



**A TAM-Based Study of AI-Assisted Lesson Planning Among Libyan EFL Instructors:
Adoption and Ambivalence**

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Abstract

The increasing integration of Artificial Intelligence (AI) into teaching and learning has emerged as a transformative force in education, calling for an understanding of how teachers adapt these technologies. This study investigates how Libyan EFL instructors in higher education perceive and adopt AI-assisted lesson planning, extending the Technology Acceptance Model (TAM) with Creative Enhancement as an additional construct. A questionnaire was administered to 60 Libyan EFL instructors. The questionnaire comprised 23 Likert-scale items operationalising five TAM constructs: Perceived Usefulness (PU), Perceived Ease of Use (PEOU), Creative Enhancement (CE), Concerns/Ambivalence, and Behavioral Intention (BI), alongside a Verification Behaviour item and four open-ended qualitative questions. Data were analysed using descriptive statistics, one-sample t-tests, Pearson correlations, independent-samples t-tests, one-way ANOVA, and deductive content analysis. All five constructs were rated significantly above the neutral midpoint, with BI recording the highest composite mean ($M = 4.06$) and verification behaviour the highest single item mean in the study ($M = 4.40$). Time-saving was the dominant perceived benefit (68.3% of open-ended responses), while over-reliance was the leading concern (48.3%). A positive correlation between Concerns and BI ($r = .420, p < .001$) indicated that ethical awareness and adoption intent coexist rather than conflict. No significant differences were found by gender or teaching experience. Libyan EFL instructors demonstrate a pattern of adoption with ambivalence, receptive to AI tools yet critically vigilant about their outputs. The study extends TAM by supporting the Creative Enhancement construct and challenges the assumption that concerns suppress adoption, proposing instead that ambivalence is constitutive of responsible professional AI use. Implications for AI-focused professional development and institutional policy in Libyan higher education are discussed.

Keywords: *Technology Acceptance Model (TAM); artificial intelligence; EFL; lesson planning; Libya; teacher technology adoption; Creative Enhancement; AI ambivalence*

Introduction

Teaching is considered one of the most demanding professions, requiring teachers to take on and manage responsibilities far beyond their classrooms. This profession is not only about transmitting knowledge from teachers to students, but also about creating opportunities for student collaboration and creative expression, developing students' critical thinking skills, accommodating individual differences, and performing many interactive tasks, which create a heavy workload. Designing a well-structured lesson plan is key to effective teaching; however, manual planning can be overwhelming. Creating an organized lesson plan is both time-consuming and cognitively exhausting. Therefore, without adequate support from

technological systems, teachers are greatly limited in their ability to employ innovative and transformative teaching practices.

One promising solution is the integration of artificial intelligence (AI) tools into lesson planning. AI has been integrated into education widely lately. Its software and applications are being used by teachers to support their teaching in several ways, including generating lesson ideas, designing assessment tasks, suggesting activities for exercises, or customizing materials for different proficiency levels. AI tools have the potential to enhance lesson planning by providing access to a wide range of resources, suggesting appropriate teaching strategies, and offering adaptive content suggestions. These tools allow teachers to experiment with creative approaches to teaching that may not have been possible within traditional lesson planning. Despite these benefits, AI integration into lesson planning also raises concerns regarding teacher autonomy, critical engagement with AI-generated content, and ethical considerations surrounding reliance on technology.

The TAM model (Davis, 1989; Venkatesh & Davis, 2000) was utilized as the theoretical basis for identifying variables that influence Libyan teachers' acceptance of utilizing AI for developing lesson plans. The TAM states that there are only two belief structures (Perceived Usefulness/Perceived Ease of Use) that influence an individual's intentions to use new technologies. This study extends the original framework by adding a measure of ethical/autonomy concerns related to the conflict between faculty acknowledgment of AI's usefulness and their apprehension regarding AI's ability to accurately assess student learning, provide standardized assessments, and utilize professional judgment.

The tension between AI's benefits and its risks to teacher autonomy and ethical practice is of unique significance when examined through the lens of Libya's Higher Education environment. This tension is particularly relevant within Libya's Higher Education context, given that universities have suffered from many years of underinvestment and political instability (GEFRI, 2026) and thus experience significant constraints in terms of institutional support for faculty members to integrate technology (Shalbag, 2026). Therefore, it will be necessary to investigate how faculty in Libya resolve the tensions between the potential advantages and disadvantages of utilizing AI in order to inform relevant policies and professional development programming that can assist in meeting the needs of Libyan Higher Education. Specifically, this study aims to explore teachers' perceptions of AI assistance in lesson planning; examine the extent to which AI tools support pedagogical innovation and creativity; investigate how AI use affects teachers' professional autonomy and critical engagement with content; and identify challenges and ethical considerations associated with AI-assisted lesson planning.

In light of the foregoing, this study is guided by the following research questions:

1. To what extent do Libyan university faculty perceive AI-assisted lesson planning as useful and easy to use?
2. How do perceived usefulness and ease of use relate to faculty's behavioural intention to continue using AI for lesson planning?
3. What role do ethical and autonomy-related concerns play in shaping adoption intentions?
4. What are the primary benefits, drawbacks, and institutional recommendations identified by faculty?

By providing the first empirically supported theoretical study of Libyan Faculty Members' perceptions towards utilizing AI for assisting with lesson planning, this study aims to contribute toward informing faculty member training programs, institutional policy-making processes, and national-level strategies for promoting the incorporation of AI into education.

Literature Review

Artificial Intelligence (AI) is transforming education by mitigating the challenge of rising educator workloads and facilitating student-centered instructional strategies. Given the rapid advancement of AI technology, it is essential to evaluate its influence on lesson planning, personalized instruction, and associated ethical considerations. This literature review critically analyzes the effects of AI solutions on educators' responsibilities, pedagogical methods, and the overall learning environment.

AI in Higher Education

AI in education refers to the use of intelligent technologies, including programmed systems, software, and applications that can perform tasks and generate answers that require human intelligence, such as problem-solving, decision-making, designing activities, and providing instant feedback. Artificial Intelligence plays a crucial role in both general and higher education, influencing educators and students' academic improvement by offering a range of opportunities and challenges to support them in achieving more effective outcomes (Edtech, 2020).

