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Determining factors that can influence the understanding and acceptance of advanced technologies in universities' teaching and learning

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ABSTRACT

As Information and Communication Technologies (ICTs) have advanced, numerous new tools have been implemented to improve the effectiveness of instruction at the university level. It has had a ripple effect throughout Saudi Arabia's educational system. One of the results of this shift is the rise of e-learning, which requires technological means for delivery. Therefore, the purpose of this study is to investigate the elements that influence Saudi university students' acceptance of technology in teaching and learning. Data were obtained from 309 students. The data were analyzed using SPSS software. Surveys were used as the primary technique of data collection for this study. The results of the survey show that perceived ease of use, technical support, training, and content quality are expressively related to the acceptance of technology among university students. This study also provides evidence that there is a direct variation in people's acceptance of new technology, which helps explain 73.5 percent of people's acceptance of new technology. The results of the study will provide empirical data regarding the effective adoption of technology in Saudi universities, which will help in the growth of teaching and learning in the country. Similarly, the findings of the study may be of interest to researchers and policymakers in Saudi Arabia in providing the fundamentals for the acceptance and utilization of technology in education.

1. Introduction

Because of the rapid developments in technology, keeping up with them and incorporating new technologies into all aspects of life is vital. Many countries have made a significant investment of a significant amount of money in information and communications technologies in order to improve the content of quality education (Al-Mamary, 2022a). Similarly, Buabeng-Andoh (2012) found that countless governments have made a multilateral investment in new advanced technology to enhance academic teaching and learning. Equally, regardless of the huge percentage of these alternative investments in telecommunications innovations and communication systems, and expert advancement to enhance the standard of the learning process, numerous wealthy nations still have low levels of science and technology implementation and acceptance in academic learning and teaching. Technology has been acclaimed all over the world for decades. The impact of Information and Communication Technology (ICT) on teaching and learning is an enthralling subject that must be grasped in order to predict the outcome (Pandey and Pandey, 2020). Al-Mamary et al. (2021) wrote that in today's generation, economic system, and heritage, suggestions for future research appear to suggest that technology is significantly altering the norm. Understanding as well as effective implementation of new changes are as vitally valuable as their formal emergence. This issue is particularly pertinent in light of the present health crisis, particularly in terms of education. Learning institutions' practices are altering as a result of technology implementation.

On the other hand, digital transformation in the academic learning and teaching process would have to be extremely successful in the eyes of all various stakeholder groups, including students, professors, and higher education institution management. Based

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on adequate measurements, the influence of technology has also piqued the interest of both teachers and students in the last few decades. For example, the Saudi Arabian government has vigorously encouraged the use of technology in schools at all levels of education, from initiatives for higher institutions to the ministry of higher education (Binyamin, 2019; Al-Mamary et al., 2021).

Saudi Arabia's Ministry of Higher Education goes on to empower its professionals to persuade the acquisition of different portable technological devices for undergrad students, teachers, and administrators in all institutions of higher learning with advantageous economic circumstances and ensure secure internet interconnection.

Each university in the kingdom must be able to reach the targets of the allocated Key Performance Indicator (KPI). Therefore, for the Saudi Ministry of Higher Education to actually accomplish the state-wide quality education e-learning global agenda, in a similar spirit, the Saudi Arabian Ministry of Higher Education advised that at least 50% of public university courses be delivered online for blended learning to be successful (Alshehri and Alahmari, 2021). To sum it all up, several other government agencies have already inaugurated global technology investment opportunities to keep enhancing the traditional academic teaching and learning process in various colleges and universities. While acknowledging the value of using technology in education, the majority of Arab countries in the Middle East and impoverished countries continue to struggle with the adoption of technology in education. Especially in relation to Saudi Arabia, this essay examines the primary elements that inspire students to use technology in educational procedures. In addition, this entire article provides a conceptual framework model that determines the essential variables that might very well impact science and technology understanding and acceptance in different settings of colleges and universities around the globe. Accordingly, the conceptual model used in this study may aid the government in identifying characteristics that will encourage more students to accept and adopt technology in schools and universities. Furthermore, this research will highlight the obstacles that students encounter in Saudi universities.

2. Literature review

Technology was introduced and used in Saudi education through a variety of methods. Technology is developed and frequently used in Saudi Arabia, primarily through classroom teacher education programs, as well as research and innovation use of novel different instructional strategies, and developing software items, in addition to making them easily accessible to the general public for broadcast by media organizations (Alqarni, 2015).

