. Some days I'm really pessimistic about it, and whether I want to keep using it or how it's impacting society. It obviously has a lot of value, but it's also really scary what might happen. (#14, Global North, HE, Dean)

I find it hard to land anywhere other than in the middle because I think there are elements of both. If we were to say solely that we see it in only positive terms, I'm not sure that's really truthful, because I think there are all sorts of challenges and pitfalls that we must absolutely acknowledge. (#4, Global North, HE, Vice Principal Learning and Teaching)

Theme 2: A small group of leaders (11%) identified what they see as a divide in perceptions of and attitudes about AI. These perceptions are conditioned by geopolitics with a distinction between the global north and the global south. These leaders noted that the global south is hopeful that the benefits of AI can be reaped by their countries to address perennial educational challenges.

The last maybe three, four years, I went to so many conferences and people all wanted to hear about the dangers, right? And I said, you know what, I'm not doing this theme anymore because here we're not able to create danger. This could be an issue for the U.S. and Canada and other countries, but our country is not going to take over the world with AI. We want to keep up with the rest of the world. We want to participate. And if

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there's something good it can do for us, we want the benefits. (#38, Global South, K-12, Director)

There is a hidden kind of entry barrier that's not easy. People think that, like Google, you hit a bar and then you type something and ChatGPT gives something back. I mean, that's one approach. But then any cleverer, production-oriented use requires a lot more skill training and, of course, a lot more cash. So, there is a big divide between the way developing countries are looking at it and the OECD countries. (#17, Global North, HE, Special Advisor to the President)

Theme 3: Of the 45 leaders who were interviewed 19 (47%) expressed frustration about what they described as misplaced staff/faculty concerns with respect to AI including too much focus on whether teachers like using AI, too much power or credit being awarded to AI, what these leaders see as a disproportionate focus on the potential for academic dishonesty, and misguided efforts to keep AI out of the learning process.

Staff/faculty are giving too much power or credit to AI:

I'm concerned that it's becoming too alluring, too sexy, in my view. And that gives it power. (#2, Global North, HE, President)

I know how it works, and I know there's still a lot of things that it can't do. The problem is, it's very well marketed by a lot of companies. I'm struggling with trying to essentially tell everyone that it can't do this. (#15, Global South, HE, Professorial Chair in Artificial Intelligence)

Staff/faculty focus on academic dishonesty:

There's a complete disproportionate worry about cheating with ChatGPT. Everybody talks about how much LLMs can do, and how wonderful it is, and professionally it's wonderful, and all the things it could do, ignoring other risks, such as ethics, data privacy, equity. So, we ignore all this, and just look at what things it can do, until it comes to academic honesty. And then because students will cheat, we will not use LLMs,

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the discussion of how we grade learners takes over everything else. (#1, Global North, HE, Senior Research Director)

Staff/faculty focus on trying to keep AI out:

The immediate fear is, how do I prevent a student from using this? How do I detect whether or not they're using it to cheat? Yada, yada, yada. I don't think we've had the right conversation. Sure, you can say, please don't, but these kids are growing up where that concept of generative AI is going to be ubiquitous to them. (#42, Global North, HE, President)

Theme 4: Almost all leaders identified the outcomes of AI integration as more significant than potential cheating. They identified the role of the teacher, the potential loss of critical and creative thinking skills, the redefinition of knowledge, and learners' agency as far more significant issues that must be addressed in education. Leaders said that we have barely begun to consider these issues.

We are now finally at the point where it is arguably the most disruptive technology to higher education in a generation, [but] we're having the wrong conversations. We are focused on conversations that are consistent with the discussions we had when say, cell phones emerged in the learning environment... The question is how do we integrate it? AI is not going to necessarily replace the professor, but a professor with AI will replace a professor without AI. (#42, Global North, HE, President)

I think our interest is how do we support teachers to support meaningful learning and instruction? How do we empower students to use these tools to give them agency to continue to learn and deepen their ability to learn and change and grow whether the technology is ready or not. (#22, Global North, K-12, Director of Innovation)

And what it means is that the labor that is necessary to acquire knowledge is no longer part of a process of learning, just how do I push, how do I prompt? And the loss of

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creativity in that process is an issue that frightens me... I think, really, it's like a Christmas gift. We're still playing with the paper. We haven't even opened it. (#2, Global North, HE, President)

Subtopic 2: Leaders' Perspectives on AI's Role in Lifelong Learning

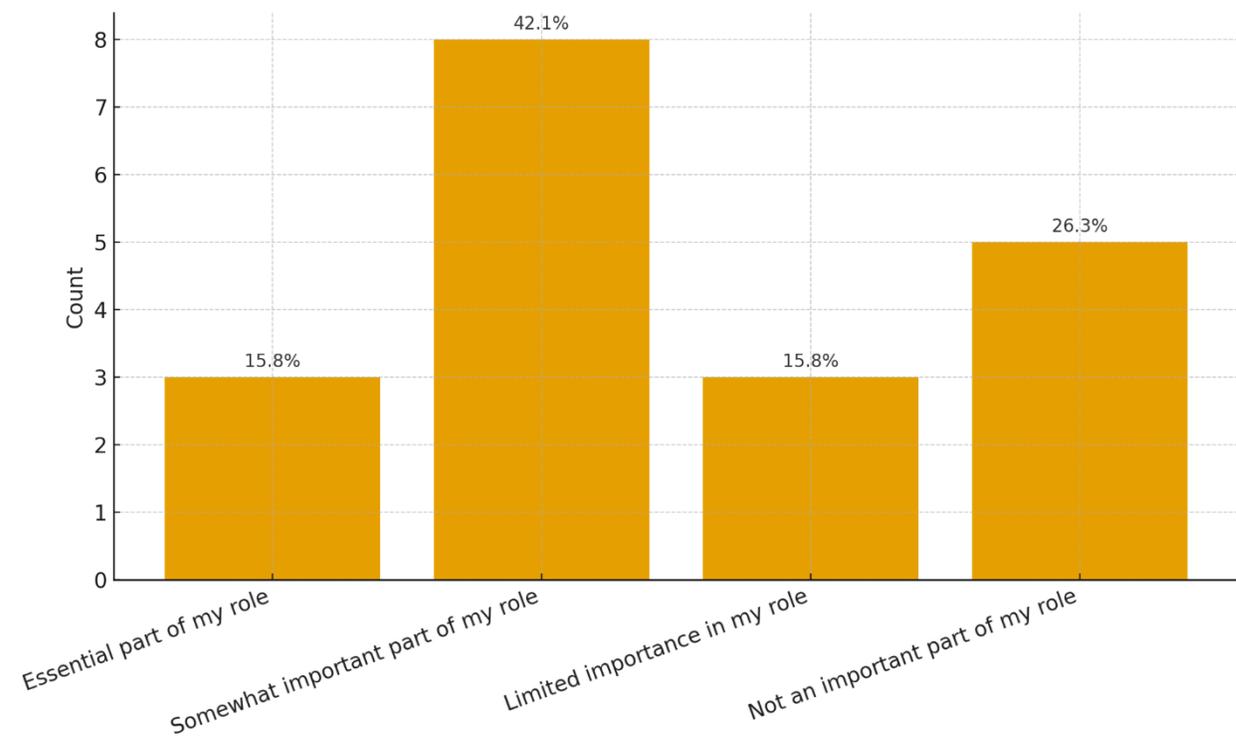
Questionnaire Findings. The questionnaire explained that today lifelong learning is seen as a means for developing curiosity, imagination, resilience, self-regulation, appreciation of the ideas, perspectives and values of others, the ability to move forward in the face of adversity, the ability to think for oneself "with a robust moral compass" (Schleicher, 2018). Respondents were then asked how important the implementation of change related to LLL enabled by AI was in their role, how likely they were moving forward to make the implementation of AI to improve LLL outcomes a school or institutional priority, and if leaders were likely to make use of AI capabilities to support lifelong learning in their school or institution where would their motivation to do so originate. Most leaders identified that leading the implementation of AI applications for LLL was essential or somewhat important in their role. This view was also represented in the interviews where leaders divided themselves between those seeing it as core work and those seeing it as not currently mandated. Moving forward most leaders saw the implementation of AI to improve lifelong learning outcomes as a school or institutional priority. Many respondents said they were highly likely or somewhat likely to make the implementation of AI to improve lifelong learning outcomes a school or institutional priority. It is interesting to note that respondents identified least often external policies and directives as the motivation to make use of AI capabilities to support lifelong

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learning in their schools or institutions. The data for the three questions is displayed numerically first followed by a narrative summation of the pattern of responses.

Figure 11

Importance of AI-enabled LLL to Leaders' Roles

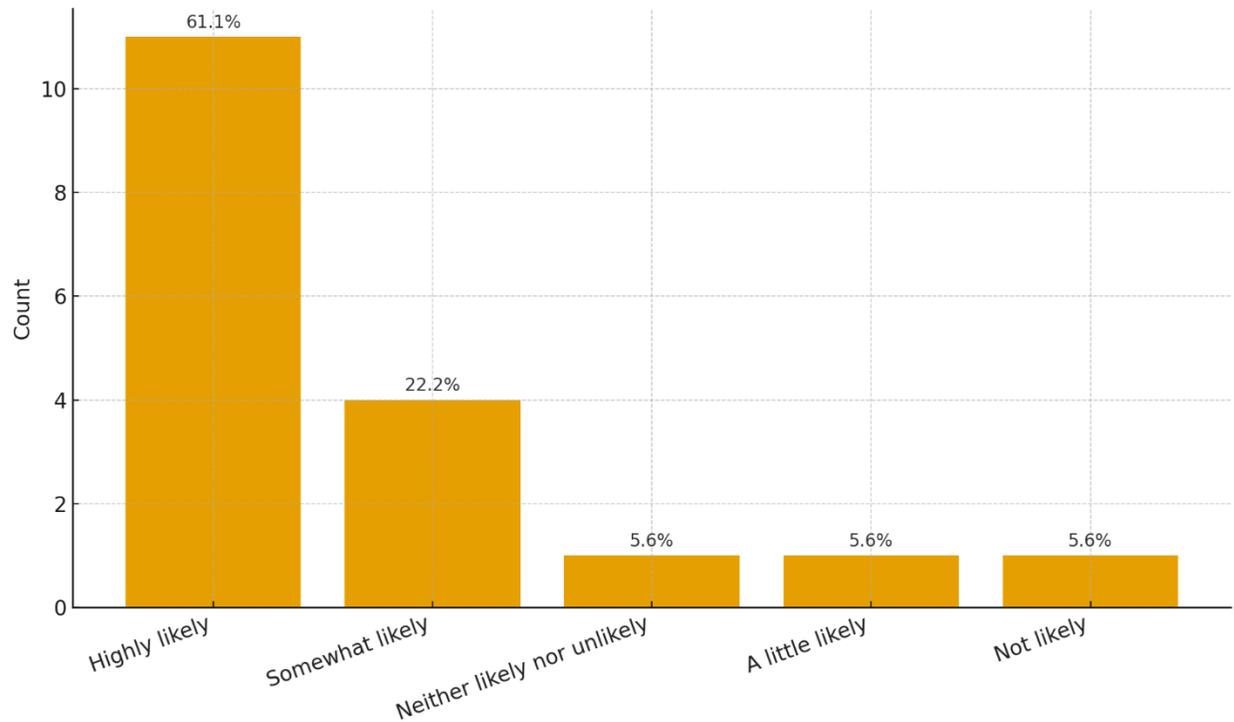


Note: Figure 11 shows that more than half of the respondents (i.e., 57.9%) said that leading the implementation of AI applications for LLL was either an essential or somewhat important part of their role. This view was also represented in the interviews where leaders divided themselves between those seeing it as core work and those seeing it as not currently mandated.

Figure 12

Likelihood of Prioritizing the Implementation of AI to Improve as a School/Institutional Priority

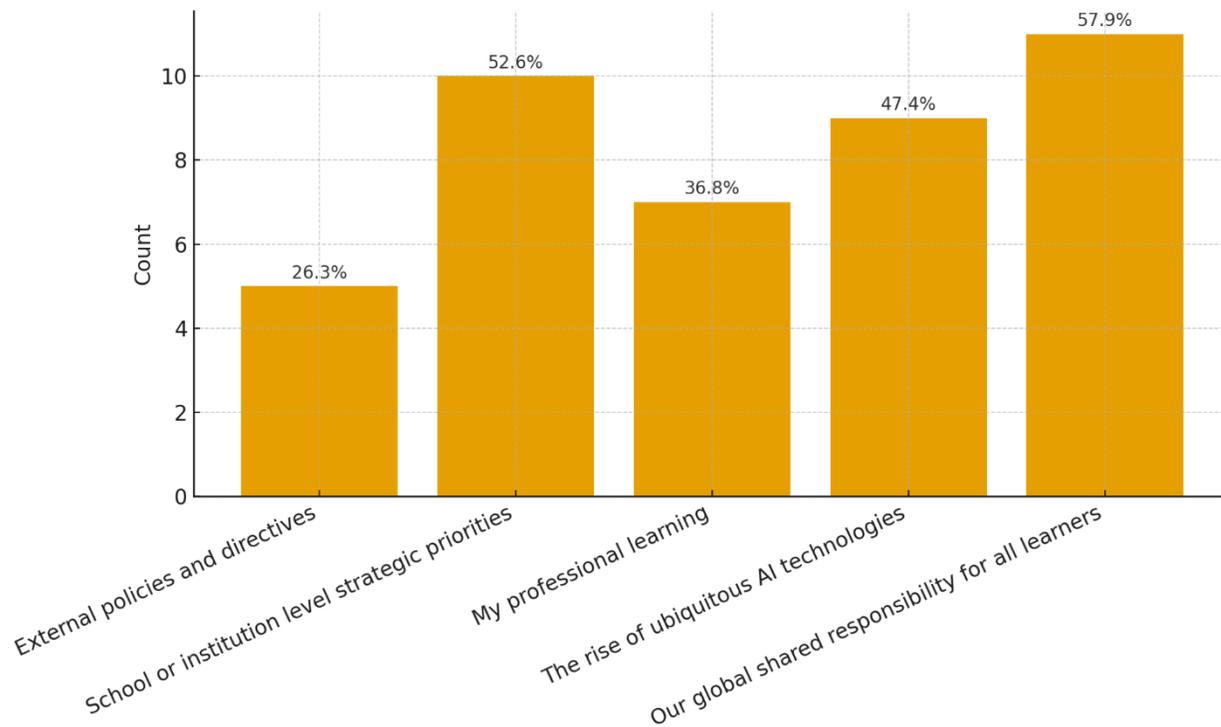
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Note: Figure 12 shows that more than three-quarters of respondents (i.e. 83.3%) said they were highly likely or somewhat likely to make the implementation of AI to improve lifelong learning outcomes their school or institutional priority. Although the percentage may be higher here than in the interviews, this future-focus on AI-enabling greater equity of opportunity for life learning for all was also reflected in the interviews.

Figure 13

Motivational Factors for Leadership in Prioritizing AI to Support LLL



Note: Figure 13 shows when leaders were likely to make use of AI capabilities to support lifelong learning in their school or institution, where their motivation to do so originates. Three sources of motivation were identified, with one being internal (e.g. school or institution level strategic priorities) and two being external (e.g. global shared responsibility for all learners and the rise of ubiquitous AI technologies). Leaders identified external policies and directives least often as a motivator for making use of AI capabilities to support LLL in their school/institution.

Interview Findings. The second interview question that was used to help identify leaders' perspectives on the benefits/risks, opportunities/challenges of AI asked participants to focus on the reimagined concept of lifelong learning (LLL) as put forward by the helping organizations such as UNESCO. The question was prefaced by a brief explanation of how over the last several years the concept of lifelong learning for all has

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evolved. LLL used to refer mainly to adult retraining for the job market or professional upgrading. Organizations like UNESCO have helped to shift what is viewed as LLL. Today LLL is meant for everyone and should involve the development of everyone's human capability over a lifetime. Given the global focus on increased equity of opportunity for lifelong learning for all through the development of human capability, it seems that the shift is underway from viewing education as a finite experience with the goal of a credential (or moving to the next educational level) to seeing education as an infinite experience. Today the pursuit of LLL is seen as a means for developing curiosity, imagination, resilience, self-regulation, appreciation of the ideas, perspectives and values of others, the ability to move forward in the face of adversity, the ability to think for oneself 'with a robust moral compass' (Schleicher, 2018). Literacy is seen as an essential tool in lifelong learning and human capability development. Literacy, then, is seen as more than a stage that we hope students achieve in the early years of formal school, but, rather, a set of capabilities that are developed over a lifetime. As a result, formal and informal learning are valued as significant elements alongside formal learning on the journey to realizing one's own capabilities. Armed with this information, leaders were then asked if they are having conversations with their staff/faculty about the global focus on increased equity of opportunity for lifelong learning for all through the development of human capability. If they were, what kinds of things are being discussed and/or undertaken? Is a role for AI been identified in realizing this reimagined vision of lifelong learning for all?

Most HE leaders from the Global North still referenced LLL using the older definition of adult retraining for the job market or professional upgrading. Two HE leaders from the

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Global North identified that the conversation was of paramount importance and further work must be done to reimagine education to address this global challenge. Although the percentage of leaders who saw the pursuit of reimagined LLL for all as a priority was higher in the questionnaires than in the interviews, this future focus on AI-enabling greater equity of opportunity was also reflected in the interviews. When HE leaders acknowledged that yes, the conversations were happening, action was being taken, and a role for AI was being defined these leaders were usually from the Global South. Most K-12 leaders both in the Global North and the Global South identified as their core work the development of attitudes, values and perspectives such as curiosity, imagination, resilience, self-regulation, appreciation of the ideas, perspectives and values of others, the ability to move forward in the face of adversity, the ability to think for oneself. Once again, several themes or patterns of responses emerged as described below.

Theme 1: Several leaders identified that these conversations are not happening at all.

We haven't had a centralized model of understanding the potential of lifelong learning and therefore the potential that generative artificial intelligence can also play in that.

(#11, Global North, HE, Director of Teaching Innovation)

We haven't necessarily had the conversation about people's skills and how they need to stay on top of AI to be committed lifelong learners, but they are conversations we probably ought to have next. (#7, Global North, HE, Associate Pro-Vice-Chancellor of Teaching, Learning and Digital Education)

I don't see much of a conversation centering around the fact that AI is going to help us or help our students in their endeavor towards lifelong learning. We are not putting them together. And in fact, now that you ask the question, even I did not think about AI as a tool to extend our pursuit towards lifelong learning. We put them in different boxes, and when we are focusing on AI, we are focusing on AI. When we are focusing on lifelong

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learning, we are focusing on lifelong learning. (#18, Global South, HE, Program Director)

Four reasons were identified for why the conversations are not happening:

1. For some leaders, lifelong learning work is still housed in a discrete department reminiscent of the approach to LLL as adult retraining or professional upgrading:

I don't think that has sort of drizzled down to the way our Lifelong Learning Unit sees lifelong learning. I still think they are seeing us very much as an elite university that can provide research-based teaching. (#28, Global North, HE, Vice Dean of Education)

2. For some leaders the core work is about moving students to the next grade or passing the credential, so they don't necessarily connect that process to LLL through the development of human capability:

Most of our focus on that discussion is currently on the initial education, on the undergrad and graduate level, on how that basically impacts literacy. (#5, Global North, HE, Rector)

My sense is that the conversation hasn't drifted down to schools, and that we're still about moving successfully to the next stage of learning. (#31, Global North, K-12, Vice Principal)

I think working in education in general makes it very, very hard to see outside the context of the job that we do. And all the lifelong learning stuff... is about learning to be, not learning to do stuff. You learn to do stuff to learn to be and you learn to be in the company of others. And it is about learning to be with other humans. So those sorts of conversations are had all the time, but they don't really reverberate across the university, which is still very highly focused on, and not unexpectedly, achieving the specified learning outcomes. (#21, Global North, HE, Dean)

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3. For some leaders there is a disconnect between the current concept of LLL as the development of a set of values and perspectives for a lifetime and educators' understanding of AI:

To be honest, no, because it's too early to have such discussions. So, talking about AI, at that level of sophistication, it takes time for the universities and the professionals in the universities to understand this technology. (#9, Global North, HE, Director)

4. And for other leaders it is wrongheaded to think that prioritizing lifelong learning for all enabled by AI will change the economic drivers of our societal development or help us learn human perspectives which are the core of reimagined LLL:

I haven't heard a single person say that AI will give better opportunities for undereducated people to enter the complexities of dialogues. On the contrary, the debate is rather that everyone needs higher levels of competencies to be relevant in a modern job market. (#12, Global North, HE, Dean)

If you enter any discourse on lifelong learning, the first thing is always about credentialing. The second thing is always about how it links to larger economic objectives of the society... At this stage, there's no widespread perception that generative AI is going to increase equitable opportunities. In fact, it's the other way around. There is a view that there are people who will have access to generative AI and those who won't. (#17, Global North, HE, Special Advisor to the President)

If you want to learn to pass an exam, then get a large language model and don't bother with the teachers. If you want to learn what it is to engage as a human being within the cultures of the various disciplines and things that we're doing, then it should be something that involves human beings. (#21, Global North, HE, Dean)

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Theme 2: Twenty-four percent of HE leaders from the Global North saw the pursuit of LLL through the development of human capability enabled by AI as currently outside their mandate. They didn't believe that they were being funded to address LLL and therefore could not take it on unless the government decides to mandate it and fund it.

Systemic level change isn't happening because that's not what we're funded to do. The core of our work is either postgraduate students paying fees to do full-time programs, or home students, self-funded or government-funded, doing full-time degrees. And there isn't a lot of funding around the margins. (#4, Global North, HE, Vice Principal Learning and Teaching)

I don't think universities have got the capacity to make that decision on their own, I think we need a national level decision on this. This is what you're going to do, this is what we need, it's strategic, it's joined up. (# 6, Global South, HE, Academic Director)

Theme 3: Every leader (100%) from the Global South identified LLL for all as the current educational priority. They acknowledged a concrete role for AI in realizing that priority through increasing equity of opportunity for more people to realize their capabilities through lifelong learning.

The penetration of smartphones is very high, despite the challenges and even for people at the lowest economic level, because a telephone is economic aid, you can do business, people buy phones, and they sacrifice to be able to buy credit. So, cell phones are pretty much ubiquitous at this point. We have an (AI-enabled) system that can recognize our spoken native language and can help you to learn to read on your cell phone, like a reading tutor. And it's got an interface, you see some text and you try to read it, and it gives you feedback if you read it correctly or not. And you can keep working on it until you learn to read better. And we made that, so it works even in low end phones with an AI model. (#38, Global South, K-12, Director)

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Speaking from my own institution, there's a desire to set up mechanisms to reach underserved individuals. So, these may be people who are marginalized, for example, or working professionals who maybe don't have time to upskill...now that AI has become much more foregrounded, there are questions about how we can augment the capabilities that we have now by using these other tools. (#13, Global South, HE, Head of Learning Sciences)

Theme 4: There were distinctions between the Global North and the Global South and between HE and K-12 on how lifelong learning is and could be delivered. Specifically, HE leaders from the Global South saw self-paced, micro-credentials as the way of the future and as a means for realizing lifelong learning for more people. HE leaders from the Global North identified the provision of MOOCs or business school sponsored, short-term certificates for professional learning as the way they were doing LLL. However, these perspectives and approaches were different from those described by K-12 leaders in both the Global North and the Global South. These leaders identified the importance of developing the predispositions, attitudes, values, perspectives and skills that would prepare a person to learn for a lifetime. They described this priority as their core work whether they used the term lifelong learning or considered a role for AI or not.

HE Global South:

One of the courses they've done is an open course, and it's teaching English at different levels in a self-paced way, anyone can take it. (#20, Global South, HE, Professor of Practice for Teaching and Learning)

We need to embrace micro-credentialing because it is the new normal and what is important is that we have micro-credentialing for academic programs, and we have micro-credentialing for skills-based programs. So, you don't need any background. You just want to have a skill, and you study, and you get a credential. How do we recognize

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this credential in a formal setting? Because it is knowledge that has been gained, it is important that we reframe our thoughts around how knowledge can be acquired. (#26, Global South, HE, Vice-Chancellor)

HE Global North:

We have the massive online open courses, MOOCs. And we have dozens of them at the various levels of technology maturity, but they are all in English and offered to the whole world. And the largest one, Elements of AI, which was done more than five years ago, has had more than 1 million people taking the course. So yeah, that starts to be a significant number. (#30, Global North, HE, Vice Rector)

I can think of some forms of short courses and professional development that are very much around supporting the growth, the individual in the workplace that have been highly successful. They've been done in collaboration with industry partners because of a specific requirement and need. (#11, Global North, HE, Director of Teaching Innovation)

K-12 Global North and Global South:

Things like curiosity, empathy, adaptive problem solving, creativity, adaptive thinking, creative problem solving, advocacy, self-direction, things like that, investigation skills, I don't know if they're lifelong learning, really, but those are the long-term outcomes we want for our kids, so that they can be successful learners and successful adults further on. And if you have some of those skills, you can apply yourself to a lot of things, because they're transferable. (#32, K-12, Global South, Principal)

We started to really interrogate who are we as a school and what do we want to do, so we went about creating new and animating principles or that really are our beliefs. And that lifelong learning piece is represented in us. (#24, Global North, K-12, Principal)

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None of the K-20 leaders who expressed value for the holistic development of the perspectives of a lifelong learner identified that they had discussed with their staff a role for AI in that work:

We talk about students having agency over their learning and setting them up to be good future learners. We talk about collaboration, we talk about knowing our people, we talk about using data to inform our learning choices and having engaged learners. We're not necessarily training our students for a particular career or a particular job but training them more to be researchers or to have an analytical critical thinking mind and so on. Have we incorporated AI into those conversations? Maybe not explicitly. (# 39, Global North, K-12, Director of Teaching and Learning)

Theme 5: In both developed and developing countries leaders recognized that this reimagined concept of lifelong learning would require significant institutional change. Such change would require time and money as well as specific strategies to affect change.

I think we see lifelong learning as unquestionably the future, which is to say there may still be concentrated three- or four-year programs, but in time, and we're just at the beginning of it, fewer people will do those, and more people will spread their education out over their life. And second, even the ones who do that will be doing lifelong learning anyway. So, we must be prepared for an education system in which that's the situation. I think the lifelong learning piece is more than five years away. I think that's 10 or 20 years away. (#23, Global North, HE, President and Vice-Chancellor)

One of the things that has come up in discussion is the financial investment to set up your infrastructure to get that right. Because you can't necessarily use the same learning management system. You may need different mechanisms for enrollment, payment gateways, the list goes on, So, the financial investment to have that, to get that set up properly, and to have a mature model that allows you to be really successful in that sort

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of future learning type space, is one that we've grappled with for some time. (#11, Global North, HE, Director of Teaching Innovations)

Theme 6: Several leaders identified significant barriers that need to be overcome with respect to implementing greater equity of opportunity for lifelong learning for all. These four barriers included: resistance to change, traditional hierarchies and paradigms, the emphasis in the Global North on high stakes testing in K-12, and the emphasis on credentials in HE.

1. Resistance to change:

As I say, this is the legitimacy of those in power. They still want to learn the same way they were taught. (#35, Global South, HE, Vice Chancellor)

And we've had push back over the years because people haven't recognized the value of our community impact projects because it doesn't look like a traditional subject that you see in most schools. And we've had to defend that time and time again. (#25, Global North, K-12, Principal)

Society has rattled on for the last 30 years with people that can only add up using a calculator, right? I learned to add and do my tables. I never ever do mental math, because now I have a phone with me that has a calculator all the time. And you know I don't feel in any way diminished that I use a calculator. I think there are shifts of things that we learn and that we used to learn that we probably don't need to learn anymore. (#24, Global North, K-12, Principal)

2. Traditional hierarchies and paradigms:

They are not goats where you must count them when they all return home in the evening. Everybody can move at their own pace and their own rate. You can all start together, but you don't have to finish together. And this is something that is not yet understood by policymakers. (#35, Global South, HE, Vice Chancellor)

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I think we're in a completely different space now. And it's acknowledging a different kind of learner who is now going to progress and be successful through our systems... We were the successful people because we had the capacity to learn large amounts of data and spit them back out again for exams. Many people that have power in our society were successful because that was their ability. So, there's a shift in power now and control and we will lose place in the pecking order. (#24, Global North, K-12, Principal)

Where I went to medical school we had 80 students per class. Now they have 89 students per class; it hasn't changed much in 31 years. Yeah, the same faculty, the students don't rotate anywhere else. They're only on campus, they only go to this hospital, they do surgery at this hospital. So, they're not as inclined to be thinking globally. (# 34, Global South, HE, Director)

I think what AI has done is show quite clearly just how much we need to upskill and learn as lifelong learners ourselves. I think so many of us thought, I've got my PhD, I do my research, I may have done some training to be an educator, and that's my professional development done. Everything else I do is about my own knowledge of my discipline. And so that's kind of been the dominant paradigm. Whilst I don't think that that's a healthy attitude, and we should always learn, I think that AI has really kind of spotlighted the fact that we don't routinely, as academic staff, upskill in line with technology and new ways of teaching and new ways of assessing students. (#4, Global North, HE, Vice Principal Learning and Teaching)

3. The emphasis in developed counties on high stakes testing in K-12:

I think that teachers are having those conversations, and I think that they're very frustrated because every time they have the conversation, they realize that the system that they're working in is constraining them on being able to produce what they want to produce. The teacher wants to produce those lifelong learners. They want to get kids to be curious. They want to make kids love the act of learning. But when you tie all these high stakes accountability to their job, they feel like they're trapped, and they must teach

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to the test. So that's a conversation that needs to be held at state and federal levels when it comes to our high stakes testing situation. (#33, Global North, K-12, Director)

4. The HE emphasis on credentials not competence:

So many of our education systems are set up so that if you fail, you can't progress. (#4, Global North, HE, Vice Principal Learning and Teaching)

Our system of education does not assess competence. So very competent people have failed because they didn't pass the examination. And the examination was just about knowledge, not competence. We need to start recognizing that knowledge can be acquired through different means, not only from the classroom. It can be done by accident. It can be done intentionally by participating in any kind of endeavor. It can be gained from work experience. It can be gained from pain. It can be gained from happiness. It can be stumbled upon; but however knowledge is acquired, it is important for us to be able to recognize that knowledge. And that, for me, is the most critical issue that comes into the picture when we talk about using AI to enhance lifelong learning. (#26, Developing, HE, Vice-Chancellor)

Research Question One Summary of Findings

The first research question was explored using two subtopics. The first subtopic explored leaders' perspectives on the rapid and pervasive integration of AI into education and what leaders saw as the benefits/opportunities and risks/challenges. The questionnaire data showed that leaders' perspective with respect to specific benefits was often balanced, but their identification of risks usually involved a clear prioritization of some risks as being greater than others. During the interviews, many leaders expressed frustration about the limitations of the AI benefits/risks conversations within their schools/institutions sensing that there were larger issues at play that need more focus and attention than whether staff/faculty like or use AI.

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The second subtopic considered leaders' perspectives on the potential of AI to address greater global equity for LLL for all. Some interview participants from HE in the Global North had some difficulty recognizing the new concepts of LLL. Leaders were split in their perspectives along the lines of Global North vs. Global South and HE vs. K-12. That is, most HE leaders from the Global North still referenced LLL using the older definition of adult retraining for the job market or professional upgrading. Only two HE leaders from the Global North identified that the conversation was of paramount importance to happen and that further work must be done to reimagine education to address this global challenge. It seems that the regulatory approach revealed in detail by leaders in the interview as the current response for many leaders regardless of whether they see it as worthwhile doing so or not, does not capture what leaders see as their motivation for change. Rather, exploration of the big issues, questions that require a reinvention of education as articulated in the interviews combined with internal strategic priorities and a need to learn more about how to respond to a global mandate for change are the motivations for leadership.

When HE leaders acknowledged that yes, the conversations were happening, action was being taken and a role for AI was being defined these leaders were usually from the Global South or K-12. Most K-12 leaders both in the Global North and the Global South identified as their core work the development of attitudes, values, and perspectives such as curiosity, imagination, resilience, self-regulation, appreciation of the ideas, perspectives and values of others, the ability to move forward in the face of adversity, and the ability to think for oneself.

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Regardless of whether they saw the pursuit of LLL for all as legitimate and worthwhile, all but a couple of leaders were unable to identify a role for AI in that challenge. Leaders provided fulsome data on this sub-topic. How these perspectives relate to the five organizing concepts of this study will be explored and discussed in the next chapter.

Research Question Two Findings: What is the current level of expertise of educational leaders K-20 with respect to AI?

While the first research question delved into leaders' perspectives and values or the why of AI integration, the second research question examined leaders' understanding of AI capabilities or the what of AI integration. This data has been subdivided into three sub-topics for ease of understanding. Each sub-topic used both questionnaire and interview questions to explore the subtopic.

Subtopic 1: Exploring Leaders' Understanding of AI Concepts and Capabilities and the Impact of Them

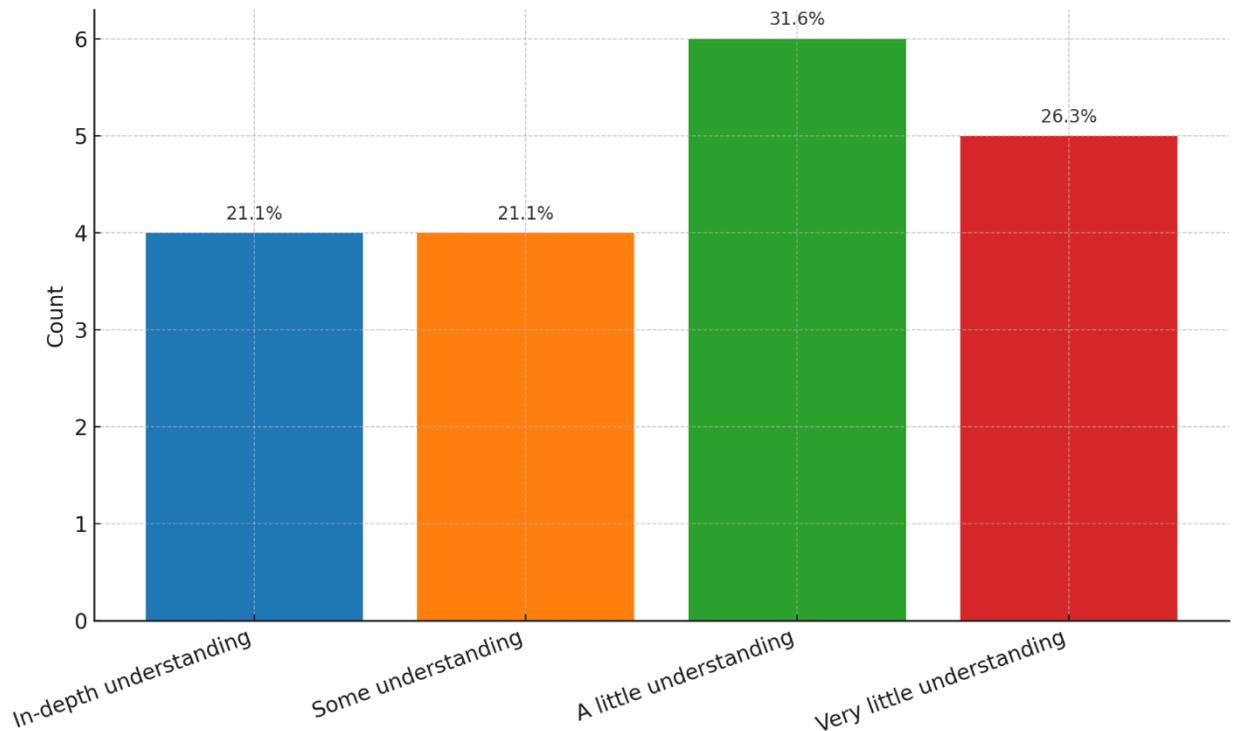
Questionnaire Findings. Participants were asked to rate their understanding of several AI concepts using a four-point Likert scale. A definition was provided for each concept. A minority of leaders had an in-depth understanding of AI and its capabilities; some leaders said that they had no understanding of some of AI's capabilities while most leaders said they have some to a little understanding. The least well-known concept of AI by respondents was Intelligent Decision Support Systems while the best-known concepts were Generative Pre-Trained Transformers and Large Language Models.

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Each of the concepts from the questionnaire is shared below. A graphic display of the data is shared first followed by a narrative summation of the pattern of responses for each concept.

Figure 14

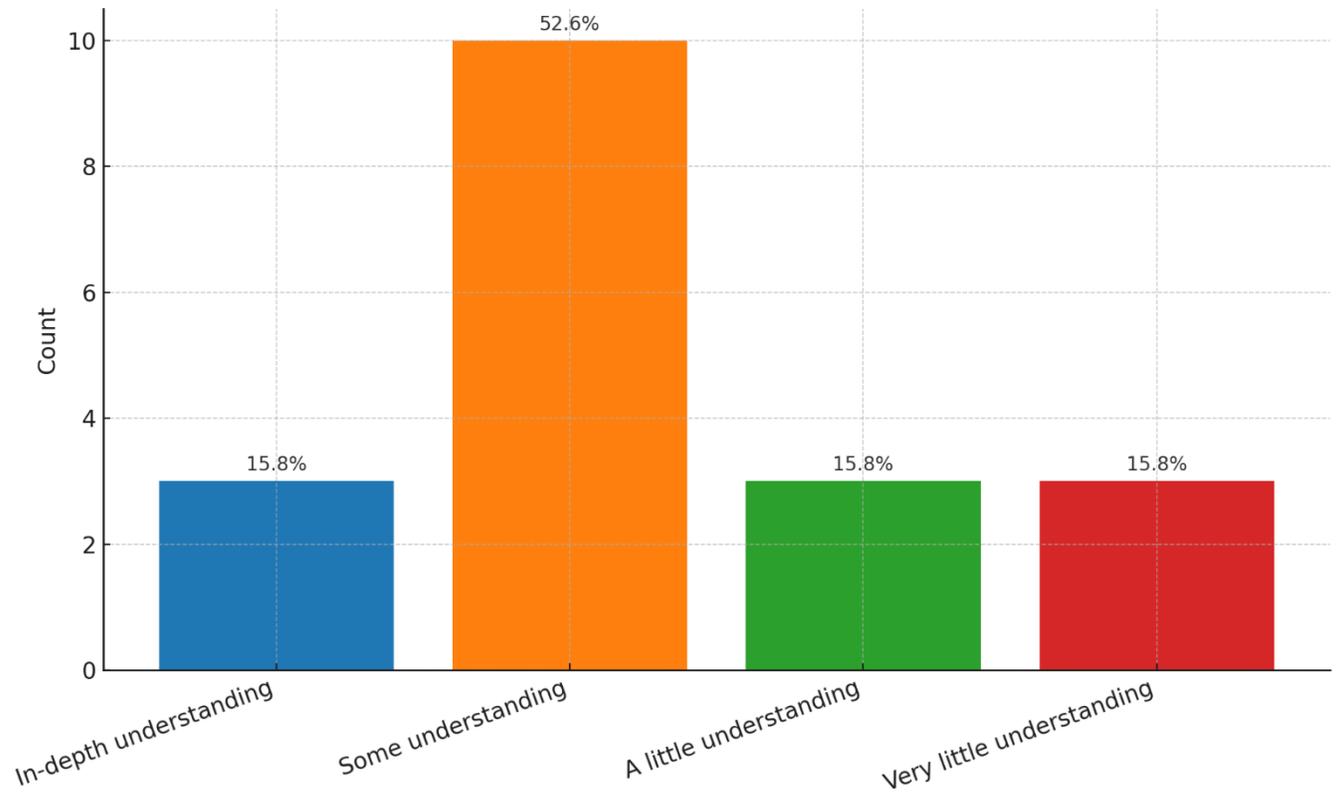
Leaders' Understanding of Artificial Neural Networks (ANN)



Note: Figure 14 shows that more than half (i.e., 57.9%) of the respondents had from little to very little understanding of ANN, how it is being developed and its capabilities.

Figure 15

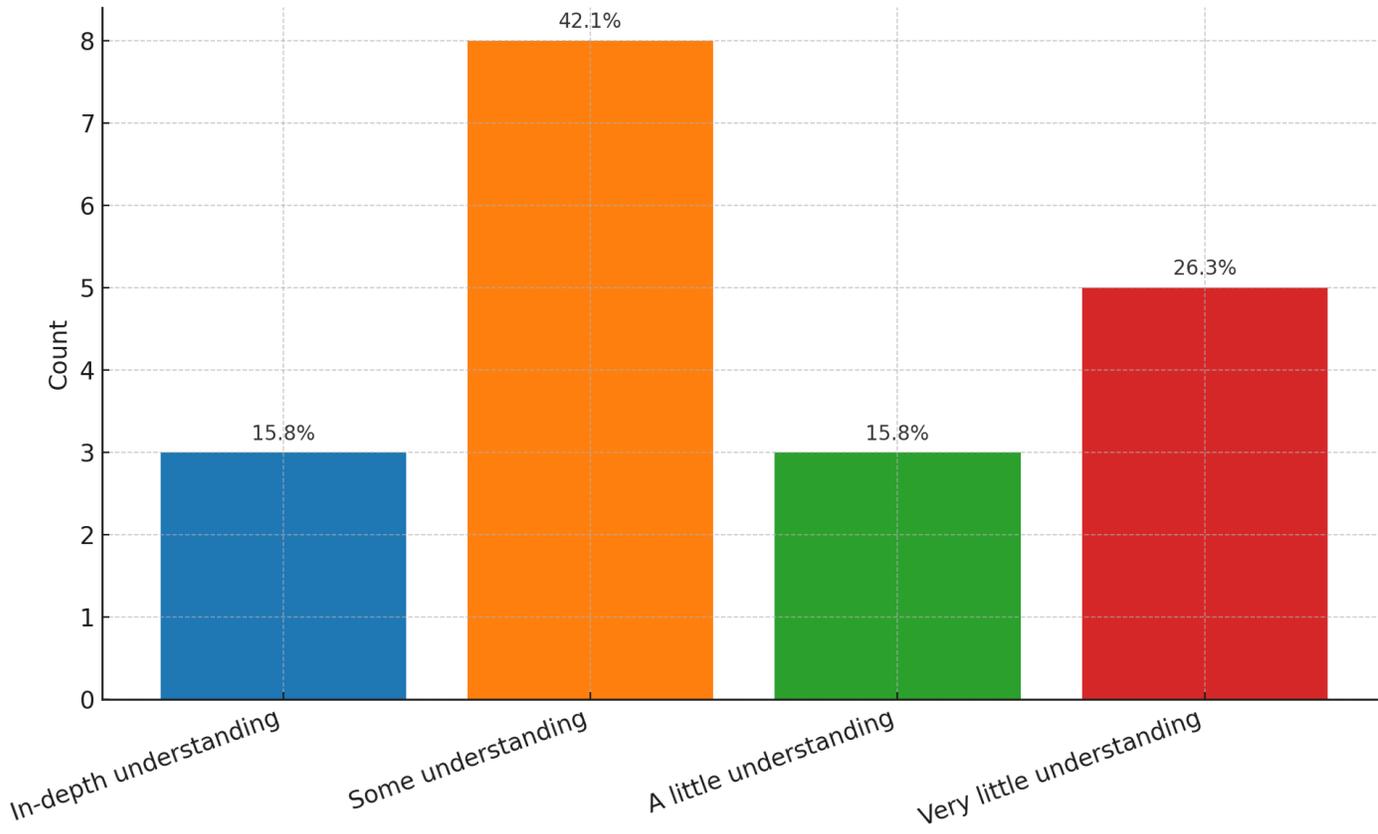
Leaders' Understanding of Deep Learning (DL)



Note: Figure 15 shows that more than half (i.e., 68.4%) of the respondents had some or an in-depth understanding of DL, how it is being developed and its capabilities.

Figure 16

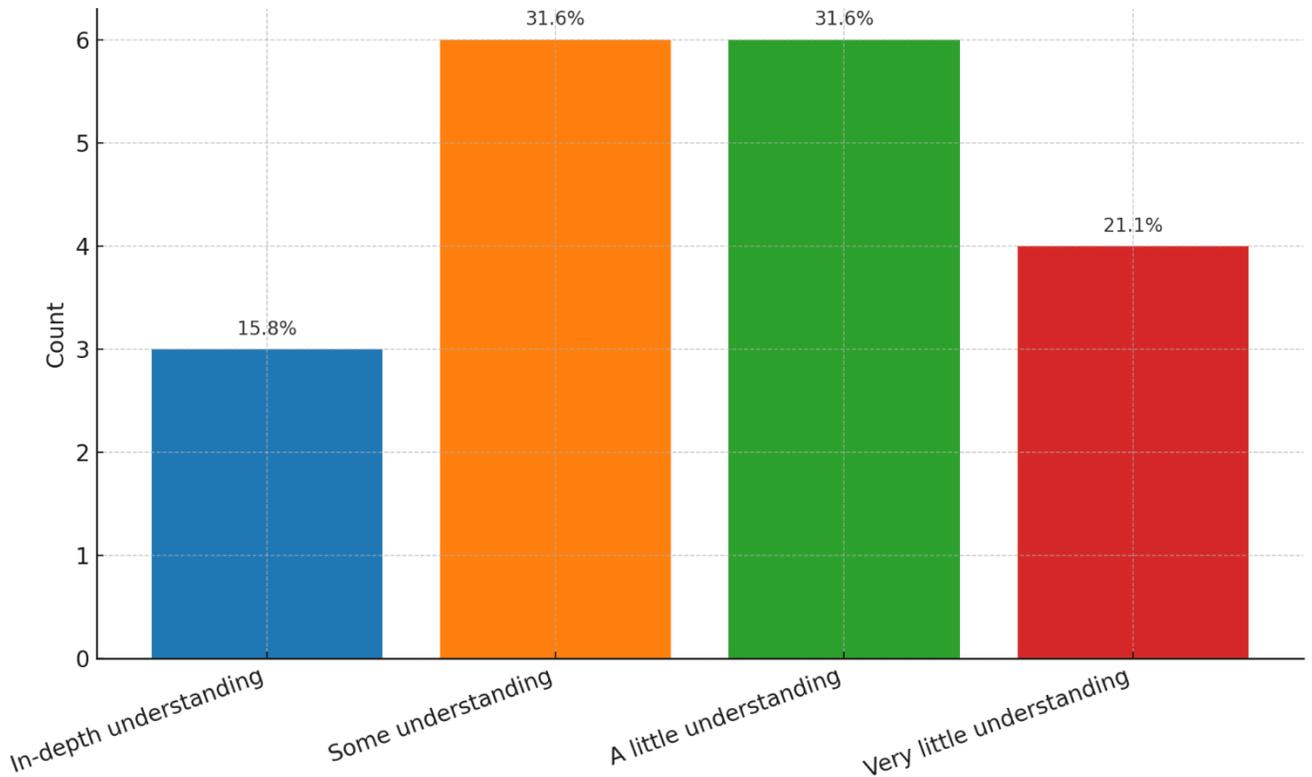
Leaders' Understanding of Educational Data Mining (EDM)



Note: Figure 16 shows that more than half (i.e., 57.9%) of the participants had some or an in-depth understanding of EDM, what it is, how it is being developed, and its capabilities.

