

Integrating AI in Education at the University Level in Lebanon: Opportunities, Challenges, and Readiness

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Abstract:

The rapid integration of Artificial Intelligence in education improved personalized learning experiences and facilitated administrative work. AI use in education at the Lebanese public and private universities is going on rapidly, even before the administrations put the basic ethical guidelines necessary for equitable and responsible AI scaling. Therefore, AI integration in education has revealed significant risks of cognitive offloading and diminished critical thinking, and has had a negative impact on students' well-being, such as technostress and loneliness. Furthermore, AI facilitated the spread of ethical concerns surrounding data transparency and algorithmic bias. To address these challenges, an explanatory mixed-method study based on two surveys was done. For quantitative results, the researcher utilized a questionnaire that tested the students' AI efficacy moderated by institutional readiness and teacher competency. Another subsequent qualitative survey was addressed to university teachers. It analyzed university policy frameworks at public and private universities in Lebanon to evaluate the efficacy of the ethical guidelines and accountability systems implemented there. The findings underscored the urgent need for structured, outcomes-based policy standards, mandatory AI literacy, and professional development to ensure AI serves as an equitable and effective tool rather than a source of implementation failure. In this way, this research is considered basically related to the Ministry of Education plan of higher education reformation in Lebanon. It is recommended to put guidelines that govern the use of AI at the universities in Lebanon. This guideline is based on six pillars: foundation, communication tool, accountability and disclosure, pedagogical concerns, data privacy and security, and institutional support

Keywords: AI education, policy framework, readiness, ethical guidelines, Lebanon, higher education, academic integrity

1. Introduction

In the past five years, the rapid development of AI in all sectors has pushed humans to think about whether artificial intelligence is going to replace human intelligence. Nowadays, this argument is critically explained among educators, researchers, and scholars.

In education, AI is transforming the roles. The rapid advancement of Artificial Intelligence (AI) is transforming sectors worldwide, with education emerging as a field particularly ready for great change (Hennekeuser et al., 2024). Ezequiel Molina, Cristobal Cobo, Jasmine Pineda, and Helena Rovner (2024) elaborated that AI is changing our lives. The AI revolution is changing nearly every aspect of our lives, and especially education. As artificial intelligence (AI) technologies become more sophisticated and accessible, their potential to reshape teaching and learning is becoming increasingly relevant. From personalizing instruction to automating administrative tasks, AI enhances educational outcomes and empowers educators to make teaching more appealing to the students (Saleh, 2024).

However, the excessive use of AI among students at the university level in Lebanon without strict guidelines is challenging, as it increases unethical behaviour (cheating, plagiarism, etc.) and reduces critical thinking.

The increasing use of AI-powered tools has led to problems concerning academic integrity and the need for AI-detection tools. A recent survey by the Centre for Democracy & Technology found that while schools are adapting



to the growing use of AI, there are still significant concerns about the effectiveness of AI-detection tools and the potential for false accusations of cheating (Ezequiel et al., 2024). Adding to the ethical problems, AI tools can also reduce students' critical thinking skills. Human dependence on AI lowers emotional and cognitive skills due to its human-like communication, raising questions about trust, ethics, and autonomy. It warns that while AI enhances productivity and convenience, it also weakens human creativity, critical thinking, and self-reliance, creating a kind of “human atrophy” (Steffen, 2025).

Therefore, this research paper highlights the fact that AI use in the educational field at Lebanese universities should be organized since educators cannot stop this devastating trend, nor can they let it move on randomly. In this way, this research paper studies the guidelines that could govern AI in higher education in the Lebanese universities to help learners take the maximum benefits without destroying their critical thinking skills. The successful integration of AI requires moving beyond the mere adoption of advanced technology and necessitates a balanced, human-centred approach that prioritizes ethical guidelines and pedagogical purpose to ensure equitable, effective, and responsible learning experiences (Hennekeuser et al., 2024). Barbara Steffen (2025) summarizes that the rapid advances in AI have fundamentally challenged students' creativity, reason, and consciousness. AI's ability to generate content quickly and efficiently is forcing us to rethink what makes us uniquely human. In fact, we believe that it is time to change perspective and to regard advanced AIs not as tools that we can control but as partners that help us to deal with today's challenges. It shifts the focus of explainable AI from a “how” perspective to a “why” perspective. Instead of asking how an AI arrived at a decision, we should ask why. On the other hand, highlighting the exact “how” is often impossible. Even if we knew the “how”, this technical knowledge would hardly help increase trust in a proposed decision.

This research paper is significant as many countries are aware of putting guidelines for integrating AI in education. First, let us start with the positive use of AI in education. Singapore, for example, is setting a global benchmark with its “Smart Nation” strategy, aiming to become a world leader in AI by 2030. This includes extensive use of AI to support personalized education and help teachers better address the needs of students, especially those with special needs. Similarly, South Korea is using AI to personalize homework and learning activities based on individual educational levels and learning behaviours, while Finland is integrating AI into its national education system with a strong emphasis on ethics and equity. However, others were cautious about this rapid transformation of AI. It is important to pause and reflect on our actions, motivations, and methods. It is equally important to understand the roles and intentions of the various users to hold the potential impacts and influences of these simultaneous developments. At present, it appears that no one, not even the experts, fully understands the unfolding events and their future implications. We are in danger of moving quickly, understanding, and engaging in a kind of technological arms race that has become incomprehensible and risks getting out of control. (Steffen, 2025).

Therefore, this research paper studies the practical considerations of AI use among Lebanese universities and what ethical precautions should be taken. Thus, the following research questions are investigated:

1. What are the positive and negative effects of AI use on university students' critical thinking skills and ethical issues in Lebanon?
2. What precautions and guidelines are followed by educators to control AI integration in Lebanese universities?
3. Are we ready to implement AI at the Lebanese Universities?

2. Related Work

AI, or artificial intelligence, refers to systems that can perform tasks typically requiring human intelligence, such as reasoning, learning, planning, perception, and language understanding, ranging from narrow, task-specific applications to broader, more general capabilities (Britannica, 2025). The field originated in the mid-20th century with foundational work in computation and logic (Britannica, 2025). However, AI use in education was debatable, which necessitates guidelines to control its use in educational organisations.

2.1 Advantages of AI Use in Education

AI in education refers to the use of artificial intelligence technologies to enhance teaching, learning, administration, and equity in schools and higher education. Applications include personalized and adaptive learning platforms, intelligent tutoring systems, automated grading, learning analytics, accessibility supports, and administrative task automation. Benefits often cited include more tailored instruction, increased student engagement, earlier identification of learning gaps, and helping educators to focus more on instruction. It has multiple tools that help learners, teachers, and administrators to personalize their learning, increase efficacy and analyze data.

First, AI has Personalized Learning and Intelligent Tutoring Systems (ITS). AI-powered adaptive learning technologies can analyze a student's strengths, weaknesses, learning pace, and preferences to tailor educational content, pace, and difficulty to individual needs (Harry & Sayudin, 2023). This customization is often delivered through Intelligent Tutoring Systems (ITS), which use AI to provide tailored guidance, immediate feedback, and customized resources (Aniekan, U. R., Chukwudi, U. M., & Imoh, S. G., 2024). This instant response helps reinforce learning and prevents misconceptions from taking root, supporting diverse learning styles, and fostering deeper connections with the material (Aniekan et al., 2024). Hary (2023) said that AI can recommend appropriate learning resources, suggest areas for improvement, and adjust the difficulty level of learning tasks. One of the primary benefits of personalized learning is that it helps to ensure that each student receives the support and guidance they need to reach their full potential. AI can help personalize the learning experience for each student, allowing them to learn at their own pace and according to their individual needs and abilities. This can improve learning outcomes and increase student engagement (Saleh, 2025).

Second, AI can increase learners' efficiency. AI can automate repetitive tasks. Hary (2023) said that AI can help improve student engagement by providing interactive and engaging learning experiences. For example, chatbots and virtual assistants can make learning more fun and interactive, and adaptive learning technologies can help students stay engaged by presenting material at their level of understanding.

Moreover, AI can analyze large amounts of data and provide insights into student performance, allowing teachers to better understand their students and tailor their instruction accordingly. This can lead to improved learning outcomes and better student performance. Ezequiel et al. (2024) said that AI is not only transforming the way teachers work but also revolutionizing the learning experience for students. By controlling the power of adaptive learning platforms, intelligent tutoring systems, and generative AI tools, educators can now provide students with suitable learning experiences that cater to their individual needs, preferences, and speed. From AI-powered tutoring that delivers real-time feedback and guidance to the use of generative AI for creating engaging and interactive assignments, these innovations are reshaping the educational context and empowering students to be autonomous learners.

Not only do AI tools help the learners, but they can also assist teachers. Ezequiel et al. (2024) said that AI is transforming the teaching profession by providing innovative tools and solutions that support educators throughout their career, from attraction and retention to ongoing professional development and classroom Practice. AI can mentor attraction and retention, give feedback for professional development, generate lesson plans and content creation for teaching support, create assessment tools, grade, and analyze them and provide automated routines for minimizing administrative workload.

Moreover, administrations can benefit from AI tools. Ezequiel et al. (2024) said that AI is being used to take the maximum benefit for education management, from efficient administrative tasks and enhancing data-driven

decision-making to improving resource allocation. AI-powered assistants can perform a wide range of tasks, such as simplifying enrollment, providing 24/7 student support, assisting professors, and automating operational processes. Advanced data matching algorithms link disparate databases, enabling comprehensive data infrastructures and facilitating early identification of at-risk students. By employing algorithms that consider preferences, constraints, and engagement indicators, AI-driven systems enhance transparency, efficiency, and equity in resource allocation, including optimizing teacher and student assignments.

