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Adopting a Governance Strategy on the use of AI in the Education Sector

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Abstract: Since the public availability of ChatGPT on November 2022, the accessibility of Artificial Intelligence (AI) related technology specifically Generative AI and its use cases has grown at a significant pace where companies are looking for opportunities to incorporate the technology into their organization (Marr, 2023). The education sector is not immune to such changes in technology and environment as the introduction of AI also provides multiple potential benefits to the sector such as personalized learning, improved responsiveness and collaboration, and access to greater educational resources to name a few (Abdulqayyum & Potter, 2024; Tambuskar, 2022). However, new risks and challenges are also introduced with the adoption of such technologies and tools that organizations must consider including algorithmic biases and transparencies, reidentification risks, unintended inferencing of sensitive information, and greater impact of data breaches (Jagtap, 2024). For the education sector such risks extend beyond the technical as an over-reliance on the use AI can lead to adverse consequences where the learning experience can become a passive one (Abdulqayyum & Potter, 2024). This paper presents a holistic and sustainable approach to managing the risks and benefits of the use of AI through the adoption of a Governance Strategy as the education sector and the organizations within needs to provide a balanced adoption of AI. Existing regulations, compliance requirements, and governance frameworks are summarized, presented and analyzed in the context of the education sector to serve as a starting point to governing the use of AI in the education sector. In doing so, the paper contextualizes the governance principles to local regulations and the education sector. The paper also aims to increase the awareness on the use of AI that may eventually balance the risk and benefits of deployment of AI.

Key Words: Artificial Intelligence; Governance: Risk Management; Data Protection; Compliance

1. INTRODUCTION

There has been a growing discussion on the use of Artificial Intelligence in various business cases as the availability and ease of use of tools and applications have in recent times increased significantly (Marr, 2023). Discussions range from benefits, challenges, and risks of the use of artificial intelligence (Abdulqayyum & Potter, 2024; Oranga, 2024; Tambuskar, 2022; Thippanna et al., 2023; U Zaman, 2023) to ethical and governance considerations on the adapting such tools and technology in various domains including the education sector (Jain & Ghanavati, 2020; Mäntymäki et al., 2023; Murdoch, 2021). Regulations and compliance requirements are also attempting to keep pace with such developments to protect the various jurisdictions and comply with existing local regulations with the European Union being one of the more visible efforts where it is working on its EU AI Act (European Parliament and of the Council, 2024). Similar efforts are taking place across other countries and jurisdictions as tracked by The International Association of Privacy Professionals (IAPP) in its Global AI Law and Policy Tracker (Gabrielle Schwartz et al., 2024). All these factors and events introduces complexities to an already challenging environment for the education sector where balancing the existence of academic freedom (Constitutional Commission, 1986) and research requirements with protecting the privacy of its data subjects and ethical use of technology (Jagtap, 2024; Jain & Ghanavati, 2020) already exhibits its own challenges and nuances (Ulven & Wangen, 2021).

This paper presents a summarization of the common benefits, risks, and compliance requirements raised by various publications and regulatory bodies via a document review to provide a baseline of requirements and considerations with some specific to the education sector. Existing different governance frameworks are also mapped to show the commonalities and differences with respect to the requirements presented. Finally, the paper provides a recommendation on governance framework adoption, existing gaps in the frameworks, and recommendations on future work in dealing with the still evolving landscape of the use of Artificial Intelligence in the Education Sector.

2. METHODOLOGY

2.1 Document-based survey

To understand the relationship between governance and the use of artificial intelligence, the the study surveyed the several sub-components of the topic in question namely, various governance principles and frameworks, risks and benefits of the use of artificial intelligence to include security, privacy and ethics, and the nuances of the education sector. This is necessary to collect the different perspectives and considerations needed to provide the target recommendations on governance for the education sector. The study included the following specific documents, sources, and domains that discusses or relates to artificial intelligence and governance list in Table 1.

Table 1. Domains, Sources, and Documents reviewed

Domain	Document and Sources
Governance Framework **(G)**	1. Cyber Security Governance Principles (Australian Institute of Company Directors, 2022) 2. Information Governance Framework (ARMA, 2020) 3. COBIT (ISACA, 2018) 4. Data Governance Framework (The Data Governance Institute, 2024) 5. Information Security Framework (ISO, 2022) 6. Privacy Governance (Fagerberg, 2023)
Regulations and Compliance Requirements **(C)**	1. European AI Act (European Parliament and of the Council, 2024) 2. UK AI Act (James Tobin, 2024) 3. Singapore AI Governance Model (Infocomm Media Development Authority & Personal Data Protection Commission Singapore, 2020) 4. National Privacy Commission Advisories (National Privacy Commission, 2019, 2023, 2024)

2.2 Values and Principles on the use of AI

In order to provide a structure and baseline for evaluating and recommending governance of artificial intelligence to the education sector, a set of baseline principles **(P)** on the ethical use of artificial intelligence defined by UNESCO (UNESCO, 2022) served as the foundation as shown below:

1. Proportionality and Do No Harm
2. Safety and security
3. Fairness and non-discrimination
4. Sustainability
5. Right to Privacy, and Data Protection
6. Human oversight and determination
7. Transparency and explainability
8. Responsibility and accountability
9. Awareness and literacy
10. Multi-stakeholder and adaptive governance and collaboration

Commonly mentioned risks and benefits on the use of AI in the education sector from existing literature review is also used as a foundation in mapping applicability of frameworks to the education sector. The risks and benefits are listed in Table 2. From the literature presented in Table 2, some recurring concerns are evident including security and privacy, overreliance, and ethical use.