Figure 17

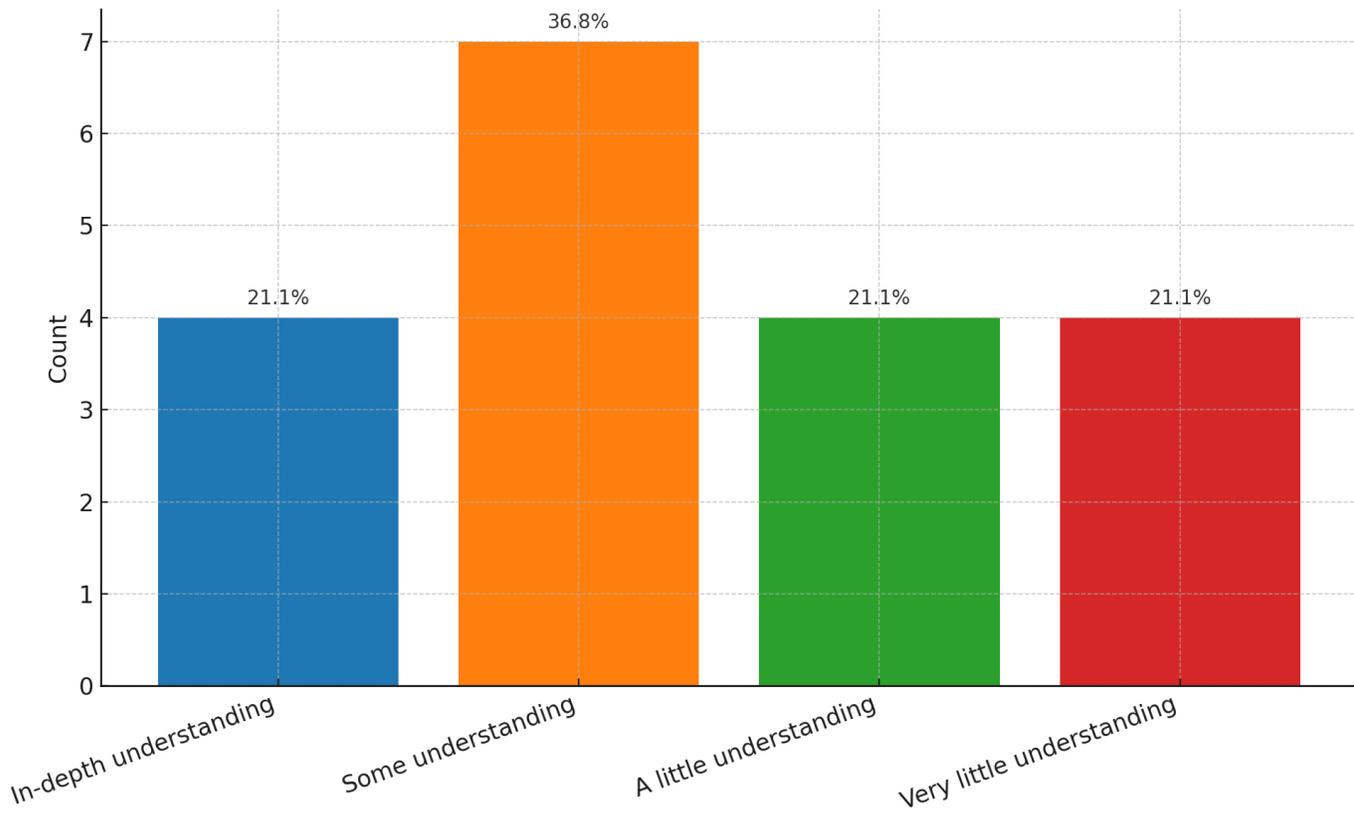
Leaders' Understanding of Expert Systems



Note: Figure 17 shows that respondents were divided with approximately half (i.e., 47.4%) having from some or an in-depth understanding of Expert Systems, and approximately half (i.e., 52.7%) having a little or no understanding of Expert Systems, how they are being developed, and their capabilities.

Figure 18

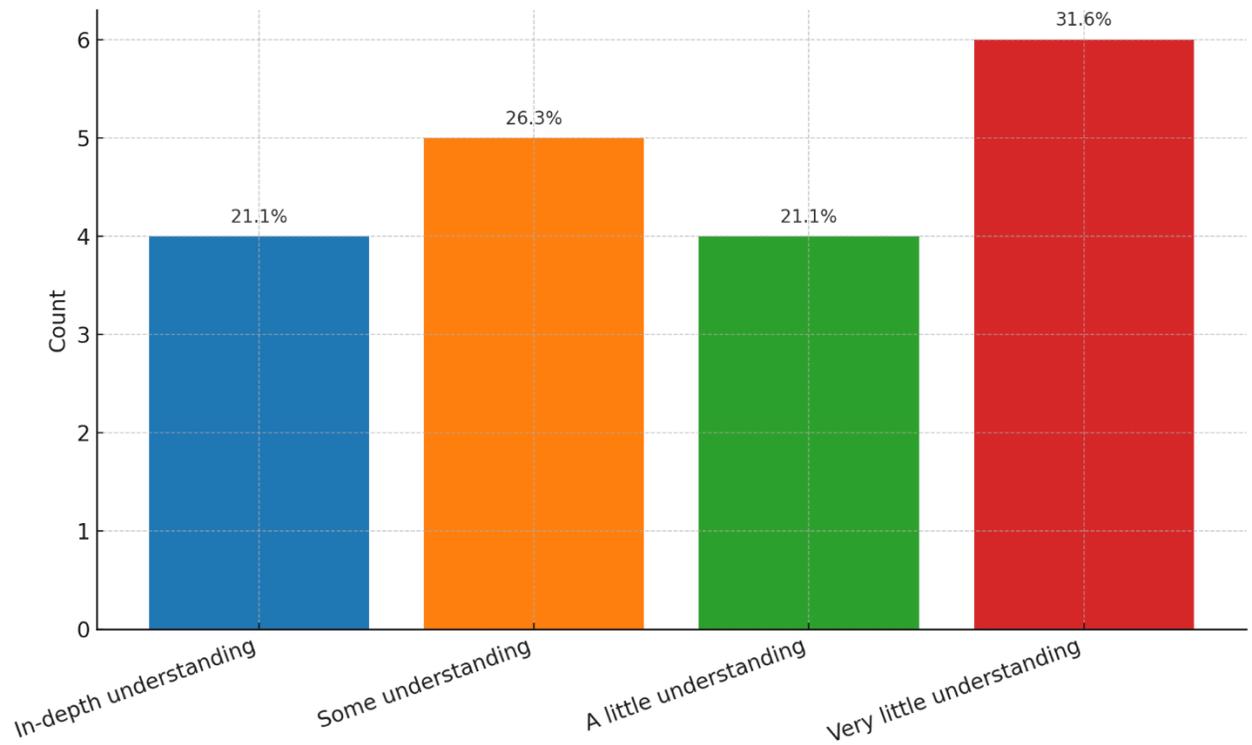
Leaders' Understanding of Generative Artificial Intelligence (GAI)



Note: Figure 18 shows that approximately one-third (i.e., 36.8%) of participants had some understanding of what GAI is, how it is being developed, and its capabilities. The other two-thirds (i.e., 63.3%) of respondents were evenly divided in their understanding.

Figure 19

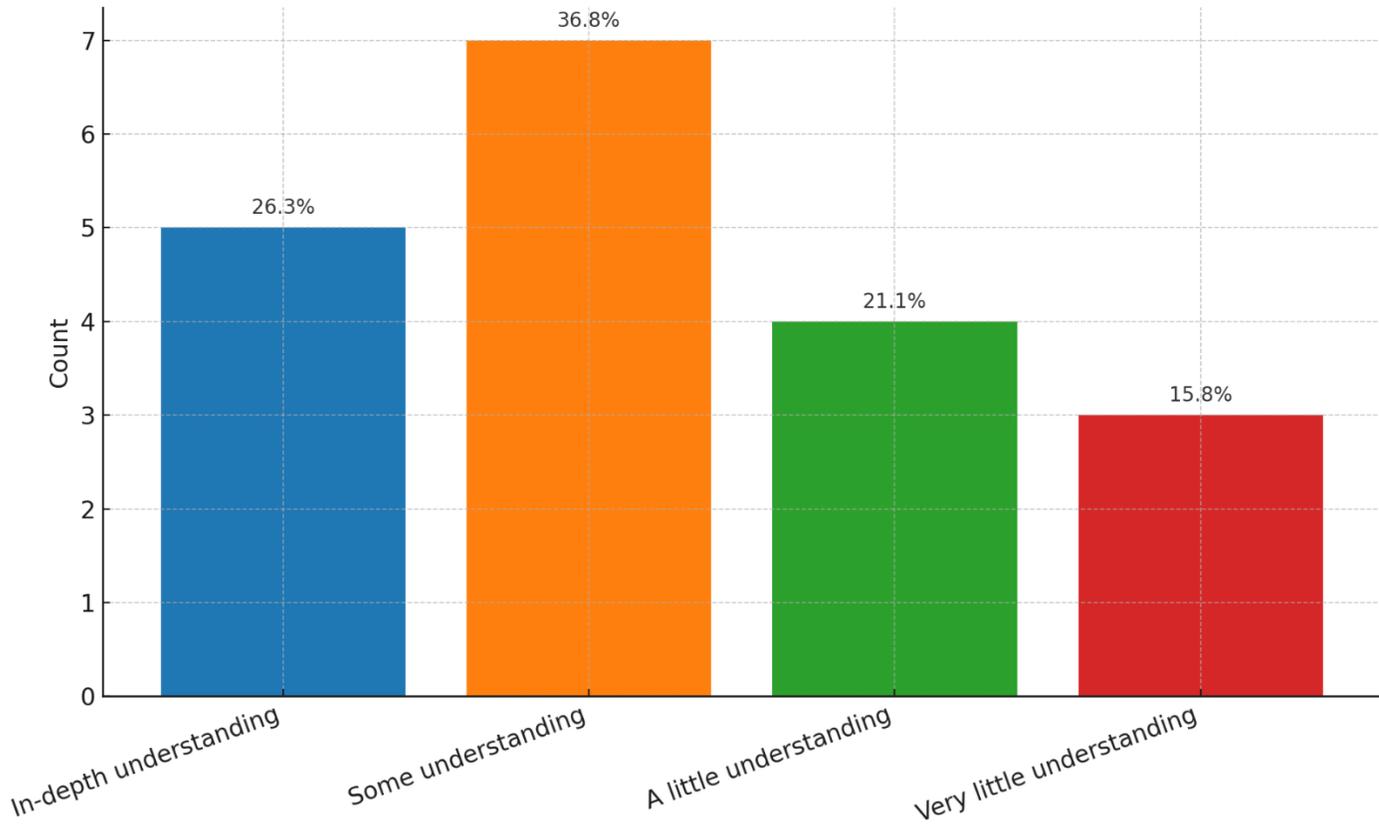
Leaders' Understanding of Generative Adversarial Network (GAN)



Note: Figure 19 shows that more than half (i.e., 52.7%) of respondents had a little to very little understanding of what GAN is, how it is being developed, and its capabilities.

Figure 20

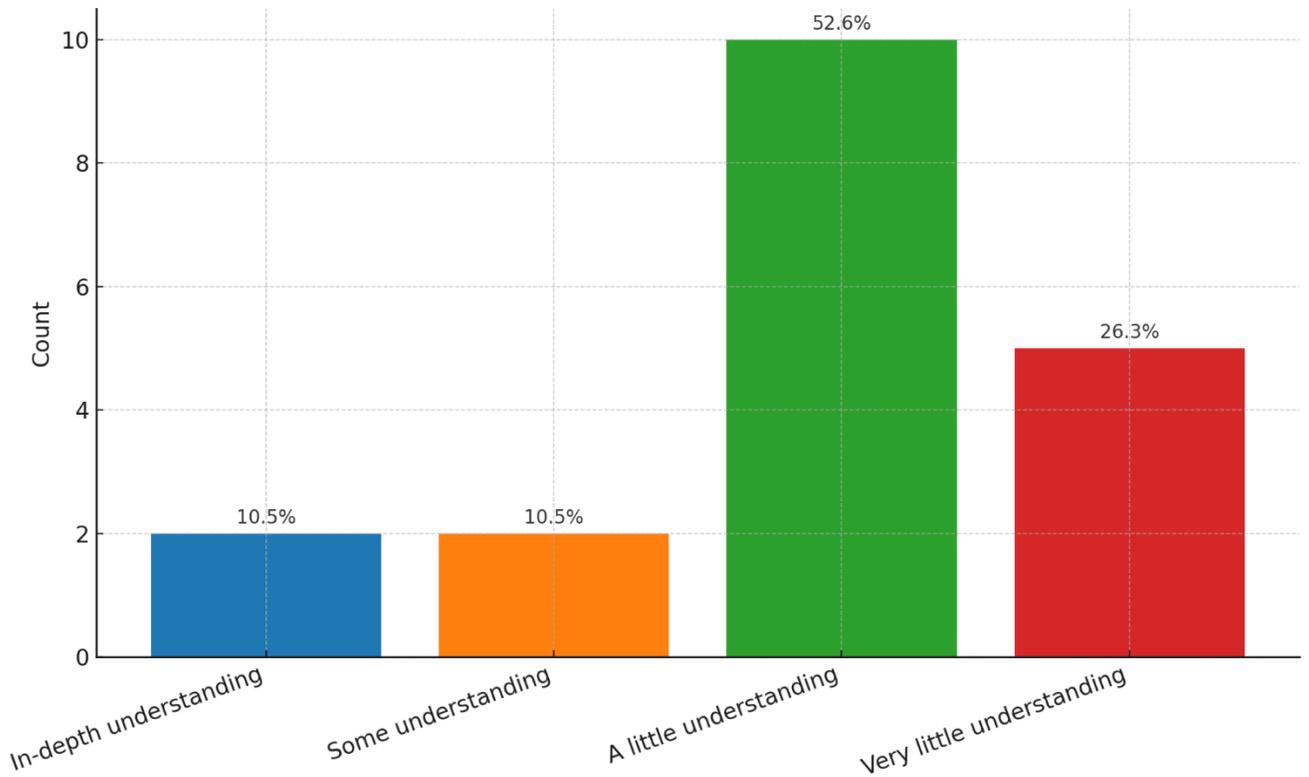
Leaders' Understanding of Generative Pre-trained Transformer (GPT)



Note: Figure 20 shows that the most common response (i.e. 36.8%) was that leaders have some understanding of what GPT is, how it is being developed, and its capabilities.

Figure 21

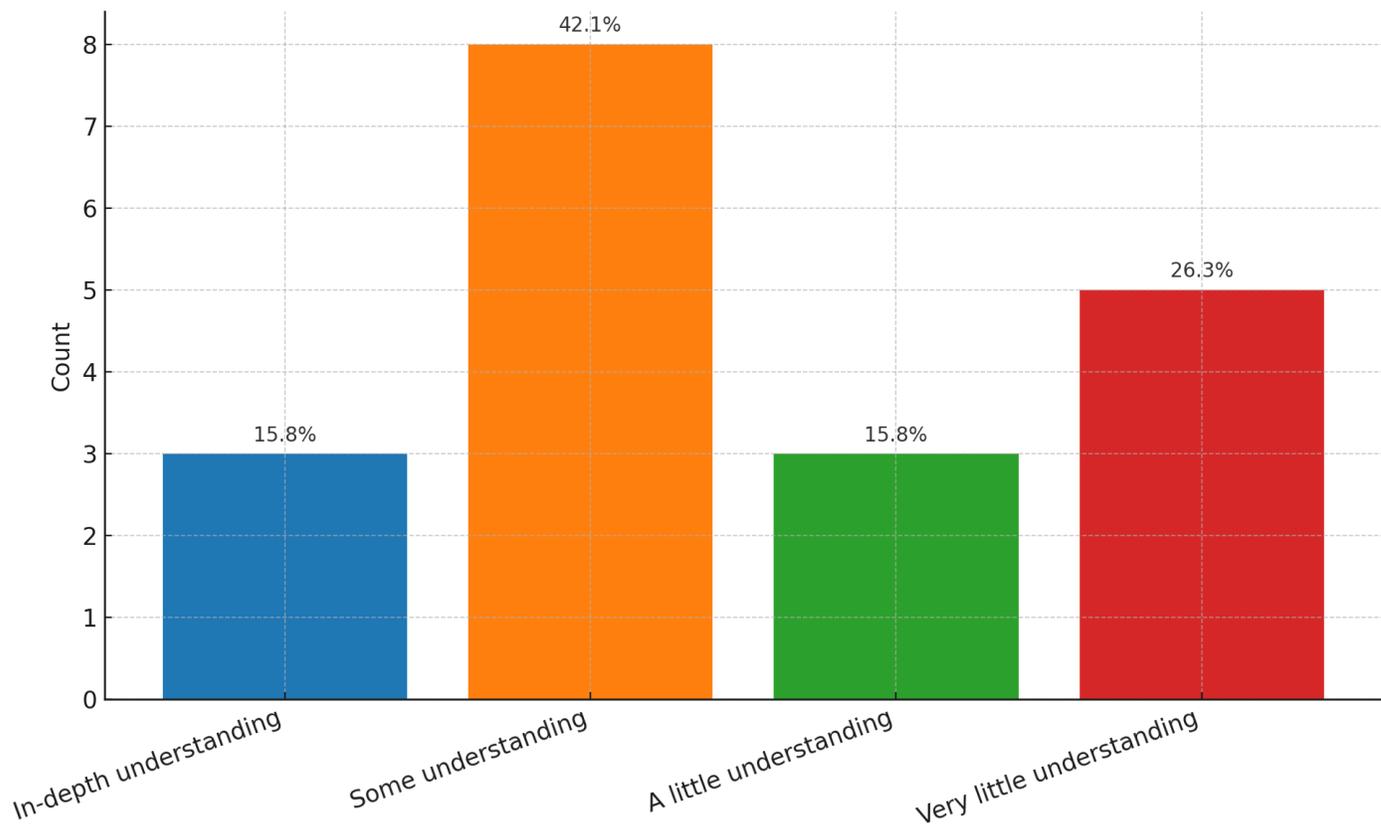
Leaders' Understanding of Intelligent Decision Support Systems (IDSS)



Note: Figure 21 shows that more than three quarters (i.e. 78.9%) of respondents had a little or very little understanding of what IDSS are, how they are being developed, and their capabilities.

Figure 22

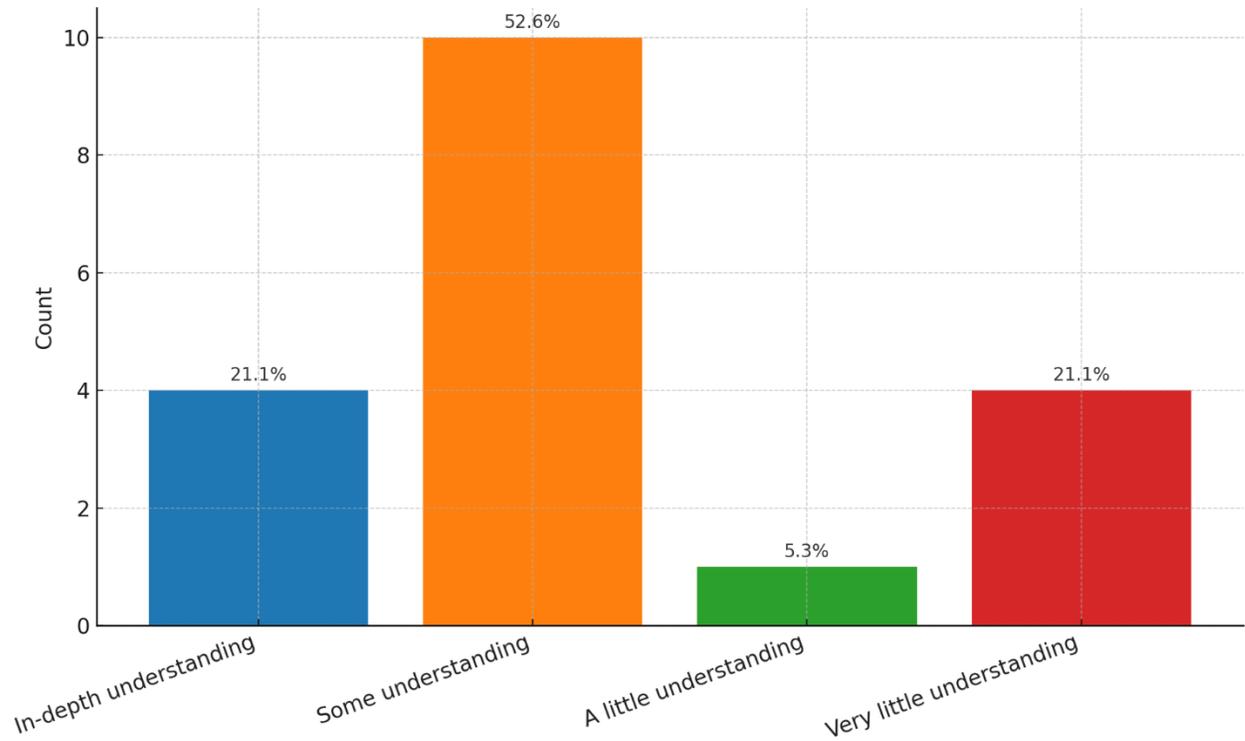
Leaders' Understanding of Intelligent Tutoring System (ITS)



Note: Figure 22 shows that this was one of the better-known capabilities of AI according to respondents as more than half of them (i.e. 57.9%) had some or an in-depth understanding of what ITS is, how it is being developed, and its capabilities.

Figure 23

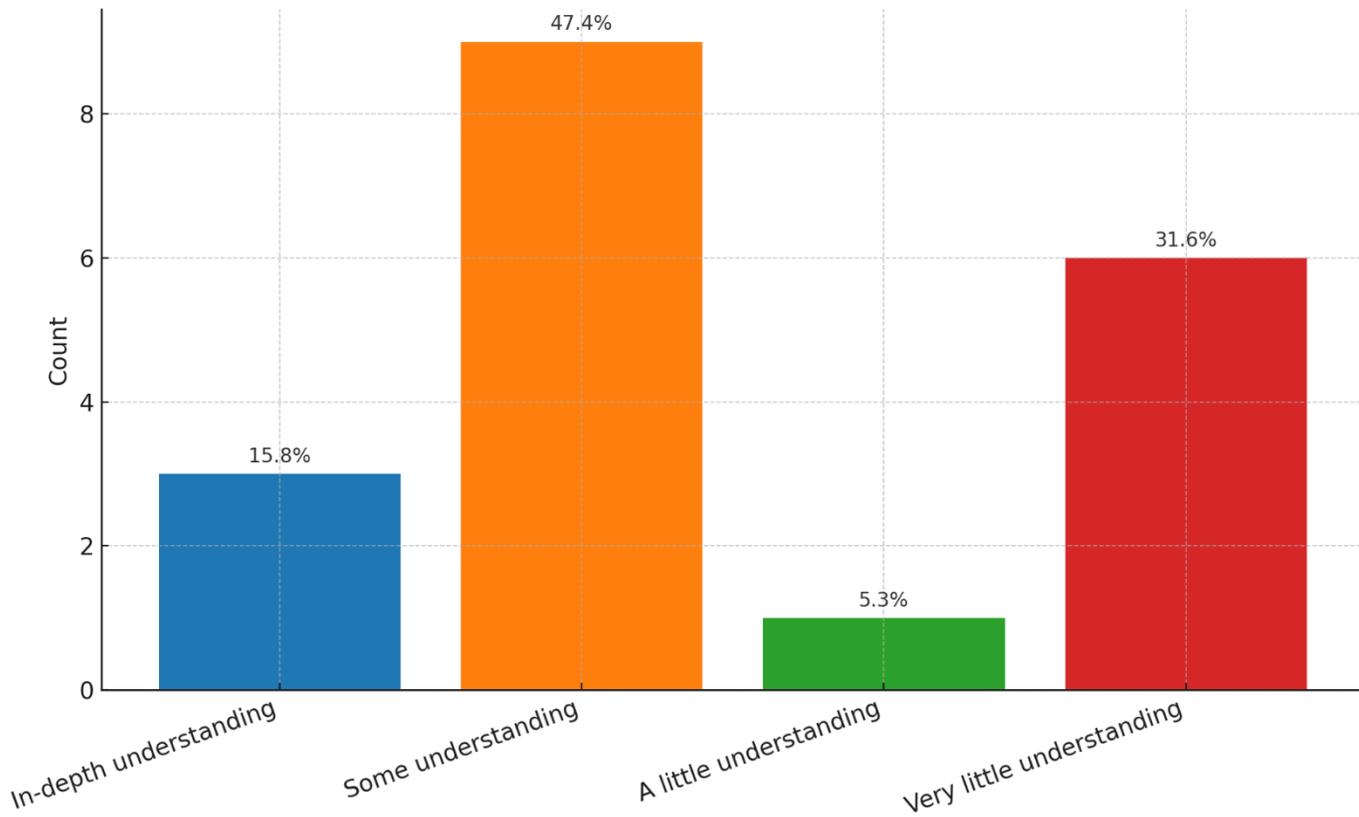
Leaders' Understanding of Large Language Models (LLMs)



Note: Figure 23 shows that slightly more than half (i.e. 52.5%) of respondents had some understanding of what LLMs are, how they are being developed, and their capabilities.

Figure 24

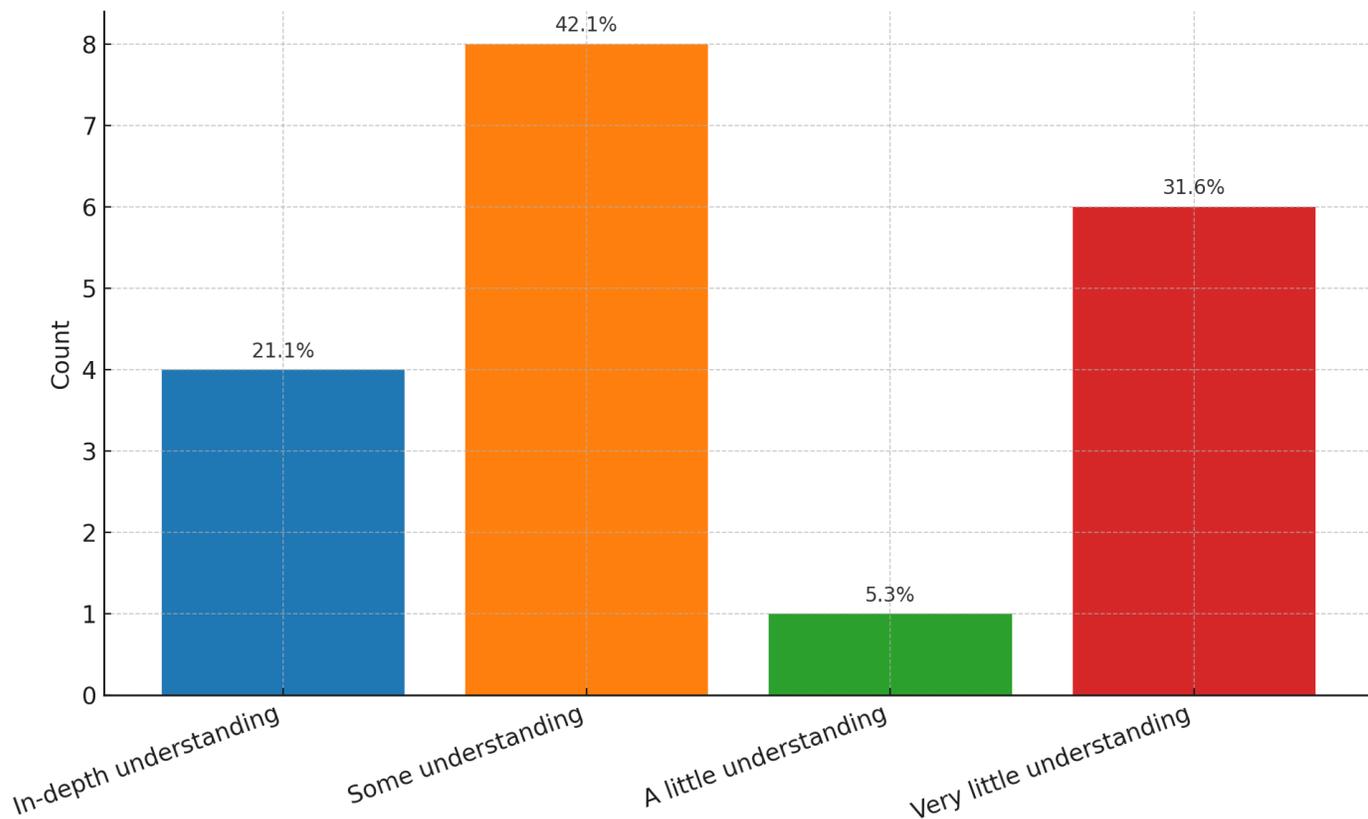
Leaders' Understanding of Machine Learning Programs (MLP)



Note: Figure 24 shows that almost half (i.e., 47.4%) of respondents had some understanding of what MLPs are, how they are being developed, and their capabilities.

Figure 25

Leaders' Understanding of Natural Language Processing (NLP)



Note: Figure 25 shows that more than half (i.e., 63.2%) of respondents had some or an in-depth understanding of what NLP is, how it is being developed, and its capabilities.

Interview Findings. Participants were asked to describe how Artificial Intelligence is used currently in their school/institution and to describe their own use of AI as well. The assumption was that in describing their use of AI and the use of others in their school/institution, leaders would reveal their understanding. The findings show several different common themes which highlight the degree of understanding by leaders of AI uses. The findings do align with the questionnaire findings in that a minority of leaders seem to have an in-depth understanding of AI and its capabilities; some leaders have no

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understanding of some of its capabilities while most leaders have some to a little understanding. However, that conclusion is somewhat simplistic as the interview responses to this question revealed layers of thinking by leaders about AI's use, their understanding of it, and approaches to the rapid and pervasive integration of AI into education. In short, leaders shared detailed perspectives on their level of expertise with respect to the integration of AI into their schools/institutions. Such layers of thinking also revealed the degree of confidence about their approach to AI integration. The identified themes from this question are shared below.

Theme 1: Many leaders are aware that some AI use in their school/institution is known about and permitted. Some use is not known about, and some use is not even known by those using it as AI is now embedded in many applications. Many leaders acknowledged that they didn't really know for certain how AI is being used in their school or institution.

Well, I can tell you about what I know about how AI is used. Who knows? It's a university and people do all sorts of things. I think that's the first point to make: I suspect I know aspects of how it's used, but I won't know in all the details. And so we are, like most universities, in the position that our students will be using AI knowingly and unknowingly, because it's just incorporated in so many devices and pieces of software. The same will be true of our staff. (#5, Global North, HE, Rector)

There's the use we permit; there's the use we know about, and then there's the use that people are not willfully adopting in ways that they know to be wrong, but they'll just be using these things because they're there and they're free and they can. (#4, Global North, HE, Vice Principal)

I think that it's widely used. I think it's the same at my university as in any other university around the globe. And what I'm really worried about is that it is not clearly understood what's going on. It's not clearly regulated what is transparent and justified

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and sensible use. I'm not just talking about students, but I'm talking about professors, teachers, researchers as well. (#29, Global North, HE, Head)

Theme 2: Some HE leaders explained that AI has been used for quite some time and so the further integration of AI was a natural evolution from how things had historically been undertaken. They described the integration of AI as *before* and *after* the arrival of Chat GPT. These leaders see the recent proliferation and uptake of LLM applications as “hype” or as a “boom”, that is, something less serious than their traditional use of AI. These leaders showed understanding of the potential of AI especially in research but did point out that AI is becoming ever more powerful.

So mainly our physics department and computer science department have been doing AI for more than 50 years now. In the last 10, 15 years, there has been a dramatic increase in use of AI in a lot of fields. So, in that sense, we have a deep experience in this. And now in the current AI boom a lot of research groups have been jumping into using AI specific to their fields. For instance, in one research group, we have been using AI tools for materials research for at least 15 years, much before the current hype. (#30, Global North, HE, Vice-Rector)

We have been using AI or AI-related technologies and approaches long before ChatGPT became a thing. (#13, Global South, HE, Head)

Theme 3: A minority of participants of both HE and K-12 identified that their schools/institutions were “early adopters” of AI. This early adoption came through staff development just prior to or coinciding with the arrival of ChatGPT. This early adoption approach translates into confidence about where their schools are at today with respect to the current integration of AI and with respect to their own understanding of AI as well.

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I would say that we have a few early adopter teachers that any technology they adopt, and they just excel at and kind of bring the rest of the staff along through little presentations. (#31, Global North, K-12 Vice Principal)

Even before ChatGPT came out we had engaged our STEAM teachers with a company to provide some training on AI. We had previously received a grant that funded a few different things and part of that was learning about data science and embedding that across K through 12 and then on top of that we started looking at AI. (#22, Global North, K-12, Director)

We are early adopters. We have done several teach meets last year around teachers introducing AI software that they were using for planning mostly. (#24, Global North, K-12, Principal)

Theme 4: Most of the leaders interviewed described their school or institution's current use of AI as occurring since the arrival of Chat GPT into education. These leaders fall into two groups: those who have employed systematic integration of AI and those whose approach to AI integration has been unsystematic. Those who describe their school or institution's use and integration of AI as unsystematic sense their school or institution is lagging.

Unsystematic integration:

All that stuff is very unsystematic. I think we are trailing tremendously. When I speak with my friends in various other industries, including public administration municipalities, they are way, way ahead of us in terms of customized AIs and chatbots and decision support or feedback systems. I think we're way behind. (#12, Global North, HE, Dean)

I would say that it's at the beginning stages of AI; it is there, teachers are using it, but not fully. (#8, Global North, K-12, Vice-Principal)

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In teaching, it hasn't come up that much yet. (#5, Global North, HE, Rector)

Systematic integration:

We decided right at the outset to take a different tack to it and to do three things. One, which is to have a hub devoted to articles, analysis and news about AI. The second way has been our webinar series to provide a series of opportunities to reflect on AI in higher education. And the third way has been to develop and now promote four very specific "homegrown" AI apps." So effectively our own AI center where you can mine and ask questions and interrogate without being subject to wider information. (#2, Global North, HE, Director)

We now have AI tutoring assistants, which are now being integrated into learning management systems. We have already piloted it. And now that we are very comfortable with it, we want to scale it up and roll it out to the rest of the courses that we have. (#26, Global South, HE, Vice-Chancellor)

Leaders who have taken a systematic approach to integration describe their efforts in positive terms whether referencing their approach to professional learning of staff/faculty or to curriculum change. The implication of a more systematic approach to integration, as described by these leaders, is greater confidence and understanding of AI as well as more efficiency in some cases with respect to curriculum development.

In terms of quality of output for instructional design, the AI somewhat performs a little better in my considered opinion from the experiences that we've had than putting a pool of people together. So, in a matter of minutes, you can generate hundreds of questions for a particular course which saves so much time and energy. It cuts the interventions and reduces the risk of leakage of questions and reduces the risk also of many kinds of academic misconducts. (#26, Global South, HE, Vice-Chancellor)

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We offered an opportunity for teachers to become an AI fellow and join a cohort along with administrative support. So, they received some funding and time to do an action research project to explore some different tools. We also had a regional summit that we launched specifically focused on AI. Those are just examples of us understanding the importance of this and finding ways to support, validate, and embrace AI. (#22, Global North, K-12, Director of Innovation)

Theme 5: Almost every leader showed an awareness and acceptance of a wide range of staff/faculty adoption and use. In some instances, the school or university has institutionalized a particular LLM application. They have done this for reasons of security and cost.

Reasons of Security:

We've really pushed staff away from using ChatGPT because of the open database particularly where staff create accounts with their university credentials, which is a no-no. (11, Global North, HE, Director)

We decided to not open it up for students just because there were issues around age initially, and then there were issues around data and privacy and not being convinced. More recently, Gemini obviously has integrated AI into their platform with Google, and we're a Google workspace school. We're about to open that up to students, but we do need to go through the process of getting parent permission or at least parent acknowledgement of the fact that we're about to open that up to students as well. (#25, Global North, K-12, Principal)

We have formally adopted Microsoft Copilot and just recommended that colleagues use that for any internal documentation, so as not to be uploading it. We've set it so that it doesn't go outside of the university, so people can use the technology, but not be sharing university data with a large language model that we don't want to do that with. (#4, Global North, HE, Vice Principal Learning and Teaching)

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Reasons of Cost:

We have been very open about how teachers are encouraged to utilize artificial intelligence. So, what we did specifically [was] create Agnes. She utilizes open source, open web UI and then he created all the stuff around Open Web UI to where we have API access to all the large language models, so it doesn't cost us hardly anything and then we provide that access to our teachers through APIs. (#33, Global North, K-12, Director)

Theme 6: Leaders described six common uses of AI in their school/institution. Because they were able to explain them, the assumption was that they understood them. These six uses include research and data analysis particularly in medicine, science and technology fields, report writing, accessing resources for lesson and lecture planning, assessment tasks, translation, and communication with parents.

1. Research:

From a research perspective, it's a very key component of what's going on around the university. (#36, Global North, HE, Dean)

It's used in research in various ways from the very natural sciences use of AI, which is not generative in general, but could be used in other ways, in imaging or in predictive forecasting way. It's used in language models in research. It comes up in all domains in research as an interesting tool or something to develop. (#5, Global North, HE, Rector)

There might be 20 research ideas to complete a systematic review or a database study in psychiatry. Well, ChatGPT will provide me with 400 ideas. And then I'll say, please narrow these down that weren't performed by anyone else in the last 20 years, five years. So now we come up with a copy of 10 studies. I'll say please provide me a list of all published studies in the English language since 2007. Please narrow those articles to studies that have had more than 20 patients. Now we're down to 17. So now we're going

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*to do a meta-analysis of those 17. Please summarize these articles in an Excel table.
Boom. (#34, Global South, HE, Director)*

2. Report writing:

I think it's being used for report writing, which I'm also okay with as long as teachers have oversight, and they feel that the report accurately reflects where the students are at. If English isn't a teacher's home language, you know, it's harder, and they should take advantage of those tools. (#27, Global South, K-12, Principal)

I asked every teacher to create a course summary. Some, it was very clear, they'd used AI. I think that's an appropriate use of AI, because it saves time. But the problem I have with it is I wasn't sure it was in their voice, really. (# 32, Global South, K-12, Principal)

3. Resource acquisition:

But I would say it's mostly used for lesson planning and resource development, especially with French immersion. Resources in French immersion seem to be a 30% higher cost and sometimes are just harder to get. So often French immersion teachers are using it to make resources. (#31, Global North, K-12 Vice-Principal)

4. Assessment tasks:

They're using it to help devise questions for exams. So, if I'm ChatGPT, can you please bring in questions based upon the lecture just provided in a multiple-choice fashion with five choices? And so ChatGPT will do an initial stab at those questions. And then the faculty will review those questions, change them, modify them, things like that. And we greatly limit what they can do because obviously we're not interested in ChatGPT now being the professor, but it's still a significant role. (#34, Global South, HE, Director)

And then of course, report card writing, I think it's helped a lot with some teachers. (#31, K-12 Vice-Principal)

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We have a Spanish teacher who's using bots as like personal tutors for kids...she has some way of seeing the conversations later or getting feedback from the bot on how each kid did. (#32, Global South, K-12, Principal)

5. Translation:

Translation is a common use. We're not a bilingual school, but there are two key languages: English and Spanish. If you get a kid from Korea or Japan, sometimes they're a little bit of an outlier in that there's no one that can support their language. So, we are happy to use AI for language needs like that. (#32, Global South, K-12, Principal)

6. Curriculum and lesson planning:

Professors in basic science are using artificial intelligence to help them craft lectures. They can run that lecture through ChatGPT to add animation to look for better images. They're using it to devise and establish actual lectures and curriculum that they're devising for the student. (#34, Global South, HE, Director of Student Research)

A grade three teacher was working on a writing assignment. I don't know what AI program she was using but she would put the language into it then it would create the picture based on what the students had written. It was neat for kids to see, is this what you meant when you said these words, when you said big? Did you mean this when you said fiery? And so that's what we want kids to do, some of those tasks that they could assign and have an AI support them so they can be more creative. (#31, Global North, K-12 Vice-Principal)

A few leaders expressed concern about AI being used to evaluate student work.

I've got some staff who want to use it for experimentation and marking. That's not something that we support institutionally at this point in time. I don't think we are going to support that. (#7, Global North, HE, Associate Pro-Vice-Chancellor)

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I also made changes to the policy that specify that marking cannot be outsourced, and marking is a form of academic judgement. And that created a bit of tension. (#11, Global North, HE, Director of Teaching Innovation)

We have also been looking at how teachers can use it as a bit of an agent to support them around feedback, not doing the marking for them, but how they might use AI in terms of supporting feedback on student work. (#25, Global North, K-12, Principal)

Theme 7: Almost all leaders recognize that student adoption of AI came very rapidly.

They describe student use as pervasive and often greater than that of their teachers/professors. Several leaders also identified the problematic nature of some of that use. Leaders identify the convenience of using AI as taking something away from students.

I can assure you that many students, many university students are using AI more than their professors. This is for sure. But the issue is that most of them are lacking this critical thinking approach of using those tools. (#9, Global North, HE, Director of Advanced Educational Technologies and Mobile Application)

Our students are using it for every assignment, basically. (#10, Global North, HE, Dean)

I think students are using it very much to assist with their academic writing. I think they're using it to shape assignments. (#7, Global North, HE, Associate Pro-Vice-Chancellor)

If you don't tell them not to use it, or if you don't make the assignment difficult for them to use AI with, or if you don't support them enough so that they do it themselves, and they don't understand the relevance, they will use it. (#20, Global South, HE, Professor of Practice for Teaching and Learning)

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Leaders said that students' motivation to use AI depends on a variety of factors, three of which were commonly identified by respondents: students' perception of the school/institution's academic culture, students' technological expertise and subject/discipline, and students' desire to improve their grades. K-12 leaders identified that student use is easier to detect when you know the students.

1. Academic culture of the school or institution:

There's an interesting sort of phrase that when I talk to students, I hear quite a bit. And that is, I just want my work to sound more academic. And that kind of makes me smile a bit because I just think, well, what kind of institution, what kind of academy, what kind of system are we in when people can't use their authentic voice and they must become something else? (#7, Global North, HE, Associate Pro-Vice-Chancellor)

2. Subject/discipline area of study:

It highly depends on the subject matter, and the learning objectives of a particular course, right? If you're doing professional writing, you wouldn't want your students to use AI because you wouldn't be able to gauge their improvements in terms of professional writing. making... or sometimes following strict and stringent rules, like in architecture, sometimes AI just fails miserably... And a lot of students opt for or prefer not to use it in those types of courses, even though they are allowed. (#15, Global South, HE, Professorial Chair in Artificial Intelligence)

I think that many students are lacking this sophisticated approach of building their own AI tools...Because to do so, you must have the skills of building an AI tool. The only exception to this approach might be the students working in a computer science department. They have already the development skills to create such applications. This is not an approach that someone who is studying history, for example, can do. (#9, Global North, HE, Director)

3. Desire to improve their grades:

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There are students who would try to increase their grades because of the use of AI. And that's what we're trying to at least resolve with this policy. We're going to try to resolve how we would equalize the field a bit more, to ensure those who want to learn would still be able to learn in an environment where AI is predominant. (#15, Global South, HE, Professorial Chair in Artificial Intelligence)

But it's very apparent that kids know how to use especially Chat GPT but it's very easy to pick up when you know the child, right? (#10, Global North, K-12, Vice-Principal)

Theme 8: Leaders' understanding of AI and their personal use varies. Some leaders of K-12 schools and HE institutions use it a lot and some don't use it at all.

I use it a lot. So that's personal. (#5, Global North, HE, Rector)

I love a bit of tech. And so, I use it a lot. (#24, Global North, K-12, Principal)

I think it's fair to say that our administration has hardly begun using it, at least not in the formal procedures, but when I ask one of my people to give me some info on dropout rates and so on, I'm pretty sure they use various AI tools to support the analysis. (#12, Global North, HE, Dean)

If leaders say that they do use AI, they use it primarily to craft words and to analyze data.

Both these uses are seen as positive by leaders because they save time.

I always use it for reporting to our Board of Governors...it was an extremely cumbersome task that could take the best part of a day and a half, that I was out of circulation for other things. It's not perfect, but the structure is there. And then I get to add in and change or edit as is needed for the report, but unbelievably helpful. (#24, Global North, K-12, Principal)

As a senior leadership team, we use AI daily to do a lot of work around our data information and using it to look for trends and patterns and recommendations but also

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using it alongside the work that we're doing recommending interventions and next steps and strategies for dealing with any issues that arise. (#22, Global South, K-12, Principal)

Leaders also use AI to do the work they find burdensome, that is, AI allows them to be more efficient with their resources both in terms of time, energy, and cost. They find it beneficial to use AI where it can organize them, save them time and allow them to work more efficiently.

In terms of administration, simply put, work is made easier. And from what I see, it helps to reduce the number of people you need to work on a particular thing at any given point in time... Prior to AI you would have had to wait and ask a secretary to do some administrative support. But now, you can do a lot of the things by yourself. So, it reduces the workload and in addition to that, it makes work more efficient and effective administratively. (# 26, Global South, HE, Vice-Chancellor)

I'm personally using it for analyzing student feedback this week, which is interesting and controversial, but I'm finding it very helpful. (Developed, HE, Pro-Vice-Chancellor)

I use it to organize my week and approaches to meetings. I'll often put in the problem, if I'm preparing for a meeting with a parent, and to try to see it from a few different perspectives and approaches, maybe to take in the meeting. And I find that helpful. I use it for writing my responses to the emails that you get, and you're like, Oh, for the love of God, this is not an issue. And I tended to put them on the back burner and see: will it go away? (#24, Global North, K-12, Principal)

However, leadership is also aware of the double-edged sword of the AI promise of efficiency.

But just on a personal note, I think the idea of AI being used to write music and poems and novels is just awful. I hate that. I want AI to make my grocery list and do those sorts of things so that I can do these other, more creative things. Like, I want to go write poetry. (#31, Global North, K-12 Vice-Principal)

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Theme 9: Most HE participants have begun regulating AI use. Such regulation takes many forms from folding acceptable use of AI statements into existing academic integrity policies, creating specific AI use policies, to crafting position statements which focus on responsible and realistic acknowledgement of use, to designing step-by-step faculty guidelines. In many cases these regulations, position statements, policies, etc. have been created out of expediency, that is, recognition of the reality of students' pervasive use of AI, and a sense of responsibility to prepare students for using AI beyond the walls of the school or institution.

We've developed a general code around what ethical use and all of that, that everybody must abide by, but it leaves lots of room for departments to make individual decisions about how much or how little they'll allow it to be used. (#23, Global North, HE, President and Vice-Chancellor)

You must declare how you have used AI, and you also must clearly describe how you have written prompts, how you have continued using it. But of course, it depends a lot on what kind of work you're doing. If you think AI has been used, without any declaration, how do you then handle that? And how does it affect the score? Would it be just given a zero or will it just get maybe a lower grade or whatever? And how do you judge it? So, it's been a quite long process, and we have tried to include a lot of people in the discussions about how to work with AI. (#28 Developed, HE, Vice Dean for Education)

We are encouraging our faculty in charge to really make it available for our students, because the dangerous thing which we feel like we should be more cautious about is if we prohibit them from using AI, the likelihood of them using AI would be greater. (#16, Global South, HE, Dean)

Before you even decide whether you're going to allow your students to use AI, you must try your assignments on AI yourself and see, is this something you're going to allow your

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students to use AI for? Then you must redesign your assessment, so the students don't use AI for it. But if you still choose to do an assignment where you don't want students to use AI, and you suspect that a student has done it, you need to compare it to previous writing. You need to interview the student and the interview isn't, have you used AI or have you not, or I think you've used AI, but rather, tell me about the process of how you wrote this paper. (#20, Global South, HE, Professor of Practice for Teaching and Learning)

Some leaders acknowledge that these acceptable use regulations are in an almost constant state of evolution.