To sum up, AI tools are helpful for students, teachers, and administrators. It can act as an assistant to facilitate education. AI-powered assistants are emerging as a promising solution to streamline administrative processes in educational institutions. Thus, AI is expected to offer more opportunities to improve student outcomes while requiring responsible design and implementation through collaboration among education leaders, technology developers, and researchers.

2.2 Challenges of AI in Education

Integration of AI in education is relatively new. Its use is still debatable among scholars and educators. The overreliance of AI in education has created problems related to reducing accuracy and privacy, diminishing critical thinking skills, academic dishonesty, and neglecting human feelings.

The first challenge is that AI reduces privacy and security. Hary (2023) illustrated that the collection and analysis of large amounts of personal data from students could be dangerous if it falls into the wrong hands. Institutions must ensure that they are responding appropriately to protect students' privacy and prevent data breaches. Privacy and Data Protection: AI systems in education collect vast amounts of sensitive student data. Ethical use requires strict adherence to regulations like the General Data Protection Regulation (GDPR) or the Family Educational Rights and Privacy Act (FERPA) to safeguard personal information and ensure data is used only for beneficial educational purposes (Gouseti et al., 2025).

Moreover, AI lacks trust considerations. As students may be hesitant to accept grades or feedback generated by protected AI systems, they prefer to have human input and evaluation. It is important to establish trust with students and make them feel comfortable with the technology (Hary, 2023). The collection and processing of great amounts of student data by AI systems introduces significant privacy risks, including breaches, unauthorised use, and potential commercial exploitation (Hennekeuser et al., 2024).

Third, AI systems can also be expensive to implement and maintain, which can be a challenge for educational institutions that are already facing budget constraints. Thus, institutions must carefully consider the costs and benefits of implementing AI systems in their classrooms (Hary, 2023).

Fourth, AI has potential bias. Hary (2023) said that AI systems can be biased, particularly if they are trained on biased data. This can result in unfair treatment of certain students and affirms the existence of inequalities. Institutions must ensure that their AI systems are unbiased and do not perpetuate existing inequalities to assure fairness principle. Another major concern is algorithmic bias, where AI models trained on distorted data preserve socioeconomic, racial, or gender disparities in educational outcomes. Guidelines emphasize the need to officially document AI systems for bias and ensure equitable access and outcomes for all students (Verma et al., 2024; Adams et al., 2023).

Furthermore, AI tools show ethical problems. AI introduces complexities regarding academic integrity, requiring clearer policy definitions of what constitutes plagiarism or cheating when AI tools are used to generate content (Hennekeuser et al., 2024). They also show problems concerning academic integrity and autonomy. The rise of generative AI tools (like ChatGPT) necessitates clear policies on acceptable use in assignments to prevent academic misconduct and plagiarism. Students also should be careful that over-reliance on AI could reduce critical thinking and autonomy (Saleh, 2025; Cotton et al., 2024).

Moreover, all AI users must understand how AI systems work, what data they use, and how they arrive at their decisions since a lack of transparency is a significant ethical implication (Bouzouita & Kooli, 2024). Hary (2023)

said that AI-based education systems must be designed with accessibility in mind, ensuring that all students, including those with disabilities, can access and use the technology. AI systems must also be transparent, with clear explanations of how they make decisions and why. This can help build trust with students and ensure that they understand the technology. AI-based education systems must be fair, ensuring that all students are treated equally and not discriminated against based on their race, gender, or other factors.

Moreover, over-reliance on AI tools raises concerns about cognitive offloading, where students may reduce independent verification of information and rely uncritically on AI-generated content (Hennekeuser et al., 2024; Gerlich, 2025). Studies have noted that excessive reliance on AI can lead to diminished cognitive returns and reduced skepticism (Gerlich, 2025). As generative AI becomes increasingly integrated into higher education, its influence is reshaping what it means to learn, teach, and think. Drawing from constructivist theory, Bloom's Taxonomy, and the Cattell-Horn-Carroll model of intelligence, Gerlich proposes a shift from utilitarian models of learning to a framework that emphasizes conceptual agility, dialectical reasoning, and meaning-making. He concludes that AI may alter cognitive development, risk passive knowledge acquisition, and deepen achievement gaps. Thus, we need a human-centered, inquiry-based model of education that redefines learning beyond the proficiency in problems toward the cultivation of imagination, ethical reasoning, and validated curiosity.

Adding to this, the "rot brain theory," often termed "brain rot," discusses that excessive exposure to superficial, hyper-stimulating digital content, such as short-form videos and social media, leads to cognitive decline, including diminished attention spans, memory retention, and critical thinking skills among students (Mostafa et al., 2025). This phenomenon manifests through prefrontal cortex fatigue from constant distractions, weakening neural pathways for sustained reflection, complex problem-solving, and analytical engagement, as passive consumption reinforces quick reflexes over deliberate reasoning (Yousef et al., 2025). In educational contexts, students exhibit reduced focus during prolonged tasks, difficulty transitioning to deep learning, and reliance on external tools like search engines, deleting the foundational skills needed for critical analysis and hinders academic performance.

To sum up, integration of AI in education remains controversial among scholars and educators, as overreliance leads to critical issues such as privacy risks, diminished critical thinking, academic dishonesty, and neglect of human elements. Consequently, a human-centered, inquiry-based education model that promotes imagination, ethical reasoning, and epistemic curiosity is imperative to balance AI's benefits with the preservation of core educational values.

2.3 Global Guidelines for Controlling AI Integration in Higher Education

The rapid advancement and public accessibility of Generative Artificial Intelligence (AI) tools have presented an unprecedented challenge to the foundational principles of academic integrity and traditional pedagogical practice in higher education (Chan, 2023). AI should serve to enhance, not replace, the fundamental human elements of teaching and learning. Teachers and institutions must maintain complete responsibility for educational decisions. Accountability frameworks are needed to determine who is responsible when an AI system produces an error or causes harm. Li (2019) revealed that UNESCO had a global role in putting a framework for AI use. Universities globally have responded not with universal prohibition, but with evolving, nuanced guidelines designed to control AI integration by balancing student learning objectives with the preservation of intellectual honesty. The institutional policies established across major universities cluster around three central themes: mandatory disclosure and transparent citation, the redesign of assessment to prioritize higher-order thinking, and the enforcement of institution-wide ethical principles.

First, the cornerstone of all institutional control over AI integration is the requirement for explicit transparency from students. Some universities asserted that submitting work generated by an AI tool without acknowledgement constitutes a fundamental breakdown of academic integrity (Mulengu & Shilongo, 2024). Actually, students must actively declare the extent to which they utilized AI tools in their submitted assignments. This disclosure often extends beyond merely mentioning the tool. It frequently requires a brief narrative outlining the purpose of the AI use, such as using it for brainstorming or generating a summary, as well as the part of the final work that was derived from the AI's output (Cornell University, n.d.). University guidelines for controlling the integration of AI

in education have many sides. They are defined by a dedication to transparency through mandatory disclosure and strict citation requirements (University of Alberta, 2024).

Second, when AI-generated content is permitted, some universities require students to cite the tool following established style guides, such as APA. This involves treating the AI model similarly to software, listing the developer as the author, the year of the version used, and the model's name and version number in the reference list. Furthermore, it is a widely adopted best practice to include the exact prompt used to generate the content, often in an appendix, allowing instructors to verify the student's level of engagement and critical thinking. Crucially, students retain full responsibility for the factual accuracy and integrity of the final work, making verification of AI-generated references (Shukla,2025).

Third, to effectively control AI's role in education, universities have recognized that policy alone is insufficient; a shift in pedagogical approach is necessary. This shift manifests primarily in the redesign of assessment and the adoption of contextual usage policies. Many institutions advise faculty to adopt a "traffic light" system for assignments: designating AI use as prohibited (Red Light), permitted with citation (Yellow Light), or encouraged/required (Green Light), with the default often being prohibited unless explicitly stated otherwise (Burnard & Cupido,2025). This approach ensures that control remains relevant to the assignment's learning goals. For example, AI use is typically restricted in secure, supervised environments, like in-person examinations, while it may be encouraged for complex, open-ended research projects.

More fundamentally, educators are encouraged to revise assessment strategies to focus on skills that surpass AI's current capabilities. This involves designing tasks that require human-centred abilities, such as real-world application, critical self-reflection, original ethical analysis, and the application of knowledge within a unique or localized context. The goal is to view AI not as a replacement for learning, but as an "electric bike" that reduces burden while keeping the human fully in control of the direction and final output. This integration requires fostering AI literacy among students, equipping them to use AI tools responsibly and ethically while understanding their inherent biases and limitations (Chan, 2023). AI is a necessary shift in pedagogy toward higher-order, human-centric assessment (Cacho, 2023).

Furthermore, at the institutional level, comprehensible guidelines seek to govern AI usage through a set of ethical and legal principles that protect both the institution and its community members. Tsinghua University, for instance, advocates for grounding policies in core principles such as responsibility, data security, and critical thinking. A critical control measure is the warning against introducing sensitive, private, or confidential information into open-source generative AI models due to inherent data security and privacy risks. Furthermore, the principle of fairness and inclusion guides policy development, acknowledging that premium access. Universities must adhere to fundamental ethical frameworks, particularly concerning data security and the responsible use of computational power. As AI technology continues to evolve, these institutional controls will require ongoing adaptation to ensure that academic institutions fulfil their mission of fostering genuine scholarship and intellectual development. (Rayan and Stah,2021)

Therefore, the significant benefits of Artificial Intelligence (AI) in education mandate its integration, yet this must be approached with caution, requiring institutions to use it judiciously rather than blindly. To navigate this essential transition, UNESCO's guidelines emphasize four pillars for a smooth, equitable, and ethical adoption: first, investing in necessary infrastructure, specifically high-speed internet and devices, is crucial for equitable access, particularly in underserved communities. Second, preparing educators through comprehensive professional development is essential, covering not only technical skills but also pedagogical strategies that leverage frameworks like UNESCO's ICT Competency Framework for Teachers (UNESCO, 2018). Third, fostering AI fluency at the organizational level involves building institutional capacity, establishing dedicated teams and a culture of experimentation, to integrate AI effectively into processes from curriculum design to decision-making. Finally, proactively addressing ethical risks through multi-stakeholder collaboration is the most important issue, necessitating safeguards for student data privacy, reducing algorithmic bias, and continuous evaluation of AI's

human impacts, utilizing resources such as the OECD AI Principles (OECD, 2019) and IEEE's Ethically Aligned Design (IEEE, 2019; UNESCO, 2023) as starting points for contextual adaptation.