In which the student proceeds, his/her learning focuses on his physical energy and potential, as well as prior knowledge and qualifications. E-learning is among the most sophisticated methods of correspondence distance learning in the broad sense, as well as digital e-learning. In addition, most Saudi universities use the Learning Management System (LMS) in education. LMS is a collection of software tools that are used to provide, track, and administer educational experiences (Aqlan et al., 2021; Al-Mamary, 2022b; 2022c). They are made up of a number of applications that are housed in a user management system. Higher education organizations frequently neglect variables that encourage or discourage consumers from using technology.

LMS stands for Web-based learning processes and is a crucial topic for future education. It has already begun to dominate the bulk of applications in higher education institutions around the world. In this respect, LMS stands out as a more significant method since it makes instructional practices available to learners whenever they want, which in itself is impossible to achieve in a formal education system. Blackboard is one of the most widely used e-learning platforms in Saudi Arabia today. A significant advancement in the use of digital e-learning systems platforms by all academic institutions of higher learning to fully promote traditional classroom teaching and learning activities via the online platform (Al-Ghurbani et al., 2021). The main goal of using LMSs, like many other instructional technologies, is to achieve the course or training's intended learning outcomes while also enhancing student teachers' collaboration with corresponding online courses since both have the opportunity to promote truly innovative teaching-learning strategies which achieve a variety of academic requirements in a variety of environmental situations. And apart from the fact that many colleges around the world have implemented learning management systems (LMS), their effectiveness requires a thorough understanding of the end-user acceptance process. Despite the rapid expansion of such systems in recent years, Saudi Arabian universities continue to encounter a number of obstacles when it comes to e-learning (Luppicini and Walabe, 2021). Among some of the huge obstacles that so many Saudi Arabian academic institutions encounter are the understanding and adoption of e-learning education programs (Sandhu and Alharbi, 2020).

3. Important factors influencing the use of advanced technologies in academic achievement in Saudi Arabia

Al-Mamary et al. (2021) reported that advancement in ICT has now emanated as a substantial element of the academic context and indeed the students' learning curve. Therefore, in this era of technological breakthroughs, it enables us to continue education and learning more efficiently and successfully and streamline operations. Technology's value in education has become abundantly evident. Scholars discovered a series of

elements with a certain impact on future tech recognition as well as full assimilation throughout the teaching and learning process. The criteria that encourage students to employ innovative technologies in the classroom differ by nation. When it comes to incorporating ICTs into classroom activities, there appears to be a split between enthusiasm and fear of the consequences of the numerous challenges faced by academic researchers and high school students in colleges and universities in Saudi Arabia. Table 1 summarizes some of the significant determinants influencing technology acceptance in teaching and learning in Saudi Arabia. The proposed model for this study will be drawn based on the most agreed factors in most studies, in particular with respect to Saudi Arabia from 2019 to 2022.

4. Conceptual model and hypotheses development

Based on 16 studies conducted between 2019 and 2022 in the field of intention and acceptance of the use of technology in the field of education in the context of Saudi Arabia which mentioned 33 factors affecting the acceptance as well as the actual intent to be used advanced technologies, which are the study of Khan et al. (2021), Al-Mamary et al. (2021), Almaiah et al. (2022), Afandi (2022), Alharbi et al. (2021), Chatti and Hadoussa (2021), Al-Ghurbani et al. (2022), Alsmadi (2020), Alharbi et al. (2019), Alammary et al. (2021), Al-Shargabi et al. (2021), Alshehri and Alahmari (2021), Binyamin et al. (2019), Badwelan and Bahaddad (2021), and Alkhaldi et al. (2021).

As to the method, the methodology used in this research to construct the conceptual framework is to carefully select the different variables that were tested in a quarter of the above studies. It is clear from Table 1 that the most critical determinant influencing full understanding and acceptance and intention of using advanced technology in the field of education are four factors: Perceived ease of use, technical support, training, and content quality. The long-term learning model is displayed in Fig 1.

