

Acceptance to Students' Adoption of Artificial Intelligence in Lebanese Higher Education.

Sahar Ahmad Harajli

Lebanese University- Faculty of Education, Beirut, Lebanon,
sahar.harajli@st.ul.edu.lb

Abstract

This study examined the factors significantly affecting academic's staff acceptance to students' adoption of Artificial Intelligence with in the Lebanese University in particular Faculty of Education. Data was collected from 36 University Instructors and trainers across the faculty. A questionnaire was administered to the participants focusing on perceived pedagogical Risks, Effort Expectancy of the academic staff in detecting AI incorporation and using AI detecting tools, facilitating conditions provided by the Lebanese University and acceptance to students' adoption of artificial intelligence. Regression analysis and Pearson Correlation were employed to examine the correlation and effect of each factor on the acceptance to students' adoption of artificial intelligence according to the Unified Theory of Acceptance and Use of Technology (UTAUT). Findings suggest that the whole model had a significant effect on the acceptance to students' adoption of artificial intelligence, with a noteworthy significant effect in particular to Facilitating Conditions, in addition to openness among academic staff in student's incorporation of AI. The insights derived from this study hold a particular significance that can help the Lebanese University in providing ease to its academic staff in the light of students' using AI.

Key words:

Artificial Intelligence, Acceptance, Lebanese University, UTAUT.

Résumé

Cette étude a examiné les facteurs affectant de manière significative l'acceptation par le personnel universitaire de l'adoption de l'intelligence artificielle par les étudiants de l'Université libanaise, en particulier de la Faculté d'éducation. Les données ont été collectées auprès de 36 instructeurs et formateurs universitaires de la faculté. Un questionnaire a été administré aux participants en se concentrant sur les risques pédagogiques perçus, les attentes en matière d'effort du personnel académique pour détecter l'incorporation de l'IA et utiliser les outils de détection de l'IA, les conditions facilitants fournies par l'Université libanaise et l'acceptation de l'adoption de l'intelligence artificielle par les étudiants. L'analyse de régression et la corrélation de Pearson ont été utilisées pour examiner la corrélation et l'effet de chaque facteur sur l'acceptation de l'adoption de l'intelligence artificielle par les étudiants selon la théorie unifiée de l'acceptation et de l'utilisation de la technologie (UTAUT). Les résultats suggèrent que l'ensemble du modèle a eu un effet significatif sur l'acceptation de l'adoption de l'intelligence artificielle par les étudiants, avec un effet significatif notable en particulier sur les conditions facilitantes, en plus de l'ouverture du personnel académique à l'intégration de l'IA par les étudiants. Les renseignements tirés de cette étude revêtent une importance particulière et peuvent aider l'Université libanaise à faciliter la tâche de son personnel académique face à l'utilisation de l'IA par les étudiants.

مستخلص

تناولت هذه الدراسة العوامل التي تؤثر على قبول أعضاء هيئة التدريس لاعتماد الطلاب للذكاء الاصطناعي في الجامعة اللبنانية وخاصة كلية التربية. تم جمع البيانات من 36 مدرسًا ومدرِّبًا جامعيًا في الكلية. وتم إجراء استبيان على المشاركين مع التركيز على المخاطر التربوية المتصورة، والجهد المتوقع من أعضاء هيئة التدريس في اكتشاف دمج الذكاء الاصطناعي واستخدام أدوات الكشف عن الذكاء الاصطناعي، والظروف المسهلة الموفرة من قبل الجامعة اللبنانية. والقبول باعتماد الذكاء الاصطناعي من قبل الطلاب. تم استخدام تحليل الانحدار وارتباط بيرسون لفحص ارتباط وتأثير كل عامل على قبول اعتماد الطلاب للذكاء الاصطناعي وفقًا للنظرية الموحدة لقبول واستخدام التكنولوجيا (UTAUT). وتشير النتائج إلى أن النموذج بأكمله لديه تأثير كبير على قبول اعتماد الذكاء الاصطناعي من قبل الطلاب، مع التأثير الكبير الملحوظ للظروف المسهلة من الجامعة اللبنانية على وجه الخصوص، بالإضافة إلى انفتاح أعضاء هيئة التدريس على استعمال الطلاب

للذكاء الاصطناعي. إن الأفكار التي يُخلص إليها من خلال هذه الدراسة لها أهمية خاصة يمكن أن تساعد الجامعة اللبنانية في التسهيل على أعضاء هيئة التدريس جراء استعمال الطلاب للذكاء الاصطناعي.