We do have an ethical code on AI, which has been set up by the executive board. And we have an AI responsibility document from the point of view of the device, deans on education, lecturers, students, and all these different responsibilities are described on what they are responsible for, which is probably too old after it was released, right? (#5, Global North, HE, Rector)

When Chat GPT came out, we had the policy for using Generative AI in teaching, in three months. And then since then, we've updated and extended it a lot and complemented the examples. (#30, Global North, HE, Vice-Rector)

Some leaders recognize that even when policies and regulations and position statements do exist there is still confusion.

I think, no matter how clear we've tried to be about the principle of responsible use and the guidance, they're confused and they're hearing mixed messages. And partly that's because it doesn't just come from the university, it comes from different educators within the university, it comes from peers at other universities, it comes from the media, etc. So, it's a really noisy space. (#19, Global North, HE, Dean)

Some leaders have agreed to the development of such policies, regulations, and responsible use statements despite their own concerns about whether the exercise is futile

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or focused on the wrong things. These leaders want the bigger picture and the longer-term use to be the priority rather than this moment of student and staff/faculty use in their school or institution. These leaders also think that the focus should be on learning as opposed to assessment.

I don't see the value of institutionalizing it. (#20, Global South, HE, Professor of Practice for Teaching and Learning)

We wanted to draft a little bit more down to earth; we didn't want to draft it too early it might hinder some development. (#15, Global South, HE, Professorial Chair in Artificial Intelligence)

Very quickly, we decided that as a rule of thumb, it was not allowed to use AI in written reports or exams unless it was specifically allowed. And I think that it was sort of dragging things out a bit until we were prepared to do something real. (#28, Global North, HE, Vice Dean)

And what I've been talking about, which isn't explicitly in the policy, is that AI emphasizes the need for human creativity and deep understanding of a subject. It's clear that if you want to write an essay about something where there's 10,000 people before you that have written an essay on the same topic, it's clear that the AI can write that, at least in English, for you in a minute. But then the question is why write an essay which has been written 10,000 times before? Write an essay with an original idea, or of course in natural sciences with original data or original insights, which then really make it worthwhile to write the thing. (#30, Global North, HE, Vice-Rector)

My more measured opinion is that we should be looking for learning and not looking for cheating. (#21, Global North, HE, Dean)

Subtopic 2: Leaders' perspectives on leading AI development and their sense of autonomy, control and motivation

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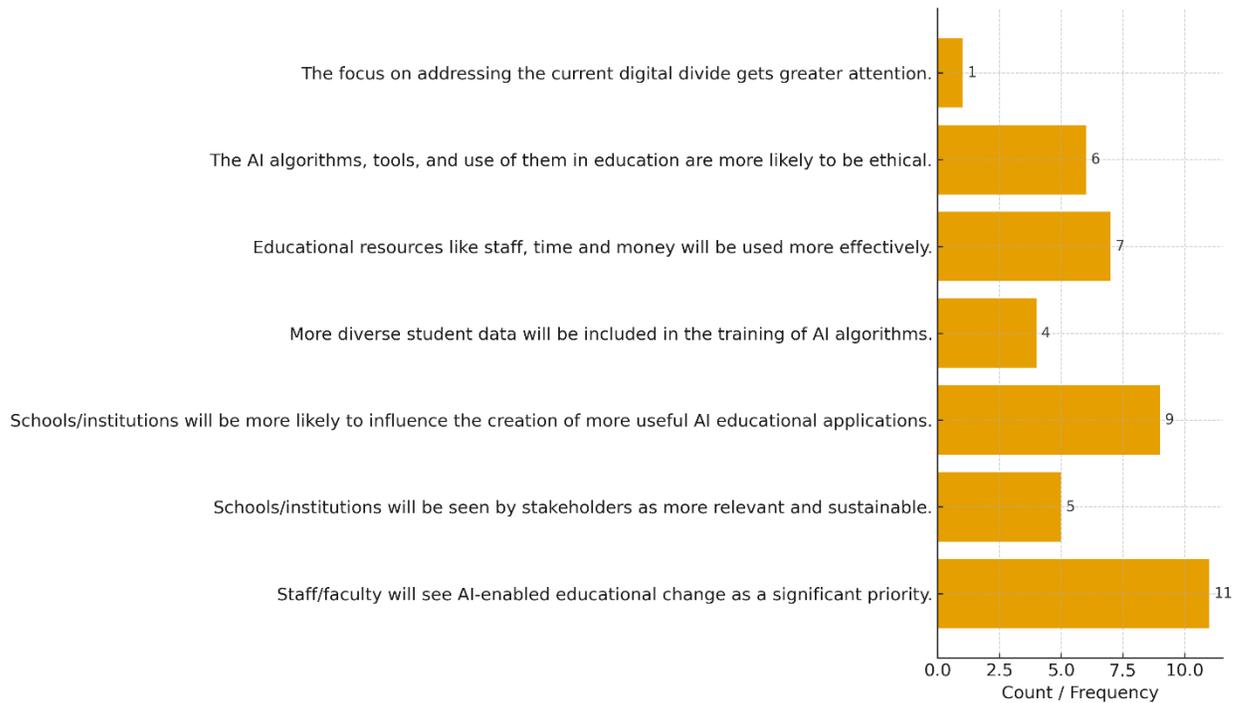
A second set of questionnaire and interview questions were used to explore the research question about the current level of expertise of educational leaders K-20 with respect to AI. This time the focus was on whether leadership should become actively involved in soft diplomacy in leading how society in general thinks about AI and its use and, related to that, whether leaders felt motivated to undertake such leadership work. Participants were also asked if they felt they had autonomy and control with respect to the integration of AI into education.

Questionnaire findings. Leaders were asked to consider the benefits and risks of leadership becoming actively involved in the implementation of Artificial Intelligence for lifelong learning for all. They were provided with seven potential benefits of doing so and six potential risks. And asked to choose what they saw as the greatest benefit and the greatest risk. The respondents identified two main benefits: 1. Staff/faculty will see AI-enabled educational change as a significant priority; and 2. Schools/institutions will be more likely to influence the creation of more useful AI educational applications.

The questionnaire results are shared below both numerically and graphically.

Figure 26

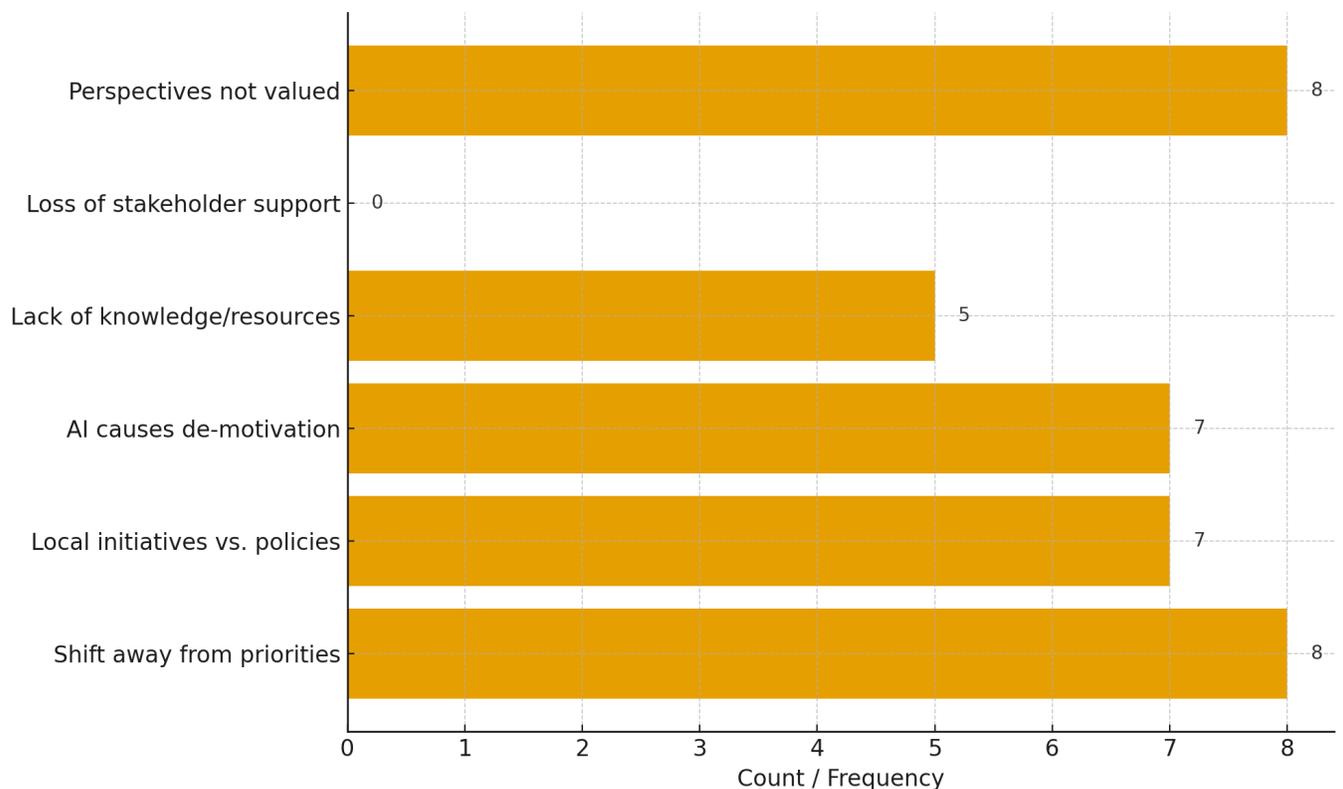
Benefits of Education Leaders' Active Involvement in the Implementation of AI for LLL



Note: Figure 26 shows that the top two benefits of educational leaders becoming actively involved in the implementation of LLL for all were identified as staff/faculty seeing AI-enabled change as a significant priority or in other words, leading change by example and second, the potential for education to influence how AI applications for education are developed will potentially make them more useful. Only one participant identified as most beneficial involvement in the opportunity to influence change with respect to the digital divide.

Figure 27

Risks of Education Leaders' Active Involvement in the Implementation of AI for LLL



Note: Figure 27 shows that the two greatest risks as identified by educational leaders of them becoming actively involved in the implementation of LLL for all were that the focus may shift away from the educational priorities which are deemed to be more important to their education community right now and, second, the perspectives of leaders when shared may not be valued or treated seriously. Interestingly, none of the participants saw a loss of stakeholder support as a risk.

Interview Findings. Like identifying the benefits and risks of active leadership in the integration of AI, interview participants were asked if leaders should be cautious about involving themselves in guiding the design and implementation of AI in education

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because of the ethical missteps that have been well publicized or whether leaders saw a role for educational leadership in shaping public understanding of AI. Like the questionnaire results, interview respondents also thought such a role was important to be undertaken by educational leaders.

Leaders were also asked to reflect on how much autonomy, control, and motivation they felt they had right now with respect to how AI was being developed for and used in education. Most leaders responded that they often felt overwhelmed by the speed of development which affected their sense of autonomy and control, but, despite this, almost every leader agreed in theory that there was a role for educational leadership in helping the larger society learn to think about and talk about AI.

A few leaders had moved beyond theory to doing such soft diplomacy and advocacy already. And their AI literacy expertise was positively impacted as a result.

Finally, some leaders spoke of their involvement in the development of AI as more than a question of whether they wanted to. They saw their involvement in the development of AI for education and how it is thought about and used in education as a fundamental responsibility of leadership today.

Theme 1: Most participants expressed how quickly AI development is occurring and how little control they feel. They used metaphors of speed and inevitability to describe the development of AI and their sense of powerlessness in the face of it.

I am afraid that we're closer to the train going down the track analogy in this case because the market controls the development and the students control the use. So, my autonomy is indeed how I navigate within it, but the development is rushing forward. (#1, Global North, HE, Senior Director of Student Research)

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We cannot go against AI, since AI came like thunder, like water, like rain. You cannot fight against that. So, you should be able to use it in such a manner that the student will benefit from it. (#3, Global South, HE, Pro-Rector of Education, Research, Graduate Studies)

I was feeling like I was drinking from a fire hose, like the level of detail, the level of APIs, the bots, it was incredible. And it made me really discouraged because it's a full-time job just to keep up with this stuff right now and how to make the most of it. (#14, Global North, HE, Dean)

Theme 2: Despite their recognition of a lack of autonomy or control, all but one leader saw a role for public education in shaping how society thinks about AI. They saw two avenues for such a role. One was through shaping the perspectives of students when they go home and out into the world as they take with them ways to think about AI that have been taught to them. The second way is through public advocacy, especially with government. For many this is how it has always been: education being one of the key drivers of shaping public opinion.

The reality is that when we start talking to kids about AI, when we start really rolling this out, it's going to impact a thousand households in the community. I think there's a place for soft diplomacy, but to me, it's about how are you enhancing your community to support your kids? I think that's our ticket in. (#40, Global North, K-12, Principal)

It's absolutely the role of education. We spend so much time with children that we need to be the ones who are educating them on how to use it and how not to use it as well. We can't be at the mercy of parents because a lot of parents don't know it either. And it is our responsibility as educators to educate parents. How to think about it, talk about it. (#39, Global North, K-12, Director)

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Ironically, my university considers itself the right people to give recommendations to the government, but not the right people to implement the use in their daily practice. (#12, Global North, HE, Dean for Education)

But we know how to do this, right? But this happened before on climate and sustainability. We got questions from public and private industries and people coming to us when they had questions on sustainability and climate. Because ...they needed to have a different lexicon, a different way of thinking. And that's how we distinguished our university role from the more private markets. And this happens around the digital revolution. And well, beyond this to how we deal with a multipolar fragmented world. (#5, Global North, HE, Rector)

I believe there is a role of us in soft regulation of emerging technologies. I think we grow cynical about politics maybe and whether we can, but we do still try to influence which I think is great. (#15, Global South, HE, Professorial Chair in Artificial Intelligence)

Theme 3: Despite recognizing that this had always been a role of education, to influence and to educate and thereby help shape societal outlooks on issues, leaders were divided on whether such advocacy and soft diplomacy were happening. That is, some leaders recognized with respect to the role of education to influence society through soft diplomacy, in the case of AI this may be more theoretical than what is happening in practice.

That was always the role of university to shape the discussion, to have a public discourse and so on. But nowadays we are lagging and there are two reasons for that. First, because we have a lot of noise, a lot of voices from social media. And even people that claim to be experts, or something like that, now have a stage too. We are giving them a voice. And second, we lag behind industry. I think that it is probably the most prominent area of research that is now in the hands of industry, not so much in the hands of

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academia. We should be much more present. But how to do it is another big topic. (#29, HE Developed Head of the Department of Learning Analytics)

Other leaders had the opposite view. They saw themselves and their school or institution as much more actively involved in such soft diplomacy efforts.

Well, I would say that we are influential. We have a Center for Artificial Intelligence. It's really meant as a center for public outreach and disseminating results of AI research and so on. And it's been quite successful. Many politicians have attended the events and so on. And the top people have been heard in parliament. (#30, Global North, HE, Vice Rector)

I'm on the board of directors for the city's AI Alliance. And one of the things that we talk about a lot in that alliance is the workforce and what we're producing coming out of education and going into the workforce. If we don't have a seat at the table, if we can't talk about what our students need to know about artificial intelligence, to question it, to test it, to argue with it, to use it as a companion, not as somebody just feeding them information, then when they get out of K-12 education, they're going to be absolutely lost in the noise. And so, I think that the educational leaders that have been there and done that and have the scars to prove it are the ones that need to be at the table now. Otherwise, you have no business creating a tool that you think is going to save a classroom. (#33, Global North, K-12, Director of Technology)

Theme 4: Leaders who had greater AI literacy expressed a greater sense of control. Such knowledge and understanding came from doing their own inquiry and designing their own instances and applications of AI in their own buildings. These leaders expressed a greater sense of control than others who were not doing so. Leaders who expressed this greater sense of control and autonomy were motivated to learn about AI. They placed a

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high value on their own development of knowledge about AI because it gave them a sense of control and it made their leadership of AI meaningful.

Leaders have two areas of control that are very clear. There is such a wealth of thoughtful podcasts, thoughtful newsletters that are literally keeping you up to date all the time. I mean, you can just take a bath in it every day. And the second one is that I really think it's also an opportunity for us to create our own tools. This is what we've done. It's a philosophical approach. We should not simply buy AI from ChatGPT, from OpenAI and so on. We should be creating our own tools. We have the capacity, for God's sake. So, let's do it. Because if you try to create something that really is working with you, you're going to have to understand. You're going to have to get inside the beast to fully understand it. (#2, Global North, HE, President)

We are looking at what we would call frugal AI, where you really don't need these extremely complex and expensive data centers. OpenAI owns some of them, Microsoft owns some of them. One in Texas that Microsoft is building is supposed to consume close to 500 million liters of water, which requires that people in the area stop using some water for themselves. So, you don't need that kind of resource intensive operation. We are willing to show that frugal AI with open source LLMs, can run out of simple basic computers. (#17, Global North, HE, Special Advisor to the President)

But that's the other big discussion here, at the senior level, how do you get to be sovereign? Do it yourself and you learn from it. (#5, Global North, HE, Rector)

Theme 5: Some leaders spoke of their involvement in the development of AI as more than a question of whether they wanted to do so. They saw their involvement in the development of AI for education and how it is thought about and used in education as a fundamental responsibility of leadership.

So, for me, it's about knowledge. It's about leaders understanding [AI], what it can do, its parameters, its potential, but understanding it from a position of use. Leaders do need

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literacy. But that only stands on a personal hunger. If you're not interested, if you want to keep doing what you're doing, then you're probably going to be a terrible leader in the age of AI. You need to be accepting of flux. And if you can't accept flux, and you don't want to learn, you're probably not much use as a leader in the current climate. (#7, Global North, HE, Associate Pro-Vice-Chancellor)

There are days when I question what it is that I'm doing with myself, because I feel like it's such an indulgence to play with toys when people need textbooks and chalk and paper. Why are you bothering with these interventions when there's so many basic needs? And so, to console myself when I'm having self-doubt, I just say that, well, it's a complex problem, and many people with many different skills are needed. So, at least contribute your voice where you can. (#13, Global South, HE, Head of Learning Sciences)

I think as an institution that's trying to prepare students to function in this world, to be citizens in this world, to be able to navigate and work and live their lives in this world, we need to provide them opportunities, access and education around what the technology is, how it works, the pros and cons of it, and how they can use it to empower their life and to become whatever they want to be. And if we're not doing that, we're creating an issue of justice because whether it's perfect or not, every day more and more companies are incorporating these technologies into their platform. (#22, Global North, K-12, Director of Innovation)

Subtopic 3: Understanding of AI's Effect on Jobs

The final sub-topic that was used to explore this research question about the current level of expertise of educational leaders K-20 with respect to AI explored whether leaders thought AI was changing education and if so if it was changing education for the better, and if they were aware of the replacement conversations that were happening with

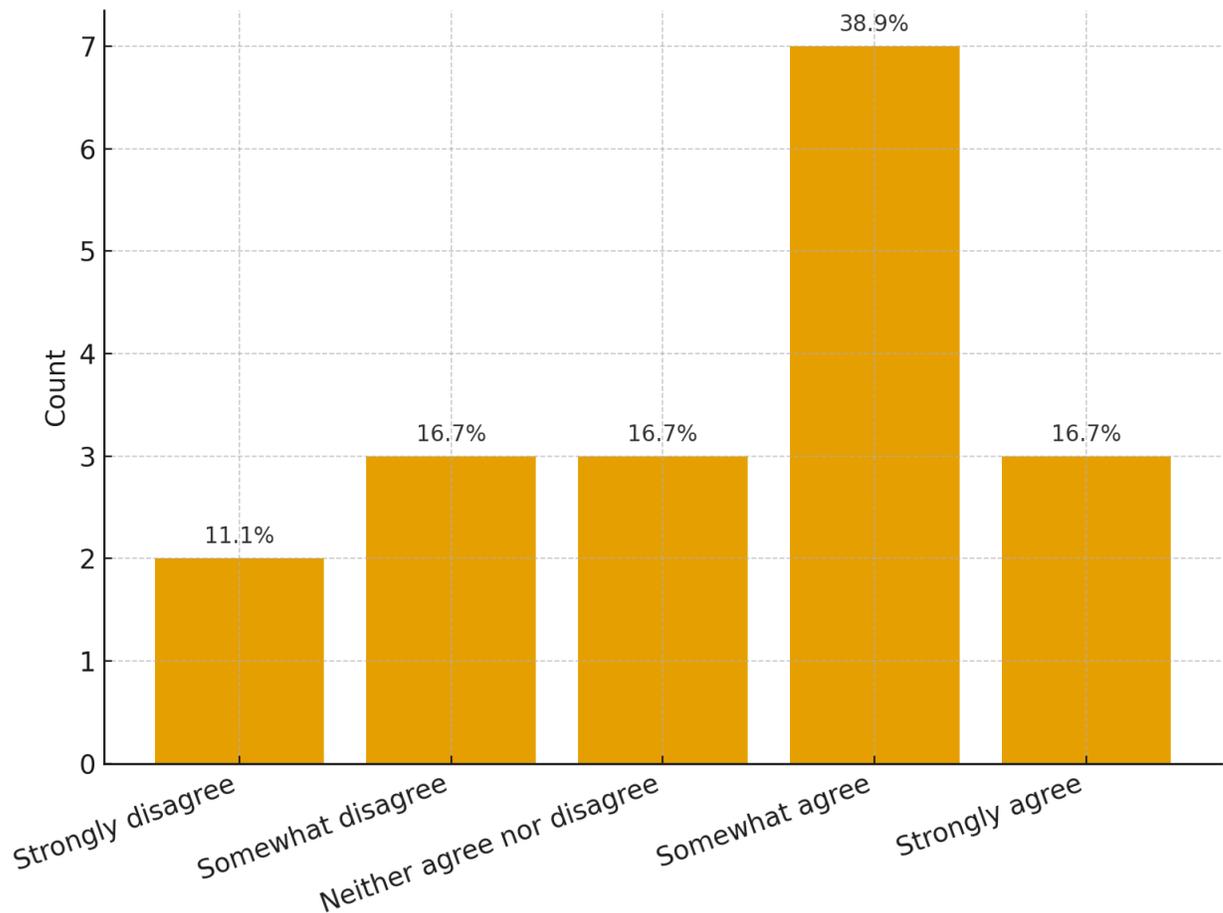
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respect to how AI is changing job roles and professions. Two questions from the questionnaire and one interview question were used to explore these questions.

Questionnaire Findings. Participants were given two global questions to gauge their opinions on how AI might be affecting education. Leaders were asked if they thought AI was changing public education for the better. Respondents showed little agreement in their opinions.

Figure 28

Do Leaders Think AI is Changing Education for the Better



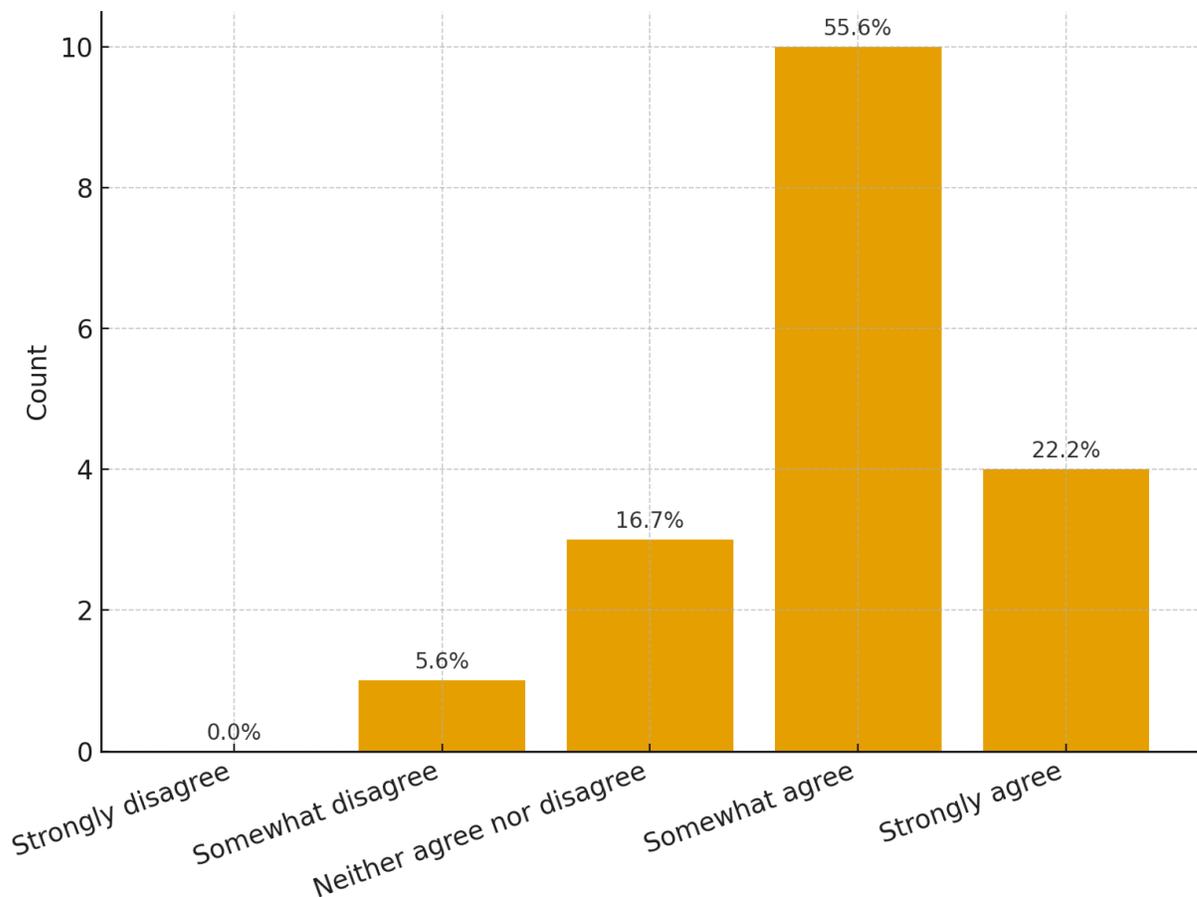
Note: Figure 28 shows that leaders were divided in their perspective on whether the further integration of AI into education is for the better. Slightly more than one-third (i.e.,

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38.9%) of respondents said they somewhat agreed that AI was changing education for the better, but opinions generally were scattered.

Figure 29

Do Leaders Think AI in Education is Changing Leadership



Note: Figure 29 shows that slightly more than half of respondents (55.6%) thought AI is somewhat changing education leadership. No one (i.e., 0%) thought AI wasn't changing leadership; it was just to what degree where opinions of participants differed.

Interview Findings. Participants were asked about the replacement conversations. Currently both news media and social media speak of AI replacing jobs. Participants

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were asked if this replacement conversation is one that is happening at their school or institution, whether the replacement conversation was the right conversation to be having and if it isn't what should educators be talking about instead? What emerged is that there are two main views on this issue, and they are probably the same two general views every time a disruptive technology is introduced into the wider marketplace. One is the techno-optimist view of "abundance" that is, that disruptive technologies ultimately create more opportunities, drive productivity, and increase wealth. Some groups of people will go through difficult transitions and will truly be displaced, but overall society sees economic improvements. The other is the techno-pessimist view of decline and alienation, that is, we innovate ourselves further into atomization and obsolescence, where we are disconnected from each other, from nature, and from a sense of societal purpose. In many ways the subtext of the participants' answers was whether AI is fundamentally different from preceding disruptive technologies and therefore whether the pattern of the past will continue.

Theme 1: Not all leaders said that the replacement conversation was happening. This was true for both K-12 and higher education. Where it was identified as not happening, leaders did identify that they had heard of the idea of AI replacing jobs and entire professions, and it was a conversation that they thought should be happening.

Institutionally, though, in terms of our processes, it really hasn't been a priority conversation. I'm not seeing that anyway. (#11 Global North, HE, Director of Teaching Innovation)

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Replacement of job roles, careers that we're potentially preparing students for, may not exist. I think it's an important conversation. Yes, I do think we should have it. (#7, Global North, HE, Vice-Chancellor)

No, but some amount of conversation cannot be avoided. Part of the reason is that influential bodies like the World Economic Forum over the last decade and private consulting firms like McKinsey have been publishing reports, which influence political leaders and businessmen in a big way, that there will be job losses. So, there is a perception that it would lead to job losses or replacements are possible. (#17, Global North, HE, Special Advisor to the President)

Theme 2: Those leaders who said the replacement of jobs and professions by AI was being discussed had also seen evidence of this happening.

We're already seeing it. So, we have a big accounting program. And we used to have a partnership with PWC. And they have now ended the partnership because they're investing so heavily in AI. A lot of our first-year students who would have done the internship level they've been replaced with AI. So, we're absolutely seeing it. (#10, Global North, HE, Dean)

Essentially, when you make a phone call for customer service, that's one of the jobs that they're thinking would be replaced. But what happened was that the people, the ones who are taking calls, are still there. It's the middle management that is being replaced. Because the middle management needed to review calls before. Now, it's AI that's reviewing everything 24 seven. So, that's one of the things that is happening. And as I mentioned, this is happening everywhere. (#15, Global South, HE, Professorial Chair)

But when asked if that meant programs and courses were changing because of jobs being replaced, the responses in all but two cases were always “not yet”.

And does that mean that programs are being examined with respect to whether they'll continue or be altered in some way because of the replacement? No, no, no, no, no. I'm

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thinking more like we think of it as the conversation about what's happening out there in society. (#23, Global North, HE, President and Vice-Chancellor)

It's happening. You can see jobs thinning out for certain fields already. So, I think the university has to respond to that, but it won't rush. (#19 Developed, HE, Dean)

Theme 3: Some leaders expressed that the replacement conversation is either irrelevant or not the right focus to take.

I don't think we see [the replacement conversation] as a valid way forward. My view might be different from others, but I don't see it as a threat. I would much rather be looking at how can AI augment what I do. (Global North, K-12, Principal)

My job is to make decisions based on the balance of probability of data. Well, hell, a computer can do that, right? So, what is my role then as a college president? Well, it becomes the human part of that. I can have a computer helping make decisions, but can a computer talk to a donor, create a human connection, understand that donor's passion, understand where that donor wants to see something change in the world, match their passion to an opportunity? That's a human effect. It's not a computer effect. We've got this emergence of the Renaissance moment for the humanities that we're missing. (HE, President)

There will also be AI losses, but we have been thinking about the problem not in that parochial way, but as the larger problem of, as AIs do jobs, new technologies invent other jobs, but unlike prior new technologies, this technology is capable of learning how to do those jobs and it's hard to see how it doesn't progressively eat jobs. What does that mean? How might we change that? (#23 Developed, HE, President and Vice-Chancellor)

The leaders who didn't see the replacement conversation as particularly relevant had several reasons for their position. For example, they cited their knowledge of past technological change where new technology required the creation of new jobs. Although

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some traditional occupations were lost, new jobs were created because of technological changes. As a result, the net total was the same. Leaders did note that the new jobs created by AI may be more sophisticated and therefore require a different skill set.

With the advent of AI, there's a lot more jobs in the AI field as well, right? So, you have people who manage servers. Cleaning the equipment is a technical task, right? And then, of course, there's more power requirements. So, there'll be new power plants that will open. So, there's a lot of job markets that will open. But of course, these are more highly technical skills. (Developing, HE, Professorial Chair in Artificial Intelligence)

Other leaders noted that societal forces are at least as important as AI are influencing job changes and job loss.

In a sense, I'm not worried about people losing their jobs, because somehow through the last century, we've continuously invented more work out of having better support functions...I think other societal changes are driving, and they are partly AI-influenced. So, for example, working from home, working nomads, changing jobs more often, all that stuff. I think they are more transformative in the way we work. (#12, Global North, Developed, HE, Dean)

Right now, we have quite high unemployment but that's mainly because the economy is not doing so very well. But I would say this AI has maybe a very minor influence on unemployment. (#30, Global North, Developed, HE, Vice Rector)

Several leaders noted the basic human need to interact with other humans as a limiter to the replacement of jobs by AI.

A child that may be struggling or just needs to hear the right words. Sometimes AI can do that, right? Try this strategy. It has empathy behind it, but it's not real, right? It's not someone that you're going to run to. I feel that when it comes to a child or a human, eventually they're going to need another human. (# 8, Global North, K-12, Vice-principal)

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Unlike a human, which you can blame if something doesn't work, if an AI system doesn't work, who do you blame? (#15, Global South, HE, Professorial Chair)

I presume that there will be new jobs that we may not have imagined, you know, and some jobs are also going to become redundant. So, it is important that we keep equipping ourselves with skills that are not easily replaceable. (#26, Global South, HE, Vice-Chancellor)

I think that gets hard to imagine...not having a kindergarten teacher, a grade one teacher, you know? I think the teacher, the human part of noticing kids, can't be replaced. (#31, Global North, K-12, Vice principal)

Theme 4: Some leaders had a different perspective on AI replacing jobs. The leaders noted that AI was needed to supplement shortages in the job market. For example, some leaders from developing countries noted a shortage of teachers in education. If AI could help solve shortages, then they would be keen to see that happen. Other leaders noted the demographic changes in society globally that make it difficult to meet needs in healthcare. They saw a positive role in the supplementation of these vacancies by AI. Others identified cost savings through the reduction of manpower as beneficial.

There's a teacher shortage here in general. So, if you tell me that there are computer programs or robots or whatever that can take the role of certain teachers, there are so many gaps to fill. I say, go for it. That's one. Second, many of the teachers that we have in the public-school sector are very poorly prepared. If there was technology that could fill in some of those gaps, I am 100% in favor. (#13, Global South, HE, Head)

But as we see it right now, sort of the demographic changes that we have in our society and the increasing demand for health services, I don't think we can meet the requirements without AI. So, I think we're not thinking so much about replacement, but probably more about supplementation and being able to continue doing what we're doing

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right now, plus all the new demands and all the new possibilities that we're seeing ahead.
(#28, Global North, HE, Vice Dean)

Theme 5: Some leaders felt it was important to have different conversations. They said that the replacement conversation might act as a catalyst for these other conversations which focus on issues that are larger and more complex than AI replacing jobs. These leaders saw the opportunity to rethink education, what is prioritized in teaching and why, as the more important conversations.

I think that there are some other shifts in conversation that have already started which are much more productive than that, but it is a conversation that hasn't happened. Improving the ability to have certain kinds of educational experiences by using AI rather than the reduction of tasks, because that's the more interesting question. What can we do with this that improves the experience of learning, improves the experience of teaching, to reduce repetitive tasks that may not be particularly productive while increasing time and space for learning-rich engagement? That's the question. (#36, Global North HE, Dean)

AI's should be able to replace most things that we do. The question is what are the things that we do that we still value? (#21, Global North, HE, Dean)

I have a lot of uncertainty about what this is going to look like and are we able to shift fast enough to address that?... I think to me the value of school then is human connection and really creating that sense of belonging and creating these shared experiences that we can help create that hopefully in some way help the students and adults navigate this rapidly changing world. I don't think we're doing enough fast enough, but that I think is just the general state of how fast things are changing. (#22, Global North, K-12, Director)

These conversations were happening 10 years ago with one-to-one laptops. But the idea was we've got creativity, we've got emotional intelligence, we've got empathy... But now AI is developing soft skills. (#32, Global South, K-12, Principal)

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Theme 6: As a result of these complex questions, some leaders identified the group of students they felt most concerned about moving forward. They described these students in three ways as those who are already marginalized, those who may lack the foundational skills, and students who are average to slightly below in their academic learning.

I think I worry about those who were already marginalized the most. The precarious are just more precarious, especially as you erode student and educator relationships and we create more distance between people. I think people can get lost in the cracks. (#19, Global North, HE, Dean)

People still need to have a foundation of a thing before they can use AI for it. People are going to use AI in the workplace, so they should use it in education is not an answer. This would be like giving kids Excel sheets instead of teaching them math. (#20, Global South, HE, Professor of Practice)

Mediocre graduates who haven't bothered to learn how to use these AI tools, they are going to suffer a lot. And all the entry-level jobs, which is like a basket full of unsorted data, make sense of it and tell me what to do, those jobs are disappearing. And so, I'm really worried about the gap. And I'm interested in what that might lead to in terms of work-life transformation, because we already have this push towards more individualized, personalized ways of living, and less respect in authorities...And until the world realizes what they really need, and what other skills we have, I think a lot of people will get lost... I think it is dangerous for those who are not excellent. I would say faculty, teachers as well, not just students. (#12, Global North, HE, Dean)

Theme 7: Some K-12 leaders identified curriculum changes they have already implemented. They see these new curriculum initiatives as a direct response to the conversations and actualities of AI replacing jobs and to other social realities of today

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such as the ubiquitous and influential role of social media, sustainability, and ethical concerns. The focus of these leaders is on the impact of teaching and learning in this moment in time.

Ten years ago, we were at a crossroads. We had an opportunity as a society, as a nation to step in with social media and educate our children about how to use it responsibly and ethically. We chose not to. And look at the mess we're in because we didn't intervene. We have that opportunity now with AI to step in, to immerse ourselves, to really understand why AI is important to our children, and the evolution of society. So that's our why, really. We've created this next gen curriculum with a real focus on AI. We look at ethics. We look at decision trees. We look at prompt engineering. We look at what AI is, what it isn't, how it manifests itself in society, etc. And we've just brought it down to primary school. (#41, Global North, K-12, Director)

Over the past few years, we've implemented a K through 8 worlds of work initiative aligned with realistic, artistic, social, investigative, conventional and enterprising. And so basically K through 8 students explore 54 different careers, one from each category at each grade level... I think we're looking at what are the skills and knowledge that students really need going into this world. (#22, Global North, K-12, Director)

We believe we've got a responsibility to go beyond specialist subjects and teach people transferable skills that are going to serve them well in tertiary education and the workplace. So, we commit one day a week, since 2009, to large scale, long-term impact projects where our students work and partner with external stakeholders to address a real problem or an issue underpinned by design thinking and agile methodologies and informed by a whole lot of principles that are to do with lifelong learning and those soft skills and competencies. Students are out of school because they're working in a community group or they're working in a business. (#25, Global North, K-12, Principal)

So, we are conceptualizing learning at a learning outcome level or a competency level. We're designing programs as a series of competencies, not as a series of courses. What

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that allows a learner to do from a lifelong perspective is enter the learning journey wherever they want. (#41, Global North, HE, President)

Research Interview Question Two Summary of Findings

The three subtopics were used to investigate leaders' understanding of what AI is and its capabilities. The first sub-topic revealed multiple dichotomies between leaders' knowledge and understanding and experiences of AI's capabilities. These dichotomies revealed leaders expertise with AI as they identified use that is permitted vs. unpermitted; use that is known vs. use that is unknown; early adoption vs. recent adoption; integration of AI that is being undertaken systematically vs. unsystematically; regulated vs. unregulated or minimally regulated use; student vs. staff motivation for use; none or minimal use by leaders vs. pervasive use by leaders for reasons of time, efficiency and cost. All these dichotomies revealed different degrees of leaders' knowledge, understanding of, and confidence about the integration of AI.

The second subtopic provided clarity on leaders' perspectives on leading AI development and integration and their sense of autonomy, control and motivation in doing so. Despite their recognition of a lack of autonomy or control, all but two leaders saw a role for public education in shaping how society thinks about AI. Only a few leaders see themselves currently as actively involved in soft diplomacy about how society thinks about AI and its use, almost every leader said it was an important role for educational leadership to undertake. A few leaders recognized that this had always been a role of education: to influence and to educate the broader society on issues of common concern.

Leaders who had greater AI literacy also expressed a greater sense of control. Such knowledge and understanding came from doing their own inquiry and designing their

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own instances and applications of AI in their own buildings. Leaders who expressed this greater sense of control and autonomy were motivated to learn about AI. They placed a high value on their own development of knowledge about AI because it gave them a sense of control and it made their leadership of AI meaningful. Some leaders spoke of their involvement in the development of AI as more than a question of whether they wanted to. They saw their involvement in the development of AI for education and how it is thought about and used in education as a fundamental responsibility of leadership today.

The third subtopic took the perspective of exploring leaders' understanding of AI through their understanding of AI's impact on the workplace, including education generally. Respondents showed little agreement about whether AI was changing public education for the better although they recognized that educational leadership is changing. Not all leaders said that the conversation about AI replacing jobs was happening in their school/institution. This was true for both K-12 and higher education. Where it wasn't happening, leaders did identify that they had heard of that idea, and it was a conversation that they thought should be happening. Those leaders who said the replacement of jobs and professions by AI was being discussed had also seen evidence of this happening. Some leaders expressed that the replacement conversation isn't relevant or the right focus to be taken. The leaders who didn't see the replacement conversation as particularly relevant had several reasons for their position. For example, they cited their knowledge of past technological change where new technology required the creation of new jobs. Although some traditional occupations were lost, new jobs were created because of

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technology. As a result, the net total was the same. Leaders did note that the new jobs created by AI may be more sophisticated and therefore require a different skill set.

Some leaders had a different perspective on AI replacing jobs. These leaders noted that AI was needed to supplement shortages in the job market. For example, some leaders from developing countries noted a shortage of teachers in education. If AI could help solve shortages, then they would be keen to see that happen. Other leaders noted the demographic changes in society globally that make it difficult to meet needs in healthcare. They saw a positive role in the supplementation of these vacancies by AI. Others identified cost savings through the reduction of manpower as beneficial.

Some leaders felt it was important to have different conversations. They said that the replacement conversation might act as a catalyst for these conversations, but the real issues were larger and more complex than replacing jobs. These leaders saw the opportunity to rethink education, what is prioritized in teaching and why, as the more important conversation to be had.

Research Question Three Findings: How will specific supports help educational leaders K-20 to realize this universal mandate for change?

Three subtopics were used to explore this research question.

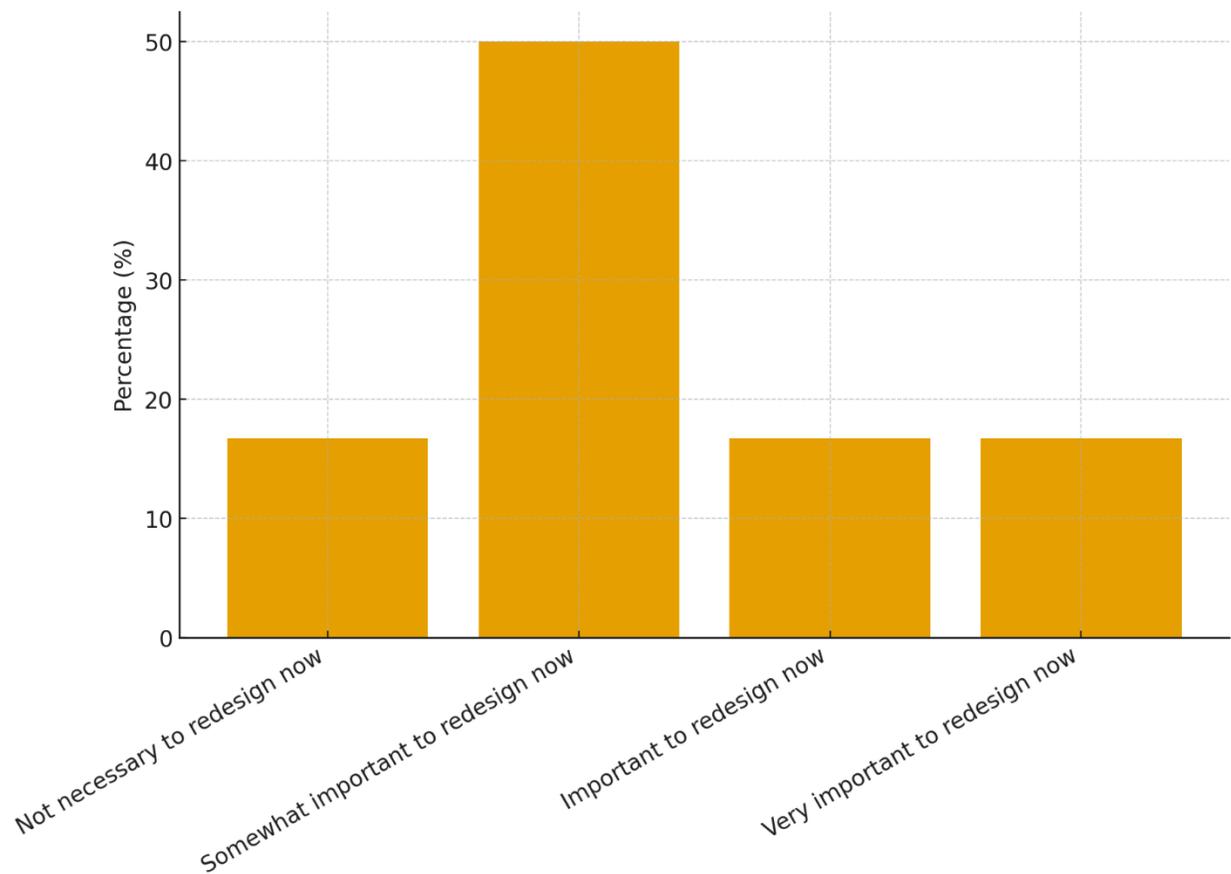
Subtopic 1: How the Integration of AI into Education is Happening Differently from other Technological Implementations

Any understanding of what support might be needed requires an understanding of how change happens. So, to begin with leaders were asked in both the questionnaire and the interview about the nature of change in their school or institution.

Questionnaire findings. Leaders were asked to rate eight potential changes that could be made on a scale from “not necessary to redesign now” up to “very important to redesign now”. In short, this question asked leaders to prioritize what changes might be made. For each of the eight potential changes, leaders’ perspectives on the change are described narratively first then graphically.