The increasing integration of Artificial Intelligence (AI) in teaching and learning has emerged as a transformative force in the field of education. It brings about a significant shift in how teachers design, deliver, and reflect upon instructional practices, offering new opportunities to enhance the educational process. A study examined 424 peer-reviewed journal articles published up to March 20, 2025, through bibliometric analysis and identified personalized learning, learning analytics, and intelligent tutoring as the dominant areas of AI research in higher education didactics. The same study noted quick publication rates recently, reflecting intensifying scholarly and institutional interest in AI's pedagogical potential (Espino et al., 2026)

The field of education is considered an ideal setting for testing and implementing AI technologies. This is because educational activities across learning and teaching are based mainly on knowledge, and AI programs designed to enhance cognitive abilities and problem-solving skills, based on algorithms and knowledge bases, can effectively support and reinforce the teaching and learning capabilities of both teachers and learners. Since the emergence and spread of AI in the mid-1950s, its technologies have increasingly been used to facilitate education and training in various fields, including languages, science, technology, engineering, mathematics, and medicine (Perrotta & Selwyn, 2020). To date, AIED applications are developed to support teaching and learning activities such as content preparation and dissemination, interactions and collaboration, and performance assessment (Chassignol et al., 2018; Perrotta and Selwyn, 2020)

AI in Lesson Planning

Within the widespread use of AI applications in Higher Education, AI-assisted lesson planning has distinctly emerged as a diverse and educationally significant domain. Lesson planning is a central function for all educators and involves transforming curriculum requirements into comprehensive instructional plans, anticipating students' needs and adapting materials to meet their individual needs, and developing lessons based on assessment goals. This work is highly cognitive and consumes considerable amounts of educators' time as it represents a significant part of the non-instructional workload for many educators.

Chontal et al. (2026) published a systematic review of the use of large language models to automate tasks in the process of instructional planning. Their review analyzed data from 16 studies involving both secondary and Higher Education institutions. Results indicated that there were consistent time-saving effects and reported improvements in clarity and

usefulness of the generated educational materials among educators who applied large language models. While results varied greatly among the studies, the authors noted that the majority of the studies were conducted at a higher educational level and involved relatively small sample sizes. Limitations of the studies included lack of replicability due to variability in methodology, high dependency on quality of prompts used to access the systems, and multiple ongoing technical and ethical issues related to the systems.

Complementary research regarding the impact of generative AI on the development of instructional materials was conducted by Nuryadin, Karlimah, and Nugraha (2026). They documented several areas where benefits were evident, including increased time and workload efficiency, greater support for educators, enhanced ability to personalize and adapt materials for individual students, and enhancements to the overall learning experience. In contrast to replacing teacher expertise with AI, the authors noted that AI serves as an enhancement tool that augments routine instructional processes.

Recently, there has been an explosion of empirical research focusing specifically on lesson planning. Van den Berg and Du Plessis (2023) investigated how generative language models contribute to lesson planning for teacher education. The researchers concluded that generative language models can be beneficial in providing specific materials and support mechanisms to both practicing teachers and student teachers. Additionally, Chua, Sathasivam, Mafarja & Rahim (2026) researched preservice science teachers in Malaysia who utilized AI-supported lesson planning. Data showed that AI helped structure content, organize instructional flow, provided activities, and saved time. However, participants also noted that limitations exist when utilizing AI for lesson planning, including needing very specific prompts, possible factual errors made by the system, possible misalignment with local curriculum standards, and sometimes impractical recommendations. These findings support that the effectiveness of AI is heavily dependent upon the user's critical thinking and contextual judgment.

Researchers have also investigated whether generative AI could assist in addressing long-standing pedagogical problems, such as differentiated instruction. For example, Amofa et al. (2025) studied how emerging technologies can support novice teachers' transition from standardized instructional approaches to more inclusive methods. Technology Acceptance Models have also begun to emerge as a methodological approach for studying AI-assisted lesson planning. Specifically, Ratumanan & Krismiyati (2025) applied a revised version of the Technology Acceptance Model (TAM) to investigate vocational teachers' behavioral intentions towards and actual use of generative AI-based lesson planning tools. Behavioral intention was determined as being the most powerful predictor of use behavior influenced by hedonistic motivation, habits, performance expectancy, and effort expectancy.

In total, the cumulative body of literature has shown similar trends. Clearly, generative AI tools can decrease preparation time, facilitate instructional design, and enhance responsiveness to student needs. Notwithstanding, all of these benefits depend on users' proficiency in designing effective prompts to elicit desired responses from generative AI systems, aligning those responses with local curricula standards, and establishing supportive organizational structures within schools. Most importantly, the collective literature supports that AI operates most effectively as an augmentative tool necessitating human oversight and expert professional judgment.

Theoretical Framework: The Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) was developed by Fred Davis in 1989 as a modification of the Theory of Reasoned Action for the purpose of predicting technological

adoptions within an organization. Davis (1989) stated that TAM is "a parsimonious yet powerful" model that provides a simplified mechanism to understand and predict how users will accept and utilize new Information Systems. Davis (1989) proposed that there are two major cognitive beliefs associated with an individual's behavioral intentions to adopt a technology. These two belief structures were: Perceived Usefulness; defined as the degree to which an individual perceives that utilizing a specific system will improve his/her job performance. Perceived Ease of Use; defined as the degree to which an individual perceives that utilization of a specific system will require little or no physical/mental effort. Both of these beliefs collectively affect attitudes toward using a technology. An individual's attitude toward a technology affects their behavioral intention to use it, which ultimately determines whether they will actually use the technology. The original TAM model proposed that Perceived Ease of Use has an indirect effect on Perceived Usefulness because technologies that individuals perceive to be easy to use are perceived to have greater utility. As a result, external factors such as technology characteristics, user demographics, and environmental factors all affect behavior toward using a technology by influencing these internal belief-structure constructs.

Although numerous other models have been proposed for predicting the rate at which users will adopt new technology, no other theory has received as much attention as TAM. A recent meta-analysis conducted by Scherer, Siddiq & Tondeur (2019) was based upon data from 124 correlation matrices generated from 114 TAM-based studies that involved nearly 34,000 teachers. As such, the results confirm that TAM is effective for explaining technology acceptance within educational environments. Specifically, the analyses indicated that Perceived Usefulness is a significant predictor of Behavioral Intention, while Perceived Ease of Use is a significant predictor of Perceived Usefulness. Additionally, the findings of another meta-analysis of TAM-based studies conducted by Scherer and Teo (2019) showed that the variables of TAM explain an average of about 39% of the variability in teachers' intentions to utilize technology. Since its development, TAM has been used extensively to predict teacher adoption of various types of educational technologies, including Learning Management Systems (LMS), E-Learning Platforms, and Mobile Learning Tools. This demonstrates that it may be viewed as a generalizable framework for examining the adoption of various forms of educational technology.