1-Introduction:

Over the past few years artificial intelligence utilization in education has gained an increase in reputability (Zhang et al., 2023), among not only teachers in their practices, but among students as well, according to Draghici et al. (2024), half of responders among who were training at the university reported usage of AI among the past 2 years. Denecke et al. (2023) emphasizes that AI intelligence has gathered insights in many areas including higher education.

According to Ofosu-Ampong (2024) new technology offers some benefits, however its acceptance by different educational stakeholders remains of a big interest to researchers, he also points out that technology acceptance among students has been sufficiently studied, however minimal attention has been given to Lecturers' acceptance to AI for their students' adoption, nevertheless, he also added that a small number of studies have investigated intentions among educators to accept AI for their students, and the factors affecting this acceptance.

Lebanon, just like any other country has been influenced by artificial intelligence's advent. For instance, Lebanese University, Faculty of Education holds its upcoming conference entitled: "Re-Thinking Education and Teaching in the Era of Artificial Intelligence Challenges, Opportunities and Perspectives", showing the significant trend of AI, Lebanese University is encountering. However, as far as our knowledge, in addition to being a student in this university, there exist no clear policy and guidelines toward student's incorporation of AI in their work, this may leave insights open on the academic staff level of acceptance and factors affecting their acceptance to student's adoption of AI. Moreover, having the user's acceptance toward modern technology being emphasized on, in the latter, in our estimation and access to publications, the acceptance of A.I among Lebanese University's academic staff has not been studied yet, as a major concern of ours, Faculty of Education at the Lebanese University.

This study aims to address this gap by examining the factors that significantly affects acceptance of A.I among academic staff within the scope of students using it, in addition to level of openness and acceptance they show, based on UTAUT model proposed by Venkatesh et al. (2003). The literature shows the success of this model in explaining variations in acceptance on the use of new technologies, where Chatterjee & Bhattacharjee (2020) points out in their study that it could explain 70% of variations compared to other theories that could explain only 17 to 53%, thus, it may be successful in analyzing acceptance of our academic staff regarding their student's usage of AI, moreover he points out that researchers omitted or added new constructs to this model and still showed good results.

1.1. Conceptual Frame work:

1.1.2. Academic Staff:

refers to those with formal teaching responsibilities, including lecturers, professors, research fellows, and postgraduate students who teach, so in our context they will be those with formal teaching responsibilities at the Lebanese University Faculty of Education- Deanery, including PhD (Professors, associate professors, others if there exists, and non-PhD holders (trainers).

1.1.3. Perceived Pedagogical Risks:(PPR)

Wantin et al. (2002) defines perceived risk as a perception that the user will encounter loss upon using the technology, it had a negative significant effect on acceptance through out the literature, where Chatterjee & Bhattacharjee (2020) found out that it has a negative significant effect on adoption of AI in Indian higher education, however, Ofosu-Ampong (2024) in his study showed a positive significant correlation between perceived pedagogical affordance and acceptance among professors.

As for our study it will focus on students using AI unethically, enhancement of originality of students' work, reducing creativity, misidentifying of genuine students work as AI generated by AI detecting tools.

1.1.4. Effort Expectancy (EE):

Effort expectancy is defined as "the degree of ease associated with the use of the system" (Venkatesh et al., 2003). In our context it will be the ease of use our academic staff encounter while using AI detecting tools, or while assessing their students work. It has a positive significant effect on the attitude towards accepting AI (Chatterjee & Bhattacharjee,2020), a note worthy effect was shown by Molefi et al. (2024) on acceptance as well.

1.1.5. Facilitating Conditions (FC):

the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system" (Venkatesh et al., 2003). In our context, it will be the access to AI detection tools provided by the Lebanese University, clear guide lines and policies on the ethical and responsible use of AI by students, in addition to seminars, trainings, and conferences to overcome pedagogical challenges of AI. It has a positive significant effect proven by the literature among the previous studies as well.

1.2. Hypotheses:

H1: Perceived Pedagogical Risk has a negative significant effect on acceptance toward students' adoption among the academic staff.

H2: Effort Expectancy has a positive significant effect on acceptance toward students' adoption among the academic staff.

H3: Facilitating Conditions has a positive significant effect on acceptance toward students' adoption among the academic staff.

