

## Integrating Artificial Intelligence into Educational Strategy: Challenges and Opportunities for International Schools in Egypt a Case Study of Repton School Cairo

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### Abstract

Artificial Intelligence (AI) is poised to become a cornerstone of educational transformation, offering pathways to personalized learning and operational efficiency. This study investigates the integration of AI into the strategic management of international K-12 schools in Egypt, a highly competitive market. It focuses on how strategic AI adoption can enhance pedagogical outcomes, administrative efficiency, and the overall quality of education. Despite Egypt's National Artificial Intelligence Strategy (2025–2030), adoption at the school level is often fragmented. This paper uses a qualitative case study of Repton School Cairo to analyze a mature, first-mover strategy. Through a document analysis of the school's official AI policies, governance frameworks, and public case materials, this study finds that Repton has moved beyond fragmented tools. The school has developed a holistic, "human-centred" (UNESCO, 2019) strategy centered on (1) proactive data governance that mitigates key ethical risks, (2) the development of a secure, in-house AI assistant named "Nour," and (3) a school-wide AI literacy program. This paper proposes the Strategic AI Integration Framework for Education (SAI-F-Edu), validated by the Repton case, to offer other international schools in Egypt a phased roadmap toward AI-driven educational excellence.

**Keywords:** Artificial Intelligence, Education Strategy, International Schools, Egypt, Ed-Tech, Case Study, Personalized Learning, Repton School Cairo, Data Governance, AI Policy, Dynamic Capabilities, Resource-Based View (RBV), VRIO

## Introduction

Artificial Intelligence (AI) has shifted from a disruptive technology to a strategic imperative shaping global competitiveness, and the education sector is no exception. Globally, AI is being embedded into core educational strategies to optimize administrative processes, create personalized learning pathways, and provide data-driven insights into student performance [1]. This is guided by a "human-centred approach" that positions AI as a tool to promote inclusion and equity, not widen divides [2]. For emerging economies, AI in education offers a leapfrogging opportunity to enhance learning outcomes and prepare a future-ready workforce [3].

Egypt's government has recognized this transformative potential through its National Artificial Intelligence Strategy (Second Edition, 2025–2030) (Ministry of Communications and Information Technology [MCIT], 2025). This strategy emphasizes building "human capacity" as a core goal, intersecting directly with the "Digital Egypt" initiative's mandate for educational development. The international K-12 schools sector is a critical, high-visibility arena for this transformation. These institutions compete on educational quality, student outcomes, and technological advancement to attract parents, making them bellwethers for broader innovation [4].

However, a significant gap exists between this national vision and on-the-ground implementation. Many schools adopt AI-enabled tools in a piecemeal, tactical fashion [5]. This ad-hoc adoption often lacks the strategic, whole-school approach required to integrate AI effectively into pedagogy, operations, and, most critically, data governance.

This paper addresses the core research problem: the critical gap between Egypt's national AI vision and the fragmented, ad-hoc adoption of AI tools at the school level, which undermines strategic educational benefits and exposes schools to significant data governance risks. It conceptualizes AI integration not merely as an IT upgrade, but as a strategic management challenge. This study employs an inductive, qualitative case study approach to investigate this problem. By deeply analyzing the case of Repton School Cairo, a first-mover in the sector, it seeks to build a theoretical understanding and a practical framework (the SAI-F-Edu) from the ground up, exploring how a comprehensive, evidence-based AI strategy can be built and implemented.

## Research Philosophy and Approach

This study is grounded in a pragmatist research philosophy, which prioritizes the research problem and values practical, actionable outcomes. It employs an inductive research approach. Unlike a deductive study that tests pre-existing hypotheses, this research begins with the empirical observation of a specific phenomenon—Repton School Cairo's AI integration strategy. Through a qualitative analysis of this case, we identify patterns and themes to develop a broader conceptual framework (the SAI-F-Edu) that explains how strategic AI integration can be achieved. The relationship between the core concepts under investigation can be understood in terms of independent and dependent variables, albeit within a qualitative context:

- **Independent Variable (The Strategic Intervention):** The implementation of a holistic AI strategy, characterized by integrated governance, secure technology, and comprehensive literacy training.
- **Dependent Variable (The Strategic Outcome):** The achievement of sustainable competitive advantage, manifested through enhanced differentiation, operational efficiency (cost leadership), and the development of dynamic capabilities.

The central proposition of this paper, derived inductively from the Repton case, is that the independent variable (holistic AI strategy) is a primary driver of the dependent variable (sustainable competitive advantage) for international schools in Egypt.