2.4 Controls and Guidelines of AI in Lebanese Education

The rapid emergence of Generative Artificial Intelligence (AI) has forced educational institutions worldwide to establish regulatory measures, and Lebanon is no exception. Due to its decentralized higher education system and the urgent need for modernization, Lebanon's strategy to control AI use is characterized by establishing national ethical and competency frameworks, emphasizing data privacy, and promoting a human-centred approach to technology integration, rather than outright prohibition. The controls implemented are primarily principles-based, guiding responsible deployment across the primary and tertiary sectors.

First, the most significant action taken at the national level involves the development of an AI Competency Framework by the Centre for Educational Research and Development (CRDP), which operates under the Ministry of Education and Higher Education. This framework serves as the foundational policy document, controlling AI use by defining the necessary skills and ethical boundaries for students and teachers (CRDP, 2025). Central to the CRDP's control strategy is the principle of a human-centred approach, affirming that AI tools must serve to support, not replace, educators, thereby preserving the crucial teacher-student relationship and ensuring pedagogical decisions remain human-led (CRDP, 2025). Furthermore, the framework enforces strict ethical and responsible use, requiring AI-powered learning tools to guarantee non-discrimination, fairness, and transparency in their operation. Crucially, the framework ties AI use to compliance with existing legal measures, mandating that all data collected by AI educational tools must adhere to Lebanese data protection laws and be used strictly for designated educational purposes to protect individual privacy (CRDP, 2025).

Second, institutions have increasingly focused on developing overarching ethical and governance guidelines to regulate AI implementation. The Lebanese University (LU) has published comprehensive guidelines centred on the ethics and governance of AI, aiming to establish a unified ethical framework for trustworthy AI deployment across society. These guidelines emphasize core ethical principles such as justice and fairness, reliability and safety, accountability, and responsibility. While these high-level policies provide a strong ethical foundation, research shows a gap at the technical level in many Lebanese higher education institutions, where specific academic integrity policies related to generative AI use remain underdeveloped, leaving instructors responsible for managing issues like AI disclosure and plagiarism. LU's guidelines, particularly those from its Faculty of Law, Political & Administrative Sciences, represent a foundational step toward a cohesive national governance model for AI in Lebanon, moving beyond course-specific regulations to propose an integrated regulatory system. The guidelines include principles prioritizing human well-being and societal stability, such as ensuring equitable AI use without discrimination, safeguarding privacy and security, emphasizing human oversight and accountability, guaranteeing AI reliability and safety, promoting transparency, and aligning AI deployment with social and environmental goals. Moreover, the guidelines propose an innovative national regulatory framework incorporating a monitoring and enforcement mechanism through a proposed National Authority for Artificial Intelligence. This authority would oversee compliance with ethical principles, license AI models related to critical infrastructure, and advise policymakers to support responsible AI evolution. By adopting this detailed and systemic approach, the Lebanese University positions itself as a leading voice in AI governance in Lebanon, advocating for structured, ethical, and accountable AI usage at national and institutional levels (Lebanese University, 2024; Nasser & Harati, 2022).

Third, leading institutions have started issuing formal guidance and frameworks to address AI use. The Lebanese American University (LAU) has provided comprehensive guidance documents for faculty, emphasizing that the level of allowed Generative AI use should be clearly stated in the course syllabus (LAU Centre for Innovative Learning, 2023). This approach places the responsibility on the individual instructor to choose a policy ranging from full prohibition to encouraged use with mandatory citation. Second, policies suggest that for courses where AI use is allowed, faculty should ensure that no more than 30% of the course grade can be achieved solely or significantly using AI, promoting a robust mix of assessment methods that require human critical thinking (LAU Centre for Innovative Learning, 2023). AUL emphasized on Academic Integrity and Citation. A major control mechanism is the reinforcement of traditional academic standards applied to the new technology: it imposed

Mandatory Citation. Multiple studies and policies advocate that when students use Generative AI for permitted tasks (such as brainstorming or refining drafts), they must appropriately acknowledge and cite the AI tool, often following guidelines adapted from APA style (Hteit & Khalil, 2024; LAU Centre for Innovative Learning, 2023). Failure to cite is treated as plagiarism. Third, it is considered misconduct. The policies explicitly define unauthorized use of AI as a form of cheating under the Student Code of Conduct (LAU Centre for Innovative Learning, 2023). Fourth, it imposed AI-Resistant Assessments. Faculty are encouraged to design assignments that are difficult for AI to complete successfully, such as in-class assignments and exams, oral exams, and presentations without slides. Assignments requiring personalized reflection or application of local/real-time content (LAU Centre for Innovative Learning, 2023).

In conclusion, some Lebanese universities recognize that education requires control, not just restriction. There is a move toward integrating AI ethics and digital literacy into the curriculum, acknowledging that students are the future developers and users of these technologies (AUB Centre for Teaching and Learning, 2024). Research conducted at institutions like the Lebanese University shows a clear demand for official guidelines among students, indicating a recognized need for institutional control to navigate the ethical landscape (Mokdad, 2024).

However, to ensure effective control and integration, a significant measure involves strengthening the capacity of the educational workforce. The national strategy emphasizes continuous professional development and mandatory AI certification for teachers, ensuring they understand the ethical implications, limitations, and pedagogical applications of AI tools (CRDP, 2023). The emphasis is on teaching students *how* to use AI responsibly for research and support while maintaining accountability for the final output, a control measure designed to promote critical thinking rather than simple delegation of work.

In conclusion, Lebanon's approach to controlling AI use in education is founded on establishing a national AI Competency Framework and implementing broad ethical governance principles. While institutional efforts are robust in defining how AI should be used ethically, the ongoing challenge lies in translating these high-level controls into consistent, specific academic integrity policies across all Lebanese educational institutions to effectively manage the impact of Generative AI (Nasser & Harati, 2022).

3. Methodology

3.1 Research Design

This research aims to investigate which university students in Lebanon can benefit from AI consideration and whether any policies stand against this irresistible movement. Therefore, this research paper utilized applied research that is exploratory, shedding light on a significant problem, which is the absence of ethical policies and guidelines that control AI use in Lebanese universities. Moreover, this research paper used a mixed-method approach to collect quantitative data (% of AI benefit and challenges for the students) and qualitative data (teachers' opinion towards AI ethical policies). This research design helps the researcher to prove this problem practically, not only theoretically, and it does not just describe the problem, but it also explains it by providing significant statistical results.

3.2 Sample

To achieve credibility and reliability of the research, this research paper relies on selecting an appropriate sample size and a sample design.

The core population of the research are the students and teachers who learn and teach at private and public universities in Lebanon, which is a large population. Thus, I depended on two types of sampling. First, I used purposeful sampling where I chose one teacher and student from each of the popular universities in Lebanon. Then, I used a snowball sampling method, where the selected person distributed it among their colleagues. As the population is large, I stopped getting responses after getting 100 responses (80% students and 20% teachers), focusing on the quality of samples more than quantity.

Thus, this sample is representative of the population as it shows diversity from different universities. This will help us to generalize the results, as the participants were chosen randomly from the Lebanese university context.

3.3 Data Collection

This research paper investigates three research questions focusing on the opportunities that can be gained from AI use, the challenges that university students and teachers face and whether the Lebanese universities are ready to face this irresistible change in education. As a university instructor at the Lebanese University and AUL University, it was observable that the over-reliance of the students on AI tools sometimes surpasses the teachers' knowledge. Thus, I started collecting and taking notes on how the students use AI to solve assignments, do presentations, and prepare projects, and how they craftily do them without clear guidelines that teachers can use to detect them and even if they cheat, what rules can be put in place to stop them. Thus, this research paper relies mostly on collecting data from the two major components in education: teachers' and students' surveys.

University Students' Survey

This quantitative survey aims to investigate students' awareness of AI use in education. It follows a Likert scale that enables us to quantitatively determine the percentage of the students' responses. According to the research questions, the questionnaire is structured into four key sections, each targeting a specific aspect of AI's role and impact in academic settings.

Section A, "AI Usage and Frequency," aims to gather data on the types of AI tools students use for university coursework and how often they engage with these technologies, including generative AI and AI-powered learning aids. This section helps quantify AI penetration and usage patterns in student academic activities. (R Q1)

Section B, "Perceived Benefits and Learning Efficacy," focuses on students' subjective evaluations of AI's contribution to their learning, investigating whether AI tools improve individualized learning, efficiency, feedback quality, and overall academic outcomes. This section assesses perceived educational value and effectiveness. (R Q1)

Section C, "Ethical Concerns and Challenges," explores student worries related to privacy, security, algorithmic bias, transparency, and trust in AI systems, emphasizing the ethical dimensions of AI integration in education. (R Q 2)

Finally, Section D, "Impact on Critical Thinking and Integrity," evaluates how reliance on AI affects students' critical thinking skills, fact-checking behaviours, clarity of institutional AI policies, and the perceived risk of academic misconduct. This section addresses the cognitive and integrity-related consequences of AI use, along with institutional governance. Together, these sections provide a comprehensive view of AI's practical, ethical, and cognitive implications in university education. (RQ 3)

University Teachers' Survey

For qualitative research, a questionnaire was distributed to different instructors at different universities in Lebanon. To have easy access to all university teachers, it was translated into Arabic, and it has open, optional questions where teachers have the total freedom in responding.