As a result of advancements made with respect to Generative AI tools, there has been increased interest in using TAM and its related theories to develop an understanding of educators', students', and their associated acceptance of AI-Powered Educational Technologies. Strzelecki (2023) utilized a variation of TAM called UTAUT to find that Performance Expectancy and Habit were both strong predictors of Student Adoption rates of the tool ChatGPT. In addition, Sekyi Acquah et al. (2024) analyzed Preservice Teachers' Behavioral Intentions towards AI in Lesson Planning and found that Performance Expectancy and Social Influence were both significant predictors of Adoption Intention. Furthermore, the authors noted that Trust and Perceived Risk are important factors that should be considered when developing strategies for promoting the adoption of AI Tools, as these tools appear to generate additional Psychological Factors beyond those included in Traditional TAM Constructs. The TAM model has provided an excellent framework for how individuals accept technology; however, many researchers have indicated that there are important differences in the characteristics of Generative AI that require expansions to the TAM model. In contrast to previous educational technologies that were largely limited to automation or digitization of pre-existing instructional processes, Generative AI introduces new ethical considerations

related to issues of content accuracy, algorithmic fairness, academic integrity and personal data privacy that can independently affect users' intentions to adopt these tools based on their perceptions of usefulness and usability. Han (2003) conducted a systematic analysis of the body of literature on the TAM model and concluded that although the model was both simple and robust in terms of its ability to be applied across a wide variety of different types of technology and populations of users; it would be necessary to add additional variables and/or incorporate other theoretical models when studying innovative technologies or new contexts. As such, this recommendation is particularly pertinent to Generative AI tools as they raise numerous new ethical considerations.

Previous Studies on AI in Libyan Higher Education

To understand how Libyan higher-education institutions will adopt AI-assisted lesson planning, the context of Libyan higher education needs to be considered. For over three decades, Libya's universities have been operating in an environment influenced by the lack of investment in their physical and intellectual infrastructure, political instability, and political transition. According to the Global Education Futures Report Index (2026), Libya ranks 28th out of all countries in terms of its preparation for education with a focus on the future and 19th among countries in the Middle East/North Africa region. Libya has ranked last in the world in terms of governance and institutional capability.

Each of the studies that examined technology use in higher education in Libya found a significant disconnect between the desire of faculty members to integrate technology into their classroom instruction and the ability of their institution to support this. A study conducted by Shalbag (2026) explored technology proficiency in language teaching in Libyan universities and colleges and discovered that 61.89% of those surveyed stated they did not receive enough professional development opportunities related to using technology in their classrooms; however, 23.80% stated they felt adequate when it came to technology proficiency. Although there are many challenges that exist for adopting AI in higher education, recent events suggest that Libya may be placing greater emphasis on developing AI capabilities throughout its universities and research institutions. On January 11, 2024, Libya's Ministry of Higher Education and Scientific Research released a formal directive that called for the development of AI capabilities across universities and research centers during the next decade as part of Libya's ten-year national higher education plan (University World News, 2024). In 2025, Libya launched Libigpt, the country's first national generative AI model (Smart Co. for Technology Projects, 2025). It is interesting to note the difference between what can be accomplished through policy versus what exists within institutions. The gap between national expectations of faculty AI-readiness and the realities of resource-constrained environments and inadequate training is illustrative.

Only recently have researchers begun studying AI in Libyan higher education. Using surveys from 119 educators, Baroud and colleagues (2024) studied AI for creating content and developing curricula at the University of Zawia. While 95.20% of respondents believed AI would become increasingly important in education, only 30.20% had ever utilized AI for assessing student performance, and 79.60% had never participated in any form of training focused on AI. Shrif and Jamoum (2025) surveyed 1,000 educational professionals across Libya and found that personalized learning was identified as receiving the greatest level of agreement concerning potential benefits of AI, while funding and infrastructure were identified as being major impediments to utilizing AI. At Sebha University, Mansour and Abubakar (2025) surveyed 240 faculty members, finding generally positive attitudes toward AI, with years of teaching experience significantly affecting perceptions, while gender and

academic degree showed no effect. In the specific context of English language teaching, Mahmoud Hadaga and Mohammed Elfalfal (2025) found that Libyan EFL teachers at Benghazi University held positive attitudes toward AI but lacked formal institutional training.

Collectively, the literature establishes a foundation of generally positive faculty attitudes toward AI in Libyan higher education, alongside consistent identification of infrastructure, funding, and training as primary barriers. However, no study to date has employed a theoretically grounded framework to systematically examine Libyan faculty's adoption of AI for the core instructional task of lesson planning, nor has any study examined the role of ethical and autonomy concerns in shaping adoption intentions. The present study addresses these gaps by applying an extended TAM framework to a multi-university sample of Libyan EFL faculty. The methodology employed to investigate these relationships is detailed in the following section.

Methodology

Research Design

This study employed a parallel mixed-methods design. Quantitative data were collected via a structured online questionnaire measuring perceived usefulness, perceived ease of use, ethical concerns, and behavioral intention regarding AI-assisted lesson planning. Qualitative data were collected simultaneously through four open-ended questions embedded within the same instrument. The quantitative component tested the applicability of the Technology Acceptance Model (TAM) in the Libyan higher education context, while the qualitative component captured faculty's lived experiences, concrete examples, and context-specific recommendations. Integration occurred during the interpretation phase, where qualitative themes were used to explain and elaborate upon quantitative findings. The integration of both data types within a single instrument enabled a more comprehensive account of teachers' perceptions than either approach could have provided alone (Creswell & Plano Clark, 2018).

3.2 Participants and Sampling

60 EFL faculty members from multiple Libyan universities took part in this exploratory study. The participants were recruited through convenience sampling, supported by snowball sampling. Snowball sampling was conducted by encouraging initial respondents to share the questionnaire link with their colleagues. Data were collected over three months, from August 2025 to October 2025. The inclusion criteria required that participants be full-time EFL teaching staff members at Libyan universities and have at least minimal familiarity with one of the AI tools for educational purposes. Incomplete responses were removed from the analysis.