## Theoretical Background

The theoretical basis of this study lies at the intersection of strategic management theory, dynamic capabilities, and AI-enabled educational transformation. In line with its inductive approach, this paper does not seek to test these theories a priori but uses them as analytical lenses to interpret the findings from the Repton case and to structure the resulting framework. The theories of Porter and Teece, along with the Resource-Based View (RBV), provide the language and concepts to explain why and how Repton's strategy is effective [6,7].

Michael Porter's competitive advantage framework is highly applicable [6]. International schools compete primarily through differentiation and cost leadership. AI contributes to both. However, the Repton case demonstrates a clear focus on differentiation. By developing the proprietary, secure "Nour" bot, the school creates a unique, high-value service (safe AI for students and staff) that competitors using public tools cannot easily replicate. This secure environment becomes a key differentiator for attracting discerning parents.

Furthermore, Teece's theory of dynamic capabilities provides a lens to understand how a school can build this advantage [7]. Teece argues that sustainable advantage comes from a firm's ability to sense opportunities, seize them, and reconfigure its resources. The Repton case maps to this perfectly:

- **Sensing:** The leadership sensed both the opportunity (AI for efficiency) and the threat (data privacy risks of public AI).
- **Seizing:** The school seized this opportunity not just by buying a tool, but by investing in the development of its own secure "Nour" assistant.
- **Reconfiguring:** The AI Guide and mandatory training policies are the critical reconfiguration step. Repton reconfigured its human capital, embedding AI literacy as a core competency for all staff, thus aligning its resources with the new strategic asset ("Nour").

This strategic alignment is further supported by learning theories. The use of AI tools like "Nour" aligns with constructivist theories, where students actively build knowledge by using the AI as a brainstorming partner, and connectivist theories, which emphasize learning through networks of information that AI can help navigate.

## Linking Dynamic Capabilities to the Resource-Based View (RBV)

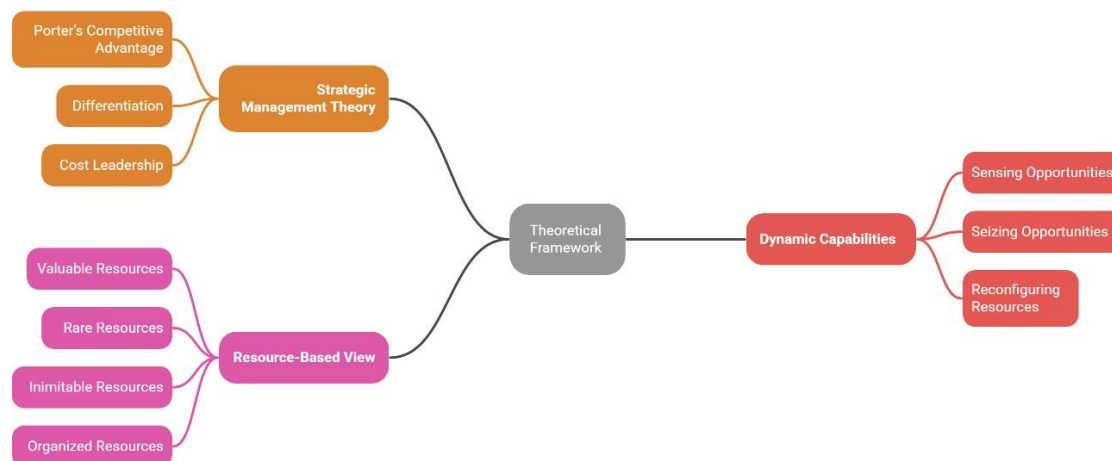
This study's analysis is further grounded in the Resource-Based View (RBV) of the firm, which posits that sustainable competitive advantage is derived from unique, firm-specific resources and capabilities that are valuable, rare, inimitable, and organized (VRIO) to be exploited [8]. Teece's dynamic capabilities theory can be viewed as the engine that creates

and modifies these VRIO resources in rapidly changing environments. The Repton case provides a clear illustration of this linkage. The school's strategic assets can be explicitly analyzed through the VRIO framework:

- **The 'Nour' AI Assistant:** This is a Valuable resource as it directly enables personalized learning and operational efficiency. It is Rare within the competitive landscape of Egyptian international schools. Its in-house, proprietary development, tailored to Repton's specific governance and pedagogical needs, makes it Inimitable—competitors cannot simply purchase an identical solution. Finally, the school's policies and training ensure it is Organized to capture the value Nour creates, completing the VRIO framework and confirming its status as a source of sustainable advantage.
- **The AI Governance Policy & Trained Staff:** The integrated system of policy and human capital is itself a VRIO resource. The governance framework is Valuable (mitigating risk and building trust) and Rare (few schools have such a mature policy). It is Inimitable due to its deep integration with Egyptian PDPL and the school's unique culture. The mandatory training ensures the organization is Organized to leverage this capability effectively.