The teachers' questionnaire aims to evaluate instructors' awareness, implementation, and perspectives on AI governance in Lebanese higher education, identifying gaps between national frameworks and practical controls while exploring strategies for ethical integration and academic integrity. It comprises four sections, each with targeted objectives:

Section 1, Policy Awareness and Institutional Governance, assesses familiarity with high-level national and institutional guidelines, such as those from the Lebanese University (LU) and CRDP, focusing on policy clarity, alignment with ethical principles like justice and fairness, and data privacy rules for student information. (RQ 1)

Section 2, Practical Implementation and Course Design, examines granular, assignment-level strategies including syllabus communication (e.g., traffic light systems), citation requirements, grade limits on AI-assisted work, and AI-resistant assessment redesigns to manage usage effectively. (RQ1)

Section 3, Academic Integrity and Challenges, investigates definitions of AI-related misconduct, detection methods, concerns over diminished critical thinking from overreliance, and the burden on individual instructors due to policy gaps. (RQ 2)

Section 4, Training and Future Direction, evaluates institutional support through professional development, promotion of responsible AI use as a tool rather than a substitute, and instructors' recommendations for standardised future controls. (RQ 3)

Overall, the teachers' questionnaire provides insights into bridging policy aspirations with classroom realities for trustworthy AI deployment.

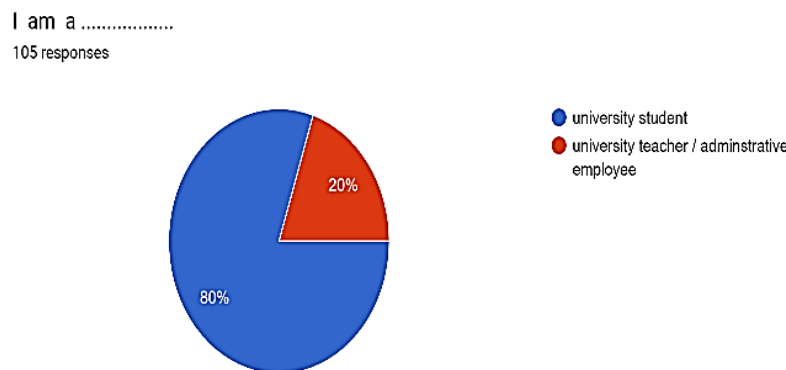


Figure 1: Demography

4. Result Discussion

Based on the research purposes, we need 80% university students and 20% teachers, so the researcher closed the questionnaire on 105 responses. (*see fig. 1*)

4.1 Students' Survey Analysis

The demography analysis focused on the diversity of the students.

46% of them are from the 20-24 age group, which is the normal age for university students in Lebanon. (*See table 1*)

Table 1:Age of the sts

Age Group	Count	Percentage
17-19	27	31.8
20-24	39	45.9
25-29	7	8.2
30-39	4	4.7
40+	8	9.4

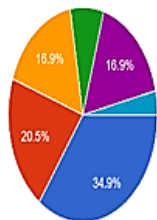
They are from different universities: Lebanese University, LIU, AUL, BAU, UOB and AUB. (*see table 2*) They are also from different stages (ranging from 1st year to PhD), and from different majors (English, pharmacy,

engineering, business). This diversity gives evidence about the diversity of the sample that was selected randomly to achieve the research objectives. (See figs.2A,2B&2C)

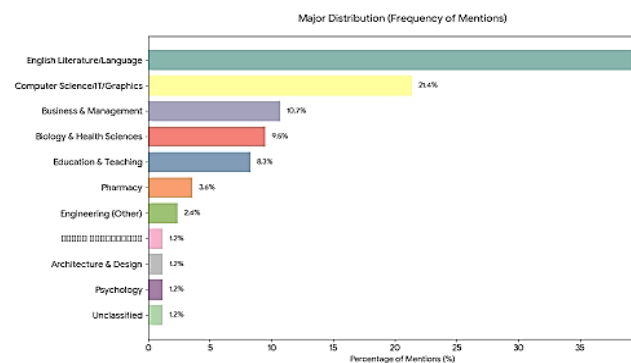
Table 2:% of universities

University	Percentage (%)
Lebanese University (LU)	55.7%
Lebanese International University (LIU)	19.3%
Arts, Sciences and Technology University in Lebanon (AUL)	8.0%
Beirut Arab University (BAU)	5.7%
University of Balamand (UOB)	4.5%
American University of Beirut (AUB)	2.3%
Other	4.5%

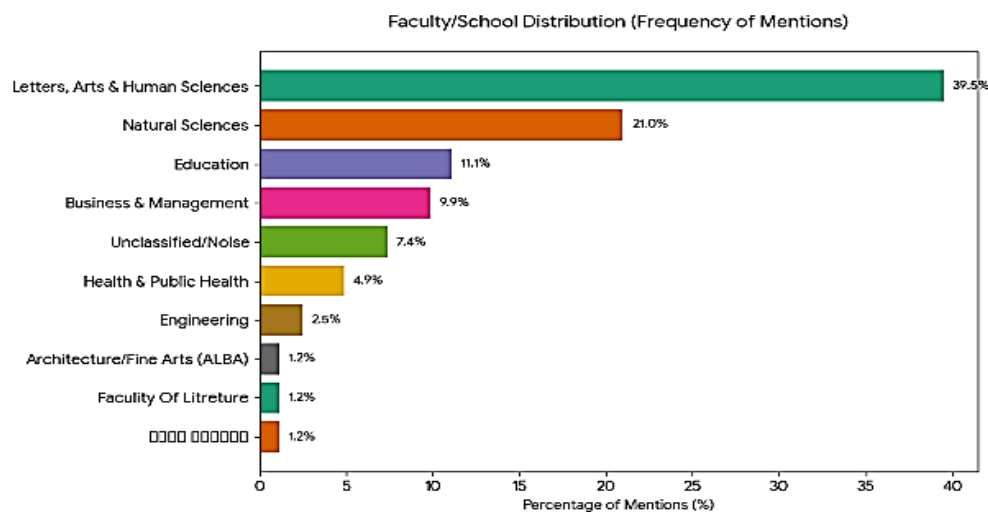
year
83 responses



(A)



(B)



(C)

Figure 2: (A)% of year, (B) students major, (C) students' faculties

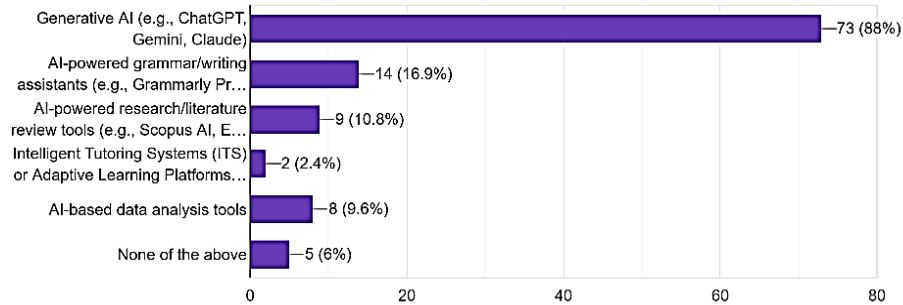
Section 1: AI Use and Frequency

According to the students' regular use of AI, the results revealed that 88% of students used AI only for generative tasks, while using it for analyzing data, assisting, and research took only around 12%. Moreover, most of the students use AI daily (33.7%) or 2-3 times per week (33.7%), and around 60% use it in assignments even though it is not permitted to use it. (See figs 3A,3BAND 3C).

These results affirmed the excessive reliance of university students on using AI in education. Thus, we are facing a threat as AI could reduce critical analysis skills, which confirms the rot brain theory.

A1. Which of the following AI tools have you used for university-related coursework (e.g., studying, research, writing)?

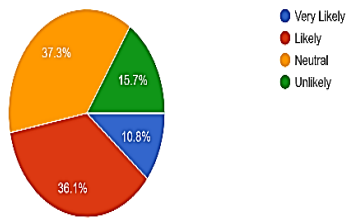
83 responses



(A)

A3. For assignments where the use of AI is not explicitly permitted, how likely are you to use an AI tool to assist with tasks such as brainstorming or outline generation

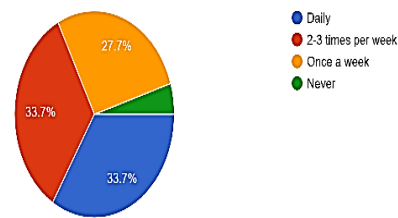
83 responses



(C)

A2. On average, how often do you use Generative AI tools (e.g., ChatGPT) specifically for academic assignments or studying?

83 responses



(B)

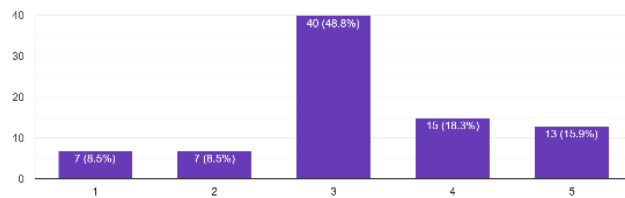
Figure 3: (A) Most used tool, (B) Frequency of AI use, (C) AI use as an assistant

Section 2: Benefits of AI and Learning Efficacy

This section reflects the extent to which students are aware of the benefits of using AI in education. It shows that students are fully aware, as 40% of them affirmed that AI tools can help them to generate content relevant to their learning path. 88% of the students affirm that AI tools help them in summarizing and revision, 80% liked the immediate feedback to reinforce their learning, 85% affirmed that AI helped in analyzing data faster, and 82% affirmed that AI developed their learning outcome (better grades). (See fig. 4A,B,C,D &E).