Figure 30

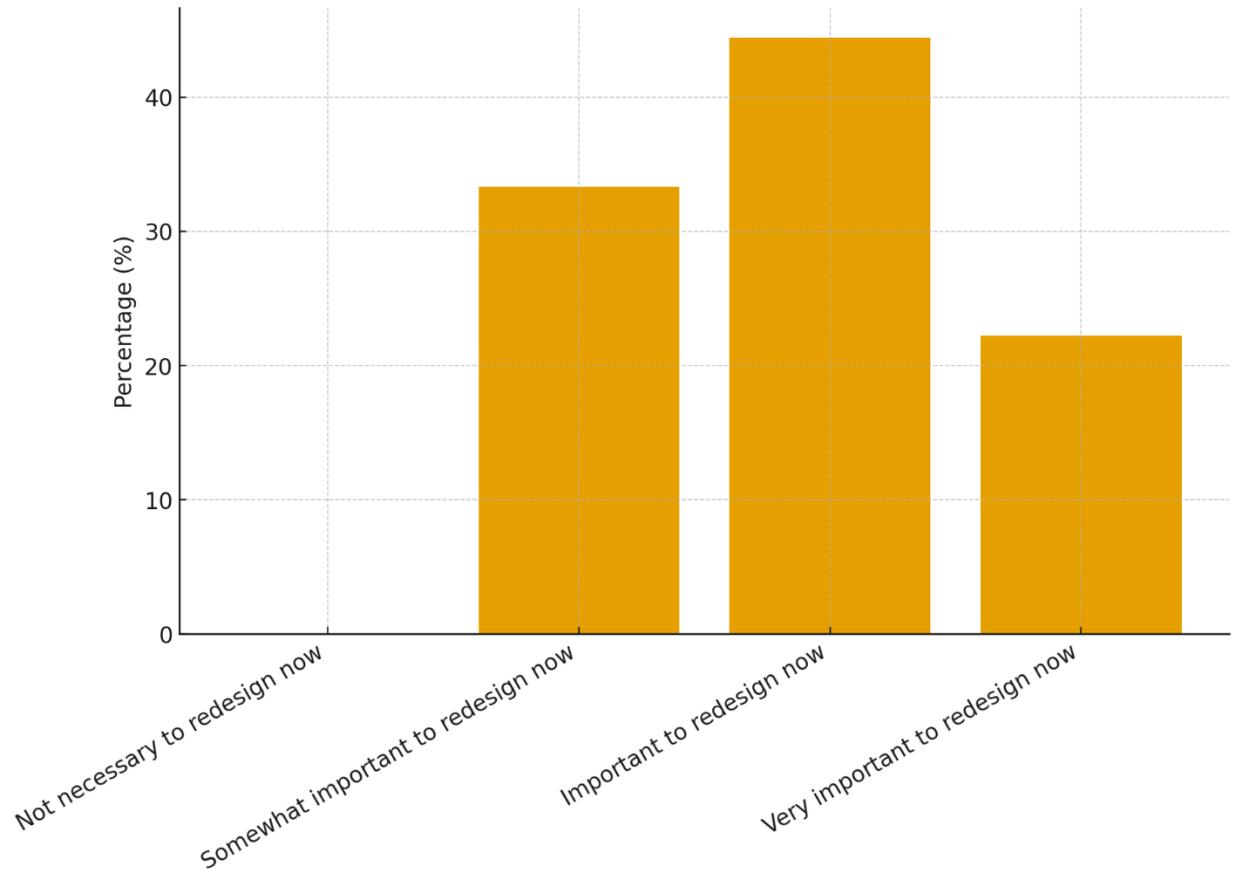
Leaders’ perspectives on the Importance of Redesigning Grade Level, Diploma or Graduate Outcomes



Note: Figure 30 illustrates that most respondents (50%) said it was somewhat important to redesign grade level, diploma or graduate outcomes now.

Figure 31

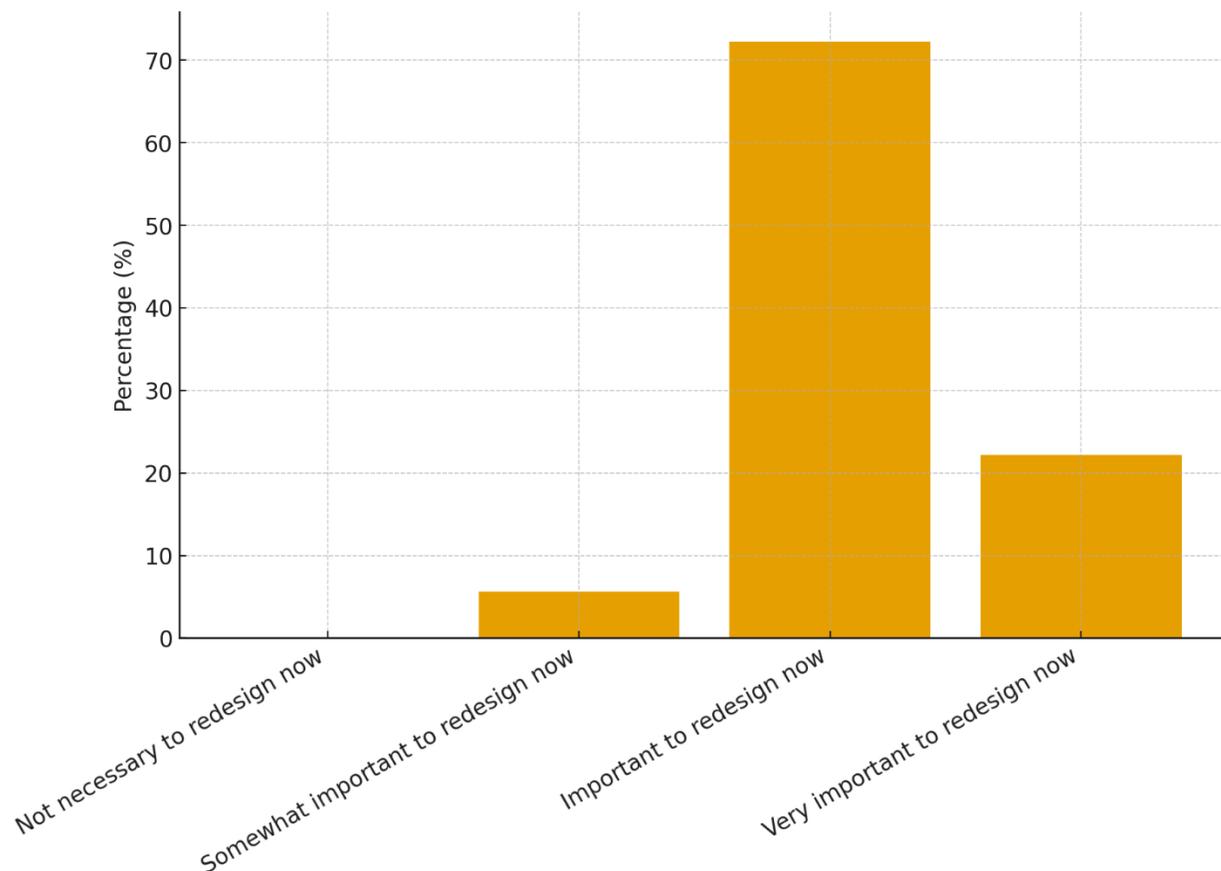
Importance of Redesigning Program or Curriculum Now



Note: Figure 31 shows that more than half (i.e., 60%+) of the respondents said it was important or very important to redesign program and curriculum now. None of the participants said it was unnecessary to do so now.

Figure 32

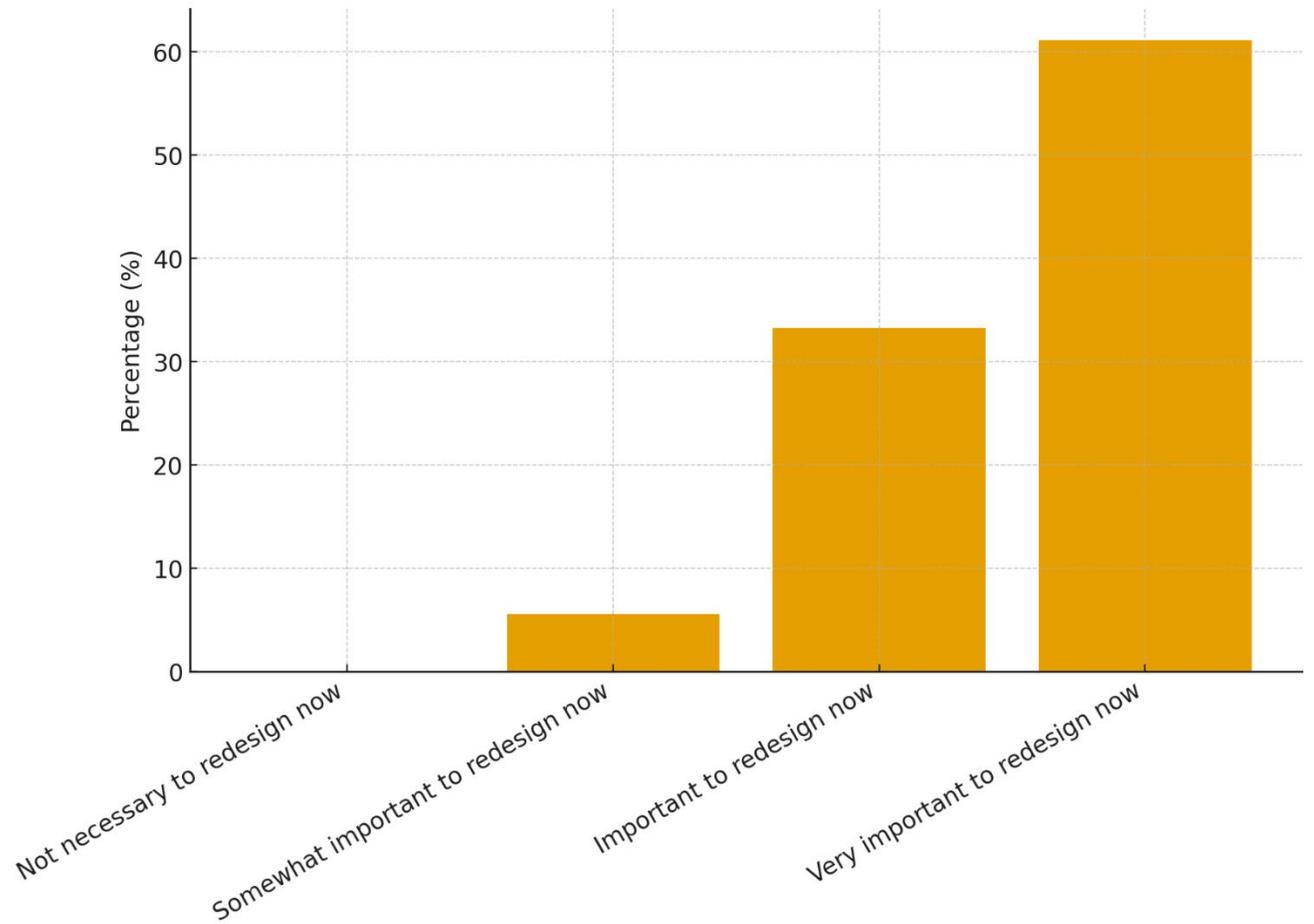
Importance of Redesigning Assessment and Evaluation Now



Note: Figure 32 shows that most respondents said it was important or very important (i.e., 90%+) to redesign assessment and evaluation of student learning now. None of the respondents said it was unnecessary to redesign assessment and evaluation of student learning now.

Figure 33

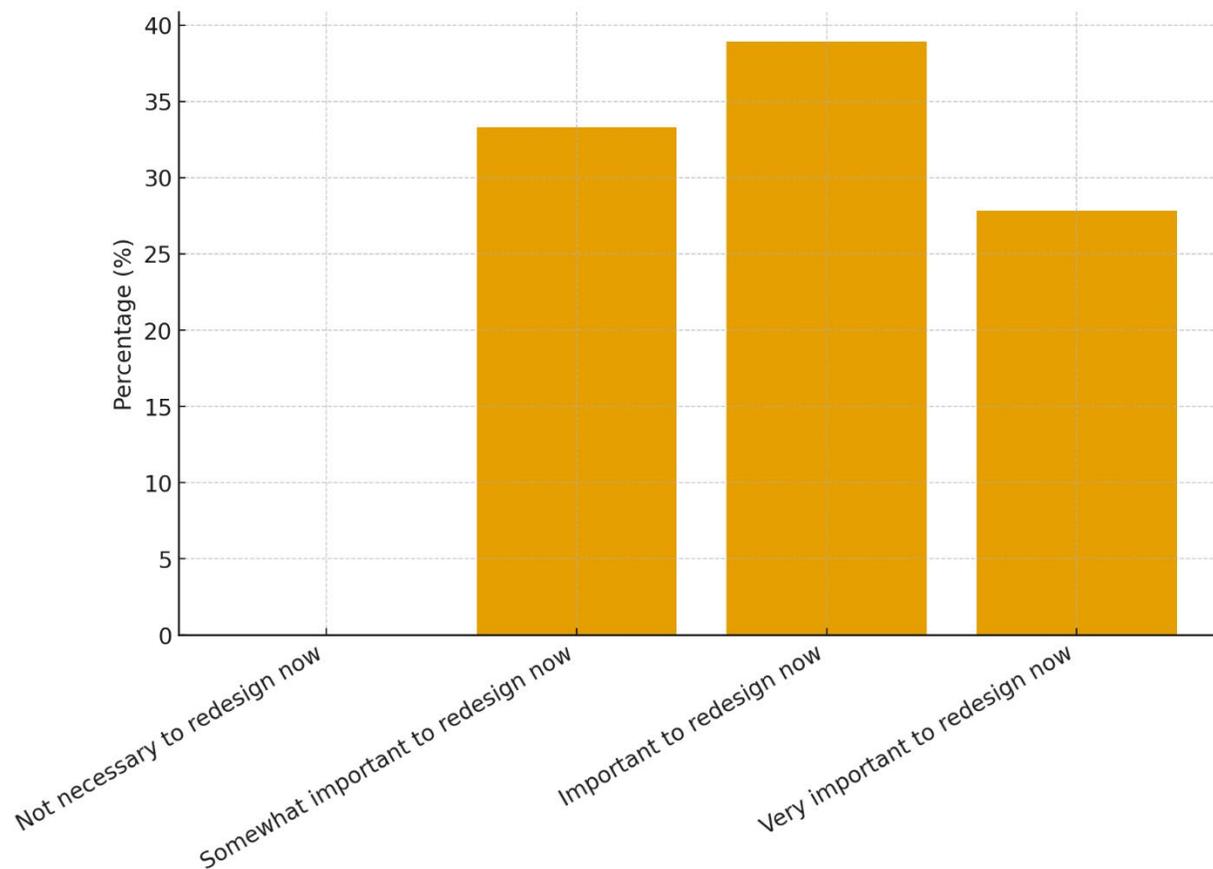
Importance of Redesigning Professional Learning Now



Note: Figure 33 shows that most (i.e. more than 90%) of respondents said it was important or very important to redesign educators' professional learning now.

Figure 34

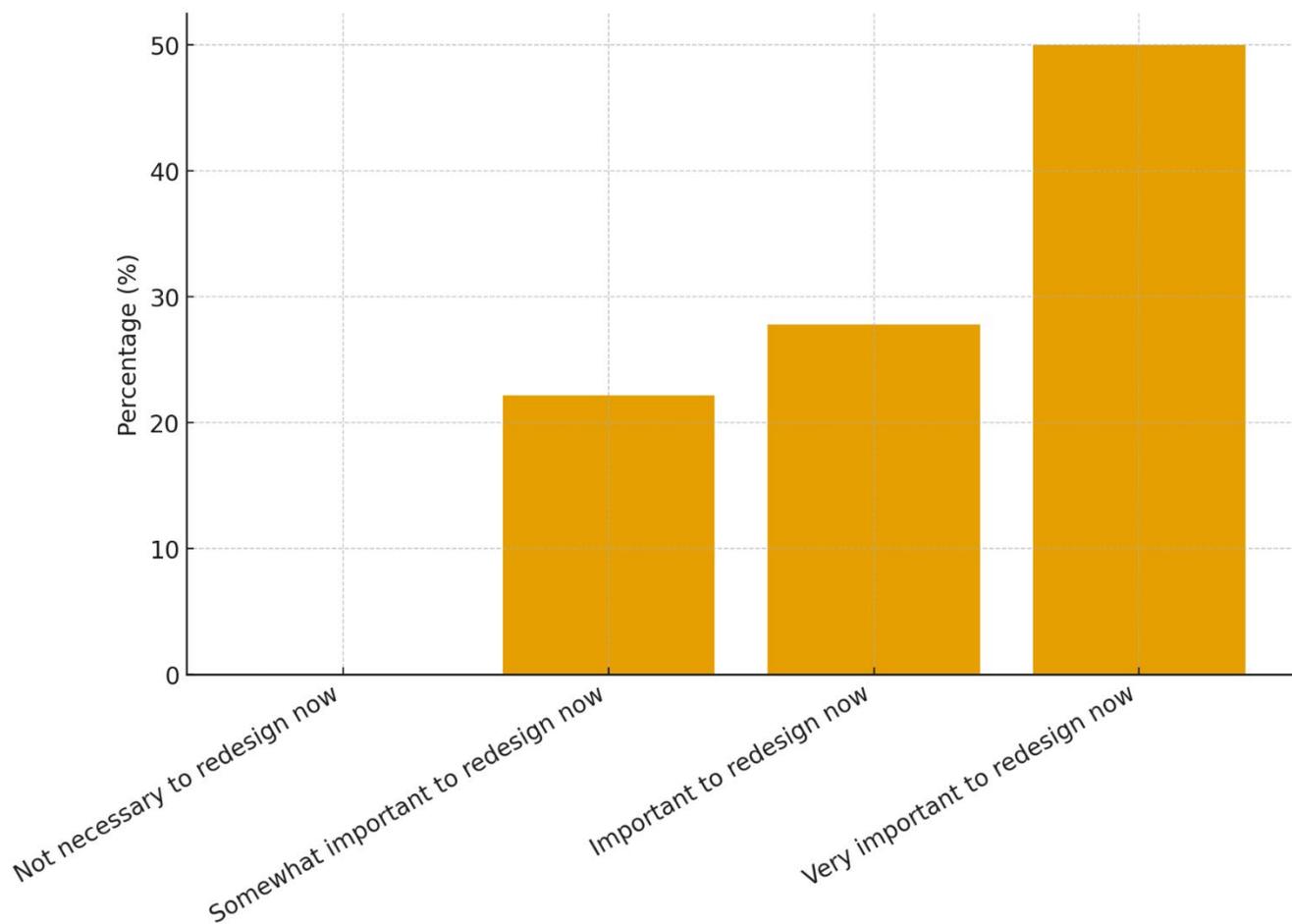
Importance of Redesigning Guidance Documents or Frameworks Now



Note: Figure 34 showed that respondents were very evenly split (i.e. approximately 30% each) on whether redesigning guidance documents or frameworks was a priority for redesigning at this time.

Figure 35

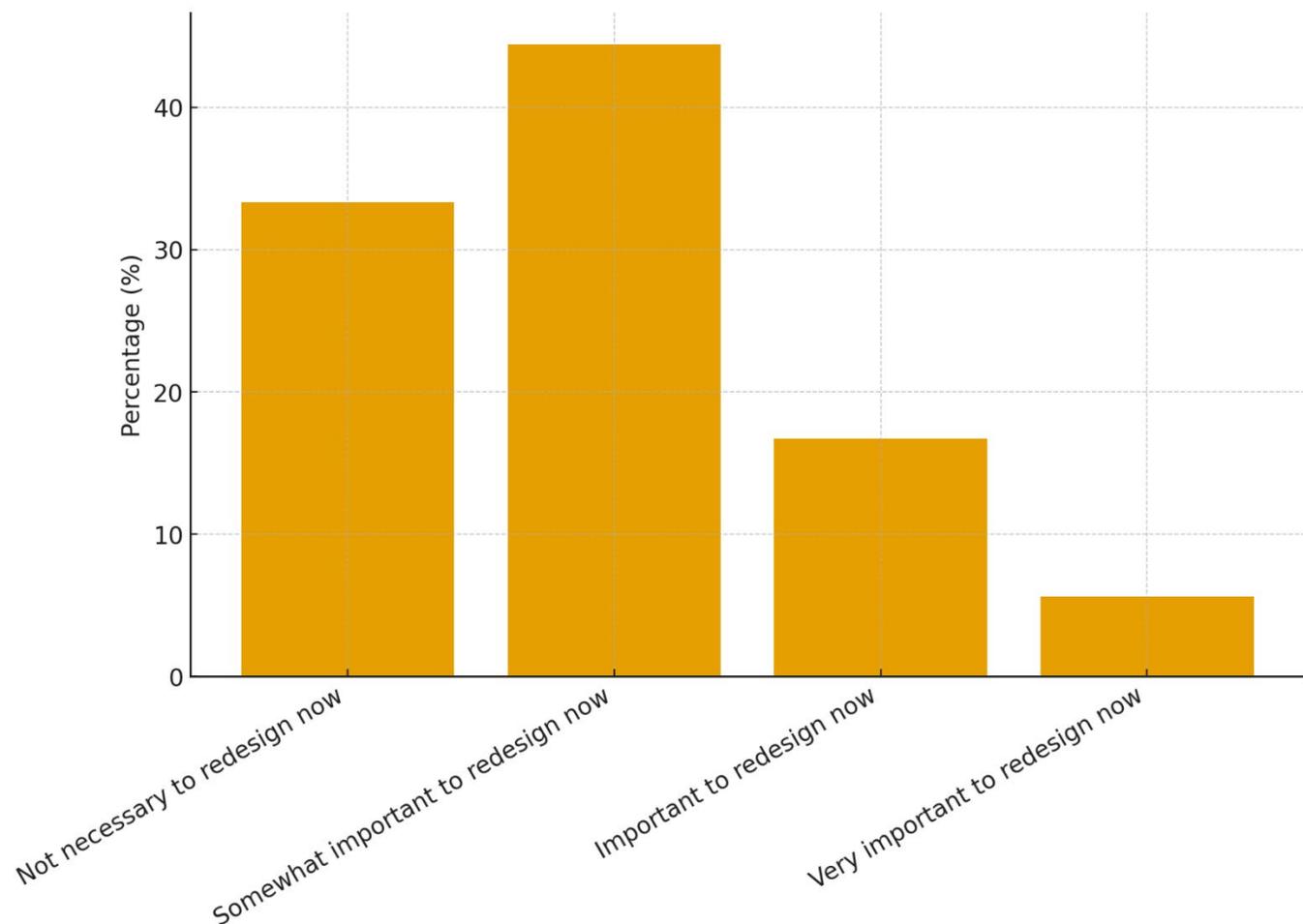
Importance of Redesigning School/Institutional Level Policies or Frameworks on AI Use for LLL



Note: Figure 35 shows that half (i.e., 50%) of the respondents said it was very important now to redesign school or institution level policies or frameworks on AI use for lifelong learning.

Figure 36

Importance of Redesigning School/Institution Level Job Descriptions Now



Note: Figure 36 shows that the most common response (i.e., + \$40%) to whether school or institution job descriptions should be redesigned now was that currently it was somewhat important to do so because of the capabilities of AI and given the global educational challenge to improve equity of opportunity for lifelong learning for all, as described in the United Nations' Sustainability Development Goal Four.

Interview findings. Whereas the questionnaire focused on what leaders saw as priorities for change, the following questions asked leaders who participated in the interviews to explain how change generally unfolds with respect to their school or

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institution. To gain greater understanding of what help might be needed by leaders K-20, participants were asked whether the further integration of Artificial Intelligence in their school or institution was unfolding as change usually happens or if this change was proceeding differently and, if so, why that might be. Every leader who was interviewed identified that this change is different from technological changes that have been made in the past. Even the leaders who saw some parallels to prior technological change initiatives, they saw clear differences as well. Leaders identified several core reasons why this change is different.

Theme 1: Some leaders identified that the integration of AI into teaching, learning and administration in their school/institution was proceeding differently from how change usually happens because of the involvement of “big tech” and government. Although government is usually involved in educational change in publicly funded education, the involvement of major technology providers with government was creating a more challenging and unusual environment than what is more typical with respect to implementing change. This was true for both participants from the Global North and the Global South.

Governments often play a big role in policy as well as in infrastructure in some countries, and that role has made a big contribution to lessening the digital divide in 25 years. However, going forward, when I look at AI, especially generative AI, governments will continue to play a role, but they may not do so in terms of bridging global divide, because thanks to the policies of the United States, the whole world of information technology is fragmenting because of two very big powers. The United States and China are treating generative AI as part of their advantage portfolio. China published DeepSeek, an open-source generative AI, an LLM, and very quickly made it part of their strategic arsenal in information warfare. So that means other countries won't have access to that anymore because it has become [China's} strategic advantage. The United

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States has created through indirect subsidies, indirect funding mechanisms major companies such as OpenAI. And now it's possible that the United States might restrict the use of OpenAI in many countries because of tariffs. And so, governments will be very careful. So, this amounts to many governments thinking that we really don't want to be part of a global grid where someone has control to switch it on and off. (#17, Global North, HE, Special Advisor to the President)

These are now multibillion, even getting close to trillion-dollar companies. And they control the entire game and there's no way around that...I think in economic terms, we're not yet an interesting market that anybody is going to invest a lot of money in. And sometimes we feel afraid of that too, because once we are an interesting market, then stuff is just going to get wiped out. (#38, Global South, K-12, Director)

And my worry is that the way the government is now throwing around these AI comments suggests that they really want to standardize how we assess kids as well. They're rebranding it and completely throwing out the baby with the bathwater. And they've introduced it with a spin campaign that every parent and voter is going, oh, that makes sense. It's like the good old days. This looks way more like what school looked like when I was there. And so, they've got a whole lot of marketing going on. They're going back to rigour. And they're going to save the education system. And educators in the system are going, are you kidding me? (#24, Global North, K-12, Principal)

As a result of the involvement of Big Tech, many leaders of schools and institutions are prioritizing their values around ethical conduct and transparency when it comes to AI.

Privacy is a standard between the communication of two people. This is not the case when you communicate with an AI tool, because you don't know the privacy standards, even if it is a brochure somewhere in the interface, you never know... So, the major responsibility of the academic community is to discuss the appropriate use of this new technology, the ethics behind it. (#9, Global North, HE, Director)

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Faculty question the university executive teams on what do you do with AI? Please use it responsibly. And when it's about generative AI, please make sure that it's not being set up by the big tech but let's develop our own open chat GTP, for instance, and train it on an open repository and make all the training coefficients that you use in language models and make them public. I think it's important to do that too, to make clear how public funds in general are being used...be open about biases in AI or what AI can do and what's not to the good of society at large. (# 5, Global North, HE, Rector)

Theme 2: Some leaders noted that this change is different from the arrival of other technology into education that was hardware or device driven because it has caused some resistance by faculty and staff, some retrenching, some return to previous practices such as pen and paper exams. Leaders identify that this resistance and retrenching stems from a cultural mistrust of students.

I think that it's following a similar pattern of technological adaptation, but I think that it is different too. I think it's easier to resist AI than it is for hardware innovations in some ways. But in that resistance, it's going back to writing blue book papers, blue book exams in person...So I think it's slightly different in that regard. And I think that the kind of ways that people are going to handle it are going to look different than smartphone use or cell phone use. (#36, Global North, HE, Dean)

The affordances of AI to do so much very quickly and substitute thinking, critique and so on really made a lot of colleagues quite concerned and many wanted us to increase the number of physical, in-person, handwritten exams that we host on campus to compensate for that. We were confronted with that early on. And we were trying to hold back the groundswell of let's just do exams on campus then, because of the whole set of reasons why we would do that. (#4, Global North, HE, Vice Principal Learning and Teaching)

Well, when change arrives, the first thing, and I think natural human instinct is to resist it. So, this is exactly what happened. The moment it came, not one faculty came to me

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and said, wow, what a wonderful tool. And the irony is, it is a wonderful tool for them when they are doing their research, when they are writing, when they are looking at materials. But when it comes to their teaching and learning, and the students are the user, then they believe that it's a very bad tool. It will kill creativity. Students will not be original with their ideas. But when faculty are using it in their research, they use it, everybody, all of them. So, I think I see a double standard. It isn't that they don't want students to benefit. It stems from the fact that we don't trust students as much as we trust ourselves. So, we believe that when we are using AI, we are honest. But when students use it, they will cheat. (#18, Global South, HE, Director of Educational Leadership)

Theme 3: Several leaders also identified that the further integration of AI into education is different from other implementations of technologies because the shift is more conceptual than physical, and more culturally pervasive than simply “plugging in” a new piece of technology for example, like a tablet or a smartboard or allowing students to use calculators instead of slide rules. AI seems to leaders to be more amorphous and, therefore, harder to pin down unlike MOOCs or social media, for example. These leaders realize that AI is not just one thing, like a platform or LMS, it is a wide and ever-evolving set of capabilities.

There's a lot of people who are still using pedagogies that they grew up with, how they were taught, essentially. And it's hard to give them a perspective shift.... So, it's hard for them to conceptualize new ideas on how to ensure that the students can use AI without compromising learning. (#15, Global South, HE, Professorial Chair in Artificial Intelligence)

It's a complete mindset change. I don't think it's technology, I think it's the culture, and how people rightly will feel that it's going to impact their academics, their academic freedom, and their job and independence. (#6, Global North, K-12, Director)

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I think it's because AI is so conceptual. And it's such a buzzword. It's on everybody's radar. Even my mum, who is a bit of a technophobe. She doesn't know what AI is but she's hearing it. It's in the vernacular. (#41, Global North, K-12, Director)

There's a bit of a double development in a very explorative way, a trying to restrict it way and see what the dangers are of AI and what the university then should do as an open institution, as a democratic institution as part of a democratic system, can we criticize it as well? We cannot stop it, but then how do we want it and use it on our own terms? (#5, Global North, HE, Rector)

Theme 4: Many leaders noted that this change is different from other implementations of new technologies because it has not had a strategic approach with a clear champion whose job it is in the organization to support the implementation of the new technology. It has been more haphazard, more ground up, more let's give it a try and see what happens. Even if in the recent past there has been a top-down approach to implementing change, this change has been more bottom up.

It's an interesting one with artificial intelligence because it sort of lacks an owner, like the champion, which is why it has sometimes fallen to the academic integrity space, because that's where we first saw it. And that's where we first had to deal with it. (#11, Global North, HE, Director of Teaching Innovation)

I would say the hard part about this one is instead of just kind of knowing the goal is this, we are marching towards this, and this is the timetable to make it happen, which happens, I think, in schools a lot, right, what we did with AI is we didn't set a timetable for it which is not what you typically would do for a structural change. (#40, Global North, K-12, Principal)

This kind of inertia to change the system is quite high. We are not streamlining anything strategically. And that is what worries me the most. We have initiatives at the level of

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departments, but on a university level, almost nothing. Kind of this ostrich approach.
(#29, Global North, HE, Head of the Department of Learning Analytics)

People were using it. Some people use it well, some people maybe are not using it so well, staff and students. And now we've got to a point where we recognize that it's not going anywhere. It's going to have long-lasting implications in terms of our teaching and learning. So, we need to be more strategic around how we're going to support staff and students in their use of AI. (#39, Global North, K-12, Director)

K-12 leaders do not credit AI as the reason for this difference but rather a culture of K-12 which values early adopters, staff as grassroots communities of learners, and school level planning.

Largely what drives us is our strategic plan. And part of that is this idea of being future focused, student centered, and innovation driven. And we really use that as our guiding compass in terms of change, in terms of improvements, innovations. (#22, Global North, K-12, Director of Innovation)

I think the staff would accuse me of planting seeds. Then, before you know it, somebody has come up with the idea, and it's not me. And they're moving forward on it. (#24, Global North, K-12, Principal)

Higher education leaders, on the other hand, identify the individualistic and often rigid culture of post-secondary education as the reason for this grassroots, bottom approach to change with respect to the further integration of AI into education, rather than the complexity of integrating AI.

This university is a very, very rigid system with a whole bunch of individuals within different parts of the system solving problems for themselves. And the problems that they're solving are often the ones caused by other people in those other bits of the system.

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It is a kind of self-sustaining stasis or metastasis where change rarely happens. And if it does, it happens very, very slowly. (#21, Global North, HE, Dean)

Broadly speaking, like every other academic institution, I used to joke that I had faculty whose scholarship was about how every institution in society needed to be upended and changed, but that it turned out it was every institution but one, which was their class, which was perfect and couldn't be touched. (#23, Global North, HE, President and Vice-Chancellor)

Despite the culture of HE often being viewed as rigid or individualistic, rapid change has happened in some places in a way that is different than what has typically happened,

No, this is not how change usually happens at the University. AI is a huge step forward. I mean, I think it's moved us forward 20 years. When students finish medical school, they must take their boards to graduate. AI has the ability to, take those 13% of students who didn't pass, here's their name, show us their passing score in anatomy in year one, and tell us what features of these 130 students are different than the 87% of students who passed and now you can maybe give them a six week remediation or educational program that better prepares them to pass step one, because if they can't pass step one, they can't move on to year three and four. So now you maybe you take your passing rate from 87 up to 94. And it doesn't sound like a lot, but 87 up to 94, that's 60 students a year that are now being able to go on to doctors, it's 4 year medical school, there's two classes per year, that's 120 students per year over 20 years, you know, you're turning out 25,000 more doctors, instead of, you know, 25,000 students that were going to have \$300,000 in debt, but never graduate medical school. If you were going to try to identify that yourself, that would probably take four or five individuals six or seven months to try to pan out that data that AI can identify in 30 seconds. So huge difference in how change happens. (#34, Global South, HE, Director)

Theme 5: This change is seen by many leaders as different from other technological implementations into education because the integration of AI into education is going to

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have long-lasting, deep-seated implications. Leaders identified that unlike other technology implementation the further integration of AI in education K-20 requires further reflection, rethinking, reinvention, and reimagining the goals and purposes of education as well as active leadership involvement.

I think there's a little bit more awareness amongst my colleagues that we're all in danger of being adrift. And some people hide and just go make it go away. And some people are out there going, I don't know what I'm doing, but I want to learn everything. I think it's quite an interesting one, because it's caused a bit more reflection. (#7, Global North, HE, Vice Principal Learning and Teaching)

We've just got to a point where actually it does need some leadership. There's a leadership vacuum. And that's not because we're not interested. It's because we've just let it roll, let it play out, see where we kind of landed, what we could learn. But there comes a moment of leadership. And I think we've just experienced that. (#7, Global North, HE, Associate Pro-Vice-Chancellor)

They want to know that the senior leadership are in there thinking about this and driving those changes forward... They just want to know that it's coming from the top and isn't something that's been invented by the middle. (#12, Global North, HE, Dean of Education)

We must redefine the goal of universities. And it should be us in the leadership who redefine the goals of universities. Why is university needed? I think we've done it before. We need to reinvent ourselves. And I think that must be done at the leadership level. (#1, Global North, HE, Senior Research Director)

Why are they still studying for four years? What's the logic? It doesn't make any sense. I'm just reflecting because when I speak to my colleagues, they say, no, they must spend four years. Who said four years? Who said every grade you must spend one year? With

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all this technology around us, young people should be able to learn much faster. (#35, Global South, HE, Vice Chancellor)

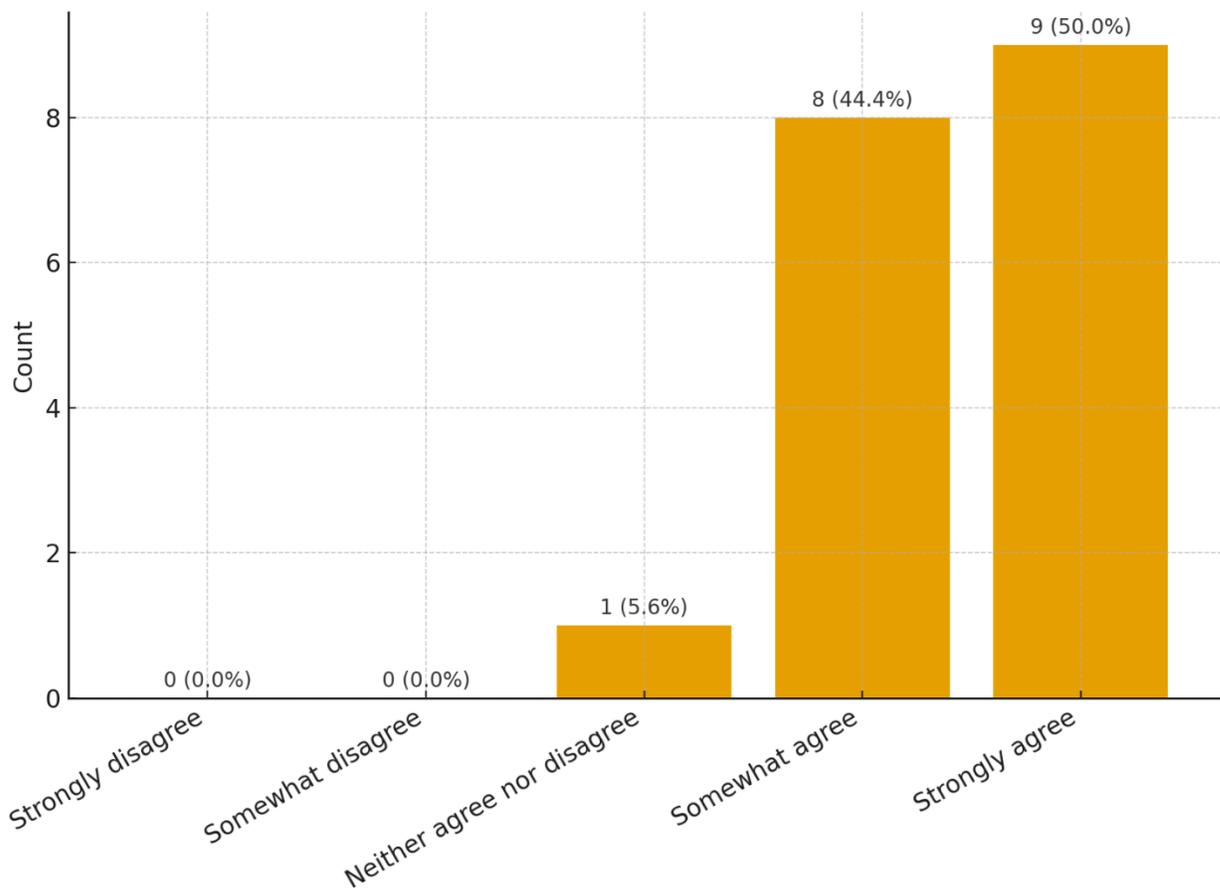
Subtopic 2: Professional Learning Needs

Given that the integration of AI into education is unfolding differently than other technological integrations, leaders were asked what help might be needed.

Questionnaire Findings. To try to gain more understanding about what help and support leaders might need the questionnaire asked whether additional support is needed to help educational leadership understand the current concept of lifelong learning for all in more depth and how AI may be of assistance.

Figure 37

Need for Leadership Support to Understand AI-enabled LLL

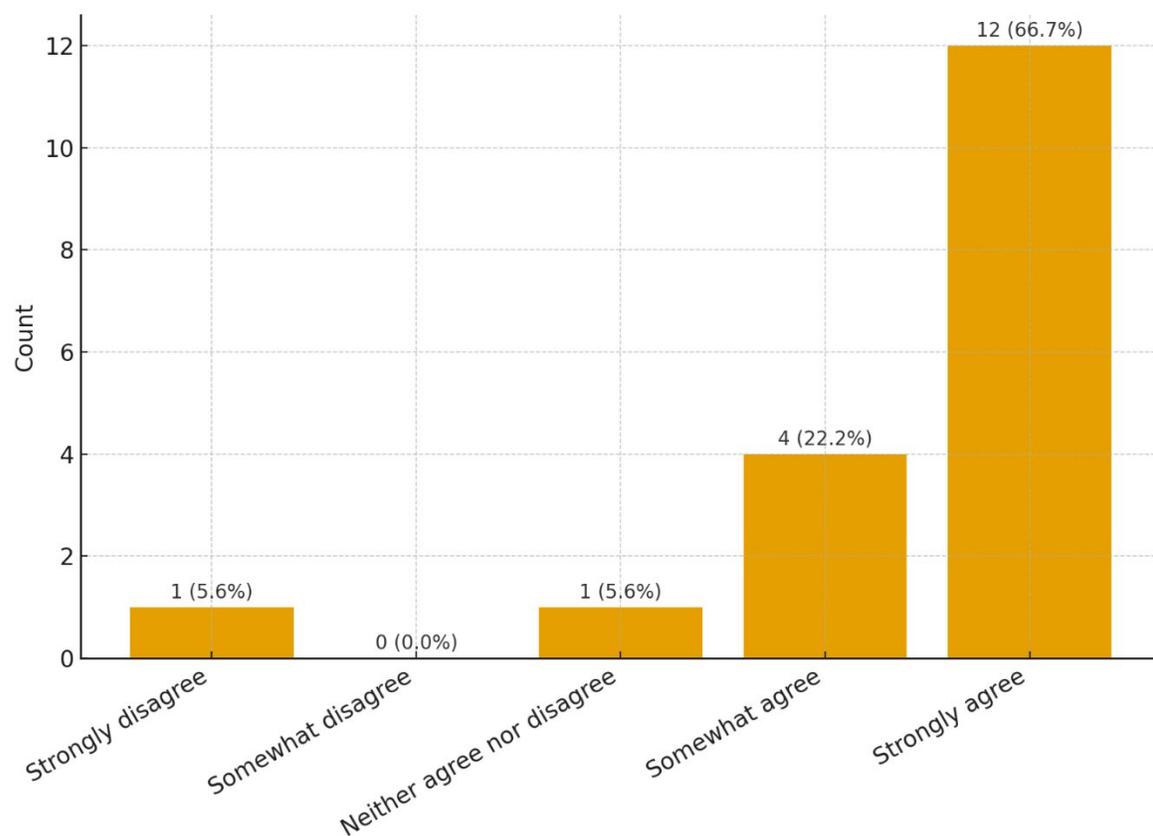


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Note: Figure 37 shows that almost all (i.e., 94%) respondents said that additional support is needed to help educational leaders understand the current concept of lifelong learning for all in more depth and how AI may be of assistance in achieving greater equity of opportunity for LLL for all.

Figure 38

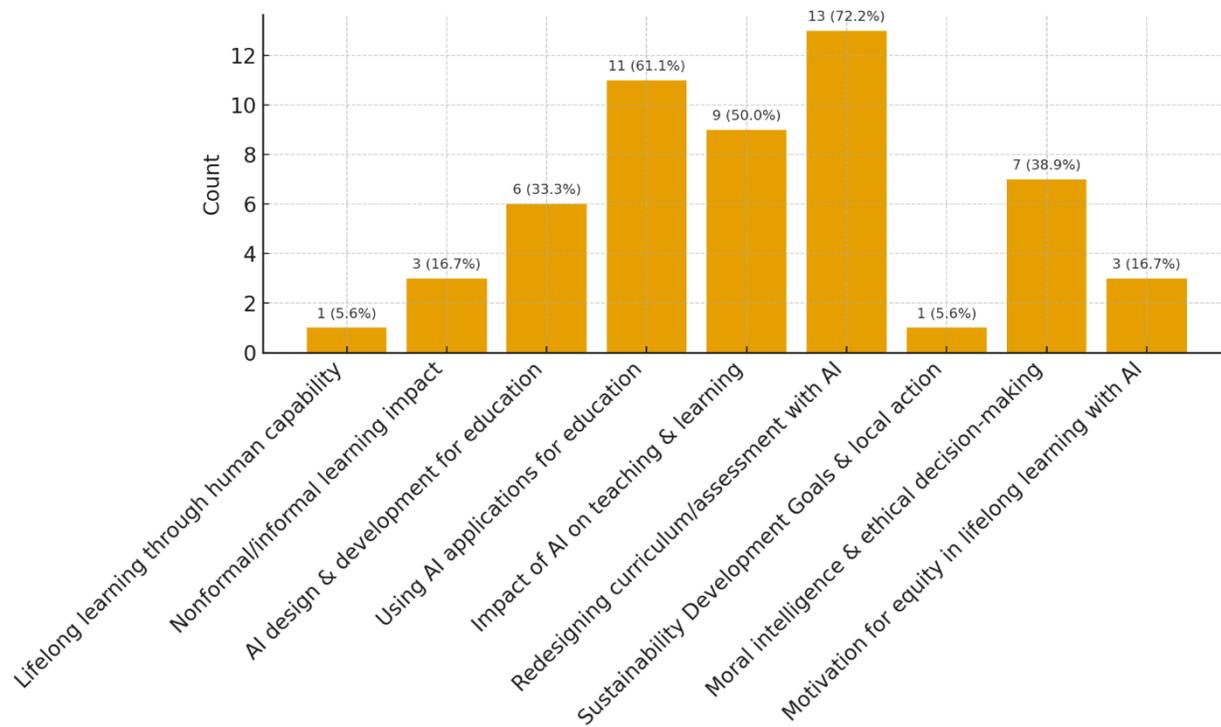
Need for Leadership Support to Understand AI as a Threat to Education and the Means for Achieving LLL



Note: Figure 38 shows that almost all respondents (i.e. 88.9%) said that additional support is needed to help educational leaders understand why AI may be both a threat to public education's structures and paradigms and the means for achieving greater equity of educational opportunity for all.

Figure 39

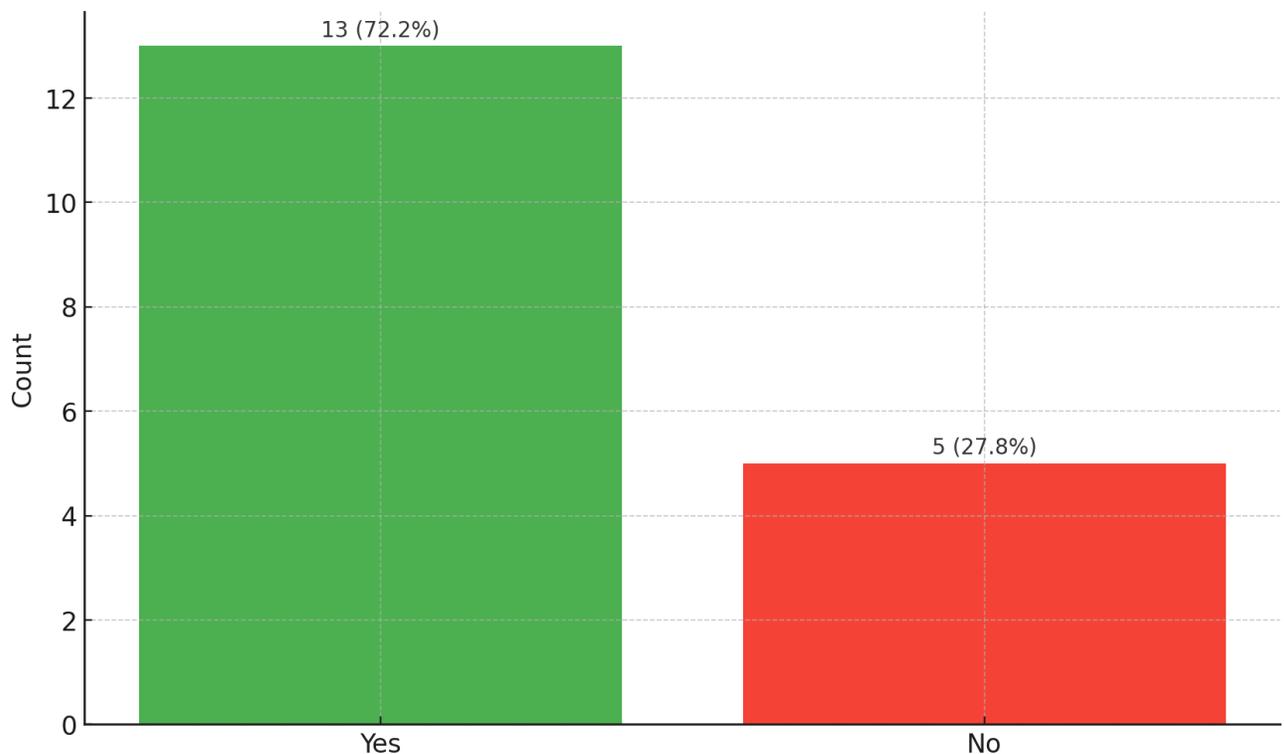
Leaders' View of Professional Learning Priorities for Staff/Faculty



Note: Figure 39 show leaders' top three priorities for their staff/faculty's professional learning. Leaders identified topics that they saw as practical or how to topics. The top three priorities were: learning how to redesign program/curriculum and assessment tasks given AI applications (i.e. 72.2%), learning how to use AI applications for education (i.e. 61.1%), and learning how teaching and learning are impacted by AI (i.e. 50%).