This study synthesizes these frameworks to argue that AI's true value emerges only when technology is embedded in the core educational and strategic intent of the institution.

Theoretical Framework for AI-Enabled Educational Transformation



## Integrated Literature Review

### From Tactical Ed-Tech to Strategic Integration

Recent scholarship highlights a critical shift from isolated "ed-tech" procurement toward AI as a strategic capability [3]. This view positions AI as a tool that can augment, not just

automate, the core functions of a school [9]. The general-purpose technology perspective argues that value arises when schools redesign operating models—not when they merely deploy tools [10]. Many firms fail at this, getting stuck in "pilot purgatory" without a clear strategic linkage [11]. This study's focus on Repton's top-down policy framework provides a counter-example.

## **Global Research Trends and Gaps**

The AI in Education (AIED) landscape is dynamic but uneven. Recent comprehensive meta-reviews show that the field is dominated by research from China and the U.S. Furthermore, the overwhelming focus has been on higher education. Studies in the K-12 sector, like this case study, are less common and therefore highly valuable. An additional gap exists in the research focus: most studies center on teachers and students, with far less attention paid to the strategic decision-making of administrators and leaders. This paper, by focusing on strategy and governance, directly addresses this gap.

## **Global Benchmarks for AI in K-12 Education**

Egypt's efforts are part of a global trend. Competitor nations in the region and beyond have launched aggressive AI-in-education strategies. The UAE, for example, has integrated AI across its curriculum, launching a dedicated "AI Code of Conduct" for its schools [12]. Similarly, Singapore's "AI@SG" initiative heavily features educational components, using AI to create adaptive learning and career guidance tools for students [13]. These benchmarks demonstrate that K-12 education is central to national AI strategy.

## **AI in K-12 Education: Pedagogy and Operations**

Within the K-12 context, AI manifests in two primary streams. The first is pedagogical. AI tools are shown to enhance self-directed learning by providing learner autonomy, real-time feedback, and individualized learning paths. AI significantly impacts the Curriculum, Instruction, and Assessment (CIA) triad by helping generate teaching materials, automating evaluation, and reducing staff workload. The second stream is operational: AI for optimizing admissions, automating grading, and ensuring campus security [14]. A key challenge, which the Repton case addresses, is bridging these two streams.

## **Governance and Ethical Risks in Egypt**

The global governance landscape is maturing, with the EU's AI Act and ISO/IEC 42001:2023 setting international benchmarks [15]. For international schools in Egypt, governance is a critical, high-stakes issue, centered on compliance with Egypt's Personal Data Protection Law No. 151/2020 (PDPL) (Talaat, 2024).

Recent reviews on responsible AI in education categorize the ethical risks into three dimensions, which provide a useful framework for analysis:

- **Technology Risks:** Privacy invasion, data leakage from public tools, algorithmic



bias, and the "black box" problem.

- **Education Risks:** Student homogenization (all students getting the same AI answers), a "teacher role crisis," academic misconduct, and alienation of teacher- student relationships.
- **Society Risks:** Exacerbating the digital divide (a gap between students who have AI access and those who do not) and an absence of accountability [16]. This paper will analyze how the Repton case strategy directly mitigates these three categories of risk.