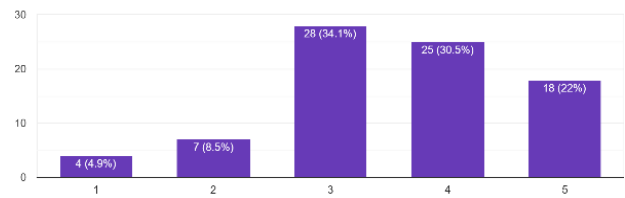
As we have seen, students are fully aware of the efficiency of AI tools in personalizing their learning and helping them to get higher marks. These results could be an indication of a second threat, which is that AI could substitute the human teacher.

B1. AI tools (e.g., ITS, personalized learning platforms) help tailor content to my individual learning pace and needs
82 responses



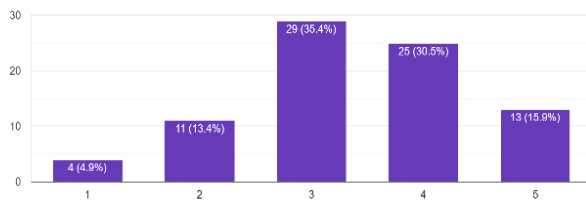
(A)

B2. Using AI tools significantly increases my learning efficiency by automating tasks like summarization or concept review
82 responses



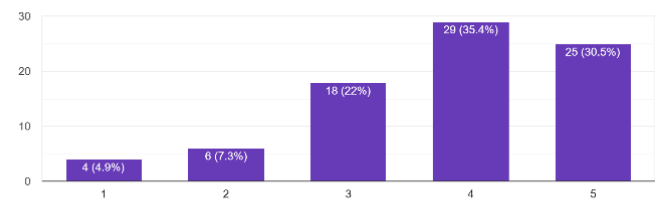
(B)

B3. AI-generated immediate feedback helps me reinforce learning and prevents misconceptions from taking root
82 responses



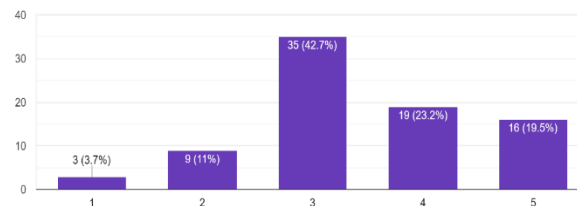
(C)

B4. AI assists me in analyzing large amounts of data or complex material faster than I could manually.
82 responses



(D)

B5. Overall, AI tools have led to improved academic outcomes (e.g., better grades) for me.
82 responses



(E)

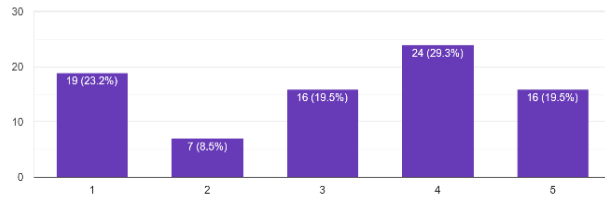
Figure 4: (A) personalization, (B) learning efficacy, (C) AI feedback, (D) critical analysis, (E) AI benefits

Section 3: Ethical Concerns and Challenges

This section reflects the students' awareness of ethical considerations when using AI tools. The most observable thing in this section is that neutral took the highest percentage in all the questions, while the positive and negative responses are nearly equal. This indicates students' hesitation towards this issue. The results revealed that 49% of the students are concerned about privacy and security while using AI, and 38% aren't. Regarding AI algorithm bias awareness, around 49% of the students are concerned, and 31% are not. Third, 46 % of them do not trust AI grades or feedback without human input, while around 33% did. Similarly, lacking transparency seems to be a problem for 27%, while 22% do not. (See fig5 A,B,C,D&E).

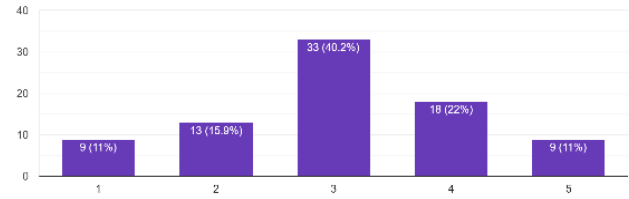
Therefore, taking ethical consideration while using AI is problematic as nearly a third of the students do not consider them, a third are neutral, and a third takes them into consideration. This indicates the ethical use of AI remains vague and unclear.

C1. I am concerned about the privacy and security of the personal academic data collected by AI educational systems
82 responses



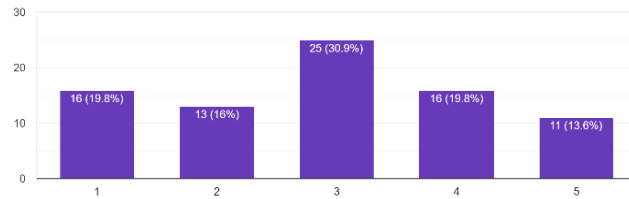
(A)

C2. I am concerned that AI systems may exhibit algorithmic bias leading to unfair grading or resources based on demographic factors.
82 responses



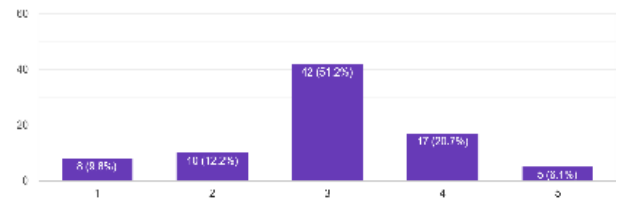
(B)

C3. I find it difficult to trust or fully accept grades or feedback generated primarily by an AI system without human input
81 responses



(C)

C4. The lack of transparency in how AI systems arrive at their decisions (e.g., recommendations) is a problem for me.
82 responses



(D)

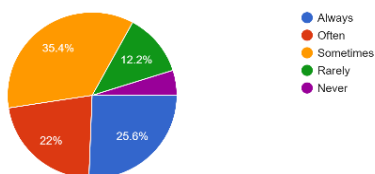
Figure 5:(A) privacy and security, (B) algorithm bias, (C) AI assessment, (D) transparency

Section 4: Impact on Critical Thinking and Integrity

This section reflects the student's awareness of developing critical analysis skills and integrity. The most observable scale that took the highest value in the first four questions is “sometimes”, and students' confirmation (yes) in the final question affirmed that students are aware that AI tools could destroy their critical analysis skills, and their overuse is not academic. However, many of them are aware of the impact of AI on their critical analysis and integrity, as the following results revealed. 50% of the students verified the results when using AI independently. 44% of the students verify the facts and sources. 57% have clear instructions from their instructors regarding the acceptance of AI use. 66.3% confirm that relying on AI tools increases the risk of academic misconduct (plagiarism, cheating). (See figs 6A,B&C)

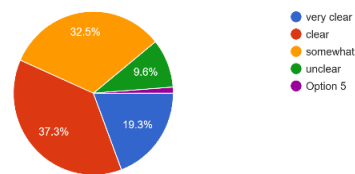
Therefore, AI use diminishes students' critical thinking skills since it is based only on individual instructions.

D2. When using Generative AI for an assignment, how often do you independently verify the facts and sources provided by the AI?
82 responses



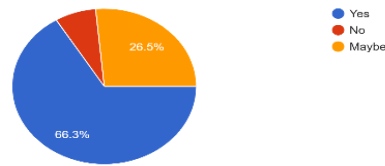
(A)

D3. How clear are your instructors' policies regarding the acceptable use of AI tools (e.g., for paraphrasing, generating code, or summarizing) in your courses?
83 responses



(B)

D4. Do you believe that relying too heavily on AI tools increases the risk of academic misconduct (plagiarism or cheating)?
83 responses



(C)

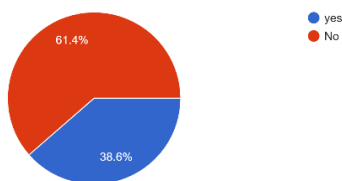
Figure 6: (A) verification results, (B) instructor's policy, (C) academic misconduct

Section 5: AI Guideline

This section reflects students' awareness of ethical guidelines. The first and third questions revealed that 61.4% of the universities do not have clear guidelines for using AI in education, and 66.3% haven't attended any training courses about AI integration in education. (*see fig. 7A&7B*). The second question was qualitative; when asking about AI rules, only 12 students responded, and they said only simple, unsatisfying words. The responses highlighted several critical guidelines for the ethical and academic use of AI in an educational setting. The dominant concern is plagiarism, which requires students to use AI as a tool for information gathering or generating a general idea rather than a source for assignment completion or direct copy-pasting. To mitigate plagiarism, the responses emphasise verification by the user/teacher, advising students to use the right prompts, always check the information provided, and use AI smartly. Furthermore, according to the ethical considerations, human oversight and agency, transparency, data privacy and security, and accountability stress that the technology should not operate autonomously. The concept of accountability is reinforced by affirming that a responsible human or organization must always be able to correct mistakes and take responsibility for the AI's outcomes. Finally, the responses touch upon the importance of citing sources, specifically recommending peer-reviewed journals or authenticated books, while upholding intellectual property rights.

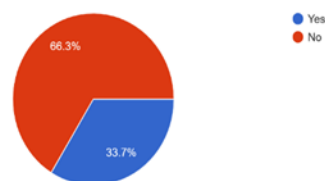
In conclusion, the students' survey revealed that AI use in education is so great, but it was based on an individual and unorganized way, which leads to problems regarding ethical use and reducing critical analysis. Thus, a balanced approach is needed to control its use in a good and effective way.