Figure 40

Leaders' Professional Learning Needs versus Staff/Faculty Needs



Note: Figure 40 shows that almost three-quarters (i.e., 72.2%) of participants identified that their professional learning needs are the same as those of their staff with respect to this moment in time where AI is being further integrated into education and there is a global challenge to reimagine education for all.

Interview Findings. Interview participants were asked to describe what success would be like five years from now at their school or institution with respect to the further integration of AI and what would need to happen to help realize that vision. Four common themes emerged. These themes revealed differences between what leaders had identified in the questionnaire as current professional learning needs for their staff where three quarters of respondents said their needs were the same as their staff/faculty's needs.

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When asked in the interview to first describe their vision of success and what it would take to achieve it, leaders identified different learning needs.

Theme 1: Many participants identified that they hoped people would have moved past what leaders see as elementary conversations around student use and academic integrity issues to focus on more significant issues including how education must change.

But I think one of the measures of success might be, have we been able to move past this obsessive focus on AI and sort of get to something more interesting. And AI is just helping us with that. Because I think now, we are looking at the shiny object instead of looking at the thing that actually matters and being able to be with that shiny object while looking at that other thing. (#19, Global North, HE, Dean)

We talk about it like it's a bit of a hot potato, and it's a bit exciting. I don't want that to be the case. You know, when we're talking about let's use AI, it needs to be something that's more fluid in our everyday working lives, and that we don't even know it's there, in some instances. That children see it as a positive tool, and adults and children see it as a positive tool, in which to enhance our learning, as opposed to cheating, it is plagiarism, children are becoming lazy, children aren't thinking. No, you've got it all wrong. It's because you don't understand AI. So, there's a lot of work for me in five years' time to get that mindset changed. (#41, Global North, K-12, Director)

Five years from now I hope that we're no longer having conversations about acceptable use and unacceptable use. I would hope that we have built a community that understands the ethics of AI use and just gets on with it and has conversations about moral dilemmas instead. (#7, Global North, HE, Associate Pro-Vice-Chancellor)

Theme 2: The further integration of AI into education in successful ways was characterized by participants as high-skilled use with seamless integration where students

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and staff/faculty understand when, where, how and why to use it with a strong focus on human choice, human dignity, and the development of knowledge and human capability.

It's not a question of whether it's integrated. It's a question of whether we're adapting. So, I think what it looks like is we have adapted to a world with AI in it. Success would be that our students are doing things that neither they nor the AI could do alone. Students give us assignments that are written by generative AIs. And that would depress me immensely. But I think that is sort of inevitably what will happen unless we do that serious rethink about what education is for. It is not for achieving outcomes that generative AIs can achieve. (#21, Global North, HE, Dean)

I think success is that you're able to give more individualized feedback to the students that challenges them to take the difficult path rather than to take a shortcut but also that we maintain a focus on the importance of people. So, I believe that human choice is still important. So, I think that would be part of it. The other thing is that I still believe students would need to have knowledge that is their own, not just look things up. Even if it's fast to look things up, it's a different thing than if you're recombining things in your own brain. (#28, Global North, HE, Vice Dean for Education)

Theme 3: Leaders said that such seamlessness would breed a level of confidence that isn't currently present in education not just with respect to understanding the complexities of AI but with respect to the value proposition of education in general.

At the one end AI becomes a seamless extension of the body, including when not to use AI because I don't use all my body parts for everything I do [while] at the same time, I'm aware of the ethical implications of everything I do. (#1, Global North, HE, Senior Research Director)

I think success would be my colleagues feeling comfortable talking to their students about it and admitting they don't always know everything. I think that level of honesty with students says we're all in this together. The world is changing. We don't have all the

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answers, but we could explore that together and have a conversation about what is the appropriate use. I think having colleagues to have confidence in its use, the limitations of their own knowledge and the appropriateness of talking to students about the world changing. (#4, Global North, HE, Vice Principal Learning and Teaching)

To me, it would be a big success if we could show that all our students, when they finish, and that probably is true then also for lifelong learning, have found a way to critically question technology. Not where it's right or wrong but critically question on what it does and how to do that. So have a way to critically ask that question. It's different than knowing how to prompt. (#5, Global North, HE, Rector)

Many leaders said that part of that seamless integration would support people in their work. AI would be further integrated in ways that help everyone in the educational community to be more productive. For staff/faculty/administration that would mean having an AI powered assistant to save them time and to become more effective:

I'm hoping that it'll make us more effective as an educational institution, that we can create more interesting, engaging, challenging learning environments where students can actually see the relevance and usefulness of whatever it is that they're learning, where they'll be able to craft their own learning paths and be motivated to learn not just to get their grades, but to actually become useful members of society. That's what I would hope. (#13, Global South, HE, Head of the Learning Sciences)

I would like to really see us be able to ramp up some of our quality assurance and the use of generative artificial intelligence tools for pulling that large data, which is often disparate and it's hard to get your head around, but helping bring that together in mappings and visualizations of our quality assurance and our assurance of learning processes. So, I think there's huge potential to be able to use it to do things that are often quite hard and quite manual, but to be able to do it on scale. (#11, Global North, HE, Director of Teaching Innovation)

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I think adopting technology in a way that actually takes away some of those routine tasks that do bore people and that they spend their labour on that could easily be replicated or done at least as a first pass by technology and not substituting that human agency and human intelligence and human critique, but freeing people up to do those more creative and interesting things. I think enabling people to harness it as a productive tool and not feel it's a threat to them would have to be success. (#4, Global North, HE, Vice Principal Learning and Teaching)

Many leaders said that for students that would mean personalized support even if that means the role of the teacher would change:

I really do think success will be, whether we like it or not, that every single individual will have free unfettered access to a Sherpa, to a companion who knows them intimately and can help them learn and can feed things to them. Now, what role is there left for the faculty or for the teacher? That I don't know. Who controls the learning companion, how do they function? That's the work for leaders perhaps. (#2, Global North, HE, President)

Success in an elementary setting using artificial intelligence would be the ability to create resources that are adaptable to all different levels. AI takes us to that next level outside of traditional teacher-centered to more student-centered learning and engagement where they're engaging with the tools, they're learning at their level and they're pushing themselves forward to be more successful in the real world. (#8, Global North, K-12, Vice-Principal)

Theme 4: Several leaders recognized that what they were describing was a reinvention of education. They saw this as a high-stakes exercise that requires some urgency on the part of leadership now. This process of learning more about the complexities of AI and its relationship to greater equity of LLL for all can lead to this reinvention of education. In short, learn more now, reinvent and survive, or don't and see the end of public education as we know it.

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We must change or we become obsolete. The problem is we've got three days, not 300 years. We must shed our past. We must let go of the stuff that we believe is tradition without letting go of the values of why we think that's tradition. And that's the heart of the leadership work then moving forward. (#42, Global North, HE, President)

Revolutionize or redesign or reform. We want to have redesigned learning, that takes advantage of AI to enhance learning outcomes for kids. We want teachers to have time to do their best work, because AI is saving them time in other places. Kids are learning better, because there are tools that can really help them in powerful ways. Teachers can take some mundane things off the table and really focus on some fantastic learning opportunities for kids with those ethics underpinning everything. (#32, Global South, K-12, Principal)

All leaders, irrespective of whether it's a university president or a school principal should understand the emerging paradigm of AI. Many university heads genuinely think that generative AI is somebody else's problem. Maybe the provost's problem. Maybe it's the security officer's problem or somebody else's problem. They sincerely think that it will go away or resolve itself. So, leaders do have to invest time. They do have to invest energy in picking this up. Because if they don't play a role, kind of a molding leadership role, they risk being totally sidelined. (#17, Global North, HE, Special Advisor to the President)

What is our value proposition? Which I think must have something to do with experiences and relationships and not just kind of mechanistic ideas about learning. I think from that value proposition will stem what success in relation to AI integration looks like. (#19, Global North, HE, Dean)

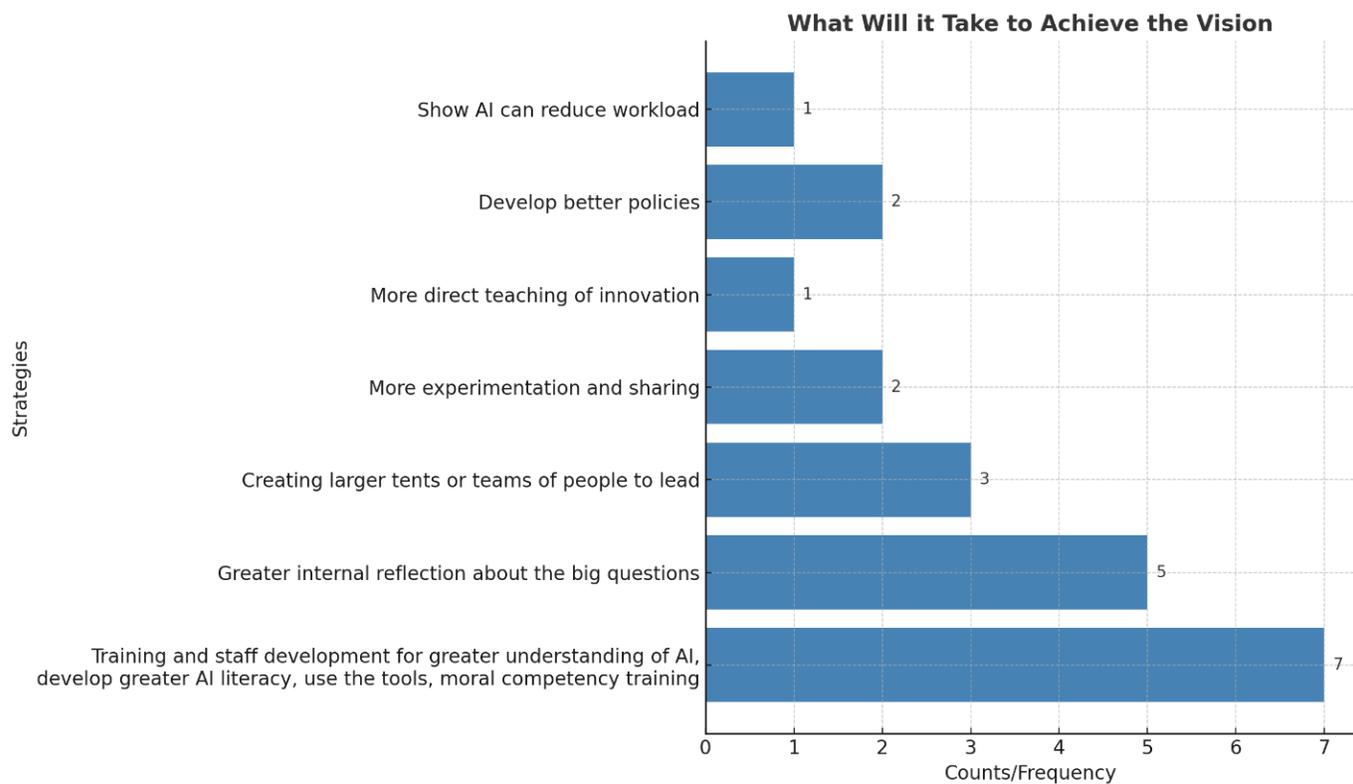
Figure 40 shows that not all interview participants identified specific strategies that might help move their staff/faculty closer to what leaders described as success five years out with respect to the further integration of AI into education. Those who identified most

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often (7 of 20) training and staff development (7 of 20) and greater internal reflection about the big questions (5 of 20).

Figure 41

Strategies for Achieving the Vision of Successful AI Integration



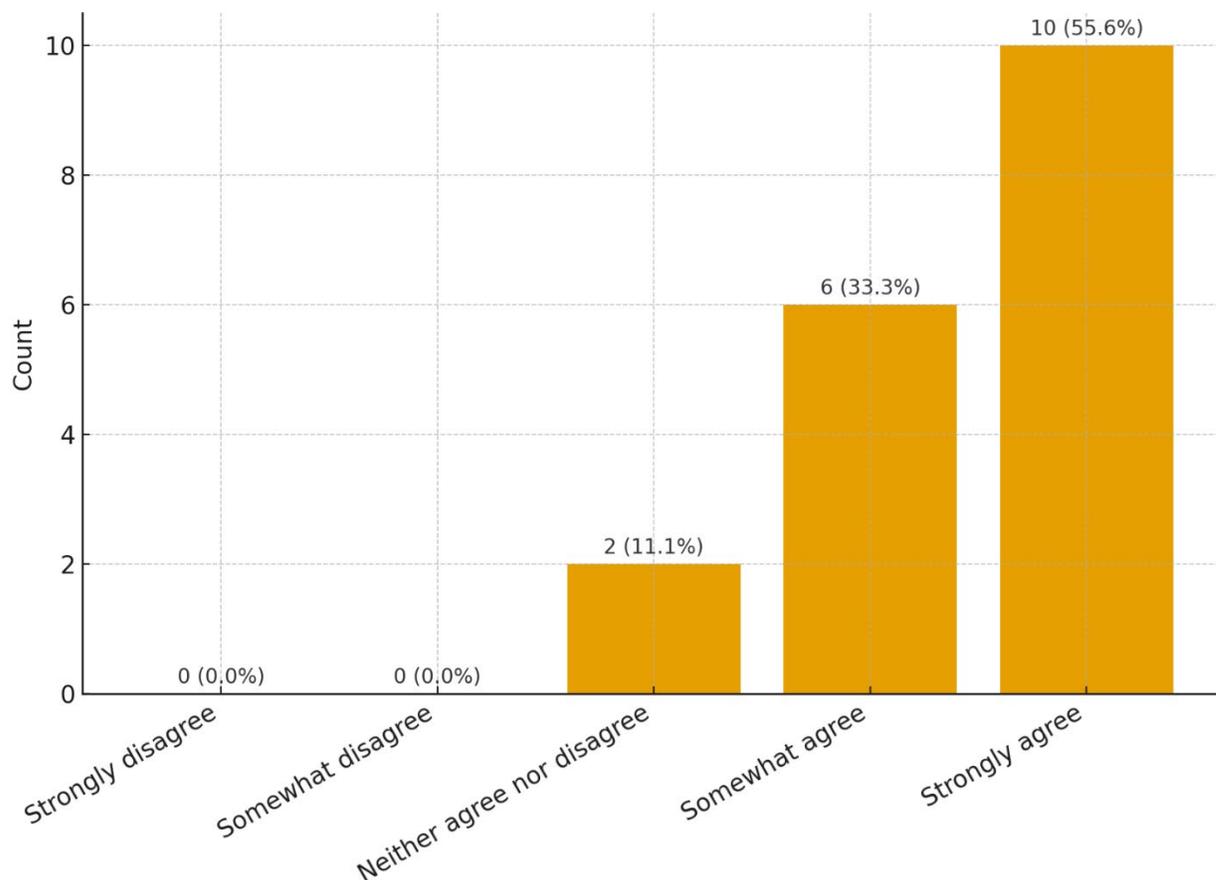
Subtopic 3: Moral Intelligence

Finally, a specific topic for professional learning was identified. Leaders were asked whether to foster the development of students' individual and moral development in an AI-enabled world, educational leaders will need deeper understanding of the competencies and frameworks of moral intelligence.

Questionnaire Findings.

Figure 42

Need for Deeper Understanding of Moral Competencies



Note: Figure 42 shows that there was no disagreement from respondents about whether fostering the development of students' individual and moral development in an AI-enabled world would need educational leaders to develop a deeper understanding of the competencies and frameworks of moral intelligence. More than half (i.e. 55%) of the respondents strongly agreed there was a need.

Interview Findings. One of the interview questions also focused on the need for deeper understanding of the competencies and frameworks of moral intelligence, specifically leaders' understanding of the relationship between ethical leadership behaviour and moral competencies with respect to AI. Research was shared to preface this question.

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Participants were told that the current research confirms that ethical frameworks by themselves generally fail unless accompanied by the exercising of some moral competencies. The literature also confirms there is a significant relationship between the ethical behavior of academic leaders and moral intelligence. Given this research, the ethical issues of AI, and the fact that educators will likely need to spend more time talking to students at all levels about the ethics of AI, leaders were asked if they thought educators in general were prepared to have those conversations with students or whether they thought more time would need to be spent supporting and preparing everyone to have those meaningful conversations.

Theme 1: None of the interview participants asked for clarification about what was meant by the term moral competencies but almost every leader interviewed said this was an interesting question and would require more reflection and effort.

Whether it's something they're capable of doing, I don't know. I think that might be an open question... I never thought about it. (#23, Global North, HE, President and Vice-Chancellor)

That's a bit beyond what it feels like right now. It's more like don't use this. And I'm hoping that maybe now it's shifting, especially in high school, middle school, this is how you can use this and to talk more in depth about it. I don't think that's happening, though. I don't know if I fully understand that conversation myself. (#31, Global North, K-12, Developed, Vice Principal)

It may be our duty to do this from an academic point of view because knowledge is there, and we know how to think in that way... And basically, it means that these questions need to get into class everywhere. (#5, Global North, HE, Rector)

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Theme 2: Most leaders said the complexities of AI were a reason for these conversations not occurring in a more strategic way with students. Different factors of this complexity were acting as barriers for different staff/faculty. Some leaders acknowledged that the conversations being had by staff/faculty about the ethics of AI were still at a preliminary or basic level and usually had to do with issues of appropriate use as previously discussed. Other leaders identified that having these conversations about ethics and the application of moral intelligence to the ethics of AI are very difficult for staff/faculty to have unless there is some fundamental understanding of what AI is, how it is created, and how it works. Leaders identified that many staff/faculty do not yet have much fundamental understanding of these concepts of AI or how they intersect with other issues and concepts of education.

First, the technical part needs to be known as well, because I found out that discussion is hardest when there's no awareness of what AI is. That's not about moral intelligence yet but that discussion gets a lot easier if you are aware, or one is aware what it can and cannot do. So, you must start there. (#5, Global North, HE, Rector)

My guess is that the stumbling block here is the difficulty staff have in comprehending AI...I think there may be a divide there due to a technical barrier that keeps people away from applying their common sense or because they'll be frightened of this technology that they don't really understand. (#28, Global North, HE, Vice Dean for Education)

If I'm honest, we're not ready for good conversations about the ethics of using AI because it requires understanding the intersection of AI and all the different educational issues that we care about. Most people I think still don't have a good enough understanding of the implications of different ways of using AI. (#19, Global North, HE, Dean)

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Other participants identified that the complexity of AI was unlike other technological implementations because AI is more than a tool thereby requiring new ways of thinking about it.

The problem is that you can have this level of reasoning on the thing that's your specialty. But you don't have that level of reasoning outside of it. And AI is something that's outside of most people's reasoning. And they're just using it as a tool. When people say it's just a tool, it really gets on my nerves. Yes, it is just a tool. But it's a tool that is not neutral. Nor are any tools neutral. But this one's particularly not neutral because it's generating knowledge. (#20, Global South, HE, Professor of Practice for Teaching and Learning)

If you think of it as being something that we want to nurture and to teach about, in the true sense of teaching...It's about having the conversations and it's about confronting the complexities. Because any ethical problem worth its salt is a wicked problem. You know, ethics doesn't matter until things come into conflict. We all know how to behave well, whatever we think well is in any given context. But when it's either this bad thing or this bad thing, which am I going to choose? Or is it this good thing or this better thing? Is this better? Why? That sort of issue. So, that's when ethics comes into play. And this is something that you can talk about. It's something that you can demonstrate. It's something that you can help people with to make those decisions and to reflect on why they made them. (#21, Global North, HE, Dean)

Theme 3: Some leaders identified that ethical frameworks alone or stand-alone ethics classes couldn't be expected to be the sole response to the need to discuss the application of moral competencies to the issues of AI. Every leader interviewed said that more time and support will be needed to help educators have those conversations. A more pervasive and concerted effort would be needed, including involving all staff/faculty from K-20 in professional learning, to empower them to do this. Strategies that participants identified

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included the development of simulations for staff/faculty and students and the development of a school-wide curriculum. Leaders thought there should be a systematic approach. It may be worth noting that only one of the 45 leaders interviewed identified that they currently had such a systematic and pervasive approach and it was for K-12.

We must start teaching more concretely for it at a much earlier age. Not only at an earlier age, but teachers must be specially trained because often teachers lack that perspective because since the end of the Cold War, the commercially driven technology development has taught people that you're helpless before technology. And now teachers are party to that. Teachers have been overwhelmed. They've been so overwhelmed by the rise of social media that they believe nothing can be done about it. Now, this is where we make a beginning showing that no, things are not that way. However monolithic they look, here are totally new ways of doing things and you're in control. You're in charge. And once teachers have that feeling, they can then influence a younger generation. Currently, the younger generation is influenced by commercial interests directly.

(Developed, HE, Special Advisor to the President)

We have a class on ethics. Does not help much. Everybody should practice and eventually in all classes, in all courses, all faculty can talk a little bit about ethics applied to his or her course. in each class, no matter what class it is, even if you are eight years old. The sooner you begin, the better. Do some simulations with the students and the faculty. (#3, Global South, HE, Pro-Rector)

Teachers need to have the knowledge, but the teacher doesn't need to be tasked with the sole person that's going to be doing this education. (#33, Global North, K-12, Director)

Theme 4: Some participants acknowledged the morally ambiguous world in which we live and how that gives rise to moral confusion for students. This moral ambiguity provided these leaders with further justification for more thoughtful and systematic

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approaches into how schools/institutions respond to these issues of ethical behaviour related to AI governed by moral competencies.

While AI is filling a gap, we've got a demographic distortion happening. That means there is pressure on people to do more with less. Public services are under threat, do more with less. That leads to shortcuts and poor behaviour. So, I think there's a tension in the moral framework. We want to be moral, we want to be ethical, but we've got to get this done because my boss needs it now. In the context of the real world, it is pretty brutal right now. (#7, Global North, HE, Associate Pro-Vice-Chancellor)

And I feel for students who come into our education systems because they have politicians left, right and centre who change their mind, who lie, who don't make evidence-based decisions. They've got people who deny what science tells them. How are they supposed to make sense of that? How are they supposed to believe in them? I think it's really complicated for students now. And then, different students from different cultural contexts have entirely different views of what is the ethical use of anything, never mind AI. (#4, Global North, HE, Vice Principal Learning and Teaching)

If a kid has eight teachers over the course of two days and they're hearing different things from different teachers, like the kid's left with a morally ambiguous understanding of what's going on or an ethically ambiguous understanding of what they're supposed to be doing. (#40, Global North, K-12, Principal)

Theme 5: Some leaders thought the terms “ethics” and “moral intelligence” would be off-putting for some staff/faculty and should be replaced by other terminology.

When I talk to my staff, when I mention the word ethics, the word moral, I can see their eyes immediately, just glaze over. People have no appetite other than a few academics to really discuss ethics these days. So, what do we do? We must figure out a way to communicate that but communicate it in a different way. Those words immediately put it in the category that people say, OK, I agree. I agree about ethics. I agree about freedom, etc. (#3, Global South, HE, President)

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I would use the term risk awareness. I know that I used the word ethical and ethics behind AI, but this is not an accurate way to describe what is happening because ethics depends on the socio-economic target group. But raising awareness on the risks that this technology may have, the risks are there regardless of the ethical framework. (#9, Developed, HE, Director of Advanced Technologies)

Other leaders preferred to focus on questions of social justice, learning, and originality.

I think social justice is the main thing that I'm concerned with. If you don't have a foundation of caring about social justice and noticing things like unconscious biases and things like that and recognizing who could get harmed and putting yourself in the place of the person who could get harmed and that kind of foundation, if you don't have that foundation, any conversation about ethics and AI or responsible use are just going to go over your head...And you also don't want to make it to the point where, able bodied people feel like they don't have a responsibility to support people with disabilities anymore because the technology will do it. (#20, Global South, HE, Professor of Practice)

I believe when we talk about inculcating moral competency, I say that if we somehow can convey to the students that learning is the goal, we can get rid of so many practices that might not be ethical in the way students conduct themselves. I don't mean that we should not talk about ethical conduct or moral values and all those things, but those themselves won't work. (#18, Developing, HE, Program Director)

What is complicated is, like with many other values, we're missing where the next generation is... So, we cannot rely upon what we consider original work to be original work in a very short piece of time. And so that would suggest we need to be more specific, concrete, and we cannot just assume that the next generation will have the same inclination. (#28, HE, Vice Dean of Education)

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Theme 6: Several leaders commented that related to this idea of moral ambiguity was the need for leadership as well as staff/faculty to also understand the necessity of modeling ethical behaviour themselves.

There's this lovely phrase from Japan, fish rots from the head. Somebody else used this Larry Hagman quote, once integrity goes, everything else is a piece of cake. And so, I think that if the senior leadership team and any organization does not have integrity, then it doesn't matter what we teach because it's just going to look hypocritical. (# 7, Global North, HE, Vice Principal Learning and Teaching)

These beautiful words on walls, how do we give meaning to those? When a student is acting dishonestly, we have a very clear process, students receiving zeroes, students being expelled from the university because their behaviour is not morally aligned with what we think is appropriate. We don't necessarily go down that same pathway with staff as often. (#11, Global North, HE, Director of Teaching Innovation)

Research Question Three Summary of Findings

Three sub-topics were used to explore the research question of how specific supports might help educational leaders of K-20 to realize this universal mandate for change. Any understanding of what support might be needed requires an understanding of how change happens. So, the first subtopic explored what leaders saw as the nature of change in their school or institution. The questionnaire was used to identify the priorities of leaders with respect to leading change given the capabilities of AI and given the global educational challenge to improve equity of opportunity for lifelong learning for all, as described in the United Nations' Sustainability Development Goal Four. Leaders were asked to rate eight potential changes that could be made on a scale from "not necessary to redesign now" up to "very important to redesign now". In short, this question asked leaders to

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prioritize what changes might be made. Almost all respondents said it was either important or very important now to redesign educators' professional learning and assessment and evaluation of student learning.

Interview participants were asked whether the further integration of Artificial Intelligence into teaching, learning and administrative work in their school or institution was unfolding as change usually happens or if this change was proceeding differently and, if so, why. Every leader who was interviewed identified that this change is different from technological changes that have been made in the past. Some leaders saw some parallels but clear differences as well. Leaders identified several core reasons why this change is different including the involvement of Big Tech with government in AI deployment and the retrenching of staff/faculty as in the return to previous practices such as pen and paper exams. Others identified that the shift is more conceptual than physical and is not just one thing, like a cellphone or LMS; it is a wide and ever-evolving set of capabilities. Many leaders noted that this change is different from other implementations of new technologies into education because it has not had a strategic approach with a clear champion whose job it is in the organization to support the implementation of the new technology. It has been more haphazard, more ground up, more let's give it a try and see what happens. Even if in the recent past there has been a top-down approach to implementing change, this change has been more bottom up. This change is different from other integrations of technology into education for many leaders because most participants are now realizing that the integration of AI into education is going to have long-lasting, deep-seated implications for education from kindergarten to post-secondary. As a result, leaders recognized the need for big picture thinking, visionary leadership. A

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few leaders identified that unlike other technology implementation the further integration of AI in education K-20 requires deep reflection, rethinking, reinventing, and reimagining the goals and purposes of education.

The second approach to understanding how support could be provided for leadership focused on if and what professional learning was needed to understand this moment in time where the further integration of AI into education might be used to increase equity of opportunity for all with respect to reconceived lifelong learning. Of questionnaire respondents, 94% said further professional learning support was needed and 89% said additional support is specifically needed to help educational leaders understand why Artificial Intelligence may be both a threat to public education's structures and paradigms as well as the means for achieving greater equity of educational opportunity for all. Leaders were asked to select up to three top priorities for their staff/faculty's professional learning and whether those priorities were the same or different as leaders' own priorities. For most questionnaire respondents the priorities were the same and included learning how to redesign program/curriculum and assessment tasks given AI applications, learning how to use AI applications for education, and learning how teaching and learning are impacted by AI. That is, the focus was on practical "how to" topics. For interview participants the learning needs were different once the vision of successful AI integration five years from now was imagined.

The third subtopic focused on leaders' understanding of moral competencies and their relationship to ethical behaviour. Most leaders identified that further support is needed for leaders and their staff/faculty to learn how and what to talk with students about. None of the interview participants asked for clarification about what is meant by the term

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moral competencies but almost every leader interviewed said this was an interesting question and would require more reflection and effort. Most leaders said the complexities of AI were a reason for these conversations not occurring in a more strategic way with students. Different factors of this complexity were acting as barriers for different staff/faculty including a lack of fundamental understanding of what AI is, how it is created, how it works or how AI intersects with other issues and concepts of education. Other participants identified that the complexity of AI was unlike other technological implementations because AI is more than a tool thereby requiring new ways of thinking about it.

Leaders identified that a more pervasive and concerted effort would be needed for understanding the moral competencies and their relationship to AI. Such strategic approaches were identified by a few leaders and included involving all staff/faculty from K-20 in professional learning, in the development of a school-wide curriculum to create an organized, institutionalized and strategic approach. Only one of the 41 leaders interviewed identified that they currently had such an approach and it was for K-12. The moral ambiguity of the current world provided leaders with further justification for more thoughtful and systematic approaches into how schools/institutions respond to these issues of ethical behaviour related to AI. Some leaders thought the terms ethics and moral intelligence would be off-putting for some staff/faculty and should be replaced by other terminology. Other leaders also saw discussions of ethics and moral intelligence as limiting and preferred the focus to be on questions of social justice, learning, and originality. Several leaders commented that related to this idea of moral ambiguity was

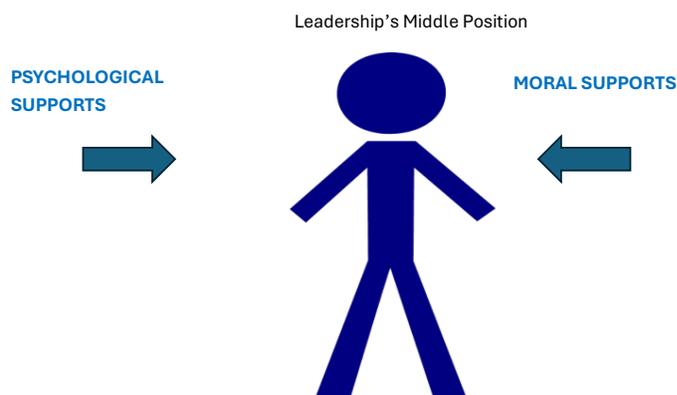
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the need for leadership as well as staff/faculty to also understand the necessity of modeling ethical behaviour themselves.

Buffered by the need for psychological supports and moral supports, many leaders find themselves assuming the middle ground between imaginaries and problemization. In some cases, leaders find that they are unable to take further action towards the imaginaries of AI as an ally because those psychological and moral supports are lacking. Figure 43 illustrates that middle position assumed by many leaders of this study.

Figure 43

Leadership's Middle Position



Together the exploration of three subtopics of how specific supports might help educational leaders in K-20 to realize this universal mandate for change generated detailed and nuanced responses from leaders.

Chapter Summary

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This chapter has shared the data from the completion of 45 interviews and 20 questionnaires by senior leaders from at least 25 countries, some in the Global North and some in the Global South. These leaders hold a variety of formal positions of leadership at or near the top of the school or institutional hierarchy. Three research questions were examined using a series of subtopics for each. The data that was generated provides an in-depth understanding of what and why leaders hold the perspectives they do with respect to the further integration of AI into education while taking responsibility to help realize the global mandate for change. The richness of the data has not been overly simplified for two reasons. First, it was important to explain the layers of perspectives that leadership hold. Second, the richness of data may assist other leaders in seeing themselves reflected in this data too. Because any practical advice that might be provided will only be helpful if leaders and others who may find this study useful to their work, can relate to the examples of perspectives and experiences provided.

Three theories have been selected for this study: human capability theory, self-determination theory, and moral intelligence theory. In addition, the two concepts of Artificial Intelligence (AI) and lifelong learning (LLL) have also been chosen. Collectively, these five constructs form a conceptual framework for this investigation as previously described in Chapter Three and can be seen in the comments and responses of the leaders. The next chapter will explore the relationship of these five concepts to the findings of this study. These results will be used to provide practical guidance to leadership as they navigate the complexities of this uncertain world at a time when the further integration of AI into education may help to realize greater equity of opportunity in the pursuit of lifelong learning for all.

Chapter 5. Discussion

The goal of this chapter is to answer the research questions of this study by drawing conclusions. This chapter will do so by first summarizing and discussing the seven key findings of this study. These findings will be explored in relation to this study and in relationship to current research which will be used to illuminate those findings. Next, the five constructs of the conceptual framework of this study, as examined in Ch. 2, will be used to identify potential leadership supports. Recommendations will be made for developing greater understanding and use of each potential support. These recommendations are not presented as a fail-proof recipe for success but as potential suggestions from which leaders may choose next steps. Finally, the limitations of this study will be used to make suggestions for further research.

Summary of Seven Key Findings

Seven key findings have emerged from the research.

Key Finding 1: Leaders Identified that Roles Determine the Benefits of AI

The leaders whose perspectives and experiences were considered in this study identified the benefits of AI by educational role. That is, the benefits of AI that were identified for students were different from the benefits that were identified for teachers, and these were different from the benefits that leaders identified for themselves. Although different for each role, these benefits were alike in that they were all utility-based or, in other words, based on the unique needs of students, teachers, and school/institution leaders. From the vantage point of their leadership role, the leaders of this study recognized that the needs of students, teachers, and themselves are different because the roles are different. As a result, the specific benefits of AI fell naturally from

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these identified role-based needs. Interestingly, leaders were quite able to identify and prioritize specific benefits of AI whether they were regular users of AI or not. The findings of this study corroborate the findings of Hales et al. (2025) who studied the perceptions of AI by 46 rural principals. Their study also showed that principals recognized AI's potential to enhance educational practices and administrative efficiency despite not being regular users of AI themselves (p. 1).

Benefits of AI for students. Leaders said the opportunity to serve students in more individualized, effective ways was the greatest benefit of AI for students. Leaders identified five beneficial ways that AI can serve students in more individualized ways. Those benefits were:

1. AI allows for the personalization of learning to make it more engaging. Personalized learning refers to the accommodation of individual learning needs, preferences, and abilities (Plass & Froehlich, 2025). I found four research papers that supported the perceptions of leaders of this study when they said AI benefits learners through personalization. First, Adiyono et al. (2025) reported on how AI-powered learning analytics, intelligent tutoring systems, and automated feedback mechanisms contributed to a more student-centered educational approach in higher education. Second, Ellikkal and Rajamoham's (2024) interdisciplinary study revealed that AI's capability to personalize learning had a significant and positive influence on students' learning. The authors said that AI personalized learning by providing students with more control over their choice of topic and by helping students select their own learning goals. Through such personalization students' sense of autonomy, confidence, and relatedness all improved. As they grew, so did students' engagement and success (pp. 39-40). Third, Cai

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et al.'s (2025) review of 158 empirical studies published between 2021 and 2024 showed that AI tools can improve motivation and engagement which together can lead to better “academic performance, student maturation, and development” (p. 1) Chiu, Xia et al. (2023) reported on how AI-based environments have been used to personalize tasks for student learning. They cite several examples including where AI was used to create and develop a virtual laboratory to assign tasks for students at an appropriate level and where an AI-skin provided real-time feedback and adaptive tasks to medical students (p. 3). They concluded that AI applications of personalized learning can be built successfully but more attention may need to be paid to the attendant learning resources that accompany those applications (p. 3). The leaders of my study did not identify the lack of learning resources as an issue when AI agents personalize learning, but these leaders did identify that one of the ways AI makes learning more individualized is through personalizing learning.

2. AI allows for more consistent, and more objective identification of learning gaps as compared to human identification of those gaps. Leaders identified this AI capability as the second beneficial way that AI can serve students in more individualized ways. This finding aligns with Naseer and Kkhawaja's (2025) study of the use of AI to mitigate learning gaps. Their study showed that AI-driven adaptive feedback demonstrated a 28% improvement in conceptual mastery, compared to 14% in the control group (p. 1). In another recent study, Mishra (2025) explored how AI can be used to identify learning gaps in foreign language learning. Both studies align with the perspective of the leaders of my study when they identified that AI's consistent, and more objective identification of learning gaps is one of the ways AI makes learning more individualized.

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3. AI enabled more accessible learning for more students. Leaders identified this AI capability as the third beneficial way that AI can serve students in more individualized ways. This finding is supported by Chandramma et al.'s (2025) examination of specific AI applications that help enable more accessible learning for students. Their study showed that Natural Language Processing (NLP) and speech recognition tools can convert speech to text and text to speech, that descriptive audio can assist visually impaired students with what might be inaccessible content, and that AI chatbots and virtual assistants can help learning to be more accessible for more students through the entire learning journey. Leaders, by virtue of their role, have a responsibility to help all learners succeed. The leaders of this study identified that AI could help them accomplish that objective by enabling greater accessibility to learning success for more students which is the third AI capability that leaders identified that makes learning more individualized.

4. AI can provide "24-7" availability of student support. Constant availability of support for students was identified by the leaders of this study as the fourth beneficial way that AI can serve students in more individualized ways. This finding is also supported in research. For example, Hew et al.'s (2023) study showed positive results from students being supported by always available chatbots regardless of whether students perceived the chatbots as easy to use or not. In other words, the availability of persistent support appears to matter to students even more than the ease of use of the support. This finding reinforces what the leaders of this study identified and that is, that the constant availability of support matters to students. Similarly, Lo's (2023) rapid literature review of 50 articles (2023) found that even though AI is not foolproof, it can act as an ever-

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available virtual tutor for students by answering questions and facilitating collaboration (p. 1). Studies like these corroborate the perspectives of the leaders of this study in their identification of AI's capability to individualize learning, in this case by providing constantly available support using chatbots and virtual tutors.

5. AI uses a more efficient and consistent approach to the credentialing of past learning when compared to human credentialing of learning. The capacity of AI to credential past learning accurately and efficiently was identified by the leaders of this study as another way that AI can serve students in more individualized ways. This finding is supported by Kumar et al. (2025) who examined how blockchain technology can facilitate decentralized and secure storage of academic credentials and certifications. They said that when combined with AI, these technologies can provide a more efficient and consistent approach to the credentialing of past learning as compared to that of humans.

In summary, the leaders of this study identified five beneficial ways that AI can serve students in more individualized ways. All five ways are validated in current research studies. Unlike the research, these leaders did not identify specific examples of specific AI providing such assistance, so it was unclear whether this was knowledge of AI that leaders had or whether they have observed AI doing so. Regardless of how they knew, the leaders of this study had general awareness of the capabilities of AI to serve students in more individualized ways, which the leaders identified as beneficial, and these capabilities are supported in the research.

Benefits of AI for teachers. With respect to teaching roles, leaders identified curriculum and resource development as a key benefit of AI use. Once again, this benefit is directly related to the needs of the role. That is, it is generally understood that teachers

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at all levels of education are responsible for the design of curriculum and the provision of student resources to support it. The leaders of this study identified that AI can be of great benefit to teachers in fulfilling this role-based responsibility. The potential of AI to be of assistance in this role-based pursuit is explored in the literature. For example, Cooper (2023) concluded that science teachers can effectively design curriculum using ChatGPT as AI was able to design rubrics, and quizzes, apply a model, and use a pedagogical framework (p. 450). Although Cooper cautions teachers to critically evaluate any AI-generated resources and adapt them to their specific context (p. 450), he does illustrate what the leaders of this study identified and that is that AI can be of assistance to science teachers by addressing a role-based need: the development of curriculum and resources. Moving to other disciplines, Moundridou et al. (2024) classified current AI tools and showed how they can be used to assist in curriculum and resource development in real-life inquiry-based learning scenarios. Celik et al. (2022) found that when AI helps with curriculum and resource creation, more time may be available for more timely intervention and assessment of student learning (p. 627). Such redesign of teacher time is also supported in the speculative study of Bozhurt et al. (2023) which identified that “generative AI signals that we need to update our instructional/learning design processes and develop innovative, and authentic assessment and evaluation strategies that can accommodate appropriate use of AI” (p. 60). Once again, the research supports the leaders of my study when they identified that AI could support teachers in designing curriculum and related resources. Although these leaders did not provide detail on the specifics of how AI supports curriculum and resource development, they did demonstrate general awareness that it was possible for AI to do so.

Benefits of AI for Leaders. Leaders' identification of how AI benefits their own work was different than what they identified as benefits for students and teaching staff. Specifically, leaders identified as beneficial the potential of AI to do routine tasks. For example, they saw as advantageous AI's capability to plan a meeting agenda, compile a newsletter or report, or craft an email. But routine tasks were not the only thing these leaders saw as beneficial use of AI. Some of the leaders of this study also identified that they use AI for decision-making, identifying system priorities, and analyzing data. These AI uses suggest a further degree of sophistication of purpose and intent. This finding is supported by Göçen and Döger (2025) who interviewed 32 public school administrators from 20 countries on their use of AI. The study sorted AI use by leaders into six managerial dimensions: data analysis, planning, administrative support, content development, communication, and professional development (p. 1). Göçen and Döger (2025) said that other AI use by leaders is best described as decision-making and policy formation which they differentiated from managerial tasks (p. 1). Similarly, Chiu, Xia et al.'s (2023) review of the literature sorted AI use in education into 13 roles. One of those roles was administration. They confirmed the capacity of AI to successfully assist with administrative decision-making (p. 10). These studies illustrate that there are layers to the role of leaders of schools/institutions with some responsibilities being managerial and some administrative and AI can be used in both cases. The leaders of my study also identified the benefits of AI as both managerial and administrative with respect to their role-based needs.

According to the leaders of this study each of the roles of student, teacher, and leader have different needs that can be helped in beneficial ways by AI. Such help by AI was

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perceived by these leaders as beneficial because it was focused on role-based needs.

Whether the leaders of this study had personally observed or used AI doing the things they identified as beneficial, is unclear but the literature does provide evidence that AI can do what these leaders think it can. Such identification of benefits by role and need matters as explained below.

Why This Finding Matters

The leaders of this study identified the benefits of AI as role and needs based. Leaders began from the premise that the roles of student, teacher, and leader are different from one another. As a result, the needs of the role are different, so the benefits of AI in addressing those needs must also be different. Leaders' identification of benefits by role and need matters because it supports having a greater focus on humancentric, purpose-driven AI development for education that embraces a systems thinking approach to its design. The research clarifies what each of these concepts means.

Humancentric Design. There is a difference between a technocratic approach to the design of AI and a humancentric approach to the design of AI as Mahajam (2025) points out. Where a technocratic approach to AI development might emphasize scalability and efficiency, a humancentric approach “provides a structured roadmap for responsible AI adoption, balancing technological efficiency with empathy, fairness, and long-term sustainability” (p. 23). Mahajam argues that the emphasis must shift in education “from merely questioning AI’s future influence to thoughtfully directing its integration to align with human values (p. 3). Maity and Deroy (2024) propose that humancentric design of AI for education is essential for three reasons: it will be more effective because it will be based on the needs and values of students, teachers, and

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leaders, it will be more understandable by those users, and it will be more trustworthy (p. 1). Maity and Deroy (2024) identified the elements of such humancentric AI design. For example, in humancentric design the information that AI produces is shared using multiple methods (e.g., visual, textual) (p. 8) which is reflective of how traditionally learning resources may take many forms while continuous feedback loops allow education's users to provide input on the explanations and functionalities of AI systems (p. 8-9). Maity and Deroy (2024) argue that humancentric design of AI is premised on the fact that educators, including leaders, are actively involved in helping shape AI for education in ways to make it more transparent and trustworthy (p. 1). If educational leadership is to influence the design and development of AI to help address the global challenge to increase equity of opportunity for all with respect to lifelong learning, then they must first understand what potential benefits by role AI can provide.

Purpose-driven Design. When the leaders of my study identified that the roles determine the benefits of AI, they were formulating clearer thinking on the purpose of AI in education. Biesta (2022) supports this notion when he says that it matters to what purpose we put AI in education. He stated that education today must certainly include the “act of (re)directing the attention of students to the world, so that they may encounter what the world is asking from them” (Biesta, 2022, np). Similarly, Snow (2028) pointed out that there is value in asking “what kinds of problems we think are important, what kinds of research we think is important, and where we think AI should go” (p. 3). Those questions are very similar to ones identified by some of the leaders of my study when they asked what the purpose of teaching and learning will be moving forward. It is in the posing and in the answering of such questions that a more purpose-driven design and

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development of AI will occur. The first and necessary step in that process is the identification of the benefits of AI by role, as demonstrated by the leaders of my study.

Systems Thinking Design of AI. If these leaders are to influence the design and development of AI in education to address the global challenge set before them, then they will also need to use systems thinking. In systems thinking the complexities of the world are approached holistically (Anadria et al. 2025, p. 6). The complexities of education today, as presented in Chapter One, include an AI-infused world and a global challenge in education to address the sustainability crisis through lifelong learning. Hefnawi (2025) says that in education such systems thinking about the development of AI begins with what leaders have identified as the benefits of AI by role and “why those benefits matter with respect to the purposes of education” (n.p.).

Combining Humancentric, Purpose-driven, Systems Thinking Design. To design AI for increased equity of opportunity for all in LLL in a purpose-driven, humancentric way using systems thinking would mean that leaders would use the benefits of AI to begin asking questions of themselves, other educational stakeholders, and of those currently designing and developing AI. For example, if a key benefit of AI is, as leaders of this study identified, more one-on-one, just in time, personalized support of student learning, then a purpose-driven, humancentric approach using systems thinking would first ask why that benefit is important. The response might be because it allows more students to be more successful, more quickly. The follow-up response must explore why that matters. If the response is, so more students can complete the assignment, assessment, course, program, credential etc. so they can move onto the next assignment, assessment, course, etc., some might say that AI design to serve such a

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purpose would simply reinforce the existing paradigms of formal education. If, however, the response is that just-in-time, one-on-one, personalized support, enabled by AI, is beneficial because it lets more students be successful, including students who might not have traditionally received the support they needed, then it is clear that a systems thinking approach to the purpose-driven design of AI is being seen through a humancentric lens. Similarly, in a purpose-driven, humancentric approach to the design and development of AI for education, AI would be used by teachers to develop curriculum and resources. The greatest benefit may be that teachers have assistance in reimagining curriculum for an AI-infused world. Zheng et al. (2024) argue that such curriculum and resource reimagining should incorporate new priorities such as project leadership skills, skills of judgement and discernment, and skills for symbiotic learning with AI (sect. 4.2.2). In short, AI design and development using a purpose-driven, humancentric, systems thinking approach has the potential to change the traditional paradigms of education.

Therefore, leaders' identification of the benefits by role and need matters because it is the first necessary step in this journey towards purpose-driven, humancentric AI design and development. The involvement of leaders in the design and development of AI is not what has traditionally occurred as explained in Chapter Two. But it is the knowledge that leaders have of the roles and needs of stakeholders that translates to the identification of key benefits of AI for education. The next step is for these same leaders to ask why these benefits matter. In so doing, these leaders can begin to take an active role in the design of AI to ensure that it is humancentric, purpose-driven and developed through systems thinking about education. This finding of my study helps leaders see that a role-need-

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benefit approach to AI is a worthwhile first step in addressing the global challenge of education to increase equity of opportunity for lifelong learning for all.