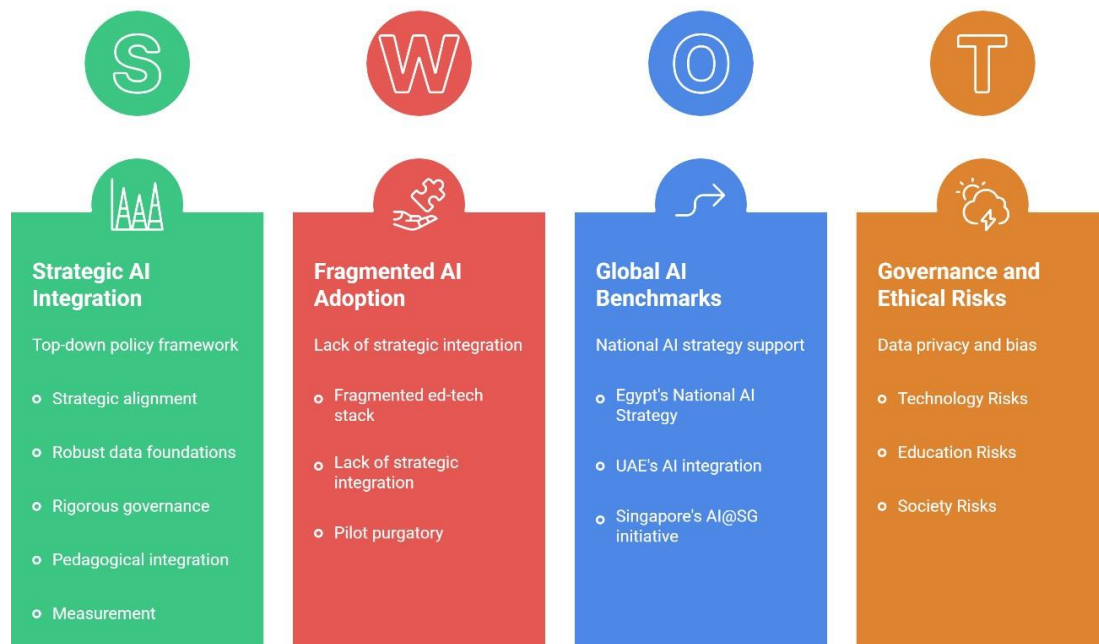
## National Strategies and Educational Readiness

Egypt's new National AI Strategy (Second Edition, 2025–2030) provides an updated roadmap, emphasizing AI for sustainable development and human capacity building (MCIT, 2025). This national vision, analyzed by policy bodies, provides a supportive top-down context [17]. However, readiness at the institutional level remains a challenge [1].

## Synthesis and Gaps

The literature indicates that AI enhances performance when key conditions co-exist: (1) strategic alignment; (2) robust data foundations; (3) rigorous governance; (4) pedagogical integration; and (5) measurement [10,18]. The primary research gaps are the lack of K-12-focused studies, a focus on strategic leadership (not just teacher/student use), and a lack of high-quality evidence on the measurable outcomes of AI interventions. This case study of Repton School Cairo aims to fill these gaps.

### AI in K-12 Education



## Research Gap

Despite the growth of ed-tech in Egypt, a clear implementation gap exists. Most international schools adopt AI-enabled tools in response to market trends, leading to a fragmented "ed-tech stack" that is not strategically integrated [4,5]. This study uses the pioneering work at Repton School Cairo to provide a model for moving from fragmented adoption to holistic strategy, addressing the documented K-12 research gap.

The research problem is the lack of strategic integration of AI tools in international schools in Egypt. Despite the rise in educational technology, schools often adopt AI in a fragmented way, driven by trends rather than strategy. This study uses Repton School Cairo to model a cohesive AI strategy, addressing the K-12 research gap.

## Research Questions

This case study is guided by three key research questions:

- What are the key dimensions of a strategic approach to AI integration for an international school in the Egyptian context?
- How has Repton School Cairo (as a case study) developed and implemented a comprehensive AI strategy, including policies, tools, and training?
- What practical action plan, based on the Repton case study and the SAI-F-Edu framework, can other international schools in Egypt follow?

## Methodology: A Case Study Approach

This study adopted an inductive, qualitative, single-case study approach, which is ideal for an in-depth, real-world investigation of a contemporary phenomenon—AI strategy—within its bounded context [19,20].

## Case Selection

Repton School Cairo, part of the Repton International group, was selected as an "instrumental case." As a premium school offering a British curriculum in Cairo, it operates in a highly competitive market [21]. It has distinguished itself as a first-mover in the field of AI strategy, making it a unique and valuable case for analysis.

## Data Collection

The data for this study consists of a qualitative document analysis of official school policies, guides, and public-facing case materials. The three primary documents analyzed are:

- **Repton School Cairo:** IT Data protection and Privacy Policy (Version 2.4) [22].
- **A Guide to Artificial Intelligence (Effective Date: August 2025)** [23].
- **International Curriculum Association (ICA) Article:** "Integrating AI into



teaching and learning" , which details Repton Cairo's implementation [24].

These documents are analyzed for thematic content related to strategic alignment, governance, technological development, and stakeholder management.