Demographic characteristics of the sample are presented in Table 1. The sample included faculty across four age categories (24-29 through 50+), both genders, varying years of teaching experience (1-5 through 16+), all three primary academic qualifications, and self-reported familiarity with AI tools.

Instrument

Data were collected using a purpose-built online questionnaire administered through Google Forms. The instrument comprised four sections, 34 items in total: 6 demographic items, 23 Likert-scale items, one verification behaviour item, and 4 open-ended questions. All Likert-scale items employed a five-point response format ranging from 1 (Strongly Disagree) to 5 (Strongly Agree).

1. Demographic and Professional Background

Section one collected information on participants' age, gender, years of teaching experience, highest educational qualification, and self-reported familiarity with AI tools (See Table 1).

Table 1

Demographic Profile of Participants (N = 60)

Age	24–29	3 (5.0%)
	30–39	27 (45.0%)
	40–49	18 (30.0%)
	50+	12 (20.0%)
Gender	Female	39 (65.0%)
	Male	21 (35.0%)
Teaching Experience	1–5 years	9 (15.0%)
	6–10 years	17 (28.3%)
	11–15 years	18 (30.0%)
	16+ years	16 (26.7%)
Qualification	Master's Degree	49 (81.7%)
	Doctorate (Ph.D.)	11 (18.3%)
AI Familiarity	Slightly familiar	8 (13.3%)
	Moderately familiar	35 (58.3%)
	Very familiar	17 (28.3%)

2. AI Usage and Adoption

This section contained items designed to characterize participants' current AI use. Respondents identified the AI tool(s) they used for lesson planning from an open text field, indicated which stages of lesson planning they supported with AI assistance, and estimated the average proportion of a lesson plan generated or influenced by AI.

3. Likert-Scale Battery

The core quantitative component consisted of 23 items rated on a five-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Items were organised into five theoretically motivated subscales drawing on the Technology Acceptance Model (TAM; Davis, 1989), the Unified Theory of Acceptance and Use of Technology (UTAUT; Venkatesh et al., 2003), and conceptual frameworks relating to teacher agency and creative professional practice (Priestley et al., 2015).

The five subscales were: (1) *Perceived Usefulness*, (5 items), assessing beliefs about AI's impact on lesson quality and pedagogical alignment; (2) *Ease of Use* (4 items), capturing perceived ease of use and effort reduction; (3) *Creative Enhancement* (5 items), examining AI's contribution to instructional idea generation and resource diversification; (4) *Concerns* (4 items), addressing worries about accuracy, ethics, autonomy, and standardisation; and (5) *Future Intentions* (5 items), measuring participants' inclination to continue, expand, and critically engage with AI in their practice. The instrument structure and post-hoc internal consistency estimates are presented in Table 2.

Table 2

Instrument Structure and Internal Consistency by Subscale

Subscale	Construct measured	Items	α
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Perceived Usefulness	Quality improvement, curriculum alignment, teaching strategy variety, responsiveness to diverse needs, authentic materials	5	.915
Ease of Use	Ease of use, independence from technical support, speed of learning, effort reduction	4	.760
Creative Enhancement	Idea generation, experimentation with methods, customisation, resource diversity, creative risk-taking	5	.853
Concerns	Reduced autonomy, accuracy and reliability, overstandardisation, ethical issues (plagiarism, bias)	4	.750
Behavioral Intentions	Continued use, peer recommendation, willingness to invest in learning, professional development participation, verification behaviour	5	.934
Total		23	

4. Open-Ended Questions

Participants were provided four open-ended questions asking for qualitative feedback about the following: (1) The major advantage of using Artificial Intelligence (AI) in Lesson Planning; (2) The most significant limitation or concern of AI in Lesson Planning; (3) Recommendations for how to include AI as part of Teacher Training Programs and Lesson Planning Practices; and (4) A description of an actual lesson or activity that was greatly enhanced through the use of AI.

Validity and Reliability

The content validity of the perceived usefulness, perceived ease of use and behavioral intention scales was determined by adapting the previously-validated TAM (Davis, 1989) scales, while making minimal changes to fit the context of lesson planning with AI. Items were developed by the researcher specifically to address issues such as pedagogical innovations, teacher autonomy, challenges, and ethics associated with teaching with AI were based upon emerging themes found within the existing body of literature concerning AI in education, which include benefits identified in Celik (2023); Trust, Whalen & Mouza (2023); and both ethical issues noted by Akgun & Greenhow (2022) and factors related to accuracy and teacher autonomy noted by Farazouli, Cerratto-Pargman & Bolander-Laksov (2023). Before full deployment, the questionnaire was reviewed by researchers for clarity, relevance, and correspondence to the research objectives. In addition, internal consistency reliabilities for the three multi-item scales used in this study (Perceived Usefulness, Perceived Ease of Use, and Behavioral Intentions) were calculated via Cronbach's Alpha. These results will be presented in the Results section.

Ethical Considerations

The study was conducted in accordance with established principles of research ethics in the social sciences. Participation was entirely voluntary, and respondents were free to withdraw at any point before submission without penalty. The questionnaire collected no personally identifiable information; responses were anonymised at the point of entry and stored

securely within the Google Forms platform. Informed consent was obtained through the introductory preamble, which clearly described the study's aims, the intended use of data, and the confidential treatment of responses.

Results

1. Participant Demographics

The sample comprised 60 Libyan EFL instructors. The majority were females (n=39; 65.0%) within this group, who were all aged from thirty to forty-nine (75.0%). 20% of participants (n=12) were fifty or older. In terms of their teaching experience, there was an even distribution of the sample throughout the middle to senior level careers. Specifically, 28.3% of participants (n=17), had six to ten years of teaching experience. 30% (n=18), had eleven to fifteen years of experience. And 26.7% (n=16), had sixteen years or more of experience. 15% of participants (n=9) were novice teachers with one to five years of teaching experience. Concerning academic credentials, 81% of participants (n=49) held master's degrees while 18% (n=11) held PhD degrees. A full breakdown of participant demographics is provided in Table 1.