But this finding also matters because it provides support to the literature that has generally explored the notions of purpose-driven, humancentric, and systems thinking for AI as unrelated concepts. For example, there is evidence that to date systems thinking “has not been applied to data-analytic model development for AI” (Anadria et al. 2025). Other researchers have provided worthwhile humancentric frameworks for AI in education which centralize “the core values of accountability, adaptability, and inclusivity, reinforcing ethical integrity, transparency, and accessibility” (Mahajam, 2025, p. 53) but have not referenced purpose-driven and systems thinking in those humancentric frameworks for the development of AI for education. Similarly, Cummings’s (2023) study examined how humancentric AI engineering might unfold but references to purpose-driven AI or systems thinking about AI are not included. Others have positioned purpose-driven AI as essential (Biesta, 2022). While McCord (2019) asked “What would be the purpose-driven, democratic version of the AI megaproject in the modern era? (p. 13). Surely, a global challenge to use AI-enabled education for the greater good would qualify. The value of leaders involving themselves in the design and development of AI to ensure that all three requirements, that is, purpose-driven, humancentric, and systems thinking, are met, may help move the needle on today’s global educational challenge to increase equity of opportunity for lifelong learning for all. The involvement of leaders in that journey is essential. The first step in that journey is the identification of benefits by role and need, as the leaders of this study have done.

Key Finding 2: Leaders' Opinion of AI Impacts What They Identify as the Risks of AI

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Leaders' opinions about AI influence their perspectives on AI risks. These opinions tend to fall into two camps. Some leaders of this study described AI as another technology tool in a long list of technology tools that have permeated education (Appendix N). For these leaders the challenges of AI and the risks associated with it are often perceived as being local. Other leaders described AI as more than just another technology tool. AI for these leaders is a multi-faceted agent of change. The risks of AI, therefore, were seen by these leaders as being global. The two views of AI as espoused by the leaders of this study will be explored separately as will be the risks that these leaders identified. Next, the research literature will be used to understand if one of these two perceptions of AI by the leaders of this study (i.e., AI is just another tool, AI is not just another tool) occurred more frequently in the past with respect to technological implementations in education. Finally, the significance of this finding will be explained.

AI is Just Another Technology Tool. Several leaders in this study characterized AI as one more piece of technology in a long history of educational innovations. From their perspective, AI is disruptive, but this is temporary. These leaders identified that eventually things will settle into routine practice. This section examines how these leaders make sense of AI's implementation into education today, how this viewpoint shapes their local sense of control over change, and shapes their identification of academic integrity risks.

Some of the leaders of this study said that AI is just another tool in a long list of technological tools that have entered education such as calculators, laptops, cell phones, interactive whiteboards, and so on (Appendix N). These leaders said that, in time, AI will

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“settle in” like other technological tools did. As one K-12 leader from the Global South and one HE leader from the Global North said:

It really reminds me of just the change towards one-to-one laptops roundabout. I was in a school in 2010, where we moved to a one-to-one laptop program. And it feels similar in that there was a lot of worry about kids getting distracted or authenticity of what students produce, similar worries. (K-12, Global South, Principal)

I think it's like the steam engine. Nobody talks about it. It just happened and it was there. I just think that with time, [AI] will bed in, a bit like the calculator, when that came in...and when pens came in, and when people went away from using slate to paper. (HE, Global North, Director).

These leaders expressed hope that in time, like with other technological innovations, there would be a return to business as usual despite there being some current local disruption or loss of control.

Because these leaders experienced other integrations of technology which they also perceived as tools, these leaders had preconceived notions of how this implementation of AI would unfold. When things unfolded differently, these leaders expressed frustration. They said they felt less in control of this implementation. As one leader said:

I think the first thing is to accept that you've got no control. I think if we think we've got control, we might be slightly confused. I think control feels good. But ultimately, I think we've been in a state of no control for 18 months (HE, Global North, Pro-Vice Chancellor)

That lack of local control over the further integration of AI into education was attributed by these leaders to the fact that normally such technological changes are led by an identifiable champion whose job it was to lead the implementation in a planned and strategic way. These leaders said that normally strategic plans and timelines, scheduled

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professional learning, and assistive training would be in place by now if a new technological implementation was underway.

As a result of the unsystematic nature of this new tool's arrival, leaders said that the implementation of AI into education was inherently risk-filled. The notion of both powerful risk and inevitability was ever present in the language of these leaders when they discussed AI's permeation into education at this moment in time. They said the further integration of AI into education was more like the arrival of "*a powerful tide*". Some said it was like "*a train steaming down the track*", "*a tsunami*", or "*a fast-moving beast*". That is, these leaders described a sense of danger and inevitability with respect to this newest technology tool's AI arrival in education.

The risk identified by these leaders who said that AI is just another tool was that of student cheating. Addressing student cheating enabled by AI was seen by these leaders as essential. Their focus has been on the creation of regulatory frameworks for AI use that do not move much beyond the identification of acceptable and unacceptable use. In summary, the leaders of this study who said that AI is first and foremost just another tool, have spent much of their leadership energies focused on the local risk of student cheating. For these leaders, the risks created by AI are directly related to the destabilization of the traditional elements of student assessment including the faith placed in the credentials of an institution. Leaton Gray et al. (2025) supported this observation in their paper. They said that Large Language Models (LLMs), "can now produce outputs that closely mimic authentic student work. If universities cannot reliably distinguish between machine-generated and human-authored assessments, the credibility of academic credentials, and the trust underpinning them, is placed in jeopardy" (p.

2070). This viewpoint of AI as just another tool but one with inherent risks, is different from other leaders of my study.

AI Not Just Another Technology Tool. While one might expect the integration of AI in K–20 education to mirror earlier implementations of educational technologies, some of the leaders in this study indicated that this is not what they are experiencing. They said that AI is more than just another technological tool that is being used in education at all levels. They identified two key differences to justify their view. Those differences are directly related to what these leaders say are the key risks of AI.

The first difference these leaders identified for seeing AI as more than simply a technological tool was that AI enables the opportunity to address challenges that have existed in education for some time. These challenges include things like making learning more personalized, using teacher expertise in the best ways possible, closing achievement gaps, and so on. These are referred to as the “affordances” of AI. The term “affordances” was first used by Gibson (1979) to speak about the way animals selectively perceive information as opportunities or invitations to help them survive (p. 19). Norman (1988) said affordances are the way that the fundamental properties of something determine its use while Graber (2020) makes a case for seeing affordances of technology as an ongoing dialogue between design and impact or possibilities and constraints (p. 8). Graber (2020) referenced Pfaffenberger’s work (1992) to illustrate that there is a difference between the design constituency and the impact constituency of a piece of technology (pp. 8-9). In other words, just because AI has the capability to address a perennial challenge of education does not automatically mean that capability will be realized by the education community.

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In the case of the leaders of this study who said that AI is more than a tool, they did not use the term affordances, but they did echo Graber's concept of it when they described AI as both a set of capabilities and as a set of processes. From these leaders' perspective AI is more than a tool because its affordances include not only the capabilities that have been built into it by its designers, but the processes of education that are altered or changed when AI is implemented in education. The leaders of this study who said that AI is more than a tool also said that the implementation of AI may very well require significant adjustment in terms of the shared conceptions of teaching and learning. For these leaders, AI is creating a shift in education that is conceptual as well as physical and more culturally pervasive than simply "plugging in" a new piece of technology.

The second reason these leaders provided for saying that AI is more than a tool is related to what they said was an urgency to act. For the leaders of this study, that urgency to act is directly related to the fact that AI is now, or soon will be, invisible to many users. Over the years, AI development has found ways to embed AI into resource constrained devices (Zhang & Li, 2023). As a result, an entirely new field of research on embedded systems has unfolded as Huang, Wang, Qin, and Tang's (2025) literature review of embedded AI illustrates. The result of AI being embedded into other technology systems means the user is not always aware that AI is running in the background. Therefore, the leaders of this study said that the window of time in which leaders can choose to act with respect to the implementation of AI into education in meaningful ways is closing quickly. As one leader said, where we once had five years to

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make our plans and successfully lead the implementation, today feels like we have five days to decide how to lead the way forward.

This sense of urgency on the part of leadership to make a difference before it is too late, was not generally a part of technological implementations from the past as illustrated in the research. That is, when calculators, laptops, or cell phones were introduced in the marketplace, education chose when to permit their use in schools. Plans were made, resources were explored, and leaders were very much part of that dialogue. For example, Collis's (1996) description of the implementation of the internet and the worldwide web into education meant teachers at all levels of education suddenly had the power to choose resources for themselves governed by their own wisdom, judgement, and evaluation skills about learning resources as opposed to that of publishers, curriculum experts, and textbook authors (p. 26). But, unlike what the leaders of my study said, Collis reported that there was no expectation that "internet literacy" would need to be taught (p. 26), that big tech would profit from education's access to the internet (p. 28), that the internet would solve significant perennial educational challenges, or that educators would take up its use (p. 29). For the leaders of my study who said that AI is more than just a tool, all these assumptions do apply which supports their view that AI is something more than another technological tool that is permeating education.

Similarly, when laptops were successfully introduced into schools, they were introduced through local, substantive mediation as the research shows. Windschitl and Sahl (2002) found that such mediation involved educators examining their beliefs about learners in their school, their views of what constitutes good teaching in their school, what the role of technology is in the lives of the students at their school, and how these

perspectives did or did not connect with the implementation of laptops (p. 201).

Interestingly, these authors noted that it was not the pervasive availability of the technology that initiated change but, rather, meaningful conversations about what constitutes effective teaching and learning. They said that it was only in that context of local, substantive mediation that it made sense “to identify and explore specific applications of laptops for instructional use” (p. 202). The implication is that, regardless of what might have been happening in the larger society, the integration of laptops into education was a choice to be made by educators first and foremost in consideration of their beliefs and values about teaching and learning and considering their local student context. In contrast, the leaders of my study identified that AI has already arrived in both K-12 and HE. Unlike the decision of whether to bring in laptops or other technology tools, AI is there whether permitted or not. As one leader of my study said:

There's probably been a lot of use of AI that we haven't been able to control. So, starting now, we will change that logic. From now on, AI is allowed unless it's specifically prohibited. (HE, Global North, Professorial Chair of AI)

Therefore, the view of leaders of this study who said that AI is more than just another technology tool is supported by research. The implementation of at least some of the technology that has arrived in education in the past such as the internet and World Wide Web, did not come with the attendant expectations associated with AI. The implementation of at least some other technological tools from the past, such as laptops, was a local choice that educators made in concert with their peers. Where once the risks were ignoring the values and perspectives of local educators, today the risks of AI, which are redefining teaching and learning, were seen by some leaders of my study as more

global. That is, it is the perception of these leaders that the opportunity to act locally is shrinking.

In summary, the views of the leaders of my study about AI and the risks of it fell along two main perspectives. On the one hand, some leaders said AI was just another tool and despite current frustrations, things will settle down. In the meantime, the local concerns with student cheating were taking leaders' time and energy to manage. On the other hand, some leaders said AI was more than just another technological tool. The research supports this view with respect to recent implementation of technology such as the internet, World Wide Web, and laptops. For these leaders AI's capabilities and processes provide a set of affordances to do things differently including the ability to act to make change. However, they believe that the window of time in which they can do so as leaders is diminishing.

Why This Finding Matters

The personal opinions of leaders studied in this research project affected what they identified as the risks of AI to education. Those who saw AI as another tool identified local risks particularly that of student cheating. Those who saw AI as more than another tool, identified global risks particularly that of the urgency to act. If the risk is seen as local, then, in theory, the consequences of the risk are local and, in theory, the risk can be solved locally. But if a risk is seen as global then the risk may only be ameliorated globally. Bengio et al.'s (2025) international safety report identifies general AI risks as large-scale social harms, malicious uses, and an irreversible loss of human control over autonomous AI systems (pp. 18-20). One such large-scale social harm might be the loss of opportunity to use AI to enable greater equity of opportunity with respect to lifelong

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learning for all. Bengio et al. (2025) advocate for a proactive, collaborative response to those identifiable risks. The need for proactive, collaborative solution-seeking by educational leadership supports not only the amelioration of the potential risks of AI for education but also reinforces the need for more active involvement on the part of leadership in the design and development of AI for the greater good.

Key Finding 3: Leader's Perception of the Challenges of AI Impacts Their Identification of the Opportunities of AI

Once again, the perceptions of leaders on the challenges of AI as they relate to the opportunities of AI are divided. Some leaders of this study saw that the challenge of student cheating has led to an opportunity to reemphasize the value of the teacher and of traditional educational relationships between teacher and student. Other leaders saw the challenge of student cheating as an opportunity to try to address more global issues such as social justice inequities through the redesign of curriculum and assessment and the opportunity to use a more distributed or shared approach to leadership.

Several leaders noted that November 2022 changed the plagiarism playing field when OpenAI released the Chat GPT service for free. They said that historically, teachers/instructors/professors' knowledge of the discipline or field of endeavor and plagiarism detection tools such as Turnitin were used to detect if plagiarism had occurred. With the arrival of free access to AI, those traditional techniques for detecting student plagiarism were changed, as the leaders of this study noted. At first, the hints of AI use were obvious. Papers were submitted with the watermarks of AI. Comments such as "regenerate response" appeared at the end of every ChatGPT response generated before September 2023 (Ardito, 2025, p. 1). Almost simultaneously to the arrival of AI

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came the AI detectors (Paustian & Slinger, 2024). However, studies like Liang et al.'s (2023) showed that non-native English speakers' writing was flagged by these detectors as AI-generated. Klee (2023) identified that when faculty trusted the AI detectors, students were accused of cheating erroneously. Some universities decided to turn off the detection capabilities of some AI packages due to concerns about false positives (Coley, 2023). As one leader of this study said students were frustrated when their assignments were flagged incorrectly:

Our students are already angry at our faculty members who are tagging their assignments as 100% ...when we run them by AI checker, of course, it will turn up as 100%. (Developing, HE, Dean)

Open AI and other LLMs eventually closed their detection tools due to their inability to differentiate between human and LLM-generated text. As some of the leaders of this study said there were simply too many cases to be dealt with in a disciplinary way at their school/institution, so they stopped using the detectors.

When the physical hints and AI detectors began to disappear, some leaders of this study said the value of educators' judgement was prioritized in determining if plagiarism was present. The research shows that this approach was problematic. Clark et al.'s (2021) study found that without training, evaluators at best were able to distinguish between ChatGPT3 and text written only by humans at the level of random chance (p. 7282). Fairly quickly, educators generally recognized that such approaches to identifying plagiarism were unhelpful. The conversations, debates, and confusion about what to do instead took hold, as identified by leaders of this study. How leaders chose to respond to that challenge of AI identified their view of the opportunities of AI.

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Some leaders responded by organizing committees and task forces to consider whether regulatory frameworks and policies needed to be put into place to address the plagiarism challenges created by student use of AI or whether existing ethical guidelines and plagiarism policies would suffice. Some leaders of this study said that new processes were established including where teachers were expected to “run their assessment tasks through AI” to determine if it was relatively “AI-proof”. Other leaders identified that two streams of assessment would be undertaken. In one stream students were permitted use of AI. In the other stream they were not. Results will be scrutinized.

Ardito (2025) identified that by persisting with an approach to academic integrity challenges that relies on “detection-oriented policies” (p. 15) misses an opportunity to explore “the bigger questions around the role of knowledge and of teaching and learning and what will need to change in terms of the paradigms and structures of formal education” (p. 15). This is exactly the point that other leaders of this study make. That is, some of the leaders of this study said that this moment of challenge with respect to issues of academic honesty is a significant opportunity to change assessment of student learning to address the inequities that have existed for some time in the paradigms of education. These inequities include gender, disability, social and economic status, ethnic and cultural background, and geographic location (Oakes, 2005). Recently literature has described those inequities not as deficits on the part of the learner but as issues of equity and social justice (Aiston & Walraven, 2024, p. 2). The change in perspective has not made the challenge easier to fix. As Aiston & Walraven (2024) identified “[t]here are no easy solutions – because if there were, they would have been implemented long ago” (p. 11). Doing things differently is seen by these leaders as a measure of success with respect

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to AI implementation. The redesign of student assessment and curriculum outcomes is such an example. Some leaders of this study said they are using AI to help them with that redesign by asking AI to align assessment tasks, rubrics, and learning outcomes. This finding is reflective of Fernández-Sánchez et al.'s (2024) report on their action research project. They explained how rubrics were developed using AI tools like ChatGPT. The findings highlight AI's ability to enhance "precision, efficiency and alignment with curricular objectives, thus facilitating personalized learning experiences" (p. 1).

According to the researchers, this research illustrates the potential of AI to be transformative in education. In short, some of the leaders of this study said that the challenge of a potential increase in student plagiarism is also an opportunity to address equity challenges. For example, one leader said:

AI can hurt and benefit equity and it can do it at the same time. It can help somebody make sense of a text, and it can also imbue their responses with certain types of bias.
(HE, Global North, Program Director)

These leaders who identified that this challenge of student cheating comes with an opportunity to engage in significant reflection, rethinking, reinventing, and reimagining of the goals, purposes, and value added of formal education for all learners, also sought ways to involve others in these conversations. Such involvement of others is reflective of what is described in the research as distributed leadership (DL) (Hartley, 2007; Gronn, 2008; Leithwood, Mascall, & Strauss et al, 2009; Harris, 2013). DL is another in a longer list of emergent, collaborative, or co-leadership approaches (Bolden, 2011, p. 252). Bennett et al. (2003) identified three characteristics of DL that regularly appeared in the literature with respect to DL: 1. Leadership emerges as the property of a group; 2. The boundaries of leadership are open; and 3. Expertise is distributed (p. 7). It is unclear

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from my study whether the leaders who said that the challenge of AI enabled student plagiarism is an opportunity to address more global challenges such as social equity issues through reimagined assessment of student learning, intended their approach to these challenges and opportunities to be that of distributed leadership. But the rationale of these leaders for involving others in these discussions was clear. These leaders recognized that the challenges of AI and the complexity of the issues and opportunities that stem from them, require the involvement of others. Moving forward it will be interesting to observe whether the sheer complexity of the challenges, issues, and opportunities of AI will warrant greater use of a style of educational leadership that is even more shared or distributed. In the meantime, some of the leaders of this study have identified the opportunity to work with others through meaningful conversation as a step in that direction.

In summary, how leaders viewed the challenges of AI, including that of the potential for an increase in student cheating, affected what they saw as the opportunity. Some leaders saw the opportunity in traditional ways such as the design of new policies on academic honesty or a reaffirmation of the role of the teacher in student assessment. Other leaders had a more expansive view of the opportunities including using redesigned assessment to address longstanding issues of social inequities in education or to move closer to distributed leadership approaches.

Why This Finding Matters

In the call to have leaders involve themselves more directly in the design and development of AI for education to address the challenge of greater equity of opportunity of lifelong learning for all, it is important what view leaders have regarding the

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challenges of AI. For it is the perspective on challenges that directly impacts leaders' identification of opportunities. It is in addressing opportunities that the potential for change will happen. The challenges that leaders identify have an impact on what they see as opportunities. This approach matters. When the integration of AI into education is driven through a lens of opportunity to do things differently, the implementation of AI is no longer solely a technological change. AI embodies the opportunity to improve the challenges of equity and social justice that have perennially plagued education. Such leaders see great benefit in distributing the leadership to a larger pool. In recognizing the challenge that AI potentially accelerates problems, some leaders see the opportunity and necessity to do things differently. It may very well be that the less traditional responses from leadership move the agenda of lifelong learning for all enabled by AI farther along the continuum of change.

Key Finding 4: Leaders Identify the Current Role of Big Tech in the Implementation of AI as Problematic

The collaboration between government and big tech with respect to the further integration of AI into education is seen by some of the leaders of this study as having a problematic impact on education. Those leaders identified three reasons for their concerns. First, the involvement of government with big tech is moving the AI implementation agenda forward more quickly than leaders feel comfortable with. Second, these leaders say that this collaboration is extending the reach of big tech into education in unacceptable ways to emphasize the values and priorities of big tech at the expense of those of education. Third, these leaders say they have concerns about the social responsibility of big tech or lack of it. These leaders acknowledged that

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government is often involved in educational change in publicly funded education. But the involvement of major technology providers in conjunction with government to direct the implementation of AI into education is creating a more challenging environment from the perspective of some of the leaders of my study than what is typical with respect to implementing technological change.

These leaders said the collaboration between government and big tech in some places in the world is of concern because it is moving the AI implementation agenda more quickly than these leaders would like. Leaders say they wish to be aware of how well AI meets the needs of education first, but they recognize that integration of AI into education is happening anyway, without waiting for leaders to catch up. As one leader observed about their effort to stay current and to sort out how AI may help meet educational goals *"It's like trying to drink from a firehose"* (HE, Global North, Dean). The research provides reasons why such a brisk pace of technological implementation may be problematic.

For example, Woodhouse (2016) said that it takes time for problems to show up and to conduct the research into actual use cases and those with the authority to make decisions must be motivated *"to engage in negotiation and technological reconstruction"* (p. 268). Postoronca et al. (2024) said that *"[i]n the face of accelerating technological change, continuous learning becomes essential"* (p. 714). In another study designed to fill a void in academic research about the role of government in AI development, Papyshv and Yarmine (2023) studied 31 governmental strategies. They concluded that these strategies were different based on geography with some governments (e.g., Post-soviet bloc and Asia) having a high level of involvement in development of AI, some

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governments having high involvement in control of AI (e.g., Europe), and some governments having high involvement in promotion of private sector AI development (e.g., U.K., U.S.) (p. 79). It is worth noting that Papyshv and Yarmine's (2023) categorization of governments' high involvement in AI was conducted for 2017-2021 whereas my study considered leaders' perspectives on the involvement of government with big tech in 2025. But the perception of leaders of my study that there is a "high involvement" between government and big tech aligns with Papyshv and Yarmine's (2023) study. Regardless of what form this high involvement takes, some of the leaders of my study said that one of the problematic outcomes of this involvement of government with big tech is that the AI agenda for education is moving forward more quickly than is desirable.

The second concern that leaders identified with respect to the partnership between big tech and government to advance AI implementation in education is that the values and priorities of education and their concerns about AI are being set aside in big tech's effort to speed up the implementation of AI into education. As one of the leaders of my study said government too is complicit in that AI push at the expense of educational priorities and values:

These throwaway comments that politicians make about how they're going to solve everything with AI, and they'll just get AI writing this and AI marking all of this. Have they got no understanding about how problematic that is?... It's very unusual, the level of overreach. (K-12, Global North, Principal).

This perception by some of the leaders of this study of overreach on the part of big tech and government alliances focuses on how AI is being implemented. For these leaders they fear a centralized approach will rush the AI implementation without proper

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attention being paid to the perspectives of educators such as themselves. The fear on the part of some of the leaders of my study is that such big tech values or priorities are amplified at the expense of those of education when big tech partners with government to move the implementation of AI into education more rapidly. A recent study supports these leaders' concern. Holmes et al.'s (2025) survey of 156 researchers, educators, and policymakers in 56 countries stressed that how decisions are made about the implementation of AI – centralized versus decentralized – affects whose interests come first (p. 10). Holmes et al. (2025) reported that those surveyed said there should be a slowdown in the AI-driven, so-called transformation of education (p. 21). Their study contrasts the priorities and values of big tech with those of education. They said that big tech education is seen as:

a site of disruption and performance, a privileged terrain for further technological experimentation, ultimately displaced from pedagogy...[whereas] a child's development relies on key conditions such as time, rest, socialisation, and discovery – experiences that should not be overshadowed by a push for digital integration, data tracking, or performance metrics simply because such technologies exist. (Holmes et al., 2025, p. 21)

In other research, Williamson (2018) also reported on how the priorities and values of big tech are different than those of education. He studied the Silicon Valley startup schools to illustrate the goal of big tech to reimagine education to be more closely aligned to the priorities of big tech. Williamson (2018) described those startup schools as “surveillant, data-capturing, experimental laboratories and scalable venture capitalist schools built to run on the social, cultural, economic and political operating systems of

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Silicon Valley itself' (p. 233). Similarly, Adeoye and Otemuyiwa's (2024) explored the desire of big tech to co-develop curriculum and content with schools/institutions in their quest to serve learners better (p. 41). Adeoye and Otemuyiwa (2024) say the challenge for big tech is overcoming the resistance to change which characterizes traditional systems (p. 42). However, the leaders of my study, who expressed concern about the values and priorities of education being displaced by the values and priorities of big tech in the hurry to implement AI into education, were the same leaders advocating for change. That is, their concern about the devaluation of educational values in the AI agenda is not because these leaders are resisting change. It is because they think the values and priorities of education must not be lost. They said they could see the opportunity that AI provides to change the traditional paradigms of education does not mean that the traditional values of public education should change the responsibility of leadership. As one interviewee of my study said it is the responsibility of leadership to ensure that those values are not lost:

Tech is the easy part. We must let go of the stuff that we believe is tradition without letting go of the values of why we think that's tradition...And so how do we create educational quality in a world of tomorrow that has some different systems? And that maybe doesn't take us four years to go from concept to delivery. That's the heart of the leadership work then moving forward. (H.E., Global North, President)

The result of the devaluation of educational priorities and a prioritization of big tech values is that an underlying current of mistrust arises. That is, some of the educational leaders of this study identified their skepticism and mistrust that big tech wants to do the right thing by education. Lindross Cermakova et al. (2024) reported that "AI (EdTech) can only develop at the speed of trust" (p. 2). Havinga (2024) concluded that more diverse perspectives must be considered equally to those of big tech itself for trust to be

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built between education and big tech as often teachers are the last viewpoint to be considered (p. 8). Some of the leaders of my study would agree that devaluing educational priorities and values in the rush by big tech to implement AI in education is building mistrust by educators of big tech.

The third reason some of the leaders of this study identified that the alliance of big tech with government in advancing the implementation of AI for education is problematic is because of the leaders' concern over the social responsibility of big tech. Education is a human enterprise whose duty of care to its constituents is not merely a nice thing to do but it is often embedded in the law of democratic nations. Therefore, these leaders recognize that the ethics of AI must never be an afterthought. As one of the leaders of my study said:

I think that people such as Zuckerberg and of course Musk and others have more impact on society than politicians...Every engineer becomes an ethical decision machine. And I don't think they understand the ethical implications of their actions. (HE, Global North, Senior Research Director)

For these leaders such ethical concerns do not end with the protection of privacy of students. These leaders are also concerned about the risk of AI integration broadening the existing digital divides. That is, some of the leaders of this study said that the big tech alliance with government advancing the agenda of AI implementation into education more rapidly may have social consequences including exacerbating the digital divide. As this leader noted:

Usually when there's new technology introduced, it broadens the gap because those who have access and experience and literacy are able to use it better. Google, Wikipedia, internet, and the shift to online learning, all of these have broadened the gaps. How do we make sure that AI doesn't do it? (HE, Global North, Senior Research Director)

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Research on the social responsibility of big tech with respect to the integration of AI into education is lacking. Capasso and Umbrello (2023) noted that the “tech giants are arguably the most impactful market players when it comes to the digital age. However, they operate seemingly autonomously despite the impacts they have on multiple stakeholders” (p. 245). Capasso and Umbrello (2023) advocate for big tech having a social licence to operate. They defined the purpose of a social license as building trust and consent “of people and communities affected by the business model’s actions” (p. 241). For the purposes of my study that community is education. According to Capasso and Umbrello (2023) the advantage of having such a social license to operate in place would be that it could identify the criteria for diverse collaboration so that missing trust could be created (p. 245). Although there is no evidence that big tech has such an agreement for operating in education, it may be a worthwhile idea for leaders to pursue who are concerned about the social responsibility of big tech with respect to education. In the meantime, some of the leaders of this study identified that their concern about the social responsibility of big tech is having a problematic impact on education.

In summary, some of the leaders of this study identified that the current role of big tech in the implementation of AI in education was problematic from their perspective for three reasons. Those three reasons were 1. Big tech is moving the AI implementation agenda forward more quickly than leaders feel comfortable with; 2. The values and priorities of big tech are being prioritized at the expense of educational values and priorities; and 3. The social responsibility of big tech or lack of it may have a negative impact on education. In short, the concerns that some of the leaders have with respect to

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the rapid advancement of AI into education enabled by big tech working with government move well beyond the walls of these leaders' own schools/institutions.

Why This Finding Matters

Some of the leaders of my study recognized that the involvement of big tech and government in the implementation of AI into education warrants concern not just for those in their schools/institutions but for education and its stakeholders globally. Such concern matters because it illustrates that the implementation of AI into education has more than local impact; it has global ramifications. This perspective matters because it sends a warning to all those in education implementing AI. The message is that there is more at stake than the successful implementation of another piece of technology for education. The speed of AI implementation and the champions of it are threatening the priorities and values of education, potentially exacerbating social issues such as ethics, and the digital divide. Leaders who recognized that to be the case understand that they are facing a significant leadership challenge. The result is a more challenging environment in which to lead than what is typical with respect to implementing change driven by the integration of technology.

Key Finding 5: Leaders' Perceptions of How AI Differs from Previous Technological Implementations Shapes Their Leadership Approach

The approaches of the leaders of this study with respect to the further integration of AI into education and the need to address the global challenge of increased equity of opportunity through lifelong learning can be described in three different ways. Together these three approaches provide a leadership model for leading the integration of AI into education. The three approaches will be described first. Then existing leadership theories

will be identified to show that some elements of each approach are related to existing leadership theories but none of the existing theories thoroughly describe the three approaches taken by the leaders of this study. Finally, why the finding matters will be discussed.

Leadership Approach 1: Future-focused, Immersive AI Leadership, Consciously Committed to Learning Regardless of Uncertainty. Some of the leaders of this study regard the implementation of AI into education as significantly different from prior technological integrations. The more they see it in this way, the more likely they are to lead its integration in active and immersive ways. This approach to leadership is characterized by five elements as outlined below.

1. Recognition that lifelong learning (LLL) for all is the new educational agenda. These leaders understood that LLL is the new global educational goal. They understood that education must change its paradigms to accommodate a reimagined role. Regardless of how far along these leaders' schools/institutions were with respect to this new agenda for education, these leaders acknowledged that LLL is the new priority that they must work toward. As one of the leaders of this study said:

I think we see lifelong learning as unquestionably the future, which is to say there may still be concentrated three- or four-year programs, but in time, and we're just at the beginning of it, fewer people will do those, and more people will spread their education out over their life. So, we must be prepared for an education system in which that's the situation. (HE, Global North, President and Vice-Chancellor)

2. Demonstrated optimism about the future. Despite a lack of certainty and despite current challenges, the focus of the leaders who followed this approach to the further implementation of AI into education was on the future. Leaders who immersed themselves in active ways to further the integration of AI into the educational experience,

did so despite any guarantees of certainty about the future of education including the sustainability of their roles. Regardless of the complexity, they committed themselves to learning and they committed themselves to finding answers to the existential questions about AI enabled education. Their gaze was often not only on the immediate concerns of acceptable versus unacceptable use of AI; rather, it was on the future. These leaders sensed that such debates would sort themselves out in time, but they were less certain that questions about the role of teaching, learning and knowledge would do the same. So it is to these existential questions that these leaders turned their focus. As one leader of the study said:

If we're not asking the right questions, we're going to become obsolete, bloody quick...This is truly creating an existential question for us. (HE, Global North, President)

3. Recognition of the need for and commitment to the involvement of others in both reflection on and action aimed at change. Leaders that were future-focused, immersed in AI, and consciously committed to learning about it knew that leadership is no longer a solitary activity. These leaders recognized that the lack of certainty is the very reason they must bring others together in reflective dialogue. Such dialogue seeks to define the human future in AI. That is, such leaders looked beyond this moment in time. They catalyzed the conversations around fundamental questions such as:

What is learning? What is knowledge? What is the role of human agency in an AI-infused world? What is the role of leadership? What is the moral responsibility of education? What is ethical AI behaviour? What is the value proposition of AI-enabled education?

4. Active involvement in soft diplomacy beyond education to help shape how AI is being created, used, and talked about not just within education but in society.

Besides engaging in active, broad, and collaborative conversations and reflections within their school/institution, these leaders act to influence others in the larger society. They

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sought opportunities to be para diplomats and to exercise soft diplomacy to help shape how AI is being created, used, and talked about within education and within the larger society. They sat on civic committees, wrote articles for the press, accepted speaking engagements, invited politicians and other societal leaders to come inside the school or institution to see for themselves how AI was being used, and they talked about how a reconceived role for education might be imagined. Leaders who followed this pattern of leadership were proactive about positioning AI as more than a tool but as an agent or ally of change for the greater good. As one such leader of this study said:

I also work outside of school with the National AI Forum...a national set of working groups that are looking at AI use in every part of different industries in the country... It can't just be about education. (K-12. Global North, Principal)

5. Commitment to their own learning about AI and to that of others despite the near impossibility of staying up to date. These leaders said that they stretched their own learning by building local applications of AI. They understood the impossible task of staying current with respect to how AI is being designed and developed for education, but they actively engaged in learning about AI anyway. They understood the value of, as one leader said, of having “*a thousand flowers bloom*” (HE, Global North, President) when it comes to encouraging staff/faculty to explore and take risks with AI to learn more. However, these leaders didn't use that as a reason not to do what leaders do, which is to enable and shape the creation of a value-based vision of a shared and desirable future, to define the path forward for achieving it, while supporting others so they can thrive. These leaders' commitment to learning more about AI themselves and their encouragement and involvement of others to do the same translates to preparing actively to reimagine and reinvent education, and their work has already begun.

Leadership Approach 2: Present-focused Reaction Through Collaborative

Adaptation. Other leaders of this study were more present-focused. They used collaborative, well-intentioned reaction, and adaptation to address this moment in time. This approach to leadership with respect to the successful integration of AI into education is demonstrated by five characteristics as outlined below.

1. The focus of these leaders was less about leading for a complex and uncertain future and more about managing this moment successfully. In this approach to the global challenge at hand and the uptake of AI to help address it, the focus of these leaders was less about leading for a complex and uncertain future and more about managing this moment successfully. These leaders were concerned about managing the current use in their buildings and that such use aligned with the ethical principles of education such as academic honesty.

2. They viewed AI as a tool more than as an agent of change. These leaders spoke of AI as a tool. Although they recognized that the concept of AI as a potential ally in the larger global call for change might be a worthwhile idea, the practicalities of the current educational mandate limited for these leaders what could and should be done at this moment in time.

3. They considered what was already happening in their own building as well as in the larger society and only acted when they felt they finally must. These leaders acted in response to what they saw and heard happening with students, staff/faculty, government, business, and industry. They took note of what government, business, and industry were doing before they acted themselves. When they felt they had no other choice, they acted.

4. They saw education as the recipient, not the driver, of technological change.

Leaders who adopted this present focused reaction through collaborative adaptation approach, did so with the view that the design and development of AI for the educational experience was happening beyond the walls of the school/institution. In many ways they saw education as the recipient, not the driver, of technological change. They received comfort from knowing that others must also respond to this unusual moment in time. These leaders were open and willing to learn from others about their experiences and plans. As one leader of this study said:

The good thing is, from a management point of view, we are all doing the same thing at the same time. You can very, very easily get smarter by asking other people what they are doing, and I think that there's beauty in that. (HE, Global North, Associate Dean of Education)

Because these leaders who followed this approach viewed education as the recipient of technological change, they trusted that the problems with AI were temporary. They trusted that these problems would be solved by those working on AI outside the school/institution. As one leader said:

Leave aside all the problems of biases and hallucination and so on, because that can be fixed along the road.... So, there are still problems, but they are being solved as technology develops. (HE, Global North, Associate Dean of Education)

5. These leaders who followed this approach in leading the further integration of AI focused on the present and the traditional work of education.

Although these leaders recognized that lifelong learning is the current global educational challenge/agenda, they remained focused on the present and on what they saw as the core work of education. They acknowledged that LLL is the current challenge. They were sorting out how to address it but like AI, for these leaders it is a process of reaction and adaptation that must

occur without sacrificing the core work of education as it is currently known. These leaders managed this present moment as best they could.

Leadership Approach 3: Acquiescence Exercised Through Passive Oversight in Reference to the Past. The final approach to the integration of AI demonstrated by some of the leaders of this study could be described as that of passively monitoring the further integration of AI into formal education. This approach to leadership, taken by some of the leaders of this study, is identified through six traits as outlined below.

1. Passive oversight of what is happening with respect to AI integration into education. These leaders were most certainly aware of AI's permeation into education. However, they took the stance of passive oversight. Their leadership was exercised through monitoring the change as opposed to directing the change.

2. They allowed change to bubble up from the bottom with minimal interference. The leaders who followed this approach reported on how some teachers/faculty and students were using AI and how they were using it themselves. But such bottom-up emergence of usage did not mean they were encouraging or discouraging the instances where AI was being used to do things differently. Their role was one of passive oversight.

3. They saw their leadership role as only one in a network of authorities on how AI would come to be integrated and used. These leaders were aware of the regulatory work being done by governmental bodies. They understood the outcome of such work will impact on the work at the school/institutional level. They understood that the local jurisdiction is only one part of a network of authoritative bodies with respect to AI.

4. They didn't necessarily view AI as a problem or as an ally. Their perspective was on how it was used. For these leaders, if AI was used to free up time, that by itself was neither an advantage nor a disadvantage, a strength nor a weakness. But nor did such usage for these leaders identify that AI could be an ally. For these leaders, it depended on how the freed-up time was used. If it was used to pursue more learning in one's field of study, then the use of AI would have been educationally worthwhile. If it was used to pursue non-educational things, then it would likely not have been worthwhile.

5. They expect that the current AI frenzy will settle down and things will eventually return to normal. The leaders who followed this approach to the integration of AI into education said that the further integration of AI into education was like other implementations of technology that have come before. These leaders used the similarities to other educational technology implementations to reassure themselves and others that things will work out. What they saw as a short-term over-focus on AI, would settle down and things would return to normal. As one leader of this study said:

I personally think we're in the garden of hype cycle... Now, whether it's a good thing in the long term, I'm not sure, to be honest. (HE, Global North, Director)

6. They used a historical lens or reference to the past to reassure themselves that the value of formal education will continue to matter. Unlike the other two leadership approaches described above where leaders were either future or present-focused, the leaders who followed this approach of acquiescence exercised through passive oversight had a perspective of education and technological change framed by the past. They viewed the traditional value of education as the relationships that are built between faculty and students. They saw such relationships as education's "value add". They said that that value would continue to matter.

Research on Leadership Theories. Leadership theories have been widely researched. Over time leadership theories have been updated and replaced. Because schools/institutions are dynamic places, it should not be surprising that theories about its leadership are constantly changing. According to Amanchukwu et al. (2015) (pp. 7-8), this plethora of theories can be sorted into three major categories as follows:

- a. Leadership as process (e.g., situational theory: the best course of action depends on the circumstances; participatory leadership: the input of others is considered; transactional theory: clear expectations and consequences is the leader's job; contingency theory: no one style is best as it depends on the leader, the followers, the situation).
- b. Leadership as traits (e.g., trait theory: personality characteristics make some people natural leaders; behavioural theory: leaders are born not made).
- c. Leadership as skills (e.g., transformational theory: leadership connects with others to increase motivation, inspiration, moral behaviour; skills theory: leadership is learned and developed).

The three approaches used by the leaders in my study do not align completely with any of the categories or theories within them. For example, although the leadership approach described as future-focused, immersive AI leadership, consciously committed to learning regardless of uncertainty included a commitment to the involvement of others. The involvement of others in leadership and decision-making generally fits the "leadership as process" category as described by Amanchukwu et al. (2015) and participatory leadership theory particularly. But this approach taken by some of the leaders of this study was also characterized by an optimistic outlook, an outlook that

might be found in the “leadership as traits” category in general or in the “leadership as skills” category in general and in transformational leadership theory in particular. Such an example illustrates that the pattern of three approaches taken by the leaders of my study did not neatly align with Amanchukwu et al.’s (2015) categories of leadership or the examples they used to categorize existing leadership theories.

Some researchers have argued that the complexities of the current challenges that educational leadership must face means the time has come to change the approach to leadership theory entirely, that is, “previously effective criteria and norms no longer adequately address these challenges, prompting the emergence of novel approaches to educational leadership that embrace proactive adaptation” (Peng et al., 2024, n.p.). For example, the arrival of the knowledge era prompted Uhl-Bien et al. (2007) to identify that something new was needed beyond the historical identification of theories and styles that had already taken place. Uhl-Bien et al. (2007) identified a new leadership theory entitled “complexity theory”. Uhl-Bien et al. (2007) explained this theory as “an emergent, interactive dynamic—a complex interplay from which a collective impetus for action and change emerges when heterogeneous agents interact in networks in ways that produce new patterns of behavior or new modes of operating” (p. 299). It seems that the three-part pattern of leadership observed in my study may come about because of leaders’ recognition of complex, adaptive challenges. According to complexity theory adaptive challenges are “problems that require new learning, innovation, and new patterns of behavior” (p. 300). Some of the leaders of my study did identify problems that required new learning, innovation and new patterns of behaviour. However, the three approaches used by leaders in my study were not simply about the recognition of the

importance of these complex, adaptive challenges. Rather, it was the reflections and activities that leaders undertook or did not undertake in response to those challenges that made the three approaches unique. Consideration by leaders of the complex, adaptive global challenge to increase equity of opportunity for lifelong learning for all is important. But the response that leaders make to the challenge will define their leadership. That leadership response includes both thinking and doing. Combined the three approaches used by leaders in this study present a model for leadership that does not align itself completely with other leadership theories as described in the research.

Why This Finding Matters

It is useful to identify the pattern of these three approaches to the leadership of AI's integration into education for a few reasons. First, other leaders and stakeholders who may find this study helpful may see themselves following similar patterns but remain curious about what others are doing. That is, leaders may have questions about what approaches are being used by other leaders and so see as instructive the approaches to leadership that they have not chosen or followed. These three approaches may provide confirmation to some leaders that they should keep doing what they are doing while inspiring others to reconsider the approach they have chosen. Finally, although attempts to categorize human behaviour always risk oversimplifying what is being considered, this three-part model may help clarify for leadership what recommendations for next steps might be most worthwhile to pursue. Faced with the arrival of the world's most powerful technology into education and a global challenge to increase equity of opportunity for all through lifelong learning, what leaders choose to do or not do matters. It matters because it is their approach to leadership that will support change for the greater good, that is, the

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adoption of AI in education to make a difference to the grand challenge of sustainability through their pursuit of greater equity for all through lifelong learning. The complex, adaptive challenge facing education today at all levels matters, but if change is going to happen before it is too late to make a difference, it is the individual and collective response of its leadership to the challenge that matters more.

Key Finding 6: Where Leaders Work and What Level They Work at Impacts their Perspectives and Prioritization of Lifelong Learning

This study sought to find out what support might be needed as leaders pursue the challenge of AI enabled lifelong learning (LLL) for all. But before support can be identified it is worth noting that leaders of this study are aligned by geography and level with respect to their perspectives on and prioritization of LLL. For example, most HE leaders from the Global North described the implementation of reimagined lifelong learning for all differently from those from the Global South and from those in K-12. Those differences in perspectives and priorities of leaders about LLL are categorized below. The research is then cited to show whether these approaches have been recorded elsewhere. Finally, the significance of this finding will be explained.

Most HE leaders from the Global North referenced LLL using the older definition of adult retraining for the job market or professional upgrading. For many of the leaders who did so, it was not a question of whether the global pursuit of reimagined LLL for all through the realization of human capability was important or whether education needed to be redesigned to prioritize it. Rather, other issues were impacting on this agenda. For example, some leaders from the Global North said the entire organization would be

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affected by any reprioritization of HE's purpose. As one HE leader from the Global North said:

But we do need that governance level and that must have representation from across the whole of the institution, and we need to have appropriate tools and training.... It's not just teaching and learning. It's research. It's finance. It's HR. (HE, Global North, Director)

Assefa et al.'s (2024) meta-synthesis of the literature on higher education's role in promoting lifelong learning supports the notion of this leader from my study that changing the conceptions of LLL in HE is complex. Assefa et al. (2024) concluded that moving beyond a rhetorical commitment to current conceptions of LLL is a challenging process for leadership (sect.5).

A second reason that these leaders from the HE in the global north gave for taking up reimagined LLL in more systematic ways was that it is not the current mandate of publicly funded HE. And the mandate of HE is inextricably connected to its funding. However, in the case of HE in one country in the Global North, current research shows that such funding mechanisms are changing.

In 2014 Hyde and Phillipson identified the funding issue as a significant challenge when they looked ahead to LLL in 2025-2040 in the U.K. to explore who would pay for it (p. 6). Hyde and Phillipson (2014) concluded that resolving the payment issues of LLL were critical given ongoing reductions in public funding and individuals' financial constraints especially for those in low to middle income brackets (p. 24). However, by 2025, the research shows that things changed dramatically in the U.K. Specifically, Mahoney and Kiernan (2024) examine the government's response to the question raised by Hyde and Phillipson (2014) about who would fund the expansion of LLL in the U.K.

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In 2025 what has been described as a transformative new funding system for post-18 learners was rolled out (Mahoney & Kiernan, 2024, p. 1). Entitled the “Lifelong Learning Entitlement” (LLE) access to loan support is provided for individuals pursuing higher level/higher education studies up to age 60 (Mahoney & Kiernan, 2024, p. 1). The purpose of LLE is to provide a single funding system for HE to help individuals pay for courses “to develop new skills and gain new qualifications at a time that is right for them through full-time degree programmes, flexibly through part-time study, or by undertaking individual modules as and when they are needed” (Mahoney & Kiernan, 2024, p. 1). In their critique of the LLE, Mahoney and Kiernan (2024) postulate that LLE creates a major shift in how LLL will be understood globally (p. 2). That is, LLE will shift the view of HE as primarily for young people (p. 2) to a view described by James and Awesti (2023) as “a system where the fundamental ambition should be to allow all people to cultivate their interests and acquire understanding, experience, and skills in disciplines and areas that excite and intrigue them” (n.p.). Leaders from the Global North in my study said that although the implementation of reimagined LLL for all may be the global challenge of education currently, HE cannot proceed to implement it because it would require many systematic changes, the government mandate for HE does not currently include reimagined LLL, and the government’s funding of HE does not support it. However, the research shows that in at least one major Global North country, change is afoot which demonstrates how these three reasons for not implementing reimagined LLL in HE in the Global North may be overturned. This perspective of HE leaders in the Global North in this study was different from that of their counterparts in the Global South.