### **Findings and Discussion (Based on Document Analysis)**

The analysis of Repton School Cairo's documents reveals a mature and holistic AI strategy. The findings are discussed below and contextualized with broader evidence.

#### **Finding 1: Proactive Governance as a Strategic Prerequisite**

Repton's strategy leads with governance. The IT Data protection and Privacy Policy (v2.4) explicitly integrates compliance with Egypt's PDPL and GDPR. Section 11 ("Artificial Intelligence") is not an afterthought but a specific, actionable set of rules. This policy directly mitigates the three categories of ethical risk identified in the literature:

- **Technology Risks:** The policy prohibits entry of any sensitive pupil data into public/consumer-grade AI tools [22]. This is a direct response to the risks of data leakage and privacy invasion.
- **Education Risks:** The AI Guide (2025a) addresses academic misconduct and the "teacher role crisis" by framing AI as a "brainstorming partner," not a replacement, and providing mandatory training, thus empowering teachers.
- **Society Risks:** By providing a centrally managed, in-house tool ("Nour"), the school ensures equitable access for all its students, mitigating the digital divide within its own community.

#### **Finding 2: Strategic Development of a Secure, In-House AI Tool ("Nour")**

In response to the risks identified, Repton's strategy was not to ban AI, but to build a safer alternative. The documents confirm the development and use of the "in-house 'Nour' AI assistant" [22,23]. The data policy explicitly designates "Nour" as the secure tool for sensitive tasks, such as translating pupil reports.

The International Curriculum Association provides specific details on Nour's functions, demonstrating its deep integration [24]:

**Curriculum Blending:** Generates lesson plans blending IPC thematic units.

**Content Creation:** Writes and adapts online content for different age groups and language levels.

**Translation:** Translates text between English, French, and Arabic.

**Resource Curation:** Provides resource suggestions, including videos, links, and images.

This demonstrates an advanced (a) sensing of a market-wide problem and (b) seizing of the opportunity by investing in a bespoke, “Enterprise Tool” (a dynamic capability, per Teece, 2018) [7].

### **Finding 2.1: A Hybrid AI Ecosystem**

Repton’s strategy does not rely on a single tool. The “Nour” bot is supplemented with other vetted, third-party AI platforms. These include Read Theory and Atom Learning to identify student challenge levels and provide targeted support in reading and mathematics [24]. Furthermore, the school uses Virtual Reality (VR) headsets for immersive learning, which teachers note helps improve student focus [24]. This demonstrates a mature, “hybrid ecosystem” approach.

### **Finding 3: A “Human-Centred,” Holistic AI Literacy Framework**

The AI Guide (2025a) demonstrates a commitment to stakeholder education, aligning with UNESCO’s (2019) “Human-Centred” approach. Its vision is to “augment, not replace, human connection and critical judgment.” The guide addresses all stakeholders:

- **Leadership:** Frames AI as a tool for strategic enhancement.
- **Teachers:** Aims to “reduce administrative workload,” a key driver of buy-in.
- **Pupils:** Provides clear, age-appropriate guidance on AI ethics and use.

### **Finding 4: Mandatory, Integrated Training to Close the “Pedagogical Gap”**

The most common failure point for AI in schools is the “pedagogical gap.” Repton’s Data Protection Policy (2025b, sec. 12) directly addresses this. It mandates “annual, mandatory data protection training” which explicitly includes “adhering to the school’s policies on... the acceptable use of Artificial Intelligence.” This systemic approach embeds AI literacy into the school’s regular professional development cycle.

### **Contextualizing Efficacy**

Repton’s investment in “Nour” is supported by broader evidence of AI efficacy in education. For example, an AI teaching assistant at the Georgia Institute of Technology (“Jill Watson”) handled 10,000 student inquiries with 97% success, and a chatbot at the University of Murcia answered 38,000 questions with 91% accuracy [25]. These cases show that a well-designed AI assistant can successfully and efficiently manage routine tasks, freeing human educators for high-value work—validating the strategic bet Repton has made.

### **A Critical Analysis of Strategic Sustainability and Trade-Offs**

While Repton’s strategy is formidable, a critical strategic management perspective requires an examination of its long-term sustainability and inherent trade-offs.