1.3. Research Questions:

- What is the effect of perceived pedagogical risks, effort expectancy, and facilitating condition on the acceptance of the academic staff toward students' adoption of AI with in the Lebanese University- Faculty of Education?
- What is the level of acceptance the academic staff at the Lebanese University exhibit toward their students' adoption of AI?

2-Research Methodology:

This study aimed at exploring factors affecting the academic's staff acceptance toward students' adoption of Artificial Intelligence at the Lebanese University-Faculty of Education in addition to the level of acceptance they have, it was done through the following steps:

2.1. Research Design:

This study is a quantitative correlational approach, aiming at assessing the factors that influence the acceptance toward student's adoption of A.I among Lebanese university academic staff at the faculty of Education, using a questionnaire

2.2. Sample:

The targeted population was the academic staff at the Lebanese University-Faculty of Education, including (professors, associate professors, Lecturers, and trainers). A sample of 36 participated in this study with a diversity from different teaching specializations, and teaching experiences.

2.3. Data collection Instrument:

The instrument used to validate our hypotheses was a questionnaire. Hassan (2023) defines a questionnaire as: "A Questionnaire is a research tool or survey instrument that consists of a set of questions or prompts designed to gather information from individuals or groups of people. It is a standardized way of collecting data from a large number of people by asking them a series of questions related to a specific topic or research objective."

Following the literature review, in addition to expert's opinion, our questionnaire was made up of 4 constructs, first: "Perceived Pedagogical Risks" (PPR: PPR1, PPR2, PPR3), mainly focusing on students using AI unethically, or the perceived risks of having genuine students' work misidentified as AI generated, and on originality of students' work. Second Construct: "Effort Expectancy" (EE: EE1, EE2) mainly related to academic staff ease of use while utilizing AI detecting tools, in addition to relying on their experiences in detecting the incorporation of AI in their students' work. Third Construct: "Facilitating Conditions" (FC: FC1, FC2, FC3), mainly focusing on Lebanese University giving access to AI detecting tools, providing clear guidelines and policies regarding the responsible and ethical use of AI, in addition to trainings, seminars and conferences regarding AI challenges in Education. The Final and Fourth Construct: "Acceptance

to Students Adoption of Artificial Intelligence” : (ASAA: ASAA1, ASAA2, ASAA3,ASAA4), mainly focuses on openness and acceptance of academic staff to their students’ incorporation of AI in their assignments and research, encouraging them to think critically while using those tools, the ease they have while assessing their students’ incorporation, and whether they set permissible rules for their students incorporation of AI in their work or not.

As such, we were able to build a questionnaire made up of 12 statements. In addition to our statements, Joshi et al. (2015) points out that Likert scale is widely used in educational research as for, we have chosen to include a Likert scale from 1 to 4: in which 1 : Strongly Agree, 2: Agree, 3: Disagree, 4: Strongly Disagree.

2.4. Sampling Method:

Jailobaev et al. (2021) states that WhatsApp application can play an important role in research, as for our questionnaire was distributed randomly via WhatsApp groups to the academic staff, by the help of the dean at the Faculty of Education at the Lebanese University: Professor Khalil AL Jammal, in addition to the help in distribution to colleagues offered by professors as well.

2.5. Validity and Reliability:

Ranganathan et al. (2024) defines reliability as the following: “The reliability or precision of a research instrument refers to the consistency of the measure, i.e., does it give similar results when used repeatedly under stable conditions?”, he also refers to validity as the accuracy of a research tool, where results indicate true findings of measured variables.

2.5.1. Face validity:

according to Ranganathan et al. (2024), it is the simplest form of validation which refers to the format and style of the questionnaire, it does not require experts. As for face validation of our questionnaire, this was accomplished by sharing questionnaire with Research Master of Arts in Education students (5 students), in which all showed an agreement regarding.

2.5.2. Content Validity:

This was done by the help of 3 experts, professors and Educational Researchers at the Lebanese University Faculty of Education, in which all statements were valid, except for PPR3 professors reported it as not clear, so it was replaced and then reapproved. In addition, piloting of the questionnaire among 3 professors was done, 1 statement was reported as unclear, ASAA3, therefore it was changed and repiloting step took step again among 3 professors who reported to misunderstanding to any construct of our questionnaire.