Table 1: Most important factors affecting the acceptance of technology in education in the context of Saudi Arabia

No.	Factors	Reference	No. of studies	%
1	Perceived Ease of Use (System quality)	Almaiah et al. (2022), Alsmadi (2020), Al-Shargabi et al. (2021), Chatti and Hadoussa (2021), Al-Ghurbani et al. (2022), Binyamin et al. (2019), and Badwelan and Bahaddad (2021)	7	43.75%
2	Technical Support (Service quality)	Almaiah et al. (2022), Alsmadi (2020), Al-Shargabi et al. (2021), Khan et al. (2021), Al-Mamary et al. (2021), Badwelan and Bahaddad (2021), and Alkhaldi et al. (2021)	7	43.75%
3	Training	Almaiah et al. (2022), Al-Mamary et al. (2021), Alharbi et al. (2019), and Alshehri and Alahmari (2021)	4	25%
4	Content quality (Information Quality)	Almaiah et al. (2022), Alsmadi (2020), Al-Shargabi et al. (2021), and Binyamin et al. (2019)	4	25%
5	Organization Administrative Support or Management support	Khan et al. (2021), Almaiah et al. (2022), and Al-Mamary et al. (2021)	3	18.75%
6	Effort Expectancy	Afandi (2022), Alharbi et al. (2021), and Badwelan and Bahaddad (2021)	3	18.75%
7	Performance Expectancy	Afandi (2022), Alharbi et al. (2021), and Badwelan and Bahaddad (2021)	3	18.75%
8	Facilitating Conditions	Chatti and Hadoussa (2021), Afandi (2022), and Alharbi et al. (2021)	3	18.75%
9	Perceived Usefulness	Chatti and Hadoussa (2021), Al-Ghurbani et al. (2022), and Alsmadi (2020)	3	18.75%
10	Attitudes	Al-Ghurbani et al. (2022), Alharbi et al. (2019), and Alammary et al. (2021)	3	18.75%
11	infrastructure	Almaiah et al. (2022) and Al-Mamary et al. (2021)	2	12.5%
12	ICT Policy	Khan et al. (2021) and Al-Mamary et al. (2021)	2	12.5%
13	Self-efficacy	Al-Ghurbani et al. (2022) and Alammary et al. (2021)	2	12.5%
14	Time limitation	Al-Mamary et al. (2021) and Alharbi et al. (2019)	2	12.5%
15	Social Factors (Social Influences)	Chatti and Hadoussa (2021) and Afandi (2022)	2	12.5%
16	Organization Infrastructure and Resources	Khan et al. (2021)	1	6.25%
17	Computer anxiety	Al-Ghurbani et al. (2022)	1	6.25%
18	Security Concerns	Almaiah et al. (2022)	1	6.25%
19	Awareness	Almaiah et al. (2022)	1	6.25%
20	Perceived Functionality	Alharbi et al. (2021)	1	6.25%
21	interests and knowledge	Alharbi et al. (2019)	1	6.25%
22	perceived reliability	Alammary et al. (2021)	1	6.25%
23	Readiness	Alshehri and Alahmari (2021)	1	6.25%
24	Learning support	Binyamin et al. (2019)	1	6.25%
25	Visual design	Binyamin et al. (2019)	1	6.25%
26	System navigation	Binyamin et al. (2019)	1	6.25%
27	Ease of access	Binyamin et al. (2019)	1	6.25%
28	System interactivity	Binyamin et al. (2019)	1	6.25%
29	Instructional assessment	Binyamin et al. (2019)	1	6.25%
30	System learnability	Binyamin et al. (2019)	1	6.25%
31	Lecturers' Influence	Badwelan and Bahaddad (2021)	1	6.25%
32	Personal Innovativeness	Badwelan and Bahaddad (2021)	1	6.25%
33	Interface Quality	Badwelan and Bahaddad (2021)	1	6.25%