**The Sustainability of Advantage and First-Mover Dynamics**

Repton’s first-mover advantage, while significant, is not impervious. A nuanced discussion must consider time-to-imitation and the costs of pioneering. Well-funded competitors could potentially develop a similar system within a 2–3 year cycle, leveraging lessons from Repton’s public-facing strategy. However, Repton’s head start is protected by the dynamic capabilities it has built—its continued ability to sense new AI trends, seize them by updating "Nour," and reconfigure its staff through ongoing training creates a moving target for competitors. The greater strategic risk lies in the first-mover disadvantages. Repton has borne the full R&D cost and assumed the regulatory risk of navigating uncharted data governance territory. Should a cheaper, compliant, off-the-shelf enterprise AI solution enter the market, Repton’s significant investment in a bespoke system could be challenged on a cost-benefit basis. This represents a classic strategic trade-off: the high cost and risk of differentiation versus the potential for a durable, defensible market position.

**The Double-Edged Sword of the Hybrid Ecosystem**

The "hybrid ecosystem" of "Nour," third-party AI platforms, and VR is a strength that introduces strategic complexity. While it provides best-in-class functionality, it also creates significant coordination costs and vendor management challenges. Strategically, this portfolio requires continuous oversight to ensure interoperability, data security across multiple platforms, and a coherent user experience. This complex ecosystem could become a liability if not managed with exceptional strategic discipline, potentially leading to technological bloat, rising total cost of ownership, and fragmentation of the very holistic experience the strategy aims to create.

**Strategic Implications: The Validated SAI-F-Edu Framework**

These findings from Repton Cairo strongly validate the proposed Strategic AI Integration Framework for Education (SAI-F-Edu). The school's actions map directly to the framework's pillars:

**Table 1. SAI-F-Edu Pillars Mapped to Repton Case Study**

SAI-F-Edu Pillar	Repton School Cairo Evidence (from Documents)
Strategic Alignment	The AI Guide (2025a) vision directly supports the school's mission to "nurture confident... learners" by aiming to "reduce admin workload" (optimizing resources) and "provide personalized learning" (enhancing core value). This frees teachers for higher-value, human-centric interactions, aligning with Porter's differentiation strategy [6].
Readiness & Capabilities	AI Guide (2025a) for all stakeholders; Data Policy (2025b, sec. 12) mandating annual AI use training.

Data & Technology Foundation	Development of the secure, in-house "Nour" AI assistant (2025b, sec. 11.3) as an alternative to public AI.
Ethical & Regulatory Governance	Data Policy (v2.4) (2025b) fully compliant with PDPL/GDPR and features a specific AI section (sec. 11).
Use-Case Portfolio & Impact	Policy designates "Nour" for sensitive tasks like "translating pupil reports," a clear operational use case.
Performance & Learning Loops	Both documents have review dates (August 2026), implying a formal "Plan-Do-Check-Act" cycle.

## A Repton-Inspired Strategic Action Plan for Other Schools

Based on the successful Repton case, a practical action plan for other international schools in Egypt emerges:

**Table 2. A Repton-Inspired Strategic Action Plan**

Requirements	Activities (Inspired by the Repton Model)	Tools & Time	Budget (EGP)	KPIs
1. Establish Governance First	Audit data practices. Draft/Update Data Protection Policy to be PDPL-compliant and include a specific "AI Clause."	3 months (IT Team & Legal Consultant)	350,000	PDPL-compliant AI Data Policy published.
2. Secure the Tech Foundation	Do Not Use Public AI for Sensitive Data. Procure a secure "Enterprise" AI tool OR develop an in-house assistant (like "Nour").	6-9 months (IT Team, Vendor/Dev s)	800,000	Secure "walled-garden" AI tool deployed.
3. Build Holistic AI Literacy	Develop a school-wide "AI Guide" (like Repton's) for leaders, teachers, and pupils, focusing on "Human-Centred" ethics.	2 months (Curriculum /IT Leads)	100,000	AI Guide adopted and distributed to all stakeholders.
4. Mandate & Integrate Training	Integrate AI acceptable use, ethics, and tool training into the mandatory annual PD cycle for all staff.	Ongoing (HR/PD Team)	250,000 (annual)	100% of staff complete annual AI training.
5. Monitor, Review, & Iterate	Establish a clear review date (e.g., Aug 2026) for all AI policies and guides to create a formal feedback loop.	12 months (SLT)	(Part of Ops)	Annual policy review meeting completed.
Total Estimated Budget: 1.5 million EGP		Implementation Duration: 12 months		

## Conclusion and Future Research

This research demonstrates that for international schools in Egypt, integrating AI is a strategic journey, not a technological race. The case study of Repton School Cairo, built on an analysis of its official policies and public case materials, provides a powerful, real-world model of a mature AI strategy. Repton's "governance-first" and "human-centred" (UNESCO, 2019) approach, combined with the development of a secure in-house tool ("Nour") and holistic, mandatory training, sets it apart as a first-mover. This strategy allows the school to mitigate significant ethical risks while capturing AI's strategic benefits for differentiation and efficiency, creating a true dynamic capability and a VRIO- compliant resource [7,8,16].