Does your university have a guideline about AI use ?
83 responses



(A)

Have you attended any training course about integrating AI in education ?
83 responses



(B)

Figure 7: (A) AI guideline, (B) training courses

Teachers' Survey Analysis

This survey was distributed randomly to teachers from different Lebanese public and private schools using purposive sampling. I received only 15 responses, which represented 20 % of the research sample. In general, I got diverse responses from different universities (LU, LIU, AUL, IUL, BAU, ULS), different faculties (arts,

literature, science, education, business, health, law, training), and different ages ranging from 25 to 52, which is the relevant age for instructors in Lebanon. It also include 62% of teachers, and the others work in universities, either in administration or in coordination. (see tables 3,4 &5, and figures 8A&B).

Thus, although the sample size that I got is small, it's relevant as it is based on a variety of universities and majors. This also indicates that students' interest in AI surpasses that of their teachers

Table 3: Teachers' Faculties

Faculty	Percentage (%)
Letters, Arts & Human Sciences	41.9%
Natural Sciences	21.0%
Education	11.1%
Business & Management	9.9%
Unclassified/Noise	7.4%

Table 4: Teachers' Affiliation

University Name	Percentage (%)
Lebanese University (LU)	50.0%
Arts, Sciences and Technology University in Lebanon (AUL)	11.1%
Islamic University of Lebanon (IUL)	11.1%
Beirut Arab University (BAU)	5.6%
La Sagesse University (ULS)	5.6%
City University (CU)	5.6%
East University (EU)	5.6%
Lebanese International University (LIU)	5.6%
TOTAL	100.0%

Table 5: Teachers' Department

Department	Percentage (%)
Language & Literature	31.2%
Business, HR & Economics	18.8%
STEM & Health Sciences	12.5%
Humanities & Psychology	12.5%
Law & Legal Studies	12.5%
Education & Training	12.5%

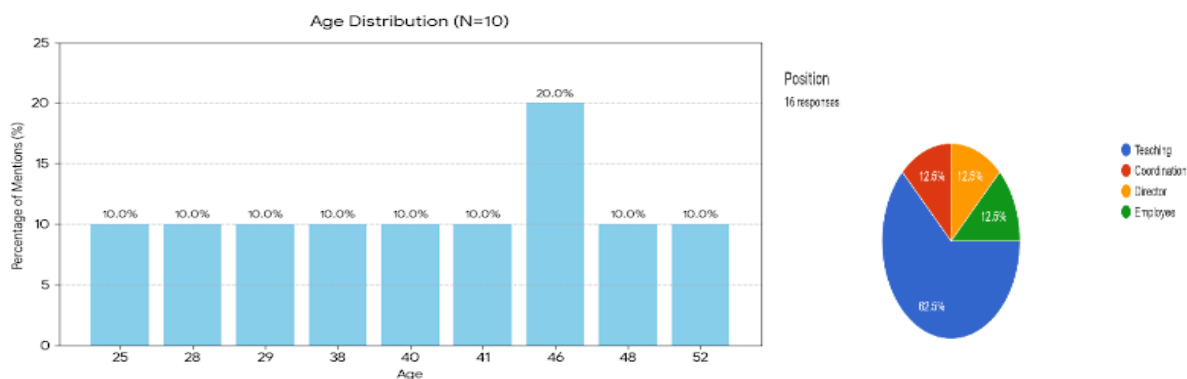


Figure 8: (A) teacher's age, (B) teachers' position

Section 1: Policy Awareness and Institutional Governance

Regarding policy clarity, nearly three-quarters of the teachers said that their university does not issue formal and comprehensive guidelines on the use of generative AI. They just focus on general ethical restrictions. According to data and privacy, 25% of the teachers affirmed that the university provided clear instructions regarding the use of confidential student data or unpublished research when interacting with public AI tools. (See figures 9A&B). The teachers also illustrated that the key rules for data protection in the courses are the primary academic rules that require students to treat AI as a tool for brainstorming and information gathering, strictly prohibiting the copy-pasting of assignments, and mandating human verification of all output. Essential ethical and operational rules dictate that users must not input sensitive or private student data (such as names or unpublished research) into AI tools, while also requiring the documentation of AI-generated content used for reference.

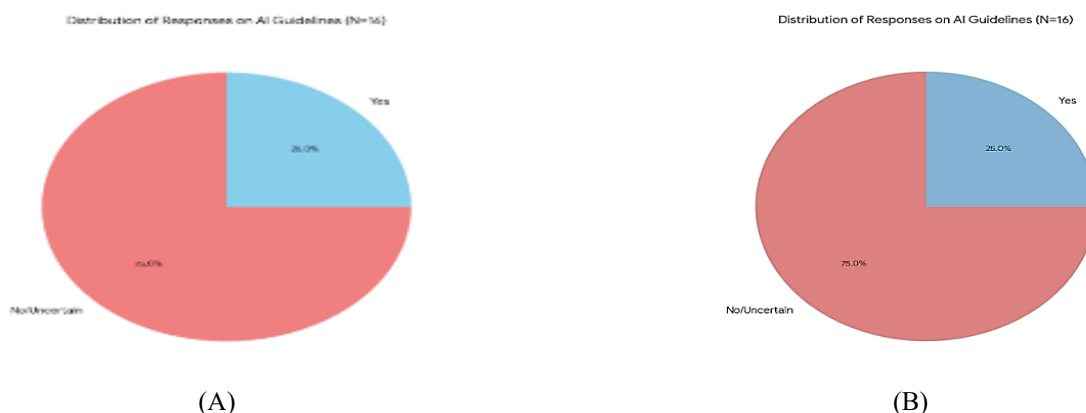


Figure 9: (A) AI integration in the university policy, (B) AI guidelines

Section 2: Practical Implementation and Course Design

According to the syllabus policy, teachers were asked about the AI usage policy for students and if they use a "traffic light" system (prohibited, allowed with citation, required) and their most common policy that they adopt in their courses. Regarding the most common policy adopted, there is a clear leaning towards permission rather than outright prohibition. The most popular approach is "Permission with Citation" (Yellow Light), which is favoured because it balances innovation and benefit while acknowledging that total prohibition is often impractical or difficult to enforce. Educators primarily permit AI for tasks like generating ideas, guidance, and support, but they strictly prohibit its use for direct copy-pasting, plagiarism, or use in formal tests. Conversely, a significant minority of responses indicated a lack of policy ("Not aware") or stated they don't incorporate AI into the syllabus, suggesting policy implementation is not yet universal.

According to the mandatory citation, teachers were asked if AI use is permitted, and about the specific requirements for mandatory citation and disclosure. The responses regarding mandatory AI citation and disclosure indicate a growing trend among educators to move beyond simple citation toward requiring a transparent, reflective account of the AI's role in the work. The most comprehensive approaches require students to include three key elements: mentioning the specific AI tool used (e.g., Chat GPT, Gemini), tackling the exact prompt or inquiry used, and providing a reflection or explanation of how the AI contributed to the work. This reflective requirement serves a pedagogical purpose. Moreover, to encourage critical thinking about the integration of AI into the learning process, rather than passive, automated use. While some educators are only beginning to emphasize disclosure of use or specifying only the tool as the mandatory requirement, the common underlying principle is a shift in focus from merely penalizing plagiarism to proactively assessing a student's understanding of their own agency in collaboration with AI.

Regarding the assessment limits, teachers were asked if they implement specific limitations, such as ensuring that no more than a certain percentage of the final course grade can be achieved solely through AI-assisted work. The responses concerning the implementation of specific assessment limits for AI-assisted work indicate a significant and structured effort by some educators to maintain the integrity of student learning outcomes. While a portion of

respondents indicated "No" or "I am not sure yet," a clear pattern emerged among the affirmative answers supporting a quantitative control mechanism. This mechanism frequently aligns with the suggested 30% limit for course grades achievable solely through AI assistance, effectively preventing over-reliance on the tools. Those who implement this limit emphasize its purpose. To ensure students develop essential personal skills such as analysis, critical thinking, and writing independently, allowing AI to serve only as a supportive auxiliary tool rather than the primary means of task completion. Further control methods mentioned include mandating a significant portion of personal, non-AI work and utilizing oral assessments to confirm genuine understanding and guard against sole reliance on AI-generated content.

Section 3: Academic Integrity and Challenges

According to misconduct, 53% of teachers said that the university's Student Code of Conduct is unauthorized AI use, and they personally perceive unauthorized AI use as the same level of misconduct as traditional plagiarism. (see *figure 10*) .According to enforcement and detection, teachers were asked about the tools or methods that they currently use to detect potential AI-generated content and about their efficiency. The responses on AI detection methods reveal a clear reliance on human expertise and comparative analysis over automated tools, especially in the context of the Lebanese academic environment. The most frequently cited and trusted methods are manual and qualitative. Educators heavily depend on their academic experience to manually review student submissions. This involves assessing the student's usual writing style, consistency of language, originality of ideas, and comparing the work with the student's previous submissions.

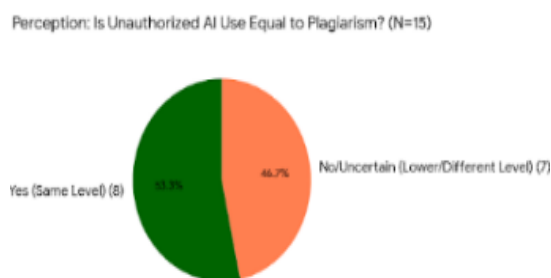


Figure 10: University Students' Code

According to practical verification, methods such as verifying sources and citations, checking for inconsistencies in the text, and using follow-up questions or in-class clarifications are employed to confirm student understanding. Specific tools are mentioned: A minority of respondents named specific commercial detection tools like Turnitin, Compilatio, AISEO, TextFlip, Advacheck, Copyleaks, Isgen, Smodin, and ZeroGPT. Many respondents expressed scepticism about the accuracy of these automated AI-detection tools, with one explicit response stating, "I do not rely on automated AI-detection tools because they are often inaccurate." This concern is generally true in the broader academic context, as many popular AI detection tools are known to produce high rates of false positives and negatives, making human judgment essential. Therefore, the reliance on manual style checks is a necessary and effective local adaptation to the limitations of current technology.