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When HE leaders acknowledged that the conversations about implementing reconceived LLL for all were happening, that action was being taken, and a role for AI was being defined, these leaders were usually from the Global South. In fact, every leader in this study from the Global South identified LLL for all as the current educational priority. And a few of these leaders acknowledged a concrete role for AI in realizing that priority. For HE leaders in the Global South in this study, it was not a question of whether they could afford to offer LLL for all but whether they could afford not to. As one leader from the Global South said:

As a university, we stand for lifelong learning, and we believe in the recognition of prior learning. Not only for people who want to advance their knowledge in any specific area, but for displaced communities, for refugees, for people who may find themselves in some kind of difficulty, whether affected by war or any other thing that displaces them and disrupts their learning journey in a traditional formal school setting. (HE, Global South, Vice-Chancellor)

While HE leaders from the Global North and South had contrasting views on the uptake of LLL, most K-12 leaders, regardless of location, identified as their core work the development of the dispositions of LLL. The development in students of attitudes, values, and perspectives such as curiosity, imagination, resilience, self-regulation, appreciation of the ideas, perspectives and values of others, the ability to move forward in the face of adversity, and the ability to think for oneself was identified as essential. These leaders did not say that these were the dispositions of lifelong learning despite identifying the very same attitudes, values, and perspectives that characterize it today. Rather, these leaders identified that these were the attitudes and dispositions that young people should carry with them for a lifetime. As one K-12 leader said:

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Curiosity, empathy, adaptive problem solving, adaptive thinking, creative problem solving, advocacy, self-direction ...are the long-term outcomes we want for our kids, so that they can be successful learners and successful adults. (K-12, Global South, Principal)

Recent literature provides K-12 educators with guidance on how to teach the skills and dispositions of LLL. For example, Ramesh's (2025) work in India, provides guidance for teaching lifelong learning skills through STEAM (science, technology, engineering, arts, mathematics) education in K-12. Zhan et al.'s (2025) book on interdisciplinary teaching makes the case that its value in Chinese K-12 education is that it teaches the skills of LLL including "critical thinking, innovative thinking, communication skills, collaboration skills and other 21st century competences to effectively tackle the complex challenges of future life and work" (p. 19). Kennedy and Sundberg's (2025) Swiss published article identified "cross-cultural communication skills, collaboration skills, critical thinking, problem-solving... adaptability, resilience, and digital competency, especially in regard to navigating unexpected challenges" (p. 461) as essential to be taught through problem-based, project-based, and phenomenology-based learning (p. 472). In short, the readily available guidance for K-12 teachers is global. It demonstrates the current emphasis on teaching the skills and dispositions of LLL in K-12 regardless of locale.

Why This Finding Matters

There are three significant reasons why it matters how leaders of schools/institutions view the current LLL agenda. First, when identifying what help is needed for leaders, context is important. That is, if a leader references lifelong learning as adult retraining or they don't see how they can possibly address it given that there are existing challenges

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such as financial shortfalls, the suggestions for support for leadership will be different. The suggestions will be different from those for a leader who is currently using AI to assess a student's prior learning and to welcome them into targeted micro-credentials regardless of whether they are a displaced person or someone seeking professional upgrading. The second significant reason why such geographical differences in leaders' perspectives of the pursuit of greater equity for all in LLL matters is because of its effect on global success. These geographical differences may negatively impact the success of education globally to address the current global sustainability crisis. Any universal progress may be delayed, stilted, or endangered if there are large numbers of institutions in the world where reimagining LLL for all is not seen as a priority. Until such time as all educational leadership, regardless of location or level, act locally to implement the global agenda to address sustainability issues through LLL, any universal equity with respect to increased opportunities for lifelong learning for all will be lacking. The third reason that such geographical discrepancies matter is that the identification and use of AI as an ally in the pursuit of that greater good may also be impacted. In other words, if the prioritization of reimagined LLL for all through the development of human capability is globally uneven, the risk increases that the implementation of AI will become an end unto itself in education, a technology that is implemented for its sake alone rather than as the potential ally it might be, in the realization of the global imperative for change. If a higher purpose for AI is not identified, mandated, acted upon, and committed to, leaders may very well not involve themselves in AI's design and development as actively as they might to the detriment of education.

Key Finding 7: Most Leaders Have Not Connected Increased Equity of Opportunity of Lifelong Learning with AI

Most of the leaders of this study did not connect AI as an ally or support in the current pursuit of LLL. More than 80% of the leaders of this study did not identify how AI might be useful in that work. There are several reasons why that connection may not have been made. Those reasons will be explored and connected to current research to determine their validity. The significance of this finding will then be summarized.

First, leaders may not have made a connection between LLL and AI because they are not fully aware of the capabilities of AI. The rapid advancements of the AI field and the challenge associated with staying current in the field were noted by the leaders of this study as previously described. The research supports the leaders' observation. For example, in a recent community-authored paper, Holmes et al. (2025) explored the results of a survey of 185 researchers, educators, and policymakers from 56 countries who said, "Keeping up to date with research and developments requires time – something the rapid advancements in AI often do not allow" (p. 13). Their finding also correlates with Cavalieri Gonçalves Pelоче's (2024) study. She found that teachers had a lack of understanding of the affordances of AI (p. 228). Although neither of these two studies looks specifically at educational leadership, the rapid pace of development in the field of AI is making it difficult for many people in education to keep up. Educational leadership may be no exception. As a result, how AI may serve to assist with the implementation of greater equity of opportunity for all through lifelong learning is not a connection that most leaders of my study are currently making. As one leader of this study said:

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At this stage, there's no widespread perception that generative AI is going to increase equitable opportunities. There's no such perception. (HE, Global North, Special Advisor to the President)

A second reason why the connection between AI and LLL is not being made by leaders may be because it is simply too early in education's thinking about AI. As one leader of my study said:

"Keep in mind that distance education and lifelong learning were there for many decades, but [faculty]couldn't appreciate this approach until the moment that they became a standard in their life. So, talking about AI, at that level of sophistication, it takes time. (HE, Global North, Director of Advanced Educational Technologies and Mobile Application)

The research also supports this line of thinking. For example, Luckin et al. (2022) explored the concept of AI readiness and provided a framework for working on it. They said that one of the advantages of AI readiness is that it helps educators see AI as a tool for connecting (p. 9). In the case of the leaders of this study, they are generally not connecting AI to the global challenge of increased equity of LLL. They are not yet seeing AI as an ally in the global agenda for educational change with the capabilities of AI. The sophistication of these ideas is, as one leader of this study said, not yet understood:

[T]his...is a sophisticated idea and so, my sense is that the conversation hasn't drifted down to schools...we're still about moving successfully to the next stage of learning. (K-12, Global North, Principal)

Another reason why the leaders of this study are not making the connection between AI and LLL may be because LLL still retains connotations of a discrete adult retraining unit. The physical separation of LLL from the rest of the HE institution may symbolize how LLL is viewed. That is if LLL is housed in a separate unit to serve a separate group of people requiring adult retraining, then it is unlikely connections are being made by

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leaders or others about how AI might be an ally in reimagining LLL for all through the development of human capability. Some leaders of this study said reimagined LLL for all was important, but it was not infused in their school/institution in any systematic way. Assefa et al.'s (2024) meta-synthesis of the literature on higher education's role in promoting lifelong learning reveals that moving beyond a rhetorical commitment to LLL is a challenging process for leadership (sect.5). Their study reveals that lifelong learning changes can be optimized in higher education institutions through responsive leadership including goal setting, funding packages, and stakeholder partnerships.

Another reason why leaders may not have made a connection between LLL and AI may be because these leaders may not have a full understanding or appreciation for the elements of reimagined LLL. In the case of K-12 leaders in my study, who said their school placed a high priority on teaching certain values, skills, and dispositions. These leaders did not say that they were LLL values, skills, and dispositions. Similarly, HE leaders of this study from the Global North may not have connected the concepts of nonformal and informal learning with the work of HE. As previously noted, with more than 1.6 billion K-12 learners out of school worldwide (UNESCO, 2021) there is a need to implement scalable solutions. Helping formal education recognize and credential nonformal and informal learning, both of which are key elements in reconceived LLL for all, could be a concrete role for AI. Abbas et al.'s (2025) study identifies that AI can successfully assist learners in nonformal settings and potentially alleviate learning deficits in a wide variety of populations. It is studies like theirs that should encourage leaders to consider the role of AI with respect to the recognition of informal and non-formal learning. Johnson & Majewska (2022)'s literature review shows that non-formal

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learning is less clearly understood. Although they say that non-formal learning is under-represented in literature (p. 6), non-formal learning has been referenced in cross-national policy contexts (p. 4). Johnson & Majewska (2022) note that non-formal learning “is most easily understood in its negative sense, i.e., as being ‘not formal’” (p. 4), so it is essential that leaders explore its meaning before a role for AI is identified. It may be that the leaders of my study do not connect AI with the LLL agenda because they do not yet have a full understanding of reimagined lifelong learning and therefore, how AI might be of assistance in that pursuit.

Regardless of the reasons that any one leader might have for not connecting LLL with the capabilities of AI, the emphasis in education on helping people earn credentials is not changing. In fact, some leaders of this study said that such an emphasis is growing in all parts of the world. As one leader of this study said:

The concept of liberal education as practiced in some campuses here in OECD countries is no longer appealing. They want people to be connected to skill building systems. They want education to lead to higher income productivity, etc. They believe that's what gives better citizenship, not a possession of new knowledge alone. There's a definite move in that direction. So, any discourse on lifelong learning, the first thing is always about credentialing. (HE, Global North, Special Advisor to the President)

Credentials are not seen by the leaders of this study as the barrier to the LLL agenda but as the means for considering how education might be packaged differently to benefit more people in more places. For example, some HE leaders of my study said that they had been reviewing the courses offered by their institution to see how they might be reconfigured into micro credentials. The literature supports this current popularity of focus on micro credentials. Bideau and Kearns's (2022) showed that micro credentials are an essential tool of lifelong learning while Gamage and Dehideniya's (2025) critical

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narrative review explores the “transformative potential of micro-credentials and... analyses the impact of micro-credential programmes on non-traditional learners” (p. 1). Gamage and Dehideniya go so far as to say that micro credentials are revolutionizing both HE and LLL (p. 1). While Galindo et al. (2024) wrote that micro credentials are “favored by historically and systematically excluded learners who find it challenging to commit to the financial and time requirements of higher education pathways. This allows micro-credentials to close the gap” (p. 23). Such research supports this focus on credentials as a priority for both the Global North and the Global South. The role of credentials in LLL is valued in schools and institutions. It is the connections between LLL, credentials, and AI that has not fully been made by the leaders of my study.

Why This Finding Matters

If educational leadership is to make progress towards reimagined lifelong learning for all, there is a need to recognize where they might find help to do so. Leaders might find that help in understanding how they can learn more about AI’s capabilities despite the rapid pace of development. They might find that help by making connections between AI and the other challenges that they face, including the global challenge to increase equity of opportunity for all with respect to LLL. They might find that help by pursuing new conceptions of curriculum that makes a place for learning that happens in less formal ways beyond the physical or virtual walls of education. They might find that help by using the value placed on credentials to think about more ways in which they might be earned. The context of leaders matters as has been pointed out in this paper previously. Any help that a leader of a school or institution seeks will need to address context. The

next section of this discussion of the research findings focuses on the specific support that might be provided using the conceptual framework of this study.

Discussion of Leadership Supports as Defined in the Literature Review

The conceptual framework of this study as explored in Chapter Two, is comprised of five constructs. They were chosen because they may provide educational leadership with necessary support for action as leaders K-20 confront the question of whether they are preparing themselves thoroughly enough for the global, educational, AI-enabled revolution that has only just begun. These constructs were also chosen because there are natural connections and progressions from one construct to another as explained in Chapter Two. The premise is that leadership's depth of understanding and use of these five constructs may influence their success as they act locally in recognition of this consequential moment in human history: a world that is unsustainable should we not all accept the responsibility to change, a mandate for education to lead us, the realization of a hopeful agenda centred on lifelong learning for all, and the potential of powerful technology in the form of AI to help us succeed. Understanding and use of these five constructs as leadership supports will depend too on which of the three approaches described above leaders have adopted to the pervasive infusion of AI into the educational exercise and whether they see that approach as continuing to be adequate.

Study Constructs 1 and 2: Supporting Leadership by Building Deeper Understanding of Lifelong Learning (LLL) as the Development of Human Capability

Those best positioned to address this global challenge of increased equity of opportunity of LLL for all through the development of human capability reside in the senior leadership roles of schools and institutions. We know this because the research

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shows that without the involvement of senior leaders in educational change, it is unlikely to succeed (Fullan, 2007; Leithwood et al. 2004, 2008, 2020). Some leaders from my study have taken on the challenge as their own. The support they need will be different from those who have not yet done so. What follows then are possible recommendations for leadership on how they might proceed.

Although these recommendations are written for leadership there very well may be value in staff/faculty in pursuing the same recommendations. These recommendations are not meant to be a recipe for success; rather, they are an attempt to provide a selection of potential strategies from which leaders could choose what is most worthwhile for them. Which recommendations a leader might undertake will depend on the seven key findings of this study, that is, their view on the benefits and risks of AI, their perception of the challenges and opportunities of AI, to what degree they see this implementation of technology as different from prior implementations of technology, their view on the involvement of Big Tech on the implementation of AI in education, their approach to leading AI implementation, their prioritization of AI integration, and how well they connect the global challenges of sustainability to AI-enabled LLL. In the end, how leadership employs the concept of LLL through the development of human capability as currently understood, will help provide meaning and focus to the further design, development and adoption of AI into their school/institution. In so doing, a greater purpose for AI in education will be defined. The following recommendations for leaders are provided as potential next steps in developing deeper understanding of LLL and human capability theory and how such deeper understanding might support leaders in

their quest to act locally to implement equity of opportunity in LLL through human capability enabled by AI.

Recommendations for leadership action.

- Learn more about the current conception of LLL and how it has changed over time.
- Learn why and how this shift has occurred.
- Develop personal and institutional awareness of the global challenge of increased equity of opportunity for LLL for all through the realization of human capability.
- Learn about the theory of human capability and how such a theory relates to reimagined LLL.
- Find a partner leader from a school/institution from the opposite part of the world (i.e. Global South for an institution in the Global North and vice versa) and talk about the concept of reimagined LLL, the challenges of sustainability, potential roles of AI in that pursuit, how formal, informal and non formal learning are being valued and recognized.
- Parse current curriculum offerings to expand micro-credential offerings that employ a competency focus.
- Explore what competency focus is and why it holds promise in the global challenge for LLL.
- Identify a role for AI in the design and delivery of repackaged curriculum offerings for an expanded usership.
- Begin the work of staff/faculty development to identify the conversations that are happening globally about LLL through the development of human capability, the initiatives that are already underway, the gaps between Global North and Global South and why they exist, how you and the institution can shift understanding and perspectives.
- Form a LLL enabled by AI strategic planning team that gives purpose to the implementation of AI.
- Identify competencies and how the current paradigms can be changed to support a competency-based approach.

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- Lobby government funding to re-identify priorities and fund them as special projects.
- Form alliances with other schools/institutions to create projects, to devise shared goals and to share findings broadly.
- Develop a deeper understanding of the concepts of informal and non-formal learning and their value to human capability development.
- Discover the ways that AI can be used to validate non-formal and informal learning.
- Find and share broadly the data from UNESCO on the number of unschooled children, on LLL global initiatives.
- Reflect on what the value is of what is added locally to the global mandate for change.
- Share your reflections and ask students, staff/faculty to do the same.
- In K-12 use the language of LLL and the development of human capability when referencing the core work of the development of attitudes, values and perspectives.
- In K-12 prioritize, identify, and celebrate the joy of learning at least as much as standardized test scores.
- In K-12 bring parents, grandparents., community members, caregivers in to share their journeys of LLL.
- Hold celebratory festivals and use public forums in HE and K-12 to share personal LLL journeys of students, staff, faculty, and other stakeholders to develop a shared vision of the diversity of LLL experiences and the development of human capability over time.
- Model the joy of learning.
- Identify which barriers to adopting the LLL agenda are most challenging and create strategic plans to address them.
- Identify a role for AI in tackling the barriers.
- Consider how to implement community impact days.
- Identify what AI can do that will save you time to work on these actions.

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- Reflect individually and publicly on the value added of public education in the pursuit of reconceived LLL for all.

Study Construct 3: Supporting Leadership through the Development of Deeper

Understanding of AI

Chapter Two outlines the reasons for educational leadership to become more actively involved in the design and development of AI for education. Some leaders of this study noted that it is essential to want to take this work on and, if you don't want to do that, then your leadership may very quickly become irrelevant. But the reasons that leaders should want a deeper understanding of AI extend beyond their own potential irrelevancy. As this study found, a deeper understanding of AI may allow leaders to use the power of AI to do more than reinforce current learning structures and paradigms. The creation of fresh ideas for how AI could support learning for a lifetime is best done, as one leader said, by those who do the work of supporting learning every day, leaders of schools and institutions *"the educational leaders that have actually been there and done that and have the scars to prove it are the ones that need to be at the table."* (K-12, Global North, Senior AI Consultant). Poquet and de Laat (2021) said that AI has the power to reconceive of learning in more comprehensive ways and has the power *"to interact with human activity, not just mediate it, and to do so at unprecedented speed and scale"* (p. 1696). Such interaction with human activity in education can include the implementation of lifelong learning for all.

The responsibility for leaders to immerse themselves in understanding, using, designing and developing AI requires that leaders rely on evidence. That is, the value educational leadership brings to the exercise is their inherent understanding of the necessity of evidence to the applications of AI. For without evidence of the benefits of AI

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to reconceive learning for all, the risks or harms may outweigh the value that AI brings to the expanded development of human capability through lifelong learning. Therefore, the value of locally led project-based research and learning is that it allows leaders to gain knowledge, skills, and confidence, all of which promote reflection and action.

The questionnaire confirmed that for some leaders there are gaps in their understanding of the subdomains of AI. These gaps matter because to speak with others about the vision moving forward, leaders must have some understanding of what they are talking about. A minority of leaders in this study had an in-depth understanding of AI and its capabilities; some leaders identified that they had no understanding of some of its capabilities while most leaders had some to a little understanding. The least well-known concept of AI by respondents was Intelligent Decision Support Systems while the best-known concepts were Generative Pre-Trained Transformers and Large Language Models. Leaders must accept their responsibility to learn more about these concepts. But as survey respondents identified, AI technology may leave some educators behind including themselves. Therefore, a commitment to learning more about AI is essential. A few leaders identified the necessity of learning as critical to leaders' success and influence we they said things like:

All leaders, irrespective of whether it's a university president or a school principal or someone below, they should understand the emerging paradigm of AI... leaders do have to invest time. They do have to invest energy in picking this up. Because if they don't play a role, a molding leadership kind of a role, they risk being totally sidelined. (HE, Global North, Special Advisor to the President)

This is not all work the leader must undertake in isolation. As described earlier, sharing leadership with others must be undertaken. Holding onto the notion of solitary leadership in this moment may be limiting at minimum and harmful at maximum. A team

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approach characterized by courage, collaboration, and reflection may be very worthwhile. Some leaders acknowledged the proliferation of AI experts that have seemingly sprung up overnight. Some leaders are rightly cautious about who to trust and how to ensure the precious minutes of learning time for staff and faculty are not used erroneously. As one leader of my study said:

We must be super careful because everybody's saying they're an [AI] expert right now. I get bombarded almost two emails a day on people wanting to come to the school and provide services. And so, I've had to make careful considerations of who's coming in and who's supporting us. (K-12, Global North, Principal)

Once again, the following recommendations are made to help leaders move toward an increased understanding of AI to support them in their work to face locally the challenge of enabling AI to support LLL for all in the sustainability crisis.

Recommendations for leadership action.

- Formulate a “what I need to learn about” list about AI capabilities and decide what you will learn more about each quarter of the year and enable others to do the same. Topics for consideration: Artificial Neural Networks (ANN), Deep Learning (DL), Educational Data Mining (EDM), Expert Systems, Generative Artificial Intelligence (GAI), Generative Adversarial Network (GAN), Generative Pre-trained Transformer (GPT), Intelligent Decision Support Systems (IDSS), Intelligent Tutoring System (ITS), Large Language Models (LLMs), Machine Learning Programs (MLP), Natural Language Processing (NLP).
- Build a team of leaders who represent a variety of perspectives. Rotate people in and out of these “seats”. For example, include a role for a mathematician, an historian, a philosopher, a pedagogy expert, a technology expert, and so on. As an action team, devise a vision for the further integration of AI to improve LLL for all in two years and in five years. What will the criteria be for further AI adoption? In this vision, how will you protect space for community, engagement

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with others, etc.? How will you ensure that the role of public education as a public good is emphasized?

- As new staff/faculty are hired prioritize AI talent.
- Decide with your staff/faculty what quality professional learning looks like then work to create opportunities for staff/faculty to articulate their concerns about being left behind.
- Formulate plans to ensure that collectively there are opportunities to learn through formal professional learning, communities of practice, co-teaching, sharing sessions, etc.
- Identify the most common and uncommon uses of AI, where you will move next with respect to integration.
- Conduct your own research with students, add to the collective pool of knowledge.
- Read, discuss, investigate which of these risks of AI are being addressed by whom, how, and where.
- When working with technology companies or when building your own AI apps and installations, identify what you see as the greatest risks, concerns, challenges and ask how they are responding to them or how you will respond collectively. What safeguards will be built in?
- Discuss, co-identify, articulate the value-added proposition of formal education at all levels that address such AI risks and challenges.

Study Construct 4: Supporting Leadership by Building Deeper Understanding of Self-Determination Theory

Chapter Two identified the principles of self-determination theory as one of the study's five constructs. In this theory, autonomous motivation or "acting with a full sense of volition, endorsement, and choice" (Ryan & Deci, 2024, p. 1) is on one end of the spectrum and controlled motivation or "feeling externally pressured or compelled to behave whether by the promise of a contingent reward, fear of punishment, ego

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involvement, or other external factors” (Ryan & Deci, 2024, p.1) is on the other end.

Media headlines about AI or the emergence of AI policy development in education may act as extrinsic motivation for leaders to learn more, to adapt practices and beliefs, and to lead others to do the same. But such motivation may be short-lived. According to self-determination theory (SDT), extrinsic motivation is the least autonomous type of motivation (Ryan & Deci, 2024, p. 3). Rather, the goal must be to have leaders internalize and personally identify the need for education to change in the face of the new global agenda for LLL for all through the development of human capability, and to want to involve themselves actively to help realize the potential of using AI in positive ways to enable those changes.

This study showed that leaders who had greater AI literacy expressed a greater sense of control and vice versa. Such knowledge and understanding came from doing their own inquiry and designing their own instances and applications of AI in their own buildings. These leaders expressed a greater sense of control than others who were not doing so. Leaders who expressed this greater sense of control and autonomy were motivated to learn about AI. They placed a high value on their own development of knowledge about AI because it gave them a sense of control and it made their leadership of AI meaningful.

Leaders' feelings of competence, autonomy and relatedness have a direct impact on their willingness to step in front of this global challenge to act locally. Leaders should recognize that their motivation, driven by feelings of competence, autonomy and relatedness, also applies to those they lead. The approach to leadership described above as future-focused, active, and immersed in AI while consciously committed to their own learning and that of others, regardless of uncertainty, seemed to produce stronger feelings

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of autonomy, competence and motivation. The following recommendations for leaders are provided as potential next steps in developing deeper understanding of self-determination theory and how it can provide support in the quest to act locally to implement equity of opportunity in LLL through human capability enabled by AI.

Recommendations for leadership action.

- Learn more about the concepts of the centrality of autonomy, competence, and relatedness and their effect on human motivation as described in self-determination theory.
- Reflect on your own feelings of autonomy, competence, and relatedness and decide what is within your control to change or improve.
- Define your guiding vision for both LLL and the further integration of AI to support it. Share it and openly ask for ideas to strengthen it.
- Build your own local instance/ apps for AI to increase engagement and confidence
- Ensure that the AI system you use responds to educator's judgment and to learner's social and emotional needs.
- Ensure that the system you use protects and includes local culture and context.
- Ensure that the system you use improves the life of the most disadvantaged student and be able to explain how that happens (Gabriel, 2022, p. 225).
- Work with other leaders to influence the creation of mandatory AI assurance frameworks to be used as audit tools that protect student and educator agency in the educational experience.
- Adopt an approach to change that is team-based, coordinated, unified and inclusive.
- Employ rapid and iterative approaches to policymaking.
- Reach across districts, jurisdictions, educational divisions to talk principles and strategies with other leaders.
- Use scenario planning to improve feelings of control.

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- Articulate your expectations with governance boards regarding what is under local (i.e. school or institution) control and why that is necessary for success.
- Choose rigorous engagement over passive complacency even when mistakes are made.
- Lead by example with respect to a “frontier” mindset, that is one that is open to learning from experience, with a focus on local freedom to manage one’s own destiny, resilience in the face of challenge, and earmarked by flexibility and adaptability.
- Serve others ethically, and with integrity so they, in turn, will do the same.
- Invite others into your building to share their AI and LLL experiences and perspectives.

Study Construct 5: Supporting Leadership by Building Deeper Understanding of Moral Intelligence

Leaders said that they needed help to learn how to talk about the competencies of moral intelligence with staff/faculty and students. Leaders had questions and concerns about what to call it and how to ensure a systematic approach to teaching it at all levels. Many said they felt unprepared to do so at this time. Leaders identified both the worthiness and the challenges of leading or enabling professional learning about moral intelligence for staff/faculty but had few concrete suggestions about how this might be undertaken. Even though frameworks for doing so do exist, none of the leaders referenced any frameworks during the interviews. The research supports the almost unanimous observation of leaders of my study that more learning about moral intelligence and how it relates to the ethics of AI is needed. For example, Kamili et al.’s (2024) study of the complex nature of AI ethics showed that there is a need for “targeted professional development on AI ethics, collaborative policy making and a multidisciplinary approach to promote ethical use of AI in higher education” (p. 1). The following recommendations for leaders are provided

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as potential next steps in developing deeper understanding of moral competencies and their relationship to ethical decision-making might support leaders in their quest to act locally to implement equity of opportunity in LLL through human capability enabled by AI.

Recommendations for leadership action.

- Invest time and energy in exploring moral intelligence frameworks and how they may help you lead this moment in time.
- Discover what they might offer in terms of helping staff/faculty teach for them in reference to AI.
- Sort out the lexicon you feel comfortable using as a school/institution such as risk awareness or ethical awareness or staying safe or moral competencies, etc.
- Seek ways to systematize the introduction of moral competency teaching into AI instruction through organized schemes of work.
- Work with those in business, industry, and the helping organizations to have them talk about their AI use and their ethical frameworks, how moral competencies are exercised.
- Use AI ethical dilemmas to start staff/faculty meetings or write about them in your regular posts to staff/faculty.
- Discuss, co-identify, articulate the value-added proposition of formal education at all levels that address AI risks and challenges.
- Spend time with and catalyze conversations around the fundamental questions: what is learning; what is knowledge; what is the role of human agency in an AI infused world; what is the role of leadership; what is the moral responsibility of education; what is ethical behaviour when it comes to AI; and what is the value proposition of AI-enabled education.
- Invest in action research on teaching for moral competencies regardless of what you call them.
- Boards of Governors of Ministries of Education will need provide moral safety if they want leaders to embrace AI.

Limitations of the Study

The limitations of these findings include the fact that particular leaders from particular places in the world at a particular time in history voluntarily shared their perspectives and experiences. A different group of leaders from different places in the world may have affected the findings in different ways. Also, these findings are for this moment in time, as previously mentioned. At a different point in this journey towards greater AI integration into education perhaps their thoughts and experiences as conveyed in this study may have been different. This study sets out to explore the perspectives and experiences of leaders in formal roles in schools/institutions. In no way does this discount the value of those who lead in informal ways. Had the perspectives and experiences of those in informal leadership roles been shared, the findings of this study also may have been different.

Chapter 6. Conclusion

This study began with the premise that it is currently unclear if leaders of K-20 publicly funded educational institutions understand what is meant by a new global agenda for education focused on the realization of lifelong learning for all, whether they see themselves as responsible for co-designing the use of Artificial Intelligence (AI) in education to help realize that mandate, or whether they see how they might use their positions of soft power and influence to help shape change. There is an urgency to the question of why there is not greater equity of opportunity for people the world-over to realize their human capabilities in the pursuit of lifelong learning (LLL) when we already know that greater learning by all is the best weapon in the fight for sustainability. That is, we know that “[g]reater investments in education are also linked to more peaceful, equal, inclusive and open societies, greater civic engagement, a more likely embrace of democratic values, and stronger social cohesion” (UNESCO & Global Cooperation Mechanism, 2024). Further, LLL is one of the most recommended strategies for achieving the global sustainability agenda (Prieto-Jiménez et al; 2021, p. 12). AI may very well be the very ally that is needed to bring LLL for all to fruition. Therefore, this study began with the assumption that today’s educational agenda is the global challenge of sustainability which is best addressed through increased equity of opportunity of lifelong learning for all. Increased equity of opportunity of LLL for all gives meaning and purpose to both the further implementation of AI into education and to public education itself. However, this study has shown clear divisions in the perspectives and experiences of those currently leading schools/ institutions with respect to their understanding of the current concept of LLL, the prioritization of greater equity of

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opportunity for the development of human capability, and the perceived benefits, risks, opportunities, and challenges for AI in those pursuits.

A number of factors have contributed to the identification of this agenda for educational change including the climate crisis, the spread of disinformation enabled by social media, the identification of global disparities in equity of educational opportunities as revealed by the Covid-19 pandemic, the displacement of hundreds of thousands of people due to global conflicts, the connection between education and health, employment, entrepreneurship, well-being and resilience (UNESCO, 2020). The Sustainability Development Goals (SDGs), particularly SDG4, as crafted by the United Nations, and 191 nation signatories (UNESCO, 2015), reflect the growing emphasis on this new educational agenda. The implementation of lifelong learning for all enabled by AI has been defined in the literature as a “grand challenge”, which is a complex problem with both technological and social components in need of innovative solutions (Ambos & Tatarinov, 2022). The capacity of publicly funded schools and post-secondary institutions to address this grand challenge will depend on their ability to renew and reinvent formal education (Ambos & Tatarinov, 2022, p. 93). This is work for today's senior leaders of schools and institutions all over the world.

With sustainability crises at their doorsteps, senior leadership of schools and institutions can ill afford to ignore the two imperatives impacting education today: the urgent need to increase equity of opportunity for lifelong learning for all and the further integration of AI into the educational experience to meet that need. The response that educational leadership makes locally to these two imperatives will require their careful consideration of the benefits and opportunities, risks and challenges of AI, their own

expertise with AI, and their recognition of what support might be most worthwhile. These were the same topics of this mixed methods research study which set out to uncover the practices and perspectives of educational leaders globally who work in different divisions of K-20 education in publicly funded systems. Sixty-five leaders from 25 countries responded to the call to participate. This final chapter provides an overview of the research project and summarizes its significance.

Review of the Research Project

The Research Context

This study targeted senior educational leaders who report to work inside a school or higher education institution that is publicly funded where education is a part of the country's Gross Domestic Product (GDP). These individuals had many different job titles as outlined in Chapter Four. All those who participated held a formal senior leadership role at or near the top of a school or institution's organization chart and had responsibility for leading teaching and learning. These are the individuals whose involvement is essential if change is to succeed (Fullan, 2007; Leithwood et al. 2004, 2008, 2020). This definition of senior leader was shared in the invitation to participate in this study with the assumption that these individuals would self-identify.

Often studies of educational leadership are undertaken for one leadership role or another, or within specific educational jurisdictions, or within one division (elementary, secondary, post-secondary). But the goal of this study was to understand the experience and perspective of senior leaders regardless of their division, job title, educational jurisdiction, or geographic location. As was argued in Chapter One, the justification for including leaders from all divisions in the same study rests in the context in which

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leadership of education currently does its work. This context binds leadership together in unprecedented ways. Today that common context is characterized by diversity, inclusion, and equity challenges, financial and environmental perils, the rise of politically polarizing milieus, the pervasive influence of digital technology, the permeation of AI into education, and a global educational agenda focused on lifelong learning for all.

This mixed methods research study set out to uncover the perspectives and experiences of educational leaders globally who work at different levels of K-20 education in publicly funded systems to try to understand if these leaders understand what is meant by a new global agenda for education focused on the realization of lifelong learning for all, whether they see themselves as responsible for co-designing the use of AI in education to help realize that mandate, and whether they see how they might use their positions of soft power and influence to shape change for the greater good.

Research Question and Outcomes

The main questions of this research study were:

- What do educational leaders K-20 see as the benefits/risks, opportunities/challenges of AI as a means for achieving greater equity for all in the pursuit of lifelong learning?
- What is the current level of expertise of educational leaders K-20 with respect to AI and what training/education is needed to implement AI in support of lifelong learning for all?
- How will specific supports help educational leaders K-20 to realize this universal mandate for change?

Each of the research questions was explored using subtopics. Appendices G to M summarize the data analysis for each research question by sub-topics and themes.

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Collective knowledge was created by asking educational leaders to identify their current perspectives and experiences with respect to these research questions. The creation of such collective knowledge from many leaders matters because it is from such collective knowledge that reflection by individual leaders may be enabled. The value of such reflection is that it leads to a sense of agency, and it is such agency that can help leaders to change their schools and institutions. Therefore, this study was designed to produce both practical and intellectual outcomes through influencing both actions as well as thinking by senior educational leadership. What any one leader chooses to focus on depends on their own context and their own understanding. Therefore, a range of recommendations were made in Chapter Five with the hope that leaders may find something of value to them within those strategies.

Method of Inquiry

The questions of this study ask “what” and “how”. Therefore, this study employed Mixed Methods Research (MMR) as its methodology as described in Chapter Three. MMR is defined as a method of research in which data is gathered and analyzed using both quantitative and qualitative approaches or methods in a single study (Clark & Ivankova, 2015, p. 4). The opinions, experiences and perspectives of leaders were captured quantitatively through a questionnaire and qualitatively through semi-structured interviews. The 45 interview participants came from 25 different countries, 12 of which were from the Global South and 13 of which were from the Global North. Questionnaire respondents (20) also came from the Global North (16) and the Global South (4). Both the semi-structured interviews and the questionnaires were conducted online.

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These leaders engaged in thinking that was genuine and exploratory. Their reflections were not devoid of emotion. Rather, they described their experiences, reflections, and perspectives of living in this moment as a leader of a school or educational institution and responding to the moment as best as they saw fit. That is, they embodied their responses and reflections. What they had to share could have comprised a few different theses; however, some key findings did emerge.

Key Findings

Seven key findings were identified. These key findings and why they matter were explored in Chapter Five. These findings were:

Key Finding 1: Leaders Identified that Roles Determine the Benefits of AI

Key Finding 2: Leaders' Opinion of AI Impacts What They Identified as the Risks of AI

Key Finding 3: Leader's Perception of the Challenges of AI Impacted their Identification of the Opportunities of AI

Key Finding 4: Leaders Identified the Current Role of Big Tech in the Implementation of AI as Problematic

Key Finding 5: Leaders' Perceptions of How AI Differs from Previous Technological Implementations Shaped Their Leadership Approach

Key Finding 6: Where Leaders Work and What Level They Work at Impacted their Perspectives and Prioritization of Lifelong Learning

Key Finding 7: Most Leaders Have Not Connected Increased Equity of Opportunity of Lifelong Learning with AI

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In addition, five potential leadership supports were identified. These five supports formed the conceptual framework for this study. They were chosen for their potential to support leaders to reflect and to act locally

Conceptual Framework Recommendations

The conceptual framework of this study was comprised of five constructs: lifelong learning (LLL), human capability theory, Artificial Intelligence (AI), self-determination theory, and moral intelligence theory. These five constructs were chosen because they may each provide educational leadership with necessary support for action as they confront the question of whether they are preparing themselves thoroughly enough for the global, AI-enabled, educational revolution that has only just begun. These five constructs were also chosen because there are natural connections and progressions from one construct to another as explored in Chapter Two. A summary of the potential strategies for developing deeper learning of each of the five constructs is provided below.

Construct 1 and 2: Developing Deeper Leadership Understanding of LLL as Human Capability

As previously stated, this study assumes that the global challenge of sustainability is the educational agenda of today. This global challenge gives meaning and purpose to both the further implementation of AI into education and to public education itself. However, this study showed clear divisions in perspectives and experiences of those currently leading schools/ institutions with respect to their understanding of the current concept of LLL, the prioritization of greater equity of opportunity for the development of human capability, and the perceived roles for AI in those pursuits. Those divisions were based on whether a leader was from the Global North or Global South and whether they

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were leading K-12 or HE. The leaders who are currently least likely to be taking on this global challenge as their core work are currently leading higher education institutions in the Global North. Several possible explanations for these differences were provided in Chapter Five.

Several recommendations for deeper leadership understanding of LLL as human capability were provided in Chapter Five. Which recommendations a leader might undertake will depend on the seven key findings of this study, that is, a leader's view on the benefits and risks of AI, their perception of the challenges and opportunities of AI, to what degree they see the implementation of AI as different from other technology integrations into education, their perspective of the role of Big Tech in the implementation of AI into education, their current approach to leading AI implementation, their prioritization of AI integration, and how well they connect the global challenges of sustainability to AI-enabled LLL. In the end, how a leader employs the current concept of LLL as the development of human capability will help provide meaning and focus to the further design, development and adoption of AI into their school/institution.

Construct 3: Developing Deeper Leadership Understanding of AI as a Leadership Ally

Fresh ideas are needed for how AI may do more than reinforce current learning structures and paradigms. That is, fresh ideas are needed for how AI might support lifelong learning and human capability development. The creation of such ideas may depend on how much leaders immerse themselves in understanding, using, designing and developing AI. In this study, leaders identified where their understanding of AI is limited. These gaps matter because to speak with others about the vision moving

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forward, leaders must have more than a passing understanding of AI. As respondents identified, AI technology may leave some educators behind, including themselves. Leaders have a responsibility to understand AI deeply if they are to tackle AI risks, limitations, and challenges in proactive ways through the actions they take. Once again, recommendations were made in Chapter Five to help leaders develop a deeper understanding of AI to support them in their work as they undertake the challenge of enabling AI to support LLL for all.

Construct 4: Developing Deeper Leadership Understanding of Self-Determination Theory (SDT)

SDT tells us that leaders' feelings of competence, autonomy and relatedness have a direct impact on their willingness to step in front of this global challenge through local action. Leaders of this study who had greater AI literacy expressed a greater sense of control. Such knowledge and understanding came from doing their own inquiry and designing their own instances and applications of AI in their own buildings. These leaders expressed a greater sense of autonomy than others who were not doing so. Leaders who expressed this greater sense of control and autonomy were motivated to learn more about AI. They placed a high value on their own development of knowledge about AI because it gave them a sense of control and it made their leadership of AI meaningful. Leaders who were future-focused, active, and immersed in AI while consciously committed to their own learning and those of others, regardless of uncertainty, seemed to have stronger feelings of autonomy, competence and motivation. Recommendations were made in Chapter Five to help leaders use a deeper understanding of SDT as potential leadership support in the face of these global challenges to change.

Construct 5. Developing Deeper Leadership Understanding of Moral

Intelligence.

When it comes to the development of moral intelligence, as it relates to the further integration of AI for the greater good, leaders of this study said that they needed help to learn how to talk about moral intelligence, to know what to call it, and how to ensure a systematic approach to teaching it at all levels. Leaders identified both the worthiness and the challenges of leading or enabling professional learning about moral intelligence for staff/faculty but had few concrete suggestions about how this might be undertaken. Even though frameworks for doing so do exist, none of the leaders referenced any frameworks during the interviews. It seems that there is much learning for leaders to do themselves about what the competencies of moral intelligence are and how to lead instruction of them to help ensure that ethical AI is prioritized. Leaders seemed strongly inclined to recognize the value of doing so but admitted that they needed help to undertake it in any meaningful way. Recommendations were made in Chapter Five for how leaders might use understanding of moral competencies as leadership support.

Contribution to the Field

This study contributes to the literature by showing that without the proper involvement of educational leaders in the design, development, and implementation of AI in education, the risk is that AI becomes an end unto itself thereby failing to realize the grand challenge of lifelong learning for all through the development of human capability. This study considers the fact that two universal challenges have presented themselves to educational leadership across all divisions at a time in history when contextual challenges to education are already both common and significant. This study

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identifies those universal challenges as the permeation of AI into the educational exercise and the improvement of equity of opportunity for lifelong learning for all. These global challenges are not inconsequential. This study identifies the potential of AI to be an educational leadership ally in the search for solutions. This study contributes to the research literature by identifying a framework of constructs that when fully understood may act as support in leaders' quest for success. Which constructs may be of greatest support may very well depend on leaders' current level of understanding of both lifelong learning for all and of AI. Finally, this study makes a case for returning educational leadership to its rightful place in the design and development of artificial intelligence for the greater educational good.

Recommendations for Further Research

This study has revealed other avenues for further research. Specifically, it would be beneficial to understand how the five constructs of this study support leaders to become more successful as they lead the integration of AI in the pursuit of LLL for all. Do these supports give meaning and purpose to the integration of AI in ways that have been missing for educators? In addition, further research would be beneficial with respect to the three-part leadership approach to the integration of AI as described in Chapter Five. Purposeful, active involvement by leaders in the design and development of AI for education and for the pursuit of greater equity of opportunity for all to realize their human capability through lifelong learning benefits from a stance of future-oriented, active, and immersive leadership dedicated to greater knowledgeability about AI and how it might enable reimagined LLL for more people. It also positively impacts the leader's sense of motivation. That is, the closer one aligns one's approach to leading AI

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to this leadership stance the more likely leaders are to feel a greater sense of efficacy in this unique moment in time. This is true for leaders from the Global North and the Global South and in HE and in K-12. However, only identifying such patterns does little to help leaders identify what they might do next. It would be worth considering how, in the long term, the three approaches to leadership described in this study turn out. Do one of the three leadership approaches found in this study help realize more purpose-driven, humancentric, and systematically designed AI?

In addition, the motivation for undertaking this study draws upon a strong belief in the value that those in formal leadership roles add, not only to their schools/institutions, but to their larger communities. Additional research could identify how such influence is undertaken in various parts of the world and what the impact of such soft diplomacy is on the larger community and its perceptions of AI.

This study has benefited from the willingness of leaders to share their perspectives of and experiences with AI and the global challenge to improve LLL for all. However, this study has captured those perspectives and experiences in this moment in time. Two years from now these same leaders very well may have different things to say. It is worth considering what leaders see today as the benefits and challenges of AI, their current level of expertise with respect to AI, and what support they might need with respect to implementing AI for LLL. But it may be worth exploring these same leaders' perspectives and experiences over time to see how they might differ in six months or a year. The hope is that in capturing these perspectives and experiences now, leaders may gain understanding of where they might head next with respect to their leadership of AI enabled LLL for all. As they use the constructs of this study to support them in their

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work, how might their perspectives and leadership change? The opportunity to revisit these same research questions again may be very worthwhile.

Summary

In some ways, public education stands at the precipice of the most significant moment in the history of its leadership. If greater global equity with respect to reimagined learning for life is to finally be realized with the assistance of AI, then educational leaders of publicly funded schools and institutions everywhere must take responsibility to act locally. These leaders must be prepared to engage in the continued design, development, and implementation of AI in educational settings for the greater good. But they must be supported in doing so. By acting locally in meaningful ways, by exercising leadership that is increasingly characterized as future-focused, immersed in understanding AI, and consciously committed to professional learning about AI regardless of uncertainty, educational leadership will model for their staff and faculty what they too must be willing to do. And by using a deeper understanding of today's conceptions of lifelong learning, human capability development, AI, self-determination theory, and the competencies of moral intelligence as support, the senior leaders of our schools and educational institutions may successfully meet this moment in time both individually and collectively. For “[w]hatever we become as these technologies become ubiquitous and we ubiquitously learn from them, it will be different from what we are now” (Dron, 2025, p. 13).

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Appendix A:

Keyways AI Impacts Lifelong Learning

Personalized learning	AI can assess individual learning styles, preferences, and strengths to create highly personalized learning experiences. This tailored approach ensures learners receive content and resources that are most relevant and effective, making the learning process more engaging and efficient.
Adaptive Learning Systems	AI-powered adaptive learning platforms can continuously adjust the difficulty and pace of learning materials based on a learner's progress. This helps learners stay challenged but not overwhelmed, optimizing their learning journey.
Skill Assessment and Gap Analysis	AI can assess a learner's existing skills and knowledge, identify gaps, and recommend specific courses or modules to address those gaps. This enables individuals to focus on areas needing improvement, making their learning more effective.
AI Tutors and Assistants	Virtual AI-driven tutors and educational assistants can provide instant feedback, answer questions, and offer guidance 24/7. These AI companions can enhance the learning experience by providing on-demand support.
Content Generation and Curation	AI algorithms can generate educational content like quizzes, practice problems, and textbooks. They can also curate and recommend relevant learning resources from a vast pool of online content.
Accessibility and Inclusivity	AI can improve accessibility for disabled individuals by providing features like speech recognition, text-to-speech conversion, and adaptive interfaces, making learning more inclusive.
Lifelong Credentialing	Blockchain and AI technologies can enable the secure verification of lifelong

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	learning achievements and credentials, making it easier for individuals to showcase their skills to employers and educational institutions.
Continuous Learning in the Workplace	AI can support ongoing professional development by identifying relevant training opportunities, tracking progress, and ensuring that employees remain up to date with industry trends and technologies.
Data-Driven Insights	AI analytics can provide valuable insights into learner behavior and performance, helping educational institutions and organizations optimize lifelong learning programs and resources.

(Fidalgo, P., & Thormann, J. (2024). The Future of Lifelong Learning: The Role of Artificial Intelligence and Distance Education.)

Appendix B:

Invitation to Participate in the Questionnaire

Study Title: Supporting Global Educational Leaders' Pursuit of AI-enabled Lifelong Learning for All

Name of Principal Investigator: Deborah Homuth, Doctoral Candidate, Athabasca University

Email: dhomuth1@learn.athabascau.ca

I am inviting senior education leaders of publicly funded schools and institutions at all levels (e.g. elementary, secondary, post-secondary) from around the world to participate in this study by completing a digital questionnaire. The target population to complete the study is 400 leaders representing 50 different nations and representing all three educational divisions. The questionnaire has 14 short-answer questions. It will take approximately 10-15 minutes to complete. The link to the questionnaire can be found below.

Artificial Intelligence (A.I.) may be of tremendous assistance in the search for solutions to global educational inequities and the pursuit of lifelong learning for all. A.I. may also change teaching, learning and educational leadership in many ways. This questionnaire is designed to find out how senior leaders are adapting to such a significant moment in education globally and what support may be most helpful. I plan to publish the results of this study in academic journals and present them at conferences as well as use them as part of my doctoral dissertation.

I will not collect any personal information about you. There are no known risks. The benefits to you lie in helping to complete the gathering of data for a study which potentially provides educational leadership K-20 with greater understanding of:

- a. The perspectives and practices of their global peers about the benefits, risks, opportunities and challenges of implementing Artificial Intelligence (AI) for increased equity of opportunity for lifelong learning for all.
- b. Leadership's current understanding of AI.
- c. How particular support may be beneficial in leaders' local quest for success with respect to this global challenge.

In short, involvement in this study may be of benefit to senior educational leadership K-20 by providing them with things to think about as well as things to do as they act locally to guide the deployment of AI for lifelong learning.

I am seeking the involvement of senior educational leaders K-20 from around the world. Research tells us that these are the individuals that must be involved for change to be sustained (Fullan, 2007; Leithwood et al. 2004, 2008, 2020). For the purposes of this study, I am defining senior educational leaders as those individuals who:

- ✓ Report to work inside a school (K-12) or higher education institution that is publicly funded where education is a part of the country's GDP exclusive of investment in private education.