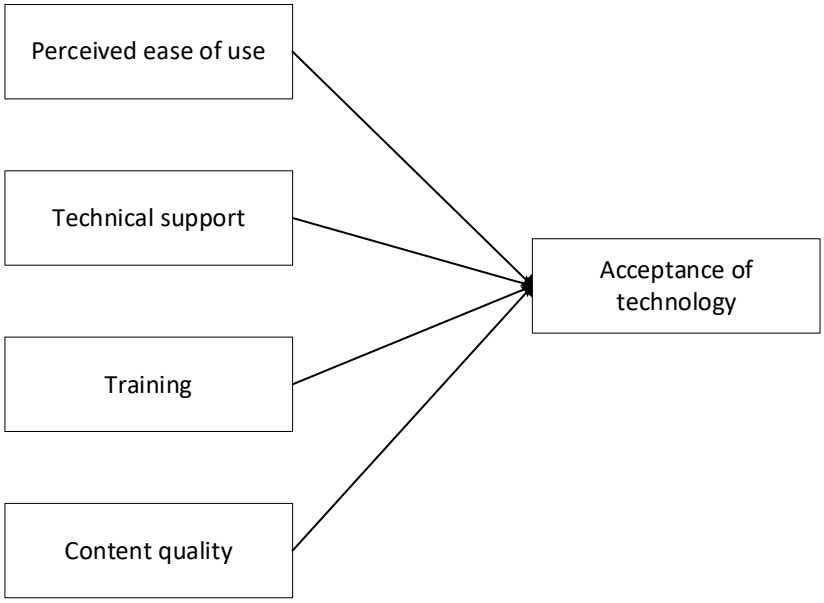

Fig. 1: The study model

4.1. Perceived ease of use

Based on the findings of Chatti and Hadoussa (2021), it can be argued that PEOU is seen as a significant predictor of adoption intent. This variable has been explained as the extent to which a specific ordinary person appears to believe that the use of a linear function of systems will indeed be simple and usually involve less effort in terms of time or energy. As a result, the possibility of intending to utilize e-learning technology increases as long as the appropriation and learning process is simple to grasp and apply. In other words, this variable reflects how confident a person perceives that perhaps the technical and operational infrastructure deemed necessary for the platform's usage is in place for the first time. Al-Ghurbani et al. (2021) claimed that PEOU is another therapeutic component that has an impact on a user's intention to fully implement and embrace systems with the aim of academic achievement. PEOU is described as the great that refers to the extent through which a new user anticipates the operating system to be effort-free in time and energy. Several studies have established a strong and positive association between a user's PEOU and their propensity to utilize and accept technology. In contrast, ease of use is a critical aspect in determining technology's adoption in education.

As a result, the following research hypothesis is established for analysis in this research paper:

Hypothesis 1: Perceived Ease of Use has a strong influence on the students' acceptance of technology in Saudi Arabian universities.

4.2. Technical support

Highly technological backing is characterized as experienced professionals that can provide assistance to regular users of operating systems and application hardware via various processes, and other methods. Students use of technology is influenced by technological support (Alshammari, 2020). Technical support, such as that provided by technicians, can improve the usage of technology (Zheng et al., 2018).

Hence, the preceding hypotheses were formulated for research in this research paper:

Hypothesis 2: Technical support has a strong influence on the students' acceptance of technology in Saudi Arabian universities.

4.3. Training

Al-Mamary et al. (2021) pointed out that training plays an important role in ICT adoption as most faculty and students need the training to use technology in education. Whereas training is indeed a crucial component in embracing modern technologies. Almaiah et al. (2022) reported that it is essential that students undergo training in good enough condition to use digital e-learning operating systems to be prepared to adapt to them. Training students to use new technologies is one of the crucial elements that can lead to their successful adoption. Solangi et al. (2018) stated that access to technology, confidence, and attitudes can all be measured with training. The training attribute is used to evaluate professional technological expertise as well as insight with regard to the use of online services in the educational learning experience, such as implementing digital training sessions, training seminars, and academic lecture courses.

Thus, the aforementioned research hypotheses were developed for examination throughout this scientific manuscript:

Hypothesis 3: Training has a strong influence on the students' acceptance of technology in Saudi Arabian universities.

4.4. Content quality

According to Binyamin et al. (2019), the accuracy of the terminology employed, the appropriateness of the material to meet the course objectives, and the relevancy of the information are all aspects of content quality. The content of digital e-learning applications should be organized in a logical manner, with sufficient resources available. High-quality material in e-learning systems can boost system acceptability, and vice versa. Teachers and students can communicate effectively using Blackboard's content-sharing tool. Given the importance of this to systems, the quality of the information generated by the Blackboard system has become critical for the system's successful and effective acceptance and use. The greater the content quality, the greater the acceptance, and vice versa (Alhussain, 2017).

Thus, the following hypotheses were formulated for investigation in this research paper:

Hypothesis 4: Content quality has a strong influence on the students' acceptance of technology in Saudi Arabian universities.

5. Methodology

5.1. Research design

The primary aim of the whole research was also to examine the variables attempting to influence the understanding and acceptance of new tech in classroom instruction and learning in Saudi Arabia. From the viewpoint of University students. The researchers pose the following question, which reflects the overall goal of the study.