2.5.3. Internal consistency:

according to Ranganathan et al. (2024) a value of 0.7 or more of Cronbach alpha expresses good associations between items. All of our constructs exhibited internal consistency where results have shown Cronbach alpha >0.7. (shown in the table below). In addition to reliability proven by results of Cronbach alpha.

Statement	Cronbach Alpha
PPR1	0.760
PPR2	0.722
PPR3	0.808
EE1	0.750
EE2	0.783
FC1	0.761
FC2	0.742
FC3	0.736
ASAA1	0.713
ASAA2	0.739
ASAA3	0.727
ASAA4	

Table 1: Cronbach Alpha Results

2.6. Ethical Considerations:

- Informed consent:

first, written consent from the dean in the faculty of Education Professor Khalil -Al Jammal to distribute the questionnaire among academic staff with in the faculty, this consent was then distributed to participants along with the questionnaire.

Second, participants were informed about the Research purpose, and procedure.

- Privacy and Confidentiality:

All participants remained anonymous, and no personal information or names, or emails were retrieved.

2.7. Data Analysis:

Descriptive and Correlational analysis were done by SPSS, at a significance level =0.05. Our variables were not normally distributed, (p-value <0.05) according to Kolmogorov and Shapiro-wilk tests, how ever because our sample is more than 31, so normality is assumed, therefore Pearson Correlation Coefficient and linear regression are computed.

3- Results and Discussion:

Our sample size is $36 > 31$, so normality is assumed among our variables. Therefore, as an answer to our main research question, Pearson Correlation Coefficient and linear Regression were computed through SPSS, to test the latter 3 mentioned hypotheses:

Hypothesis	Pearson Correlation Coefficient	R^2	Significance (p-value):	Results:
1- H1: Perceived pedagogical Risks has a negative significant effect on acceptance.	0.335	0.112	0.053	Marginally Statistically significant. H1 rejected. Significant Positive effect.
2- H2: Effort Expectancy has a positive significant effect on acceptance.	0.389	0.151	0.023	p-value <0.05: Statistically Significant H2 accepted.
3- H3: Facilitating Conditions has a strong positive effect on acceptance.	0.691	0.477	0.000006	p-value < 0.05: Highly statistically significant H3 accepted.

Table 2: Regression Analysis and Pearson Correlation Tests

3.2. Key

findings:

- perceived pedagogical risks have a marginally statistically significant effect on academic's staff acceptance toward students' adoption of Artificial Intelligence, (p-value is 0.052, this could reach significance with a larger sample size, so it is considered marginally significant at significance level 0.05, and significant at significance level 0.1) and there exist a low positive correlation, ($R=0.335$) where a variation in only 11.2% in acceptance is due to perceived pedagogical risks. ($R^2: 0.112$).
- Effort Expectancy of academic's staff in the light of their students using AI has a statistically significant effect on academic's staff acceptance to students' adoption of AI, (p-value: $0.023 < 0.05$) and there exist a weak positive correlation between Effort Expectancy and academics' staff acceptance ($R =0.389$) where 15.1 % variations in

acceptance among academic staff is based on their effort expected when their students are using AI tools, mainly ease of assessing and using AI detecting tools.

- Facilitating Conditions provided by the Lebanese University has a highly significant effect on academics' staff acceptance, (p-value: 0.0000006 <0.05), with a moderate positive correlation (R= 0.691), where 47.7% of variations in acceptance among academic staff is based on facilitating conditions Lebanese university would provide, including access to AI detecting tools, conferences and seminars, clear guide lines and policies on the ethical utilization of AI by students.