2. Patterns of AI Use in Lesson Planning

Table 3 shows the frequency of each participant’s reported use of the different AI platforms. Fifty-one participants (85.0%) stated they had used ChatGPT, whilst the second most popular tool was DeepSeek, used by twelve participants (20%), then Manus (seven participants (11.7%), and QuillBot by six participants (10%). The data suggest that there is currently a high concentration within the sector on a single general-purpose LLM, although a smaller number of teachers were using two or more specialist tools at once.

The highest number of participants reported that their use of AI affected how they produced lesson plans to between 25%–50% (thirty-two participants (52.8%). This would suggest that the majority of participants see AI as supporting their work as an authoring agent in producing lesson plans, but are not reliant on it. Seventeen (28.3%) of the participants reported that they believe AI influenced 50-75% of their lesson plans, while only seven percent (7.5%) reported that AI has influenced 75-80% of their lesson plans. Seven participants (13.2%) stated that they believed AI did not affect how they planned lessons at the time of this study, even though they had used AI tools in other areas of their profession. When looking at the specific aspects of the planning process, creating lesson materials was the most often reported use of AI in the classroom (n=41, 68.3%), followed by designing instructional activity (n=36, 60.0%), assessing students through both formative and summative means (n=24 (40.0%), and determining what learners needed to be able to achieve before starting the lesson (n=22, 36.7%). Designing differentiated instruction based on individual student needs was the least common use of AI (n=14 (23.3%), possibly because the ability to provide individualised support via technology requires additional levels of teacher professional judgment.

Table 3

AI Tool Use and Lesson Planning Patterns (N = 60)

Usage Pattern	N	% of Sample
Primary AI tool: ChatGPT	51	85.0%
Primary AI tool: DeepSeek	12	20.0%
Primary AI tool: Manus	7	11.7%
Primary AI tool: QuillBot	6	10.0%

Usage Pattern	N	% of Sample
AI influence on lesson: 25–50%	32	53.3%
AI influence on lesson: 50–75%	17	28.3%
AI influence on lesson: 75%+	4	6.7%
Stage: Creating lesson materials	41	68.3%
Stage: Designing instructional activities	36	60.0%
Stage: Designing assessments	24	40.0%
Stage: Setting learning objectives	22	36.7%
Stage: Differentiating for learner needs	14	23.3%

Quantitative Findings: Likert-Scale Items

Five subscales were constructed from the 23 Likert-scale items (rated 1–5): Perceived Effectiveness, Usability, Creative Enhancement, Concerns, and Future Intentions. Internal consistency was assessed using Cronbach's alpha. The complete item-level means, standard deviations, and subscale statistics are presented in Table 3.

1. Perceived Effectiveness

For an overall evaluation of participants' perceptions regarding each of the TAM constructs and the degree of these perceptions being positive or negative, the average values of each composite scale have been calculated and used in a series of one-sample t-tests to determine if they differ from the theoretical neutral point of 3.0. On the five-point Likert scale. All five constructs – Perceived Usefulness (PU), Perceived Ease of Use (PEOU), Creative Enhancement (CE), Concerns / Ambivalence, and Behavioral Intention (BI) -- were found to be perceived by participants at levels significantly higher than the neutral point. Full item-level data and t-test information are presented in Table 3.

Instructors rated their perceptions of Perceived Usefulness moderately high, with a composite mean of $M = 3.67$ ($SD = 1.00$); $t(59) = 5.17$; $p < .001$. Participants rated several items related to Perceived Usefulness as follows: "More varied methods of teaching" received the highest rating for the use of AI for useful purposes ($M = 3.77$, $SD = 1.18$). Notwithstanding, there was some concern that the inclusion of "real world materials" would be low in terms of usefulness ($M = 3.50$, $SD = 1.13$).

2. Perceived Ease of Use

The Perceived Ease of Use construct had a composite mean ($M = 3.77$; $SD = 0.91$) greater than the neutral point, $t(59) = 6.62$; $p < .001$. Notably, "It takes me less effort to plan using AI than it does when I do so manually," elicited the greatest individual mean of all the items within the PEOU subscale ($M = 4.08$; $SD = 1.20$), indicating a strong belief in ease of use. On the other hand, "I am able to use AI tools without having to obtain a lot of technical assistance," elicited a somewhat lower individual mean ($M = 3.57$, $SD = 1.13$), which may indicate that participants still have some reservations about their ability to provide for themselves technically.

3. Creative Enhancement

Creative Enhancement (CE) produced a composite mean of $M = 3.68$ ($SD = .78$); $t(59) = 6.77$; $p < .001$. The item "Using AI has resulted in more diverse types of resources for my students in class," elicited the largest individual mean among CE items ($M = 3.80$; $SD = .97$), whereas "Lesson plans developed using AI assist teachers in taking risks creatively," elicited the smallest mean ($M = 3.45$; $SD = 1.02$), suggesting that although participants believe that AI

contributes to providing them with additional resource options, they are less likely to perceive AI as contributing to providing them with an environment to take bold actions in terms of instruction.

4. Concerns

Concerns/Ambivalence Scale results showed a composite score of 3.32 (SD. = 0.78), $t(59) = 3.19$, $p = .002$, suggesting there are some concerns; however, they appear to be relatively moderate in terms of their level of concern. Amongst the items within the Concerns/Ambivalence scale, the highest mean value for an item was related to ethics/plagiarism/bias ($M = 3.87$; S.D. = 1.16), which had the highest proportion of ratings as 4 or 5 (68.3%). The second-highest values were those related to the factual accuracy/reliability ($M = 3.45$; SD = 1.13). Conversely, the lowest ratings in the Concerns/Ambivalence scale were for the concern that using AI would lead to a loss of creative freedom/standardisation of lesson planning ($M = 2.92$; S.D. = 1.08) and it fell just short of the mid-point of 3 on a scale of 1-5 and also the autonomy reduction item ($M = 3.05$; S.D. = 0.98) were both very close to the neutral point.