And what were the essential variables that may influence any use of advanced technologies in teaching and learning at Saudi Arabia's Universities?

To address the research questions, quantitative research will be carried out. This research data will be collected through survey methods. Participants in the study will be notified that their identities will not be revealed and that absolute confidentiality will be upheld. Furthermore, their involvement is entirely voluntary. Participants have the right to refuse to participate in the study in order to maintain research ethics. The suggested model will be tested using SPSS.

5.2. Instrument development

The questionnaires were designed to examine the effect of independent variables (Perceived Ease of Use, Technical Support, Training, and Content Quality) on the acceptance of advanced technologies in Universities' Teaching and Learning. The set of survey questions was written in English, but some of the people who participated found it a bit complicated to complete the questionnaire in English. Because the mother tongue of Saudi Arabia is Arabic, professionals interpreted the survey questions into Arabic to prevent unnecessary communication problems. The measurements will be developed using proven instruments from previous research. All the questionnaire items will indeed be evaluated on a 5-point Likert scale, with 1 indicating "strongly disagree" and 5 indicating "strongly agree." The scale will be used because it is relatively simple to create, makes data collection and analysis simple, and hence is appropriate for surveys. interpretation of aggregated data due to the numbering of each option. Where the questionnaire consists of three parts, Part 1 consists of four questions aimed at collecting information about the respondents, namely gender, year, program, and technology use skills.

Part 2 is designed to examine the four independent variables. Part 3 consists of questions about the dependent variable (Acceptance of Technology in Education). The set of survey questions was adapted from immediately preceding research findings with minimal modifications to match the original study perspective.

5.3. Reliability and validity

For some other investigators to use research findings, they must be relevant and reliable. The reliability coefficient is an effective criterion because it works to enhance the research study so that it is completely obvious and simple for the people involved. The extent to whereby the device utilized in the research paper could indeed quantify the study frameworks is referred to as statistical validity; the reliability of the research scale elements is referred to as credibility, whenever the dimension continues to produce the same end results. The questionnaire's design should be consistent with the study's objectives in order for the results to be reliable and true, as well as clear and useful (Hussein et al., 2017). The validity of the questionnaire was achieved, first, the instrument was taken from previous studies, and secondly, it was presented to a number of specialists for review and comments. All comments were taken and modified until we reached the final version. As for the reliability, the reliability was measured by Cronbach's alpha coefficient, where all the values as shown in Table 2 were higher than 0.70.

6. Results

6.1. Demographic profile

Table 3 displays the overall population information such as gender, year, program, and level of technological competency. As the numbers show, among the 309 respondents, 189 were female (61.2%) and 120 were male (38.8%). Moreover, 103 participants (33.3%) in the first year, 73 participants (23.6%) in the second year, 80 participants (25.9%) in the third year, and 53 participants (17.2%) in the last. In addition, the results show 89 participants

(28.8%) from the MIS program, 99 participants (32.0%) from the management program, 68 participants (22.0%) from the accounting program, and 53 participants (17.2%) from the finance program. Finally, the results indicate that 140 participants (45.3%) are excellent at using technology, 153 participants (49.5%) are average at using technology, and only 16 participants (5.2%) have a low level of using technology. It is noticeable that the largest percentage of students have the ability and skill in using technology, and this is due to the technology revolution and the entry of technology into all areas of life. Table 3 shows the demographic profiles.

Table 2: Reliability of research findings

Construct	Cronbach's Alpha (>= 0.7)	No. of items
PEOU	.897	4
TS	.812	3
T	.914	3
CQ	.921	3
AOT	.864	3

6.2. Descriptive statistics for the model constructs proposed

Table 4 displays the average and correlating proportions of university student viewpoints on PEOU. It's indeed completely obvious from the understudies' responses that they find it simple to know and understand when to use the truly innovative LMS advanced technologies of Blackboard. Most students also find that the learning management system (Blackboard) recommended by the university is easy to use. The students also said that they have not encountered any difficulties in using the LMS (Blackboard). In general, students find it easy for them to become qualified to use LMS (Blackboard).