3.3. Confirmed frame work:

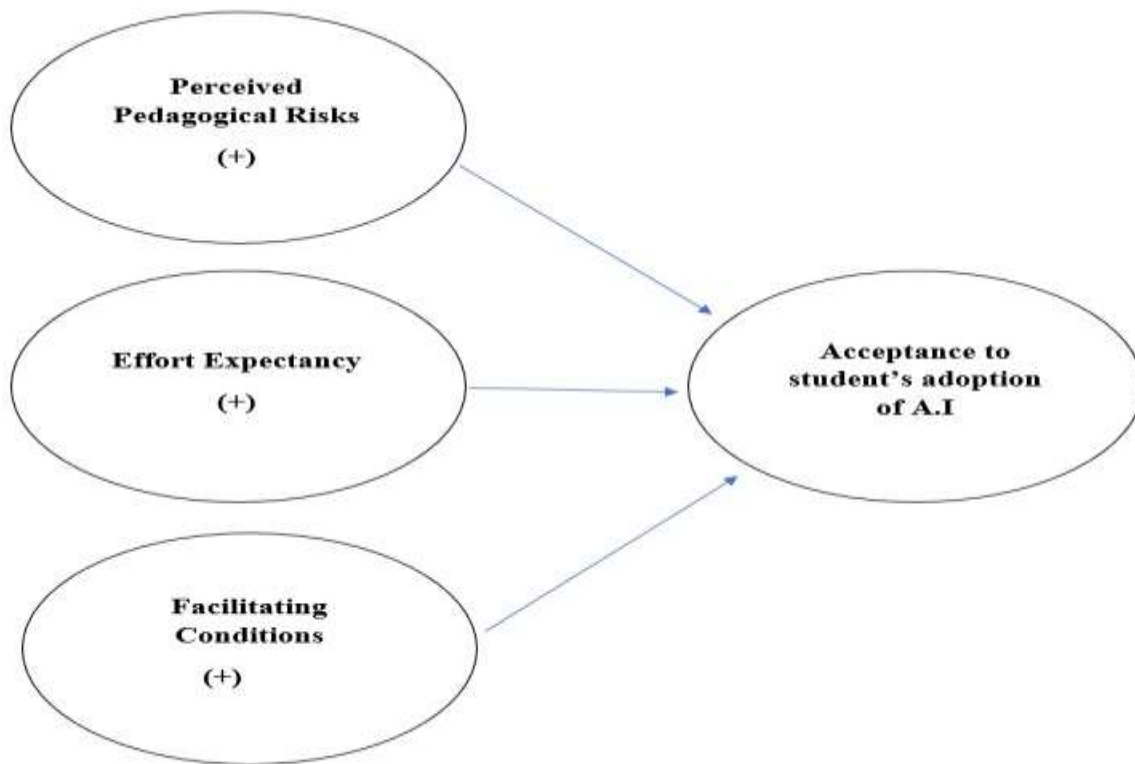


Figure 1: Confirmed Frame Work

3.4. Descriptive Statistics:

Following our sub research question, descriptive analysis was done through SPSS, to understand the level of acceptance the academic's staff has regarding to their student's utilization of AI, a summary of the questionnaire section (Acceptance to Students' Adoption) is shown below, in addition to mean and standard deviation.

Acceptance to students' Adoption of AI:	Mean	Standard Deviation
1- ASAA-1. I am open to students using AI technologies in their academic assignments and projects.	1.97	0.627
2- I encourage students to think critically when incorporating AI technologies into their academic projects.	1.56	0.504
3- ASAA-3. I feel comfortable assessing students' incorporation of AI technologies in their academic work.	2.00	0.696
4- ASAA-4. I set rules for students regarding their permissible and restricted usage of AI in projects and research.	1.85	0.657

Table 3: Descriptive Statistics for Acceptance

3.5. Key findings:

On average, academic staff at the Lebanese University-Faculty of Education has shown openness to their students using Artificial Intelligence, in which an average = 1.97 indicates a trend toward strong agreement with some differences (ASAA1), with a strong tendency for students to think critically while using Artificial Intelligence Tools, in which an average = 1.56 reassures the idea of encouraging students to do so (ASAA2), moreover, most of our respondents are confident in their ability to assess students' incorporation of AI in their work, in which an average = 2.00 shows an agreement, without strongly agreeing or disagreeing (ASAA3). It is finally worth mentioning that this openness is accompanied by most of respondents setting rules for their students for the responsible use of AI in the absence of clear guide lines and policies provided by the university to ensure responsible and ethical use of AI among students. (ASAA4)

3.6. Discussion:

Our observed trend of academic staff at the Lebanese University, Faculty of Education showed openness to students' adoption of AI aligns with (Ofosu-Ampong, 2024), in which results revealed that a high proportion among lectures expresses tendency to accept AI adoption by students (73.4%), those results were not surprising, as for AI being used in education has shown increased interest among the past years (Zhang et al., 2023), moreover it is widely spread and available to students, in which according to Draghici et al. (2024), half of responders among who were training at the university reported usage of AI among the past 2 years. However, as mentioned in the latter, faculty members acceptance is influenced by our constructs, in which those significant relationships come align with the literature reported relations.