5. Behavioural Intention

The Behavioural Intention to Use AI construct resulted in a higher average score than all other constructs ($M = 4.06$; S.D. = 1.17); $t(59) = 6.97$, $p < .001$. All behavioural intention to use AI items scored highly individually: the high scores included participation in professional development programs focused on AI ($M = 4.16$; S.D. = 1.29), willingness to spend time learning about more advanced AI tools ($M = 4.13$; S.D. = 1.28), and willingness to recommend AI-assisted lesson planning to others ($M = 4.05$; S.D. = 1.16). Importantly, verification behaviour (the tendency for teachers to check and modify AI-generated lessons before presenting them in class) resulted in the highest overall mean from all questions in the study ($M = 4.40$; S.D. = 1.08), $t(59) = 9.41$, $p < .001$, and a total of 83.0% of respondents gave a rating of either 4 or 5 for this item.

Table 4

Descriptive Statistics and One-Sample t-Tests for TAM Constructs (N = 60)

Perceived Usefulness (PU) Composite	3.67	1.00	5.17	< .001
AI improves the quality of lesson plans	3.75	1.23	—	—
AI helps align content with curriculum objectives	3.75	1.14	—	—
AI enables more varied teaching strategies	3.77	1.18	—	—
AI helps respond flexibly to student needs	3.58	1.03	—	—
AI enhances inclusion of authentic, real-world materials	3.50	1.13	—	—
Perceived Ease of Use (PEOU) Composite	3.77	0.91	6.62	< .001
AI tools are easy to use for lesson planning	3.72	1.11	—	—
Can use AI without extensive technical support	3.57	1.13	—	—
Can quickly learn new AI features for teaching	3.73	1.04	—	—
AI requires less effort than manual planning	4.08	1.20	—	—
Creative Enhancement (CE) Composite	3.68	0.78	6.77	< .001
AI generates new instructional ideas I wouldn't develop alone	3.77	1.00	—	—
AI encourages experimenting with new teaching methods	3.75	0.88	—	—
AI allows better customisation for different student needs	3.63	0.99	—	—
AI has led to more diverse teaching resources	3.80	0.97	—	—

AI-assisted planning supports creative risk-taking	3.45	1.02	—	—
Concerns/Ambivalence Composite	3.32	0.78	3.19	.002
AI reduces my autonomy in lesson planning	3.05	0.98	—	—
Concern about accuracy/factual reliability of AI content	3.45	1.13	—	—
AI risks making lesson planning overly standardized	2.92	1.08	—	—
Concern about ethical issues (plagiarism, bias)	3.87	1.16	—	—
Behavioral Intention (BI) Composite	4.06	1.17	6.97	< .001
Intend to continue using AI tools in lesson planning	3.92	1.24	—	—
Would recommend AI-assisted planning to other teachers	4.05	1.16	—	—
Willing to invest time learning advanced AI tools	4.13	1.28	—	—
Would participate in AI-focused PD programs	4.16	1.29	—	—
Verification Behaviour (I double-check AI materials before use)	4.40	1.08	9.41	< .001

Note. One-sample *t*-tests were conducted against the neutral midpoint of 3.0. Composite *t*-values and *p*-values are reported for each subscale; item-level significance was not calculated separately. **p* < .05. ***p* < .001.

Construct Intercorrelations

To examine the interrelationships among TAM dimensions, Pearson correlations were computed between all 5 composite. Results are shown in Table 5. The strongest association was merely observed between PU and CE (*r* = .793, *p* < .001), which indicates that instructors who perceived AI as useful for lesson planning were also those who experienced stronger creative gains from its usage. PU and BI were also strongly correlated (*r* = .611, *p* < .001), as were PEOU and BI (*r* = .703, *p* < .001), consistent with classical TAM predictions where both perceived usefulness and ease of use predict adoption intention. PEOU and CE showed a moderate, up to strong correlation (*r* = .647, *p* < .001). Remarkably, AI's Concerns was positively correlated with all other constructs, including BI (*r* = .420, *p* < .001) and PEOU (*r* = .459, *p* < .001), in which greater concerns did not deter adoption intention but rather co-existed with it, a pattern consistent with informed or critical engagement rather than avoidance. PU and Concerns (*r* = .280, *p* < .05) were the weakest association pattern.

Table 5

Pearson Correlations Among TAM Constructs

1. Perceived Usefulness	—				
2. Perceived Ease of Use	.647**	—			
3. Creative Enhancement	.793**	.647**	—		
4. Concerns/Ambivalence	.280*	.459**	.399**	—	
5. Behavioral Intention	.611**	.703**	.582**	.420**	—

Note. **p* < .05. ***p* < .001 (two-tailed). PU = Perceived Usefulness; PEOU = Perceived Ease of Use; CE = Creative Enhancement; BI = Behavioral Intention.

Subgroup Comparisons

Independent samples t-tests were conducted to determine if there were gender differences in instructor attitudes toward each of the TAM components. There were no statistically significant gender differences in attitudes toward PU ($t= 1.55, p=.127$), PEOU ($t=1.44, p=.156$), CE ($t=1.07, p=.288$), Concerns ($t=.17, p=.867$), or BI ($t=-.08, p=.934$). Therefore, it appears that both male and female instructors have generally similar views regarding the use of artificial intelligence for assisting in their lesson planning activities. The mean ratings for PU and PEOU for female and male instructors were as follows: Female $M = 3.82$ and Male $M = 3.40$ for PU, and Female $M = 3.90$ and Male $M = 3.55$ for PEOU. However, neither of these differences was statistically significant. The results of an analysis of variance examined the relationship between the amount of teaching experience and the Behavioral Intentions of teachers. Teaching experience was not significantly related to teachers' BI, $F(3, 56)=.24, p=.867$. Teachers' Behavioral Intentions ranged from a low of 4.02 for teachers having 1-5 years of experience to a high of 4.27 for teachers having 16 years or more of experience. Therefore, while there may be some slight positive relationship between the amount of teaching experience and Behavioral Intentions, this relationship is relatively weak. In addition, an exploratory analysis comparing the attitudes of teachers based upon their familiarity with AI demonstrated a graded response. Teachers who were very familiar with AI had greater values for PU and PEOU than teachers who were either moderately or slightly familiar with AI. For example, PU and PEOU values for teachers who were very familiar with AI were 4.12 and 4.06, respectively, compared to 3.51 and 3.70 for teachers who were moderately familiar with AI and 3.40 and 3.50 for teachers who were slightly familiar with AI. However, Behavioral Intentions remained at essentially the same value (all values were approximately 4.04-4.09) for all levels of familiarity with AI, thus providing additional support for the earlier conclusion that teachers' intentions to adopt AI technology are largely independent of their previous experiences using such technology.