The challenges identified in the literature, such as the "pedagogical gap" and data fragmentation, are not insurmountable [5]. By adopting a structured approach like the SAI-F-Edu, validated by the Repton case, school leaders can move from ad-hoc ed- tech adoption to a holistic, defensible, and effective AI strategy. This study provides a practical framework for other schools in Egypt seeking to leverage AI to enhance educational quality and maintain their competitive edge. The inductive findings demonstrate that a governance-first, human-centred strategy is not merely a technological choice but a source of defensible competitive advantage, thereby contributing to the human capital goals of Egypt's National AI Strategy (MCIT, 2025).

## Limitations of this Study

This study's findings, while robust, have several limitations. First, as a single-case study, the findings from Repton School Cairo, a premium-tier school, may not be generalizable to all international schools in Egypt. Second, the methodology was limited to a document analysis. It did not include interviews with staff or pupils, which would provide deeper insight into the cultural reception of these policies. Third, the study shares a limitation common to the AIED field: a lack of high-quality, quantitative evidence on the measurable educational outcomes of these interventions (e.g., man-hours saved by "Nour," or direct impact on student test scores).

## Directions for Future Research

These limitations open several avenues for future research. First, this study helps fill a documented research gap by focusing on the K-12 sector and strategic leadership. Future research should apply the SAI-F-Edu framework to a multi-school comparative study across different tiers of international schools to test its wider applicability. Second, a quantitative or mixed-methods study within Repton Cairo itself is needed to measure the specific, measurable impact of the "Nour" bot and the AI training program on teacher efficiency and student learning outcomes, addressing the "evidence gap" in the literature. Finally, further research is needed to explore the unique challenges of AI integration within the public

Egyptian school system [26,27].

## **Appendix A**

### **Data Collection Instruments (Adapted for Education Case Study)**

Note: The following instruments were not used for this specific document-analysis case study but are provided as a template for future research involving surveys or interviews.

#### **Survey Instrument (5-Point Likert Scale - for Staff)**

\*Scale: 1 = Strongly Disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly Agree\*

##### **Section 1: School Awareness & Readiness**

1. Our school has a clear understanding of artificial intelligence and its potential for education.
2. Senior leaders (SLT, Board) actively discuss AI as part of our school's strategic plan.
3. Teachers are aware of how AI could impact our teaching and administrative processes.
4. The school culture supports experimentation and innovation with new educational technologies.
5. Our school has assessed its readiness for AI adoption in terms of IT infrastructure and teacher skills.

##### **Section 2: AI Strategy & Implementation**

1. Our school has a documented AI strategy aligned with our overall educational mission.
2. We have identified specific areas (e.g., admissions, student support) where AI can add value.
3. AI initiatives in our school are actively supported by the Head of School and SLT.
4. There is a defined governance structure for AI projects, especially regarding student data.
5. AI integration is included in our long-term school improvement planning.

##### **Section 3: Resources & Capabilities**

6. Our school allocates sufficient budget for AI-related initiatives and platforms.
7. We have in-house technical expertise (IT team) to manage AI projects effectively.
8. Teachers receive regular, high-quality professional development (PD) related to AI and ed-tech.
9. External partnerships (consultants, vendors, other schools) support our AI development.
10. The school's core systems (SIS, LMS) are robust enough to support AI-based tools.



## **Section 4: Perceived Benefits and Challenges**

11. AI integration has improved efficiency in our administrative (non-teaching) operations.
12. The school's quality of education has increased due to AI-driven personalized learning tools.
13. Leadership perceives AI as a key driver for long-term growth and market position.
14. The main challenge to AI adoption in our school is the need for more teacher training.
15. Ethical and student data privacy concerns (PDPL) are significant barriers to implementing AI.

### **B. Semi-Structured Interview Protocol (for SLT, IT Directors, Heads of Curriculum) Theme 1: Leadership Perceptions and Strategic Alignment**

1. How do you define the strategic importance of AI within your educational mission?
2. In what ways does AI currently contribute to achieving your school's objectives (e.g., academic, operational, financial)?
3. How aligned are your school's AI initiatives with its overall strategic plan and "Digital Egypt" goals?
4. How do you balance the "hype" of AI with the practical realities of implementation in a school?