Table 2. Risks and Benefits from existing literature

Literature	Risk and Benefit
(Tambuskar, 2022)	***Benefits*** - Task Automation, Personalized Learning, Universal Access, Smart Content Creation, Teaching the Teacher, Identify classroom weakness.
(Abdulqayyum & Potter, 2024)	***Benefits*** - Immediate Constructive Feedback, Enhanced Collaboration and Interaction, Access to Wealth of Education Resources, Intelligent Learning Analytics, Continuous Learning Support. ***Concerns*** - Privacy and Security, Ethical Considerations, Over-reliance on AI, Access and Equity, Skill Development and Adaptability, Cost and Implementation.
(U Zaman, 2023)	***Benefits*** - Efficiency and Automation, Adaptive Learning Platforms, Automated Grading and AI-Powered Tools, Predictive Analytics, Virtual Assistants. ***Concerns*** - Governance and Policy Frameworks, Stakeholder Engagement , Continuous Professional Development, Data Security and Privacy, Scalability and Accessibility, Inadvertent perpetuation of inequalities or privacy violations
(Oranga, 2024)	***Benefits*** - Personalized Learning, Instant Feedback, Study Assistance, Collaborative Learning,24/7 Availability. ***Concerns*** – Vulnerability of Bias, Overreliance on Technology, Privacy Concerns, Security Risks, Ethical Use, Legal and Regulatory Compliance.

2.3 Mapping Process

To achieve the goal of the study, the UNESCO ethical use of AI principles are mapped to existing governance and compliance frameworks based on the relationships in Table 3 to show applicability, then relevant domains or guidance in the frameworks are highlighted. Finally, the guidance and mapped to the concerns in the education sector in order to provide a recommendation and identify gaps in existing frameworks for the sector.

Table 3. Relationships included in mapping

Relationship and Legend	Description
Equivalent **(E) – 3pts**	Directly mentioned in the document using exact terminology
Related **(R) – 2pts**	Partially matching terminology or use of related or possibly subsumed terminology
Applicable **(A) – 1pt**	Not directly mentioned by can be applied to the principle

3. RESULTS AND DISCUSSION

In surveying and mapping the AI principles to the governance and compliance frameworks the following observations were made:

- Industry based governance frameworks (G) focuses more on structural and operational guidance hence principles such as oversight (P6) and accountability (P8) scored high on having equivalent stipulations within the frameworks that are directly mapped to the AI principles. This is followed by security (P2), privacy (P5) as well as awareness (P9) governance and collaboration (P10). However, the same set of governance frameworks did not score on the principles proportionality (P1), fairness (P3), sustainability (P4), and transparency. One possible rationale is that such abstract principles are left to the organizations own determination as part of its governance function as opposed to being explicitly stated in an attempt to be industry agnostic and generally applicable and flexible (see Table 5).
- In contrast, regulations and compliance requirements that provide high level overall requirements rather than attempting to reach operational details focuses more on the aforementioned abstract principles where safety and security (P2) and transparency and accountability (P7) ranked highest followed by proportionality (P1), fairness (P3), privacy (P5), and accountability (P8) with similar weights (see Table 5).
- Some interesting observations include the transparency principle (P7) where it is a top requirement for compliance by did not score in the governance frameworks. One possible rationale is that although governance requires accountability, the use of AI provides certain challenges on transparency and explainability as AI models that use large models for training data sets are non-explainable based on traditional methods (Zhao et al., 2024). Other principles with similar imbalance between governance frameworks and compliance requirements include P1, P3, and P4 (see Table 5).
- Another observation is that for the principle of sustainability (P4), both the frameworks and compliance requirements scored low. One possible rationale would that the wide use of AI is currently at an early stage and given the evolving nature of the technology, discussions on sustainability would be limited at best given the current state of technology and application (see Table 5).
- Looking at individual frameworks and compliance requirements, it can observed that mature frameworks obtained higher score or coverage and applicability to the ethical AI use principles. Information Governance (G2) and Governance of Enterprise IT (G3) scored high as these frameworks incorporated privacy, security, and change management directly into the framework which can be applied to the evolving AI landscape. On the compliance requirements, the EU (C1) and UK (C2) drafts scored high which can be used as a reference in the absence of local references (see Table 4).