Qualitative Content Analysis

Open-ended questions asked participants to identify (a) the main benefit of AI in lesson planning, (b) the principal drawback or risk, and (c) recommendations for integrating AI into teacher training. A fourth item invited lesson examples. Responses were analysed using deductive content analysis (Krippendorff, 2004); recurring themes emerged in each category.

Table 6

Qualitative Themes, Frequencies, and Representative Quotations

Q1: Perceived Benefits (N = 60)		
Time-saving and efficiency	41 (68.3%)	"Getting more done in a short time, allowing me to focus on interacting with my students." (P17)
Idea generation and creativity	11 (18.3%)	"It opens different areas in front of you to create new ideas, topics and activities." (P56)
Quality improvement of lesson plans	11 (18.3%)	"It saves time, reduces grammatical mistakes and gives a solid and more detailed lesson plan." (P28)
Student engagement and interaction	9 (15.0%)	"Useful in making different kinds of activities for students." (P18)
Personalisation and differentiation	7 (11.7%)	"AI can help create personalized, efficient, and data-driven learning experiences." (P4)
Q2: Perceived Drawbacks (N = 60)		
Over-reliance and dependency on AI	29 (48.3%)	"Over-dependence on AI stultifies the brain." (P7)
Reduced creativity and critical thinking	14 (23.3%)	"Over reliance on AI can restrict creativity." (P14)

Inaccuracy and unreliable content	14 (23.3%)	"You can't rely on all the data generated by AI, it can be inaccurate or inappropriate." (P19)
Plagiarism and academic integrity	5 (8.3%)	"The wrong use of AI tools, such as plagiarism." (P18)
Contextual and cultural mismatch	5 (8.3%)	"AI may not give the required, detailed information." (P20)
Data privacy and security	4 (6.7%)	"AI in lesson planning risks data privacy issues." (P4)
Q3: Recommendations (n = 53)		
Provide training, workshops and CPD	17 (32.1%)	"Schools should provide workshops where teachers can experiment with AI tools." (P41)
Position AI as a supportive tool, not a replacement	9 (17.0%)	"Use it with awareness, it is only a supporting tool, not a substitute." (P20)
Critical evaluation and verification of outputs	9 (17.0%)	"Teachers must always verify AI's output for accuracy and bias before adapting it." (P24)
Ethical and responsible use	9 (17.0%)	"AI should enhance efficiency and creativity while ensuring ethical use." (P7)
Adapt output to student needs and context	7 (13.2%)	"I recommend using AI as an assistive tool; teachers have to adjust AI plans to student needs." (P17)

Qualitative Findings

Time-saving was the overwhelmingly dominant benefit (68.3%), corroborating the quantitative PEOU finding that AI requires less effort than manual planning ($M = 4.08$). Idea generation and quality improvement were secondary benefits (18.3% each), supporting the Creative Enhancement subscale scores.

Over-reliance was the leading concern, cited by nearly half of respondents (48.3%), far more prominently than the Likert autonomy item suggested ($M = 3.05$). This discrepancy indicates that structured scales underestimated the depth of dependency anxiety participants hold. Reduced creativity (23.3%) and content inaccuracy (23.3%) were equally prominent secondary concerns, providing qualitative grounding for the high verification behaviour mean ($M = 4.40$): when instructors describe AI output as potentially 'fake' or 'incorrect', checking before use becomes a rational self-protective strategy. Notably, contextual and cultural mismatch (8.3%) emerged as a theme absent from the TAM instrument, reflecting a concern specific to the Libyan EFL setting that AI-generated content is insufficiently calibrated to local classroom realities.

Recommendations converged on three equally weighted priorities: training (32.1%), positioning AI as a supportive tool (17.0%), critical output evaluation (17.0%), and ethical use (17.0%), forming a coherent normative framework for responsible integration. The prominence of training demands directly corroborates the high Behavioral Intention score for professional development participation ($M = 4.16$) and confirms that adoption readiness in this sample is genuine and action-oriented.

Discussion

This study examined perceptions, attitudes, and actual use of AI tools in lesson planning among Libyan EFL instructors, as well as the potential benefits and ethical risks. The research presented a framework drawing on the Technology Acceptance Model (TAM) to understand the extent to which perceived usefulness (PU) and perceived ease of use (PEOU) predict behavioral intention to use AI-assisted lesson planning. Libyan EFL instructors' perceptions of AI in lesson planning reveal a generally favourable view of its application, yet their responses also disclosed persistent ethical anxieties, concerns about AI reliability, and a near-universal

commitment to critically mediating AI outputs before use. This combination constitutes what this study terms adoption with ambivalence.

Both Perceived Usefulness and Perceived Ease of Use were rated significantly above the neutral midpoint, confirming the core TAM hypothesis that usefulness and ease of use jointly underpin technology adoption. Consistent with prior research on AI in education (Teo, 2009; Scherer et al., 2019), the strongest single efficiency indicator was the perception that AI requires considerably less effort than manual planning ($M = 4.08$). This aligns with the broader qualitative themes evident in participants' open-ended responses, where time-saving was the single most frequently cited benefit, echoing findings from related studies in EFL contexts (Godwin-Jones, 2022; Kohnke & Moorhouse, 2023).

However, the moderate rather than strong composite PU scores caution against an uncritically optimistic reading. Perceived usefulness for authentic, real-world material integration was the lowest-rated usefulness item ($M = 3.50$), suggesting that instructors recognise a tension between AI's generative fluency and the culturally situated, pedagogically nuanced demands of authentic EFL instruction in Libya. This finding resonates with Chen et al.'s (2020) observation that AI's utility is often perceived as context-general rather than context-specific, and implies that instructors in under-resourced, localised educational settings may experience a gap between AI's generic output and their particular curricular and student needs.

The Creative Enhancement factor was clearly a positive dimension of adopting AI, since the item rated highest by participants ($M=3.68$), suggesting that the use of AI has generated greater diversity in the resources available for teaching. This finding provides additional evidence for the growing body of literature suggesting that AI functions as a generative scaffold that supports or augments teacher creativity, but does not replace it (Crompton & Burke, 2023; Zawacki-Richter et al., 2019). The high correlation between CE and PU ($r=.793$) indicates that teachers who report experiencing creative benefits from their use of AI also tend to perceive it as being useful to their instruction, suggesting that creative benefit is likely to be linked to perceived usefulness in the context of developing lesson planning.