According to diminished critical thinking, 85.5% confirmed that students' over-reliance on AI tools is diminishing their critical thinking, research, or writing skills. (See *fig 11*). The pedagogical controls adopted by educators predominantly target the risk of AI diminishing students' critical thinking and writing skills by shifting assessment away from easily automated tasks and focusing on fostering responsible use. To mitigate over-reliance, faculty are implementing mandatory in-class writing assignments and oral presentations to assess genuine, unassisted comprehension and expression. Furthermore, they are establishing clear usage limits within assignments, ensuring a substantial portion of the work remains the student's personal effort. Accompanying these structural changes are initiatives to promote critical engagement by requiring students to reflect on the AI's contribution and providing awareness sessions on ethical use and the disadvantages of passive copying, thereby encouraging students to utilise AI as a tool for idea generation and support rather than as an academic shortcut.

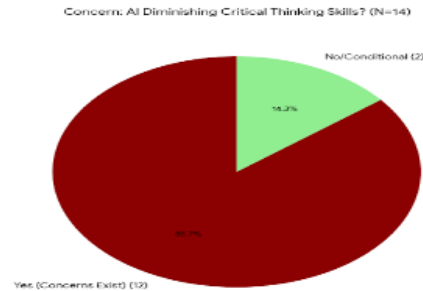


Figure 11: AI and critical thinking

Addressing the policy gap, the responses regarding institutional support for AI policy reveal a prevalent and acknowledged policy gap, with most educators feeling they must develop AI controls largely on their own. A significant number of responses explicitly state a lack of cohesive, centralized support or emphasize that the greatest responsibility falls upon the individual instructor. This forces faculty to create their own specific rules to ensure fairness and manage plagiarism, often leading to calls for more formal institutional direction to unify efforts and guarantee equitable application across the university. While some responses mention the existence of a centralized policy aimed at providing resources and support, they simultaneously acknowledge that effective implementation still requires instructors to develop their own personal controls based on course needs and experience. Thus, the sentiment suggests that while basic guidance may exist, the practical burden of enforcement and detailed policy development currently rests heavily on the individual academic staff member.

Section 4: Literacy and Training

Regarding AI literacy and training, 21.4 % said that the university provided adequate professional development or workshops to help them understand AI functionality, ethical implications, and effective pedagogical integration. This indicates a major institutional gap in preparing faculty for the AI era. The few respondents who acknowledged the lack of training noted that this presents a challenge to understanding the educational and ethical dimensions of using these tools. Conversely, only 21.4% confirmed that professional development was adequately provided, suggesting that AI literacy initiatives are either not widely implemented or have failed to reach much of the academic community, exacerbating the pressure on individual instructors to develop controls independently (see fig 12).



Figure 12: AI Literacy and Training

The analysis of how educators encourage responsible AI use confirms a strong alignment with the national strategy of viewing AI as a "critical tool" rather than a delegation of work. The primary approach involves limiting AI use to the initial, supportive phases of the academic process, such as gathering preliminary information, generating ideas (brainstorming), improving language, and using it for guidance and support. Crucially, educators

maintain accountability by mandating that the final output must be a direct reflection of the student's personal analysis and critical thinking. This is enforced through specific assessment methods, which include requiring students to document and disclose how they used the AI tool and allocating a portion of the grade to interpreting the AI's role in their work. This strategy aims to reinforce the principle of accountability while actively developing students' critical thinking skills by focusing the AI's utility on the supportive foundation, not the intellectual superstructure of the assignment.

In the expert opinion of the respondents, the single most critical control mechanism Lebanese universities must standardize over the next two years is the development and uniform application of clear, cohesive AI usage policies and guidelines. This foundational need is reflected across several responses, which call for standardization of when and how AI is permitted in academic tasks, coupled with mandatory requirements for student disclosure and documentation of the tools used. A close second key mechanism is the need for technological enforcement, specifically by standardizing detection tools and implementing a quantitative limit on AI-assisted work, often referencing the 30% threshold for reports and assessments. Furthermore, responses underscore the necessity of supporting this structure through comprehensive training for both faculty and students on the ethical implications and proper use of AI, ultimately aiming to foster a culture of student responsible use underpinned by institutional accountability.

To sum up, the teachers' survey revealed a significant institutional gap in AI governance, reporting a lack of formal university guidelines and inadequate professional training. To address this, educators are independently implementing permission with citation to reduce the risk of diminished critical thinking. Ultimately, the research calls for a standardized national framework that mandates transparent disclosure (prompts and reflections), integrates oral assessments to verify genuine learning, and provides comprehensive literacy training to shift AI's role from an academic shortcut to a collaborative tool for brainstorming and support.

5. Conclusion

AI use is problematic at Lebanese universities, although it is a pivotal assistant tool. The study revealed that students are more flexible to technological advancement than teachers. AI is a tool that could be used to assist teachers and students, but its use should be controlled.

5.1 Findings

This research paper sheds light on students' and teachers' awareness of the advantages and disadvantages of AI use at the universities of Lebanon. It investigates three questions through two surveys. This research paper has three questions; the first and second research questions investigate the benefits and challenges of AI use in Education in the universities of Lebanon, while the third one investigates if the universities in Lebanon are ready to implement AI in education relative to the students' and teachers' attitudes and behaviours.

The first and second research questions investigate the benefits and challenges of AI use in education at the universities of Lebanon. The surveys asserted that students are just using AI to generate content only. They do not take maximum benefits of AI in analysis and creative domains. Moreover, they are aware of critical thinking skills by verifying and checking the results. However, they were critical about ethical concerns, which were still ambiguous for them. This is attributed to a lack of transparency between administrations, teachers, and students. These results go along with Harry (2023), Aniekan et al. (2024), who asserted that AI can help learners to personalize learning and increase learners' efficiency. The results also affirm previous studies that reveal that AI reduces critical thinking skills (Harry, 2023), lacks ethical issues (Hennekeuser et al., 2024) by presenting biased content and leads to rot brain (Mostafa et al., 2025).

With respect to the teachers, they benefit from proactive pedagogical controls such as mandatory reflective disclosure and the use of oral assessments to ensure genuine learning. However, they faced a massive institutional policy gap and a lack of professional training for nearly 80% of faculty. Furthermore, although these strategies successfully promote transparency and help preserve students' skills through quantitative limits on AI use. They

also place an overwhelming individual burden on educators who must rely on manual verification because of unreliable detection technology. Furthermore, while AI offers potential as a collaborative tool for brainstorming, it poses a significant threat to critical thinking, a risk that is currently becoming worse by the absence of a standardized national framework and cohesive university support. These results also confirm the idea that AI help teachers to transform learning by being an assistant for teachers and administrations (Ezequiel et al., 2024). The results also confirm the necessity of regulations to control its use as illustrated by Bouzoukist & Kooli (2024), LAU Center for Innovative Learning (2023) and AUB Center for Teaching and Learning, 2024. These results go along with other studies that assert that AI use in education is essential (Hary, 2023; Ezequiel et al., 2024; AUB Centre for Teaching and Learning, 2024). However, its use reduces critical analysis skills and creates ethical problems as asserted by Gouseti et al. (2025), Cotton et al. (2024), Bouzouita & Kooli (2024) and Mostafa et al. (2025).

Relative to the third research question, which investigates whether the Lebanese Universities are ready for AI integration, this research paper asserts that we are in the first step; there are ethical and pedagogical problems that must be addressed clearly in the university guidelines. There are some basic steps done by CRDP (2025), LAU (2023) and the Lebanese University of Law (2024). These results affirm the other researchers who affirm the importance of guidelines to control AI use in education (Li, 2019; Hennekeuser et al., 2024; & Steffen, 2025). Based on these findings, an ethical guideline for integrating AI in education is needed, along with what is done by the OECD AI Principles (OECD, 2019) and IEEE's Ethically Aligned Design (IEEE, 2019; UNESCO, 2023).

To sum up, the results of this research paper asserted the importance of integrating AI in education, but this change should be based on a humanistic approach. Teachers have to change their pedagogical strategies and assessment tools towards paving the way to integrate AI in education as a tool that enhances the educational system rather than a tool that diminishes students' critical thinking skills and encourages ethical issues.

5.2 Recommendation

Based on the above results, this research paper recommends the necessity of having a guideline for each institution that controls the AI integration in education. It suggests the following University Policy Sample that governs Integration of Generative AI in education in Lebanon high level institutions. It goes along with studies of LI (2025), Chan (2023), Burnard & Cupido (2025), CRDP (2025), Nasser & Harati (2022), Mulengu & Shilongo, (2024), LAU Center for Innovative Learning (2023) and Shukla (2025).

First, according to the foundational principles and scope, the university views Generative AI as a "critical tool" for innovation and research support, but not as a delegation of core academic work. This policy is designed to ensure that AI usage enhances learning while upholding academic integrity, justice, fairness, and accountability.

Second, we need a communication method such as the Traffic Light System: All AI policies must be clearly communicated in the course syllabus using a standardized "Traffic Light" system: First, use green light for fully permitted/required: brainstorming ideas, generating outlines, improving language fluency (grammar/style), or using it for data organization/support. Second, use yellow light permitted with strict citation/disclosure: summarizing complex course readings, initial research (sources must be human-verified), and paraphrasing with mandatory student reflection. Third, use red light for strictly prohibited: Direct copying/plagiarism, generating content for formal exams or in-class tests, and completing the critical analytical core of an assignment.