3.6.1. Perceived pedagogical Risks:

This construct exhibited a significance effect on acceptance, with weak positive correlation among academic staff, in opposite to our hypothesis, retrieved from Chatterjee and Bhattacharjee (2020) study showing a negative significant correlation between perceived risks and attitude regarding

adoption of AI, this may be explained by several factors, mainly captured by academic staff accepting some risks, with a consensus on some potential benefits, in which our constructs PPR1, and PPR2 held an average concerns by academic staff, that students may use AI un ethically, even some genuine acts of students using AI for proofreading and editing may cause their work to be misidentified as AI generated, this may be shown by our PPR3 construct, in which some of responders agree that Artificial intelligence enhances the originality of students work, this assumption aligns with the positive significant relation found in Ofosu-Ampong (2024) study between perceived pedagogical affordance and acceptance among university professors toward students adoption of AI. On the Other hand, it may be explained by their confidence in assessing student's incorporation of AI in their work (ASAA2), in addition to the high level of self-efficacy and skills academic staff has where respondents agree, inclining to a strongly agreeing manner, on their ability to rely on their experience detecting AI in their students work (EE3). Finally, more research is encouraged to validate this construct and investigate the balance between risks, and benefits on acceptance.

3.6.2. Effort Expectancy of Academic's Staff:

This construct exhibited a significant effect on acceptance, with a weak positive correlation, this aligns with other studies. Chatterjee and Bhattacharjee (2020) found a positive strong correlation between Effort Expectancy and attitude toward adoption of AI, which is further more asserted in Molefi et al. (2024) study relative to acceptance among professors. Our results has shown that most of responders find it easy to use AI detecting tools, and can rely on their experience in detecting AI in their students' work, this can further be explained by Alhwaiti (2023) results showing the significant effect Effort expectancy has on teacher's self-efficacy and wellbeing, in relation to this we can infer that when AI detecting tools can be used easily by the academic staff, their self-efficacy will be enhanced, and the more competent they would feel, the more likely they are to accept AI adoption among their students. Therefore, the ease of AI detecting tools is a crucial factor to be addressed in terms of acceptance, suggesting that among the academic staff, the capability to reduce AI challenges, will allow embracing of its utilization among students.

3.6.3. Facilitating Conditions:

This construct exhibited a significant effect on acceptance with a moderate positive correlation, it focused mainly on access to AI detecting tools by the Lebanese University to professors and students, clear guidelines and policy on the ethical and permissible usage of AI by students, in which those facilitating conditions explained acceptance by 47.7%. This pattern is not new to the literature in which Chatterjee and Bhattacharjee (2020) found a positive strong correlation between facilitating conditions and behavioral intention toward adoption, in addition to Ofosu-Ampong (2024) study showing a significant relationship between organizational policies and acceptance of AI for students, in addition to Gustilo et al. (2024) findings that showed an important call for revising and formulating educational policies. Nevertheless, Draghici et al. (2024) found out a great need to define and understand ethical use when using AI. Moreover, Alhwaiti (2023) results showed a significant positive relation between facilitating conditions, and teacher's self-efficacy and wellbeing, in other words, when there is access to AI detection tools and clear guide lines provided by the Lebanese university, professors may experience an enhanced self-efficacy, and are more likely to accept their student's adoption of Artificial Intelligence.

4. Conclusion:

This study examined factors affecting acceptance among academic staff of Lebanese University - Faculty of Education toward their students' adoption of Artificial Intelligence, in addition to the level of acceptance they encounter. The Results indicated a high tendency toward accepting students' adoption of Artificial Intelligence, this acceptance is mainly driven by facilitating conditions, in addition to perceived pedagogical risks, and Effort Expectancy. Notwithstanding on the uneasiness accompanied by students' adoption of Artificial Intelligence the academic staff and students face, perceived potential benefits and the competence of academic staff in managing AI related challenges, may be the key in accomplishing a low positive relation between perceived pedagogical risks and acceptance toward students' adoption. Meanwhile this construct remains unclear with in our study, the highly significant effect of facilitating conditions and significant effect of Effort Expectancy, highlights the importance of providing access to AI detecting tools, and continuous seminars, and conferences to overcome pedagogical challenges of Artificial Intelligence, along with trainings to enhance the skill of using AI detecting tools as well, in addition to clear policy and guidelines by the Lebanese University to create an environment of self-efficient

academic staff, open to responsible and ethical use of AI by students with in the faculty, that may be extended to the whole university as well.

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