However, the lowest rated item on the CE scale ($M=3.45$), which indicated that "AI supported my ability to take creative risks in teaching", shows a significant limitation. Although instructors reported welcoming AI into their classrooms as a source of varied instructional materials and resource enrichment, they were much less certain about whether the use of AI would prompt them to think creatively and take bold pedagogical actions. This distinction reflects a conceptual distinction identified in the educational technology literature, which distinguishes between the use of AI as a means to enhance current practices versus the use of AI as a mechanism to bring about transformative changes in how one teaches (Luckin et al., 2016). The current findings suggest that Libyan EFL instructors are positioned within the enhancement paradigm, leveraging AI to produce richer lesson materials while retaining and perhaps deliberately protecting the fundamentally teacher-led character of their instructional decision-making.

The Concerns/Ambivalence subscale ($M = 3.32$) appeared to be distinct from other items. While it scored significantly higher than the middle point, it had lower scores compared to the other four domains. An interesting internal trend emerged within the ethical concerns dimension. Plagiarism and bias were clearly identified as the most significant issues they have experienced (the highest item mean of 3.87 for the entire dataset for the concerns dimension), with 68.3% of the sample responding that they "agree" or "strongly agree" that these are major problems related to AI. This supports the growing body of research focused

on the use of generative AI in post-secondary education (e.g., Zawacki-Richter et al., 2019; Fengchun et al., 2023), identifying plagiarism/attribution/algorithmic bias, along with concerns about standardizing lesson plans through AI and reducing educators' ability to autonomously plan lessons (scores $M = 2.92, 3.05$, respectively). This suggests that Libyan EFL instructors are not, at this stage, experiencing AI as a deprofessionalising force or as an agent of curricular homogenisation. Rather, their concerns appear to centre principally on the integrity and reliability of what AI produces rather than on the structural threat AI might pose to professional identity.

The most theoretically consequential finding in this domain is the positive correlation between Concerns/Ambivalence and Behavioral Intention ($r = .420, p < .001$). Classical interpretations of TAM would predict that greater concerns would suppress adoption intention; however, the present data demonstrate the opposite pattern. This coexistence of concern and intent suggests that, for this cohort, engaging with AI is experienced not as uncritical enthusiasm but as a form of informed adoption, and awareness that AI must be used carefully, reflected in the near-universal verification behaviour reported ($M = 4.40$; 83.0% endorsement at 4 or 5). This finding parallels Rezaei and Barber's (2021) concept of 'qualified adoption' and supports the argument that ambivalence and adoption are not mutually exclusive but rather constitutive of responsible professional technology use.

Behavioral Intention had the highest composite mean of all constructs ($M=4.06$) due to the consistent ratings given for each of the four items; as follows: (a) intend to use AI, (b) willing to recommend AI to colleagues, (c) invest time in learning to use advanced AI tools, and (d) participate in AI-related professional development opportunities. Given the challenges present in Libyan EFL institutions (e.g. structural issues with access to resources such as technology or professional development), it would have been reasonable to expect lower behavioral intention scores (Almansouri et al., 2020). The fact that BI was rated similarly across male and female participants, and those with varying levels of experience, further supports the idea that there is an adoption momentum among the participants sampled here. Verification, that is, the practice of critically reviewing and adapting AI-generated content before classroom use, represents a form of pedagogical metacognition that mediates the relationship between AI output and instructional delivery. Its primacy in participants' responses suggests that Libyan EFL instructors have, to a considerable degree, internalised a 'check and adapt' norm that may function as a protective factor against the reliability and ethical risks they simultaneously acknowledge. This pattern echoes the concept of teacher agency in human-AI collaboration (Pinkwart, 2016; Swiecki et al., 2022), whereby educators retain authorial control over AI-generated content rather than delegating professional judgement to the system.

Theoretical and Practical Implications

Theoretically, this study validates TAM in a North African EFL context where such evidence remains infrequent. The inclusion of CE as a TAM extension is supported by its strong associations with PU ($r = .793$) and BI ($r = .582$). More importantly, the positive Concerns–BI relationship challenges the standard TAM assumption that concerns impede adoption, inviting more nuanced framings of technology acceptance as a critically mediated process.

Practically, the near-exclusive reliance on ChatGPT (85.0%) signals institutional dependency on a single commercial platform with documented reliability limitations in non-Western contexts (Kooli, 2023). Professional development programmes should prioritise AI literacy, critical output evaluation, prompt engineering, ethical use, and contextual adaptation, rather

than tool operation alone. The high expressed readiness for CPD ($M = 4.16$) indicates a motivated cohort well positioned to benefit from such provision.

Conclusion

This study examines how Libyan EFL instructors perceive and engage with AI-assisted lesson planning through a TAM-based framework. Across all five constructs- Perceived Usefulness, Perceived Ease of Use, Creative Enhancement, Concerns, and Behavioral Intention, instructors rated AI significantly above the middle point, confirming a clear orientation toward adoption. Yet the defining characteristic of this orientation is not uncritical enthusiasm but informed ambivalence: high adoption intent coexists with genuine ethical anxiety, concern about over-reliance, and near-universal commitment to verifying AI output before classroom use.

The study makes three contributions. First, it extends TAM with Creative Enhancement, a construct supported empirically by its strong correlations with PU and BI, and applicable to teaching contexts where generative creativity is pedagogically central. Second, it demonstrates that concerns and adoption intention are not opposites but complements; instructors who are most concerned about AI are also those most committed to using it responsibly. Third, the emergent qualitative theme of cultural and contextual mismatch, specific to the Libyan EFL setting, highlights a limitation of generic AI tools, which TAM instruments are not designed to capture.

Several limitations should be noted. The sample ($N = 60$) is modest and draws exclusively from higher education, limiting generalisability. Future research should employ larger, more diverse samples, longitudinal designs, and structural equation modelling to test the full predictive architecture of the extended TAM proposed here. Qualitative follow-up through interviews would further illuminate the dependency anxieties and contextual concerns that Likert scales appear to underestimate. As AI tools become increasingly embedded in educational practice globally, understanding adoption dynamics in under-researched contexts such as Libya is not peripheral but essential to equitable and pedagogically sound AI integration.

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