Table 3: The demographic profile

		Frequency	Percent
Gender	Male	120	38.8
	Female	189	61.2
Year	First Year	103	33.3
	Second Year	73	23.6
	Third Year	80	25.9
	Fourth Year	53	17.2
Program	MIS	89	28.8
	Management	99	32.0
	Accounting	68	22.0
	Finance	53	17.2
Level of Technology Proficiency	Excellent	140	45.3
	Medium	153	49.5
	week	16	5.2

Table 5 shows the frequency components and commensurate percentage distributions of undergraduate students' personal viewpoints on technical support (TS). It is clear from the students' answers that the technical support service team is available to assist students whenever they are needed. In addition, the university has a special department for technical support services (IT Center) with technicians ready to help students when they need them. Moreover, students have the necessary instructions for using the Learning Management System (Blackboard).

Table 6 presents the descriptive statistics and commensurate percentage distribution of undergraduate viewpoints on training (T). It is clear from the students' answers that the university provides students with internal training or workshops on how to utilize the LMS. It also provides students with external training or workshops on the use of the LMS. The university also provides students with training to use the Microsoft Office application.

Table 4: Descriptive statistics for perceived ease of use

Item	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	Mean	Std. deviation
PEOU1	130 (42%)	75 (24.3%)	84 (27.2%)	12 (3.9%)	8 (2.6%)	3.99	1.041
PEOU2	136 (44%)	85 (27.5%)	62 (20.1%)	16 (5.2%)	10 (3.2%)	4.04	1.068
PEOU3	109 (35.3%)	80 (25.9%)	85 (27.5%)	22 (7.1%)	13 (4.2%)	3.81	1.122
PEOU4	136 (44%)	79 (25.5%)	71 (23%)	12 (3.9%)	11 (3.6%)	4.03	1.072

Table 5: Descriptive statistics for technical support

Item	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	Mean	Std. deviation
TS1	151 (48.8%)	80 (25.9%)	50 (16.2%)	15 (4.9%)	13 (4.2%)	4.10	1.103
TS2	154 (49.7%)	92 (29.8%)	49 (15.9%)	7 (2.3%)	7 (2.3%)	4.23	.950
TS3	124 (40.1%)	75 (24.3%)	68 (22%)	25 (8.1%)	17 (5.5%)	3.85	1.193

Table 6: Descriptive statistics for training

Item	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	Mean	Std. deviation
T1	164 (53%)	88 (28.5%)	37 (12%)	11 (3.6%)	9 (2.9%)	4.25	.997
T2	157 (50.8%)	86 (27.8%)	42 (13.6%)	9 (2.9%)	15 (4.9%)	4.17	1.083
T3	153 (49.5%)	92 (29.8%)	45 (14.6%)	9 (2.9%)	10 (3.2%)	4.19	1.007

Table 7 presents the descriptive statistics and commensurate percentage distribution of undergraduate personal views on content quality (CQ). It is clear from the students' answers that the learning outcomes/objectives for the courses of study are clearly defined in the learning management system (LMS). The LMS is well designed to help understand the content. Also, the content is constantly updated on the LMS.

Table 8 shows the frequency distributions of understudies' personal views on the acceptance of technology (AOT). It is clear from the students' answers that most of the students are satisfied with the Learning Management System (Blackboard)

recommended by the university. In addition, most students are satisfied with attending an online course. Most students think using the LMS (Blackboard) inside the core subjects is a pretty positive way of learning in the future.

Table 7: Descriptive statistics for content quality

Item	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	Mean	Std. deviation
CQ1	150 (48.5%)	90 (29.1%)	45 (14.6%)	12 (3.9%)	12 (3.9%)	4.14	1.059
CQ2	147 (47.6%)	89 (28.8%)	50 (16.2%)	9 (2.9%)	14 (4.5%)	4.12	1.074
CQ3	158(51.2%)	82 (26.5%)	52 (16.8)	8 (2.6%)	9 (2.9%)	4.20	1.004

Table 8: Descriptive statistics for acceptance of technology

Item	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	Mean	Std. deviation
AOT1	129 (41.8%)	89 (28.8%)	64 (20.7%)	18 (5.8%)	9 (2.9%)	4.01	1.060
AOT2	135 (43.7%)	93 (30.1%)	59 (19.1%)	12 (3.9%)	10 (3.2%)	4.07	1.036
AOT3	161 (52.1%)	88 (28.5%)	48 (15.5%)	3 (1%)	9 (2.9%)	4.26	.956

6.3. Regression analysis

In this study, there are four independent variables and one dependent variable, so there is no need to use structural equation modeling. Therefore, the authors used multiple linear regression, as the structural equation modeling technique is preferred to be used when there is more than one dependent variable.