Supporting Educational leaders' Pursuit of Lifelong Learning Enabled by AI

- ✓ Have a formal leadership role but many different job titles including but *not* limited to principal, vice-principal, heads of school, headmaster, school director, president, chancellor, vice-chancellor, provost, head, rector, dean; and
- ✓ Have responsibility for leading the teaching and learning of the academic program in a school or post-secondary institution.

The data gathered by this questionnaire will be stored on Athabasca University's institutionally supported systems. It will then be collated and analyzed to determine patterns and themes about the perspectives of educational leaders. Access to study data is limited to those researchers on the study team, as well as the Athabasca University Research Ethics Board which may request access to study data to ensure that the researcher has or is meeting their ethical obligations in conducting this research.

To open the questionnaire, click on the link below. By clicking the link and answering the questionnaire, I assume your willingness to participate.

Appendix C:
Study Questionnaire

Instructions

There are 14 short-answer style questions. The questionnaire will take approximately 10-15 minutes to complete. Once you have selected a response, go to the next question. If you don't wish to answer a question, simply move to the next question in the survey. If at any time, you don't wish to complete the survey, exit the browser.

Question 1: What is your job title?

Question 2: What is your school or institution's educational level? Select all that apply.

- a. Primary (e.g. student ages 4-8 years, grades Kindergarten to 3)
- b. Junior (e.g. a student ages 9-11 years, grades 4-6)
- c. Intermediate (e.g. a student ages 12-14 years, grades 7-8)
- d. Secondary School/High School/Gymnasium/Lycée/Vocational school
- e. Post-secondary College
- f. University

Question 3: Is your school or institution considered to be primarily publicly funded?

- a. Yes
- b. No

Question 4: Is your school or institution located in the Global North or Global South?

- a. Global North
- b. Global South

Question 5: Select the statement that best reflects your current understanding of the primary categories of AI applications explored in the education field.

5a. Artificial Neural Network (ANN): a computer model or machine learning program based on the organizational neural networks found in animal brains. The goal of these networks is to simulate human brain functions such as image recognition. They require large sets of data to be trained on and can recognize complex patterns in large sets of data, making it difficult to understand why the ANN made a specific decision. (Source: Luckin, 2016)

I have an in-depth understanding of what it is, how it is being developed, and its capabilities.	I have some understanding of what it is, how it is being developed, and its capabilities.	I have a little understanding of what it is, how it is being developed, and its capabilities.	I have very little understanding of what it is, how it is being developed, and its capabilities.
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5b. Deep Learning (DL): a form of machine learning that enables computers to learn from experience and understand the world in terms of a hierarchy of concepts. The hierarchy of concepts allows the computer to learn complicated concepts by building them from simpler ones. (Source: Kar, 2016).

I have an in-depth understanding of what it is, how it is being developed, and its capabilities.	I have some understanding of what it is, how it is being developed, and its capabilities.	I have a little understanding of what it is, how it is being developed, and its capabilities.	I have very little understanding of what it is, how it is being developed, and its capabilities.
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5c. Educational Data Mining (EDM): the analysis of various types of educational data by using statistical, Machine Learning, and Data Mining algorithms. (Source: Romera & Ventura, 2010)

I have an in-depth understanding of what it is, how it is	I have some understanding of what it is, how it is	I have a little understanding of what it is, how it is	I have very little understanding of what it is, how it is
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being developed, and its capabilities.	being developed, and its capabilities.	being developed, and its capabilities.	being developed, and its capabilities.
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5d. Expert Systems: AI software that mimics human experts solving complex problems such as diagnosing equipment failures or designing new equipment. (Source: Buchanan & Smith, 1988)

I have an in-depth understanding of what it is, how it is being developed, and its capabilities.	I have some understanding of what it is, how it is being developed, and its capabilities.	I have a little understanding of what it is, how it is being developed, and its capabilities.	I have very little understanding of what it is, how it is being developed, and its capabilities.
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5e. Generative Artificial Intelligence (GAI): the entire infrastructure, user interface, and data sets that when combined can create new data and content, improve the accuracy of analytics, and create virtual experiences. There are two GAI models: the Generative Adversarial Network (GAN) and Generative Pre-trained Transformer (GPT). (Source: Dwivedi et al., 2021)

I have an in-depth understanding of what it is, how it is being developed, and its capabilities.	I have some understanding of what it is, how it is being developed, and its capabilities.	I have a little understanding of what it is, how it is being developed, and its capabilities.	I have very little understanding of what it is, how it is being developed, and its capabilities.
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5f. Generative Adversarial Network (GAN): a type of Generative AI that employs two competing neural models: a generator and a discriminator. The generator produces new data that resembles the original data, whereas the discriminator differentiates between genuine and fake data. GANs can create realistic images that are practically indistinguishable from real images, and grammatically correct texts. (Source: Lin et al., 2024)

I have an in-depth understanding of what it is, how it is being developed, and its capabilities.	I have some understanding of what it is, how it is being developed, and its capabilities.	I have a little understanding of what it is, how it is being developed, and its capabilities.	I have very little understanding of what it is, how it is being developed, and its capabilities.
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5g. Generative Pre-trained Transformer (GPT): a type of Generative AI that is pre-trained on multilayer deep neural networks. ChatGPT, developed by OpenAI, is a large

language model (LLM) and one of the most powerful generative models that has gained widespread popularity since its initial release. ChatGPT is trained via transcription on a significant portion of the Internet alongside other publicly sourced data, such as Wikipedia, books, and videos. (Source: Kar, 2016).

I have an in-depth understanding of what it is, how it is being developed, and its capabilities.	I have some understanding of what it is, how it is being developed, and its capabilities.	I have a little understanding of what it is, how it is being developed, and its capabilities.	I have very little understanding of what it is, how it is being developed, and its capabilities.
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5h. Intelligent Decision Support Systems (IDSS): a user-driven, interactive, adaptable computer system that uses data integration and analytical tools. When AI is integrated into the system it becomes “intelligent” because it can employ predictive analytics for forecasting future trends and outcomes based on historical data by identifying complex patterns and anomalies using large data sets. Because IDSS can learn from past decisions it continuously improves its recommendations and insights. (Source: Phillips-Wren, 2013)

I have an in-depth understanding of what it is, how it is being developed, and its capabilities.	I have some understanding of what it is, how it is being developed, and its capabilities.	I have a little understanding of what it is, how it is being developed, and its capabilities.	I have very little understanding of what it is, how it is being developed, and its capabilities.
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5i. Intelligent Tutoring System: a computer system designed to provide individualized, personalized, adaptive and cost-effective instruction. (Source: Tsiriga & Virvou, 2004)

I have an in-depth understanding of what it is, how it is being developed, and its capabilities.	I have some understanding of what it is, how it is being developed, and its capabilities.	I have a little understanding of what it is, how it is being developed, and its capabilities.	I have very little understanding of what it is, how it is being developed, and its capabilities.
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5j. Large Language Models (LLMs): a class of models that are trained on a broad set of unlabeled data that can be used for different tasks. LLMs are designed to understand and generate text like a human. “They have the ability to infer from context, generate coherent and contextually relevant responses, translate to languages other than English, summarize text, answer questions (general conversation and FAQs) and even assist in creative writing or code generation tasks (Source: IBM). (Source: Brown et al., 2020)

I have an in-depth understanding of what it is, how it is being developed, and its capabilities.	I have some understanding of what it is, how it is being developed, and its capabilities.	I have a little understanding of what it is, how it is being developed, and its capabilities.	I have very little understanding of what it is, how it is being developed, and its capabilities.
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5k. Machine Learning Programs (MLP): a series of computer systems that automatically improve with experience and implement a learning process. (Source: Ayodele, 2010)

I have an in-depth understanding of what it is, how it is being developed, and its capabilities.	I have some understanding of what it is, how it is being developed, and its capabilities.	I have a little understanding of what it is, how it is being developed, and its capabilities.	I have very little understanding of what it is, how it is being developed, and its capabilities.
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5l. Natural Language Processing (NLP): enables computers to understand and interact with human language naturally. NLP is used for tasks such as machine translation and voice assistance. (Source: Chowdhary & Chowdhary, 2020).

I have an in-depth understanding of what it is, how it is being developed, and its capabilities.	I have some understanding of what it is, how it is being developed, and its capabilities.	I have a little understanding of what it is, how it is being developed, and its capabilities.	I have very little understanding of what it is, how it is being developed, and its capabilities.
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Question 6: Today Lifelong Learning (LLL) is seen as a means for developing curiosity, imagination, resilience, self-regulation, appreciation of the ideas, perspectives and values of others, the ability to move forward in the face of adversity, the ability to think for oneself ‘with a robust moral compass’ (Schleicher, 2018). Literacy is seen as essential to lifelong learning and human capability development, but it is now described as a way of being rather than a stage or state that a learner achieves, and formal and informal learning are valued as significant elements alongside formal learning in the journey to realize one’s own capabilities. How important is the implementation of change related to lifelong learning enabled by AI to your role?

Leading the implementation of AI applications for lifelong learning is currently an essential part of my role.	Leading the implementation of AI applications for lifelong learning is currently a somewhat important part of my role.	Leading the implementation of AI applications for lifelong learning is currently of limited importance in my role.	Leading the implementation of AI applications for lifelong learning is currently not an important part of my role.
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Question 7a: Moving forward, how likely are you to make the implementation of Artificial Intelligence to improve lifelong learning outcomes a school or institutional priority?

Supporting Educational leaders' Pursuit of Lifelong Learning Enabled by AI

- a. Highly likely
- b. Somewhat likely
- c. Neither likely nor unlikely
- d. Barely likely
- e. Not likely

7b. If you are likely to make use of Artificial Intelligence capabilities to support lifelong learning in your school or institutional priority, where primarily will your motivation to do so come from?

Rank the choices from 1-5 with 1 being the “greatest motivation” and 5 the “least motivation”.

External policies and directives _____
School or institution level strategic priorities _____
My professional learning _____
The rise of ubiquitous AI technologies _____
Our global shared responsibility for all learners _____

Question 8a: Do you have any local initiatives underway that are redesigning some part of the educational system?

- a. Yes
- b. No

Question 8b: If you have initiatives underway that are redesigning some part of the educational system, what is the general topic/area of your initiative?

Question 8c: Are you using AI in this local initiative?

- a. Yes
- b. No

Question 9: For each of the capabilities of AI listed below select what you think is the greatest benefit from the three choices provided and what you think is the greatest risk from the three choices provided. If you have no opinion on the greatest benefit and/or the greatest risk/challenge, leave it blank.

a. Personalized, adaptive learning: AI can assess individual learning preferences and strengths and can continuously adjust the difficulty and	BENEFITS Personalized, adaptive learning enabled by AI may improve engagement which may increase motivation to learn.
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<p>pace of learning materials based on a learner's progress</p>	<p>Personalized, adaptive learning enabled by AI may lead to better results for students which may increase retention rates.</p> <p>Personalized, adaptive learning enabled by AI lends itself to anytime, anyplace learning which may make learning more accessible.</p> <p>RISKS/CHALLENGES Personalized, adaptive learning enabled by AI depends heavily on educators' technical expertise.</p> <p>Personalized, adaptive learning enabled by AI reduces class cohesion when learners are working on different learning outcomes.</p> <p>Personalized. adaptive learning enabled by AI often involves collecting and analyzing learner data, which may raise ethical concerns.</p>
<p>B. Skill Assessment and Gap Analysis AI can assess a learner's existing skills and knowledge, identify gaps, and recommend specific courses or modules to address those gaps.</p>	<p>BENEFITS Skill Assessment and Gap Analysis enabled by AI is a faster process than when completed by humans.</p> <p>Skill Assessment and Gap Analysis enabled by AI is a more consistent and objective process than when completed by humans.</p> <p>Skill Assessment and Gap Analysis enabled by AI can provide detailed, individualized reports highlighting strengths and weaknesses more cost effectively than when completed by humans.</p> <p>RISKS/CHALLENGES</p>

	<p>Skill Assessment and Gap Analysis enabled by AI cannot currently assess personal qualities such as creative passion. Skill Assessment and Gap Analysis enabled by AI depends on good data without which bias may be replicated and amplified.</p> <p>Skill Assessment and Gap Analysis enabled by AI may not be able to design effective assessments for all skills potentially leaving some unassessed.</p>
<p>C. Use of student data to train the algorithm AI is trained on data including student data to become more intelligent. AI analytics can provide insights into learner behavior and performance.</p>	<p>BENEFITS Use of student data to train AI may result in more personalized learning.</p> <p>Use of student data to train AI may result in more inclusive, accessible learning.</p> <p>Use of student data to train AI may result in students receiving the help they need more quickly.</p> <p>RISKS/CHALLENGES Use of student data to train AI may breach student privacy with respect to personal information.</p> <p>Use of student data to train AI may produce unpredictable and inaccurate information.</p> <p>Use of student data to train AI may perpetuate bias particularly against non-native English speakers.</p>
<p>D. AI Tutors and Assistants AI-driven virtual tutors and educational assistants can provide instant feedback, answer questions, and offer guidance to students 24/7.</p>	<p>BENEFITS Unlike human teachers, AI tutors are available anytime, making learning more flexible and accessible.</p> <p>AI provides real-time corrections and explanations, helping students learn from mistakes immediately.</p>

	<p>AI tutors can assist millions of students simultaneously at a lower cost than traditional education methods.</p> <p>RISKS/CHALLENGES Not all students have access to high-speed internet and advanced devices, limiting the reach of AI-driven virtual tutors and educational assistants potentially perpetuating the digital divide.</p> <p>AI lacks empathy, making it difficult to provide motivation, mentorship, and emotional support like human teachers do.</p> <p>AI tutors follow programmed algorithms and may struggle to encourage creative and critical thinking skills in students.</p>
<p>E. Content Generation and Curation AI algorithms can generate educational content like quizzes, practice problems, and textbooks. They can also curate and recommend relevant learning resources from a vast pool of online content.</p>	<p>BENEFITS AI Content Generation and Curation can translate content into other languages making learning resources more accessible.</p> <p>AI Content Generation and Curation can simplify or summarize text making difficult content more accessible.</p> <p>AI Content Generation and Curation can generate content outlines on a specific topic simplifying the learning process.</p> <p>RISKS/CHALLENGES AI Content Generation and Curation produces pattern-like text which lacks emotion, nuance, and originality.</p> <p>AI Content Generation and Curation may hallucinate sources. It might state the name of a report and who published it, but that doesn't mean the report exists.</p> <p>AI Content Generation and Curation may use concepts and ideas without giving credit to the original creators.</p>
<p>F. Accessibility and Inclusivity</p>	<p>BENEFITS</p>

<p>AI can use speech recognition, text-to-speech conversion, and adaptive interfaces accommodating students learning needs in inclusive ways.</p>	<p>Students with disabilities can navigate their educational journey more independently and with more personalized support.</p> <p>Students with communication disabilities can express themselves more effectively and comprehend written materials more easily.</p> <p>AI can help identify patterns and create data-driven insights to support better decision-making and improve educational outcomes for students with disabilities.</p> <p>RISKS/CHALLENGES Accents, dialects, speech impediments, and background noise can all affect the system's ability to accurately interpret commands and may feed inaccurate data back into the algorithm.</p> <p>Dependency on internet access for AI technology to work limits the usability of the technology in situations where connectivity is unreliable or unavailable.</p> <p>AI may misinterpret non-native speakers or individuals with strong regional accents which can lead to errors in student's task completion or search for information. This creates an accessibility barrier for individuals who rely on voice recognition but do not speak in the system's "preferred" accent or dialect</p>
<p>G. Lifelong Credentialing Blockchain and AI technologies can enable the secure verification of lifelong learning achievements and credentials including the identification of relevant training opportunities and tracking professional learning progress.</p>	<p>BENEFITS AI-driven systems can instantly verify the authenticity of credentials by cross-referencing them with issuing institutions, ensuring a faster and more transparent process. This reduces reliance on manual credentialing, which may be time-consuming and prone to error.</p> <p>Students can carry their verifiable credentials across institutions and borders,</p>

	<p>creating a lifelong, decentralized record of achievements both formal and informal.</p> <p>Gaps between different credential systems worldwide can be bridged, enabling seamless recognition of qualifications across countries.</p> <p>RISKS/CHALLENGES Recognition of cultural differences in informal and non-formal learning will require educational paradigm shifts.</p> <p>Building trust in AI-driven systems and fostering widespread adoption will require collaboration between governments, educational institutions, and private organizations.</p> <p>Protecting sensitive credential data is paramount. Robust encryption and compliance with regulations is essential.</p>
<p>H. Leadership functions AI can mimic many leadership functions including but not limited to developing conclusions, making decisions, offering empathetic and compassionate responses, providing strategic planning advice, writing documents and emails and assisting with hiring.</p>	<p>BENEFITS Leadership may be able to spend more time leading teaching and learning.</p> <p>Leadership decision-making may improve with more data available more quickly.</p> <p>Leadership priorities may evolve.</p> <p>RISKS/CHALLENGES Reliance on AI tools may change the educational culture and priorities of a school or institution.</p> <p>Reliance on AI tools may impact the leader's influence, relationships, creativity and skill set.</p> <p>Reliance on AI tools may change/ increase the leader's professional learning requirements.</p>
<p>I. Automation of routine tasks</p>	<p>BENEFITS</p>

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<p>AI can grade student assignments, schedule student and staff timetables, manage student records, assess prior learning, streamline recruitment, communicate with stakeholders.</p>	<p>More time may be spent by educators with students, parents, and other stakeholders.</p> <p>Educators' overall workload may decrease.</p> <p>More time may be available to focus on teaching and learning.</p> <p>RISKS/CHALLENGES Jobs may be lost, changed and/or compensated differently.</p> <p>Professional development and training requirements may change and/or increase.</p> <p>AI technology may leave some educators behind.</p>
<p>J. Design of curriculum AI can create lesson plans, design assessment tasks, suggest resources, and assess student learning.</p>	<p>BENEFITS Less educator attrition from workload pressures may occur.</p> <p>Curriculum changes may occur more rapidly.</p> <p>Fewer human resources may be needed where teacher shortages exist.</p> <p>RISKS/CHALLENGES A human teacher/instructor/professor may no longer be needed.</p> <p>Curriculum and assessment planning may not reflect the needs of the class.</p> <p>The unique passions, interests, experiences, emphasis of the teacher/instructor may no longer be shared.</p>

Question 10: Given the capabilities of AI, as described in Question #9, and given the global educational challenge to improve equity of opportunity for lifelong learning for all, as described in the United Nations' Sustainability Development Goal #4, how important is it to you that each of the following be redesigned now?

- a. Grade level, diploma or graduate outcomes

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Not necessary to redesign now	Somewhat important to redesign now	Important to redesign now	Very important to redesign now
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b. Program and/or curriculum design

Not necessary to redesign now	Somewhat important to redesign now	Important to redesign now	Very important to redesign now
-------------------------------	------------------------------------	---------------------------	--------------------------------

c. Assessment and evaluation of student learning

Not necessary to redesign now	Somewhat important to redesign now	Important to redesign now	Very important to redesign now
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d. Professional learning of educators

Not necessary to redesign now	Somewhat important to redesign now	Important to redesign now	Very important to redesign now
-------------------------------	------------------------------------	---------------------------	--------------------------------

e. Guidance documents or frameworks

Not necessary to redesign now	Somewhat important to redesign now	Important to redesign now	Very important to redesign now
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f. School or institution-level policies, or frameworks on AI for lifelong learning

Not necessary to redesign now	Somewhat important to redesign now	Important to redesign now	Very important to redesign now
-------------------------------	------------------------------------	---------------------------	--------------------------------

g. Provincial, state or national policies or frameworks on AI for lifelong learning

Not necessary to redesign now	Somewhat important to redesign now	Important to redesign now	Very important to redesign now
-------------------------------	------------------------------------	---------------------------	--------------------------------

h. School or institution-level job descriptions

Not necessary to redesign now	Somewhat important to redesign now	Important to redesign now	Very important to redesign now
-------------------------------	------------------------------------	---------------------------	--------------------------------

Question 11a: Of these professional learning topics, select up to three (3) that you see as a top priority currently for your staff/faculty.

Learning what is meant by lifelong learning for all through the development of human capability.

Learning about how nonformal and informal learning impact formal learning and why they are included in the mandate to improve lifelong learning for all.

Learning more about how AI is designed and developed for education.

Learning how to use AI applications for education.

Learning how teaching and learning are impacted by A.I.

Learning how to redesign program/curriculum and assessment tasks given AI applications.

Learning about the Sustainability Development Goals and the expectations for local action.

Learning about the competencies of moral intelligence and how they relate to ethical decision-making for AI use.

Learning about motivation to tackle the global mandate for improved equity of opportunity for all with respect to lifelong learning for all enabled by AI.

Question 11b: Are your personal professional learning needs currently the same ones as those of your staff/faculty?

a. YES

b. NO

Question 11c: If your personal professional learning needs are different, please identify up to three topics that you want to learn more about.

Question 12: What are the top two (2) benefits of education leaders like yourself becoming actively involved in the implementation of Artificial Intelligence for lifelong learning for all?

Staff/faculty will see A.I.-enabled educational change as a significant priority. _____

Schools/institutions will be seen by stakeholders (i.e. students, staff, parents, taxpayers, policymakers etc.). as more relevant and sustainable. _____

Schools/institutions will be more likely to influence the creation of new AI educational applications. _____

More diverse student data will be included in the training of A.I. algorithms. _____

Educational resources like staff, time and money will be used more wisely. _____

The algorithms, tools, and use of them in education are more likely to be ethical. _____

Question 13: What are the two (2) greatest risks or challenges of education leaders like yourself becoming actively involved in the implementation of Artificial Intelligence for lifelong learning for all?

The focus shifts away from educational priorities which are more important to our education community right now. _____

If local change initiatives get ahead of government priorities or policies, then local change initiatives may need to be changed or abandoned which can affect morale.

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When students/staff/faculty see the increasing capability of AI they may become disenchanted and de-motivated in their work due to potential loss of careers, jobs, changes in roles, etc. _____

We expose our lack of knowledge and skills and have few resources (i.e. money, time, energy) to catch up. _____

We may lose stakeholder support. (i.e. students, staff, parents, taxpayers, policymakers etc.). _____

Question 14: Select how much you agree or disagree with the following statements?

a. Although there may not be fundamental agreement on the role of AI in education, AI is changing public education for the better.

Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
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b. As a result of AI's current use in education, the role of educational leadership is changing.

Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
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c. Additional support is needed to help educational leadership understand the current concept of lifelong learning for all in more depth and how AI may be of assistance.

Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
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d. To foster the development of students' individual and moral development in an AI-enabled world, educational leaders need deeper understanding of the competencies and frameworks of moral intelligence.

Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
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e. Additional support is needed to help educational leaders understand why Artificial Intelligence may be both a threat to public education's structures and paradigms and the means for achieving greater equity of educational opportunity for all.

Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
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Thank you for your participation in this research study. 45 education leaders are being sought for follow-up interviews. If you would be willing to be interviewed for this study, please provide your email address in the text box

Appendix D:

Informed Consent and Invitation to Participate in the Interview

Study Title: Supporting Educational Leaders Globally in Their Pursuit of Lifelong Learning for All Enabled by AI

Name of Principal Investigator: Deborah Homuth, Doctoral Candidate, Athabasca University

Email: dhomuth1@learn.athabascau.ca

Date: _____

I am inviting senior education leaders of publicly funded schools and institutions at all levels (e.g. elementary, secondary, post-secondary) from around the world to participate in this study by participating in an online interview. The goal is to interview 12-15 senior education leaders from 20 different countries. The interview will be conducted via ZOOM and will take no more than 60 minutes to complete.

I am seeking the involvement of senior educational leaders K-20 from around the world. Research tells us that these are the individuals that must be involved for change to be sustained (Fullan, 2007; Leithwood et al. 2004, 2008, 2020). For the purposes of this study, I am defining senior educational leaders as those individuals who:

- ✓ Report to work inside a school (K-12) or higher education institution that is publicly funded where education is a part of the country's GDP exclusive of investment in private education.
- ✓ Have a formal leadership role but many different job titles including but *not* limited to principal, vice-principal, heads of school, headmaster, school director, president, chancellor, vice-chancellor, provost, head, rector, dean; and
- ✓ Have responsibility for leading the teaching and learning of the academic program in a school or post-secondary institution.

Artificial Intelligence (A.I.) may be of tremendous assistance in the search for solutions to global educational inequities and the pursuit of lifelong learning for all. A.I. may also change teaching, learning and educational leadership in many ways. This interview is designed to find out how senior leaders are adapting to such a significant moment in education globally and how supports may be most helpful. I plan to publish the results of this study in academic journals and present them at conference.

Participation is voluntary. I will not collect any personal information about you. There are no known risks. The benefits to you lie in helping to complete the gathering of data for a study which potentially provides educational leadership K-20 with greater understanding of:

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- a. The perspectives and practices of their global peers about the benefits, risks, opportunities and challenges of implementing Artificial Intelligence (AI) for increased equity of opportunity for lifelong learning for all.
- b. Leadership's current understanding of AI.
- c. How particular support may be beneficial in leaders' local quest for success with respect to this global challenge.

In short, involvement in this study may be of benefit to senior educational leadership K-20 by providing them with things to think about as well as things to do as they act locally to guide the deployment of AI for lifelong learning.

If you agree to take part and you provide verbal consent, I will interview you virtually for approximately one hour. There will be no personally identifying questions. You do not have to answer any questions you do not want to. You can stop your participation at any time by telling the researcher. You may request to have your data withdrawn from the study up until September 30, 2025 after the interview by contacting me at dhomuth1@learn.athabascau.ca After the interview, the researcher will download the transcript and audio recordings to clean up the transcript for data analysis and remove any specific information that might identify the participant (such as their institution or name). All recordings will be deleted once a workable transcript is saved to the researcher's computer. I plan to publish the results of this study in academic journals and present them at conferences as well as use them as part of my doctoral dissertation.

I will not personally be identifying information from the interviews when presenting my findings. I will never include any real names with quotes. I will make every effort to ensure quotes do not identify participants. During the interview, please let me know if you say anything you do not want me to quote. Your confidentiality will be protected to the extent permitted by applicable laws. I will do this by replacing your name with a pseudonym in all publications and a study ID number in all study records. The study data will be stored on an encrypted file on Athabasca University's database. Access to study data is limited to those researchers on the study team, as well as the Athabasca University Research Ethics Board which may request access to study data to ensure that the researcher(s) have or are meeting their ethical obligations in conducting this research. The Research Ethics Board is bound by confidentiality and will not disclose any personal information. I will store your data securely for at least five years per Athabasca University Policy, after which the de-identified data will be destroyed.

If you have any ethics concerns about this study, please contact the Research Ethics Officer at gleich@athabascau.ca

This Letter of Information provides you with the details to help you make an informed choice. All your questions should be answered to your satisfaction before you decide whether to participate in this research study. Keep a copy of this Letter of Information for your records.

You have not waived any legal rights by consenting to participate in this study.

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By providing verbal consent, I am verifying that: I have read the Letter of Information, and all of my questions have been answered.

- Yes, you have my permission to audio record.
- No, you do not have my permission to audio record.
- Yes, you have my permission to use quotes.
- No, you do not have my permission to use quotes.

Consent granted verbally on _____.

Interviewer's signature: _____.

Appendix E:

Semi-Structured Interview Guide

Question 1: Please describe if and how AI is used in your school or institution and your own use as well.

Question 2: With respect to the conversations being had around the use of AI in education, some faculty/ teachers focus on a “problematization” approach to AI in education. That is, the focus is on anticipating the problems and risks associated with the use of AI in education. Other faculty/teachers focus on what might be called “imaginaries” or ideas about what we might be able to do that we haven’t been able to do before. If that is a continuum with well-articulated problematization perspectives of AI on one end and highly developed imaginaries on the other, where do you think your staff generally is along that continuum?

Question 3: Obviously the further integration of AI into education represents potentially significant change. Can you please talk a bit about the context and culture of your school/ institution with respect to how change happens? Does change generally percolate up from the bottom or from the top down or both? I am trying to sort out if the further integration of AI into education is unfolding as change usually does in your school/institution or if something different is happening.

Question 4: For a long time, lifelong learning referred to adult retraining for the job market or professional upgrading. Today LLL is seen as a means of perspectives and values as opposed to adult retraining for the job market. Those attitudes or values in today’s conception of lifelong learning include developing curiosity, imagination, resilience, self-regulation, appreciation of the ideas, perspectives and values of others, the ability to move forward in the face of adversity, the ability to think for oneself with a robust moral compass” (Schleicher, 2018). Given the global focus on increasing equity of opportunity for lifelong learning for all through the development of human capability it seems that the shift is underway from viewing education as a finite experience with the goal of a credential (or moving to the next educational level) to seeing education as an infinite experience Attached to those ideas about lifelong learning for all is a view of literacy as a way of being, as something that continues to develop for one’s entire life rather than a stage or state that a learner achieves. Accompanying these ideas are the notions that nonformal and informal learning should be valued as significant elements alongside formal learning in the journey to realize one’s own capabilities. My question is, have those conversations about lifelong learning filtered down to your school? Is a role for AI in that being considered?

Question 5: Should education play in shaping public understanding of AI? Should education be shaping ideas around how it should be considered, used, talked about? How much autonomy and control do you feel you have right now with respect to AI being developed for and used in education?

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Question 6: There is a lot of talk about AI replacing jobs and entire professions. Is this a conversation taking place in your school/institution? Is the “replacement” conversation” the right conversation to be having about AI or is there a different conversation that should be happening?

Question 7: The current research confirms that there is a significant relationship between ethical leadership behavior and moral intelligence. The research also shows that ethical frameworks alone generally fail unless they are accompanied by moral competencies. Given that we need to spend more time talking to students about the ethics of AI, probably in more places by more people, do you think your staff/faculty are prepared to have those conversations?

Question 8: How would you define success in five years with respect to the further implementation and integration of AI in your school/institution to enable lifelong learning for all? And what support will it take to get there?

Appendix F:

Summary of Findings for Research Question One: Sub-topic 1

Research question: What do educational leaders in K-20 see as the benefits/risks, opportunities/challenges of AI?

Sub-topic 1: Positioning leaders' perspectives on AI, its benefits and challenges

Greatest benefits:

- improvement in a learners' engagement and motivation
- faster, more consistent and objective than humans when assessing learner's skills, knowledge, gaps and recommending how to fix them
- enables more personalized, inclusive and accessible learning
- AI tutors are available anytime, making learning more flexible and accessible.
- difficult content more accessible
- students with disabilities can navigate their educational journey more independently and with more personalized support
- students with communication disabilities can express themselves more effectively and comprehend written materials more easily
- instantly verifies the authenticity of credentials by cross-referencing them with issuing institutions, ensuring a faster and more transparent process than if completed by humans
- enables leaders to spend more time leading teaching and learning, improve leadership decision-making through more data being made available more quickly, and evolve the priorities of leadership.
- more time may be available to focus on teaching and learning
- less educator attrition from workload pressures may occur
- curriculum change may occur more rapidly

Greatest risks:

- depends heavily on educators' technical expertise
- bias may be replicated and amplified
- potential breach of student privacy with respect to personal information
- potential perpetuation of the digital divide
- AI may hallucinate sources
- usability of the technology in situations where connectivity is unreliable or unavailable
- may misinterpret non-native speakers or individuals with strong regional accents
- protection of sensitive credential data through robust encryption and the necessity of compliance with regulations
- limitations that may ensue on a leader's influence, relationships, creativity, and skill set

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- may leave some educators behind
- curriculum and assessment planning may not reflect the needs of the class
- unique passions, interests, experiences, emphases of the teacher/instructor may no longer be shared

Common themes:

- There is a wide range of staff/faculty perspectives on AI. Leaders often cited a 70-30 split with 70% seeing AI from a “problemization” lens and 30% seeing it from an “imaginaries” lens.
- Leaders think faculty embracing AI use in HE could be found most often in research, science and technology, medicine, and business. In K-12 this group embracing AI use were identified by participants as “early adopters”.
- The divide in perception is also conditioned by geopolitics with a distinction between the global north and the global south. These leaders noted that the global south is hopeful that the benefits of AI can be reaped by their countries to address perennial educational challenges.
- Leaders expressed frustration about what they described as misplaced staff/faculty concerns with respect to AI including too much focus on whether teachers like using AI, too much power or credit being awarded to AI, what these leaders see as a disproportionate focus on the potential for academic dishonesty, and misguided efforts to keep AI out of the learning process

Appendix G:

Summary of Findings for Research Question One: Sub-topic 2

What do educational leaders in K-20 see as the benefits/risks, opportunities/challenges of AI?

Subtopic 2: Leaders' perspectives on AI's role in lifelong learning

Common themes:

- Leaders said the implementation of AI applications for LLL was either an essential or somewhat important part of their role.
- Leaders said they were highly likely or somewhat likely to make the implementation of AI to improve lifelong learning outcomes their school or institutional priority.
- Leader identified three sources of motivation for making use of AI capabilities to support lifelong learning in their school or institution (school or institution level strategic priorities, global shared responsibility for all learners, rise of ubiquitous AI technologies).
- Leaders identified external policies and directives least often as a motivator for making use of AI capabilities to support LLL in their school/institution.
- Several leaders identified that conversations about increasing equity of opportunity for LLL for all and the role of AI in achieving it including embracing nonformal and informal learning are not happening at all.
- Four reasons were identified for why the conversations are not happening: a. LLL is still housed in a discrete department reminiscent of the approach to LLL as adult retraining or professional upgrading; b. the core work is about moving students to the next grade or passing the credential; c. there is a disconnect between the current concept of LLL as the development of a set of values and perspectives for a lifetime and educators' understanding of AI; d. it is wrongheaded to think that prioritizing lifelong learning for all enabled by AI will change the economic drivers of our societal development or help us learn human perspectives.
- Every leader (100%) from the global south identified LLL for all as the current educational priority. They acknowledged a concrete role for AI in realizing that priority through increasing equity of opportunity for more people to realize their capabilities through lifelong learning.
- There were distinctions between the global north and the global south and between HE and K-12 on how lifelong learning is and could be delivered.
- This reimaged concept of lifelong learning would require significant institutional change. Such change would require time and money as well as specific strategies to affect change.

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- Leaders identified four barriers that need to be overcome with respect to implementing greater equity of opportunity for lifelong learning for all: a. resistance to change b. traditional hierarchies and paradigms c. emphasis on high stakes testing in K-12 d. HE emphasis on credentials not competence.

Appendix H:

Summary of Findings for Research Question Two: Sub-topic 1

What is the current level of expertise of educational leaders K-20 with respect to AI?
Subtopic 1: Exploring leaders' understanding of AI concepts and capabilities and its impact

Common themes:

- A minority of leaders had an in-depth understanding of AI and its capabilities; some leaders have no understanding of some its capabilities while most leaders have some to a little understanding.
- The least well-known concept of AI by respondents was Intelligent Decision Support Systems while the best-known concepts were Generative Pre-Trained Transformers and Large Language Models.
- Many leaders are aware that some AI use in their school/institution is known about and permitted, some use is not known about, and some use is not even known about by those using it. Many leaders willingly acknowledged that they didn't really know for certain how AI is being used in their school or institution.
- Some HE leaders explained that AI has been used for quite some time and so the further integration of AI was a natural evolution from how things had historically been undertaken. They described the integration of AI as *before* and *after* the arrival of Chat GPT. These leaders see the recent proliferation and uptake of LLM applications as "hype" or as a "boom", that is, something less serious than their traditional use of AI. These leaders showed understanding of the potential of AI especially in research but did point out that AI is becoming ever more powerful.
- Most of the leaders interviewed described their school or institution's current use of AI as occurring since the arrival of Chat GPT into education. These leaders fall into two groups: those who have employed systematic integration of AI and those whose approach to AI integration has been unsystematic. Those who describe their school or institution's use and integration of AI as unsystematic sense their school or institution is lagging.
- Almost every leader showed an awareness and acceptance of a wide range of staff/faculty adoption and use. In some instances, the school or university has institutionalized a particular LLM application. They have done this for reasons of security and cost.
- Leaders described six common uses of AI in their school/institution. Because they were able to explain them, the assumption was that they understood them. These six uses include research and data analysis particularly in medicine, science and technology fields, report writing, accessing resources for lesson and lecture planning, assessment tasks, translation, and communication with parents.
- Almost all leaders recognize that student adoption of AI came very rapidly. They describe student use as pervasive and often greater than that of their

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teachers/professors. Several leaders also identified the problematic nature of some of that use. Leaders identify the convenience of using AI as taking something away from students.

- Leaders' understanding of AI and their personal use varies. Some leaders use it a lot and some don't use it at all.
- Most HE leaders said they have begun regulating AI use. Such regulation takes many forms from folding acceptable use of AI statements into existing academic integrity policies, to creating specific AI use policies, to crafting position statements which focus on responsible and realistic acknowledgement of use, to designing step-by-step faculty guidelines. In many cases these regulations, position statements, policies, etc. have been created out of expediency, that is, recognition of the reality of students' pervasive use of AI, and a sense of responsibility to prepare students for using AI beyond the walls of the school or institution.

Appendix I:

Summary of Findings for Research Question Two: Sub-topic 2

What is the current level of expertise of educational leaders K-20 with respect to AI?
Subtopic 2: Leaders' perspectives on leading AI development and their sense of autonomy, control and motivation

Common themes:

- Two main benefits were identified by leaders for becoming actively involved in the implementation of Artificial Intelligence for lifelong learning for all: a. Staff/faculty will see AI-enabled educational change as a significant priority b. Schools/institutions will be more likely to influence the creation of more useful AI educational applications.
- Leaders identified the two greatest risks for for becoming actively involved in the implementation of Artificial Intelligence for lifelong learning for all: a. the focus may shift away from the educational priorities which are deemed to be more important to their education community right now b. the perspectives of leaders when shared may not be valued or treated seriously.
- Most participants expressed how quickly AI development is occurring and how little control they feel. They used metaphors of speed and inevitability to describe the development of AI and their sense of powerlessness in the face of it.
- Despite their recognition of a lack of autonomy or control, all but one leader saw a role for public education in shaping how society thinks about AI. They saw two avenues for such a role. One was through shaping the perspectives of students when then go home and out into the world as they take with them ways to think about AI that have been taught to them. The second way is through public advocacy especially with government. For many this is how it has always been: education being one of the key drivers of shaping public opinion.
- Despite recognizing that this had always been a role of education, to influence and to educate and thereby help shape societal outlooks on issues, leaders were divided on whether such advocacy and soft diplomacy were happening. That is, some leaders recognized with respect to the role of education to influence society through soft diplomacy, in the case of AI this may be more theoretical than what is happening in practice.
- Leaders who had greater AI literacy expressed a greater sense of control. Such knowledge and understanding came from doing their own inquiry and designing their own instances and applications of AI in their own buildings. These leaders expressed a greater sense of control than others who were not doing so. Leaders who expressed this greater sense of control and autonomy were motivated to learn about AI. They placed a high value on their own development of knowledge about AI because it gave them a sense of control and it made their leadership of AI meaningful.

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- Some leaders spoke of their involvement in the development of AI as more than a question of whether they wanted to do so. They saw their involvement in the development of AI for education and how it is thought about and used in education, as a fundamental responsibility of leadership.

Appendix J:

Summary of Findings for Research Question Two: Sub-topic 3

What is the current level of expertise of educational leaders K-20 with respect to AI?
Subtopic 3: Understanding of AI's effect on jobs

Common themes:

- Leaders were divided in their perspective on whether the further integration of AI into education is for the better.
- Slightly more than half of respondents thought AI is somewhat changing education leadership. No one thought AI wasn't changing leadership; it was just to what degree where opinions of participants differed.
- Not all leaders said that the replacement conversation was happening. This was true for both K-12 and higher education. Where it was identified as not happening, leaders did identify that they had heard of the idea of AI replacing jobs and entire professions, and it was a conversation that they thought should be happening.
- Those leaders who said the replacement of jobs and professions by AI was being discussed had also seen evidence of this happening.
- Some leaders had a different perspective on AI replacing jobs. The leaders noted that AI was needed to supplement shortages in the job market.
- Some leaders felt it was important to be having different conversations. They said that the replacement conversation might act as a catalyst for these other conversations which focus on issues that are larger and more complex than AI replacing jobs. These leaders saw the opportunity to rethink education, what is prioritized in teaching and why, as the more important conversations

Appendix K:

Summary of Findings for Research Question Three: Sub-topic 1

How will specific supports help educational leaders K-20 to realize this universal mandate for change?

Subtopic 1: How the integration of AI into education is happening differently from other technology implementations

Common themes:

- Most respondents said it was somewhat important to redesign grade level, diploma or graduate outcomes now.
- Most respondents said it was important or very important to redesign assessment and evaluation of student learning now.
- Most respondents said it was important or very important to redesign educators' professional learning now.
- Half of the respondents said it was very important now to redesign school or institution level policies or frameworks on AI use for lifelong learning.
- Currently it is somewhat important to leaders to redesign job descriptions.
- Some leaders identified that the integration of AI into teaching, learning and administration in their school/institution was proceeding differently from how change usually happens because of the involvement of Big Tech and government.
- Some leaders noted that this change is different from the arrival of other technology into education that was hardware or device driven because it has caused some resistance by faculty and staff, some retrenching, some return to previous practices such as pen and paper exams. Leaders identify that this resistance and retrenching stems from a cultural mistrust of students.
- Several leaders also identified that the further integration of AI into education is different from other implementations of technologies because the shift is more conceptual than physical, and more culturally pervasive.
- Many leaders noted that this change is different from other implementations of new technologies.
- This change is seen by many leaders as different from other technology implementations into education because the integration of AI into education is going to have long-lasting, deep-seated implications.

Appendix L:

Summary of Findings for Research Question Three: Sub-topic 2

How will specific supports help educational leaders K-20 to realize this universal mandate for change?

Subtopic 2: Professional learning needs

Common themes:

- Almost all respondents said that additional support is needed to help educational leaders understand the current concept of lifelong learning for all in more depth and how AI may be of assistance in achieving greater equity of opportunity for LLL for all.
- Almost all respondents said that additional support is needed to help educational leaders understand why AI may be both a threat to public education's structures and paradigms and the means for achieving greater equity of educational opportunity for all.
- The top three priorities identified by leaders were learning how to redesign program/curriculum and assessment tasks given AI applications, learning how to use AI applications for education, and learning how teaching and learning are impacted by AI.
- Almost three-quarters of participants identified that their professional learning needs are the same as those of their staff with respect to this moment in time where AI is being further integrated into education and there is a global challenge to reimagine education for all.
- Many participants identified that they hoped people would have moved past what leaders see as elementary conversations around student use and academic integrity issues to focus on more significant issues including how education must change.
- The further integration of AI into education in successful ways was characterized by participants as high-skilled use with seamless integration where students and staff/faculty understand when, where, how and why to use it with a strong focus on human choice, human dignity, and the development of knowledge and human capability.
- Leaders said that such seamlessness would breed a level of confidence that isn't currently present in education not just with respect to understanding the complexities of AI but with respect to the value proposition of education in general.
- Several leaders recognized that what they were describing was a reinvention of education. They saw this as a high stakes exercise that requires some urgency on the part of leadership now. This process of learning more about the complexities of AI and its relationship to greater equity of LLL for all can lead this reinvention

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of education. In short, learn more now, reinvent and survive, or don't and see the end of public education as we know it.

- Leaders identified most often training and staff development and greater internal reflection about the big questions as the two key strategies that might help move their staff/faculty closer to what leaders described as success five years out with the respect to the further integration of AI into education.

Appendix M:

Summary of Findings for Research Question Three: Sub-topic 3

How will specific supports help educational leaders K-20 to realize this universal mandate for change?

Subtopic 3: Moral Intelligence

Common themes:

- None of the interview participants asked for clarification about what was meant by the term moral competencies but almost every leader interviewed said that whether educators were prepared to have conversations with students about the ethical considerations of AI was an interesting question and would require more reflection and effort.
- Most leaders said the complexities of AI were a reason for these conversations not occurring in a more strategic way with students. Other leaders identified that having these conversations about ethics and the application of moral intelligence to the ethics of AI are very difficult for staff/faculty to have unless there is some fundamental understanding of what AI is, how it is created, and how it works. Leaders identified that many staff/faculty do not yet have much fundamental understanding of these concepts of AI or how they intersect with other issues and concepts of education.
- Participants identified included the development of simulations for staff/faculty and students and the development of a school-wide curriculum. Leaders thought there should be a systematic approach. It may be worth noting that only one of the 45 leaders interviewed identified that they currently had such a systematic and pervasive approach and it was for K-12.
- Some participants acknowledged the morally ambiguous world in which we live and how that gives rise to moral confusion for students. This moral ambiguity provided these leaders with further justification for more thoughtful and systematic approaches into how schools/institutions respond to these issues of ethical behaviour related to AI governed by moral competencies.
- Some leaders thought the terms “ethics” and “moral intelligence” would be off-putting for some staff/faculty and should be replaced by other terminology. Other leaders preferred to focus on questions of social justice, learning, and originality.
- Several leaders commented that related to this idea of moral ambiguity was the need for leadership as well as staff/faculty to also understand the necessity of modeling ethical behaviour themselves.

Appendix N:

A Chronology of Technological Tools Implemented into American Education

The history of technology for American education has been traced by Saettler (2004) and others. According to such authors, a short list of what might be included in a chronological timeline of technological implementations into mainstream education would, at minimum, include:

- chalkboards early 1800s
- magic lantern late 1800s
- educational films early 1900s
- stereoscope early 1900s
- film strip projector 1920s
- school radio broadcasts 1920s
- mimeograph machine late 1940s
- educational television early 1960s
- mainframe computers mid 1960s
- calculator early 1970s
- graphical calculators mid 1980s
- whiteboards late 1980s
- data projectors 1980s
- Internet and the World Wide Web 1990s
- multimedia personal computers 1990s
- laptops 1990s, early 2000s
- interactive whiteboards late 1990s
- learning management systems and hybrid learning late 1990s
- cellphones early 2000s
- iPads/tablets 2010
- 3D printers 2016
- virtual reality/augmented reality 2020
- Artificial intelligence 2023

Appendix O:
Research Ethics Approval



CERTIFICATION OF ETHICAL APPROVAL

The Athabasca University Research Ethics Board (REB) has reviewed and approved the research project noted below. The REB is constituted and operates in accordance with the current version of the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans (TCPS2) and Athabasca University Policy and Procedures.

Ethics File No.: 25942

Principal Investigator:

Ms. Deb Homuth, Doctoral Student
Faculty of Humanities & Social Sciences\Doctor of Education (EdD) in Distance Education

Supervisor/Project Team:

Dr. Mohamed Ally (Supervisor)

Project Title:

SUPPORTING GLOBAL EDUCATIONAL LEADERS' PURSUIT OF AI-ENABLED LIFELONG LEARNING FOR ALL

Effective Date: May 13, 2025

Expiry Date: May 12, 2026

Restrictions:

Any modification/amendment to the approved research must be submitted to the AUREB for approval prior to proceeding. Any adverse event or incidental findings must be reported to the AUREB as soon as possible, for review.

Ethical approval is valid *for a period of one year*. A request for renewal must be submitted and approved by the above expiry date if a project is ongoing beyond one year.

An Ethics Final Report must be submitted when the research is complete (*i.e. all participant contact and data collection is concluded, no follow-up with participants is anticipated and findings have been made available/provided to participants (if applicable)*) or the research is terminated.

Approved by:

Date: May 13, 2025

Frits Pannekoek, Chair
Faculty of Humanities & Social Sciences, Departmental Ethics Review Committee