### **Theme 2: Barriers and Enablers of AI Integration**

5. What are the primary challenges your school faces in implementing AI solutions (e.g., cost, infrastructure, vendor selection)?
6. How does leadership address teacher apprehension or skill gaps related to AI adoption? What does your PD program for AI look like?
7. What has been the biggest "enabler" for your AI pilots so far (e.g., leadership support, IT readiness, parent demand)?
8. How do you handle parental concerns about AI, screen time, and student data privacy?

### **Theme 3: Governance and Future Vision**

9. What is your process for vetting a new AI tool for pedagogical value and data privacy (PDPL) compliance?
10. How prepared do you believe your school is for larger-scale AI implementation in the next 1–3 years?
11. What role should the international schools sector play in shaping the national AI-in-education strategy?

## **References**

1. UNESCO. (2024). *AI and education: A guidance for policy-makers*.
2. UNESCO. (2019, August 21). *Artificial intelligence in education*. UNESCO. Retrieved November 9, 2025.
3. Tavakoli, A., Harreis, H., Rowshankish, K., & Bogobowicz, M. (2024, September 5). AI-driven enterprise: Charting a path to 2030. *McKinsey Quarterly*.
4. HolonIQ. (2024). *2024 Egypt EdTech Market Report*.
5. Schwaewe, J., Peters, A., Kanbach, D. K., Kraus, S., & Jones, P. (2025). The new normal: The status quo of AI adoption in SMEs. *Journal of Small Business Management*, 63(3), 1297–1331.
6. Porter, M. E. (1985). *Competitive advantage: Creating and sustaining superior performance*. Free Press.
7. Teece, D. J. (2018). Business models and dynamic capabilities. *Long Range Planning*, 51(2), 179–194.
8. Barney, J. (1991). Firm Resources and Sustained Competitive Advantage. *Journal of Management*, 17(1), 99–120.
9. Kump, B., Engelmann, A., Kessler, A., & Schweiger, C. (2019). Toward a dynamic capabilities scale: Measuring organizational sensing, seizing, and transforming capacities. *Industrial and Corporate Change*, 28(5), 1149–1172.
10. Brynjolfsson, E., & McAfee, A. (2017). *Machine, platform, crowd: Harnessing our digital future*. W. W. Norton & Company.
11. McKinsey. (2024, August 27). *Five lessons on scaling AI*. McKinsey & Company.
12. Government of the UAE. (2024). *Artificial intelligence in the UAE*. Official Portal of the UAE Government. Retrieved November 7, 2025.
13. Smart Nation Singapore. (2023). National Artificial Intelligence Strategy 2.0.
14. Selwyn, N. (2019). Should robots replace teachers? AI and the future of education. Polity.
15. European Parliament, & Council of the European Union. (2024). \*Regulation (EU) 2024/1689 of the European Parliament and of the Council of 13 June 2024 on laying down harmonised rules on artificial intelligence (Artificial Intelligence Act)\*.
16. Afrikta. (2023, April 12). *10 negative effects of artificial intelligence in education*. Retrieved November 9, 2025.
17. Digital Watch Observatory. (2025, February 20). *Egypt's National AI Strategy (Second Edition, 2025–2030)*.
18. International Organization for Standardization, & International Electrotechnical Commission. (2023). \*ISO/IEC 42001:2023—Information technology—Artificial

intelligence—Management system\*.

19. Yin, R. K. (2018). *Case study research and applications: Design and methods* (6th ed.). Sage publications.
20. Stake, R. E. (1995). *The art of case study research*. Sage.
21. Repton School Cairo. (2025c). About Repton Cairo. Retrieved November 7, 2025.
22. Repton School Cairo. (2025b). *IT data protection and privacy policy (Version 2.4)* [Internal school document].
23. Repton School Cairo. (2025a). *A guide to artificial intelligence* [Internal school document].
24. International Curriculum Association. (2023, November 21). *Integrating AI into teaching and learning*. International Curriculum.
25. Axon Park. (2023, February 8). *How effective is AI in education? 10 case studies and examples*. Retrieved November 9, 2025.
26. Ministry of Communications and Information Technology. (2025). Egypt National Artificial Intelligence Strategy (Second Edition, 2025–2030).
27. Talaat, M. (2024, May 14). Egypt: Data Protection Law overview. PWC Legal.