Table 4. Mapping of Governance and Compliance to Principles

	G1	G2	G3	G4	G5	G6	C1	C2	C3	C4
P1							R	A	R	R
P2	R	R	R	R	E	A	R	E	E	R
P3							A	E	E	A
P4							A			
P5	A	E	R	R	R	R	R	E	A	R
P6	R	E	E	E	E	R	E	A		
P7							E	E	E	A
P8	R	E	E	E	E	R	R	E	A	A
P9	A	E	E		R	A	A	E		
P10	A	E	E	R	R	A	A	A	R	A
Σ	**9**	**17**	**16**	**12**	**15**	**9**	**18**	**21**	**15**	**10**

Table 5. Summation per principle based on mapping weights

	Governance Framework	Compliance Requirements
P1	0	7
P2	12	10
P3	0	8
P4	0	1
P5	12	8
P6	16	4
P7	0	10
P8	16	7
P9	10	4
P10	12	5

Table 6. Applicability of governance frameworks to the

common concerns of AI in the education sector

Governance Frameworks	Privacy and Security	Over Reliance	Access Equity	Bias	Skills Dev
G1	P"2, P"3, P"5				P"1, P"4
G2	D1, D2, D5, D8				D3, D4
G3	APO 12,13,14 DSS 3,4,5		EDM 2, 5		APO 7
G4	DG 4,9				
G5	Sec 5,6,7,8				Sec 5,6
G6	A 1,3				

P" – principles in (Australian Institute of Company Directors, 2022)
D – domains in (ARMA, 2020)
EDM, APO, DSS – enabling processes in (ISACA, 2018)
DG – Data Governance Requirements in (The Data Governance Institute, 2024)
Sec – Section number in (ISO, 2022)
A – Approach number in (Fagerberg, 2023)

In going deeper in the governance frameworks to determine applicability to the common concerns on the use of AI in the education sector, it can be observed that the concerns of privacy and security as well as the continued skills development are addressed partially if not as a whole in the existing governance frameworks as these are common requirements even before the use of AI started to become prominent. Albeit these guidance would have to be customized to the nuances of AI, certain baseline guidance exists and can be used as a starting point for an organization baseline requirement. However, on the concerns of overreliance on AI, equitable access both to the individual and the organization, and how inherent biases can be addressed are fairly new concerns that are specific to AI and existing governance frameworks will not have an exact guidance but rather can be adjusted to consider. An example would be for G3, ensuring benefits delivery (EDM2) and ensuring stakeholder engagement (EDM5) which are board level enabling processes can be viewed as addressing equitable access as it requires benefits and engagement to be ensured. Other frameworks have potentially related guidance, however, this study did not explicitly include them in the mapping and results as these are generic and may have a wide variety of interpretation. An example would be G2 where domain 1 included business units and domain 2 included regulations as part of the governance model, these take a very generic view and may or may not include specifics on common concerns on overreliance, access, and bias.

4. CONCLUSIONS

The results show in lieu of the need to have ethical use of AI and the growing regulations and compliance requirements, the use of governance for a holistic approach to govern and manage the risks and benefits of the use of AI is critical for a consistent and sustained approach as the use cases of AI cuts across all sections of an organization and the community at large. Given that the use cases of AI is still evolving, the existing governance frameworks also shows its limitations in terms of guidance as more mature requirements such as privacy and security would have existing guidance but principles and requirements on ethical AI use such as fairness and explainability would be lacking. Although in the case of explainability, one can possibly relate it to accountability and monitoring or audit guidance recommendations, the concept of explainability for AI specifically in cases like generative AI would need advancements in processes and guidance to be properly addressed as the limitation of existing processes would prevent its support.

On specific common concerns of the education sector, the lack of guidance on overreliance on the use of AI for example goes beyond the traditional business processing concerns that may be related to vendor management guidance recommendations as for the education sector, overreliance is not just possible in back office processing but also in academic and research related activities where the dependencies and impact go beyond the considerations of vendor management. The possibility of bias and its potential negative impact is also amplified in the education sector as it is not just a consumer of information and technology but also a creator and producer where the impact of bias if left uncheck can have greater implications and impact. The regulations being crafted provides some reference on these concerns where at the minimum the need to address such concerns are made into compliance requirements in

some cases. However, there is still much work needed to provide proper guidance that can be operationalized.

5. RECOMMENDATIONS

The study surveyed a limited set of governance frameworks and regulations and compliance requirements prioritizing more commonly used frameworks and more comprehensive regulations. Future changes to such frameworks and regulations need to be revisited as considerations on the use of AI and possible guidance on adherence to the ethical use of AI would most likely be considered in the revisions and updates. However, it was observed that given the governance frameworks may not fully address the concerns of the use of AI in the education sector given that such concerns are not limited to the scope of traditional business processing. As such, future work needs to look into the balancing requirement of the education sector in the need to use AI while at the same time ensure that the knowledge is still learned by the students and intellectual creations albeit assisted by AI would still adhere to the principles of fairness, unbiassed, and can be explained and proven to be correct and accurate. Such requirements would most likely fall outside of the scope of common industry led governance frameworks and should be investigated to provide a sustainable roadmap for the education sector in the time of AI. The use of maturity models for the roadmap is also recommended to allow for inclusivity of the different levels of educational institution that are stakeholders in the sector. A stronger ethics consideration is also recommended where ethics may need to go beyond the scope of academic research and into the learning and operational aspect of the sector.

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