Third, related to accountability, disclosure, and assessment, the following instructions should be applied:

Mandatory Disclosure and Citation: If AI use is permitted (Yellow Light), students must document its role to maintain transparency and accountability.

Tool Identification: State the specific AI tool (e.g., ChatGPT, Gemini, etc.).

Prompt Inclusion: Include the exact prompt or inquiry used to generate the content.

Reflection: Provide a brief reflection explaining how the AI contributed to the work and what human effort was required to verify, revise, or build upon the output.

Defining Misconduct Unauthorized AI use is formally defined as a form of Academic Misconduct, equivalent in severity to traditional plagiarism, as it misrepresents the student's personal work.

Assessment Limit Standard: Faculty must ensure that no more than 30% of the final course grade is achievable through AI-assisted work. This ensures students develop core competencies like critical thinking, research, and independent writing.

Fourth, related to pedagogical controls, to counteract the risk of diminished critical thinking, faculty are required to integrate the following controls:

Shifted Assessments: Implement oral assessments, in-class writing, or presentations to student comprehension directly and mitigate reliance on AI-generated text.

Contextualized Assignments: Design assignments that require the use of local knowledge, personal reflection, or highly specific data that generic AI models cannot reliably provide.

Focus on Process: Grade the process and critical analysis (e.g., drafts, research journals, reflection logs) rather than solely the final product.

Fifth, to save data privacy and security, the university has to maintain a strict policy of data protection when using public generative AI tools:

Prohibited Data: Faculty and students must not input any confidential, sensitive, or personal academic data into public AI tools. This includes: Student names, ID numbers, or contact information. Unpublished student research, theses, or proprietary university data.

Faculty Documentation: Faculty using AI for course material development must ensure their use aligns with institutional data policy and document the prompts and outputs used.

Sixth, related to institutional enforcement and support, the university recognizes the individual burden on instructors, the following centralized support mechanisms:

Standardized Training: The University will provide mandatory, recurrent professional development and workshops for all faculty covering AI functionality, ethical implications, and effective pedagogical integration.

Policy Cohesion: The central administration will continuously update and clearly communicate a cohesive, university-wide AI policy to ensure fairness and consistency across all faculties.

Tool Standardization: The University will standardize the recommended use of AI detection tools (e.g., Turnitin, Compilatio) and clarify their effectiveness and limitations, emphasizing that human oversight and manual style checks remain the primary means of detection and enforcement.

Therefore, this research paper recommends the importance of guidelines that control the integration of AI in Education at the university level in Lebanon. This guideline is based on the six pillars as illustrated in the following Figure 13:

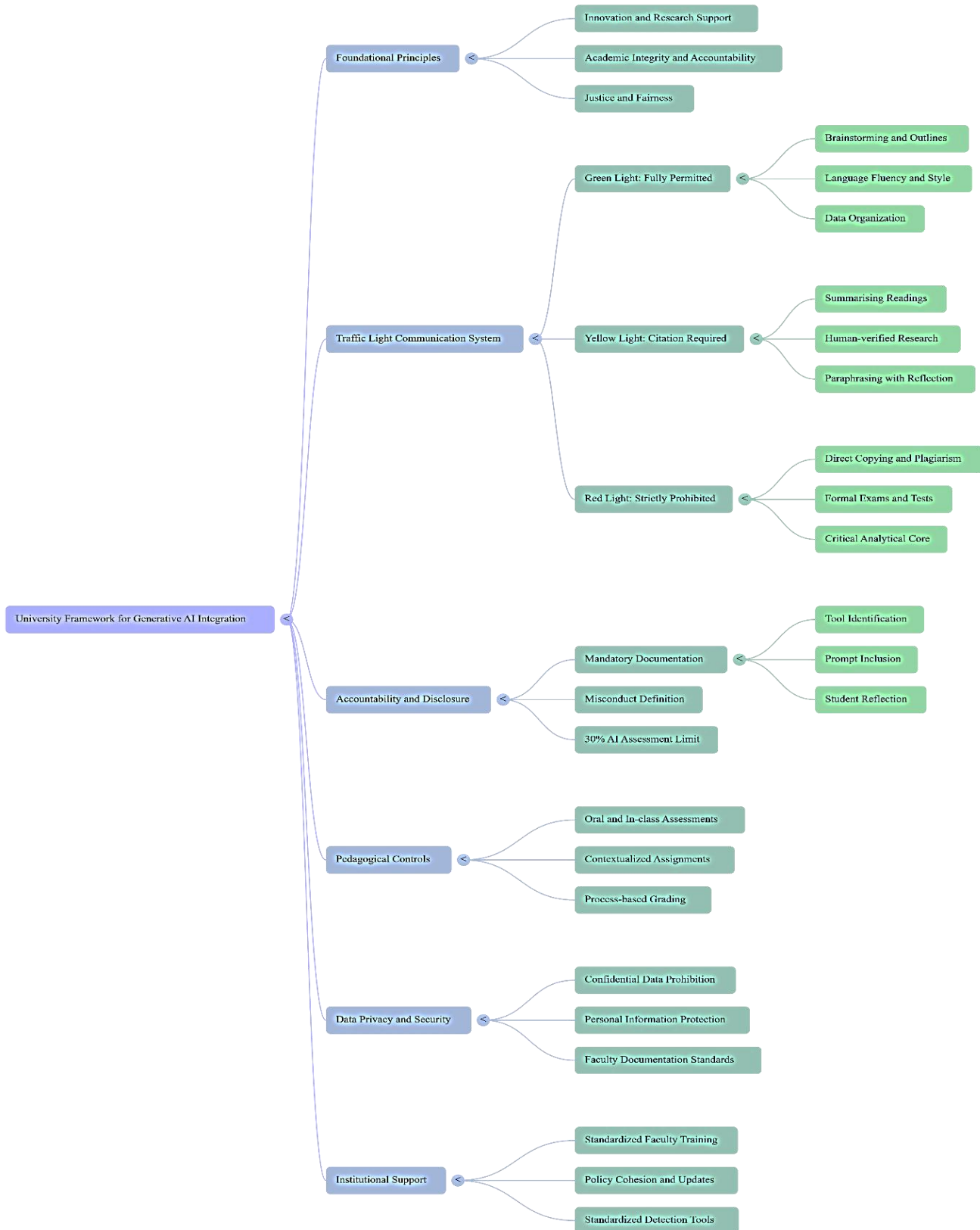


Figure 13: AI ethical framework

A final word, AI integration at the university levels in Lebanon is moving forward without permission. The students are more flexible than the teachers towards the technological advancement of AI. Thus, as students change

their studying methods, teachers must change their pedagogical procedures and assessment tools to adapt to AI transformation. However, teachers alone cannot do anything without clear policies that govern AI use by taking pedagogical and ethical issues into consideration.

Therefore, all universities, particularly in Lebanon, are asked to update their policies and educational strategies by integrating an AI ethical framework. Future research is needed to study the effectiveness of this guideline

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دمج الذكاء الاصطناعي في التعليم على المستوى الجامعي في لبنان: الفرص، التحديات، والجهوزية

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الملخص:

أدى الدمج السريع للذكاء الاصطناعي في التعليم إلى تطوير التعلم وتسهيل العمل الإداري، إذ يسير استخدامه في الجامعات اللبنانية الحكومية والخاصة بخطى متسارعة، حتى قبل أن تضع الإدارات التوجيهات الأخلاقية الأساسية اللازمة للتوسع العادل والمسؤول في هذا المجال. وبناءً على ذلك، كشف دمج الذكاء الاصطناعي عن مخاطر جسيمة تتعلق بالاتكال المعرفي، وتراجع التفكير النقدي، وأظهر أثراً سلبياً على سلامة الطلاب النفسية والجسدية مثل الإجهاد التكنولوجي والشعور بالوحدة، علاوة على زيادة المخاوف الأخلاقية المحيطة بشفافية البيانات والتحيز الخوارزمي. ولمعالجة هذه التحديات، أُجريت دراسة تفسيرية تعتمد على المنهج المختلط والقائم على استبيانين؛ حيث استخدمت الباحثة في الجانب الكمي استبياناً لاختبار مدى فاعلية الطلاب في استخدام الذكاء الاصطناعي والمُعذلة بناءً على الجاهزية المؤسسية وكفاءة الأساتذة، تلاه استبيان نوعي وُجّه إلى أساتذة الجامعات لتحليل الأطر الأساسية في الجامعات الحكومية والخاصة في لبنان وتقييم فاعلية المبادئ التوجيهية الأخلاقية وأنظمة المساءلة المطبقة فيها. وقد أكدت النتائج الحاجة الملحة إلى وضع معايير أساسية منظمة وقائمة على المخرجات، ومحو أمية الذكاء الاصطناعي الإلزامي، والتطوير المهني لضمان أن يكون الذكاء الاصطناعي أداة عادلة وفعالة بدلاً من أن يكون سبباً في فشل التطبيق، مما يجعل هذا البحث مرتبطاً بشكل أساسي بخطة وزارة التربية والتعليم العالي لإصلاح التعليم العالي في لبنان، حيث أوصت الدراسة بوضع إرشادات توجيهية تحكم استخدام الذكاء الاصطناعي في الجامعات اللبنانية تستند إلى ستة ركائز أساسية هي: التأسيس، وأداة التواصل، والمساءلة والإفصاح، والشواغل التربوية، وخصوصية البيانات وأمنها، والدعم المؤسسي.

الكلمات المفتاحية: الذكاء الاصطناعي في التعليم، إطار السياسات، المبادئ التوجيهية الأخلاقية، لبنان، التعليم العالي، النزاهة الأكاديمية