Multiple regression is an extension of regression analysis, which is normally used for accurately predicting the correlations between one or more interdependent variables (Alharbi et al., 2021).

The proposed theoretical model used in this research paper also includes research hypotheses, which are intended to investigate the causal relationships between different variables such as PEOU, TS, T, and CQ as predictor variables as well as AOT as an outcome variable.

The principal focus of this research is to investigate the adverse effects of four independent variables on the acceptance of technology by students at Universities. Therefore, multiple regression is ideal for all of this critical analysis of the data because it actually attempts to examine the study research question.

The summary of the analysis revealed that the B coefficients for PEOU, TS, T, and CQ in relation to the understudies' AOT were 0.114, 0.353, 0.200, and 0.246, points, respectively, as well as the P-values were 0.013, 0.000, 0.001, and 0.000. Thus, PEOU, TS, T, and CQ all had a major and significant influence on AOT. Whenever the B coefficients for PEOU, TS, T, and CQ variables are compared, it is clear that T used to have a significantly larger influence on university students' AOT. This also finally revealed that perhaps the predictor variables PEOU, TS, and T, as well as CQ, used to have a total consolidated R2 square of 0.735, attempting to demonstrate 73.5 proportion of the variance in AOT (PEOU, TS, T, and CQ). H1, H2, H3, and H4 have been supported by evidence data, despite having P-values less than 0.05. Table 9 demonstrates the official results of the regression model.

Table 9: Multiple regression analysis

Hypothesis	Unstandardized Coefficients		Standardized Coefficients			Result
	B	Std. Error	Beta	R Square	Sig.	
PEOU→AOT	.114	.046	.119	.735	.013	Supported
TS→AOT	.353	.044	.363		.000	Supported
T→AOT	.200	.059	.210		.001	Supported
CQ→AOT	.246	.056	.265		.000	Supported

7. Discussion

This study examined the significant influence of PEOU, technical support, training, and content quality on the acceptance of advanced new technologies in the field of education in Saudi Arabia.

The findings of this systematic research work further clearly show that PEOU has a significant impact on the acceptance of the technology, and this corresponded with research conducted by Alsmadi (2020), Chatti and Hadoussa (2021), and Badwelan and Bahaddad (2021). This means that the easier the system is, the greater its acceptance, and vice versa. Thus, H1 is accepted.

And this indicated that technical support has a positive influence on the acceptance of the technology, and this corresponds with research conducted by Alsmadi (2020), Chatti and Hadoussa (2021), Al-Mamary et al., (2021), and Badwelan and Bahaddad (2021). Students face technical problems and are unable to solve them. If the service provided by the technical support team is fast, this will have a positive impact on the acceptance of the system.

H3 is accepted by the results of this study, which further clearly show that training has a positive influence on the acceptance of the technology, and this corresponds with research conducted by Almaiah et al. (2022), Al-Mamary et al., (2021), Alharbi et al. (2019), and Alshehri and Alahmari (2021).

Students will express high levels of satisfaction once they have received appropriate training on the use of advanced technologies and genuinely feel totally equipped for that as well. Through training, students can gain the necessary skills and confidence in using technology effectively. Training is a crucial

component impacting students' satisfaction in Saudi Arabian higher education organizations. Furthermore, training plays a crucial role in increasing user knowledge of technological potential.

Moreover, the results proved that content quality has a positive influence on the acceptance of the technology, and this corresponds with research conducted by Almaiah et al. (2022), Alsmadi (2020), and Binyamin et al. (2019). Hence, H4 is accepted.

A simple and intuitive approach to organizing your courses into sections, lessons, themes, and quizzes should be at the heart of every learning management system. It doesn't have to be complicated, but the more stratified the course is, the more detailed it may become, making the experience more immersive and engaging. You should be able to visualize how your courses will look before they go live by organizing your curriculum, content, and evaluations into meaningful learning paths.

8. Limitations

The findings of this investigation are limited in some ways. To begin, the most significant disadvantage is that the results of the study cannot be generalized in any way. This is due to the fact that the research is the product of an investigation and study of a single public university in Saudi Arabia.

Therefore, in order to ensure that the findings of the study are applicable to a wider range of contexts, it would be desirable to conduct similar investigations in various geographical locations at Saudi universities or in countries that have the same geographical position. However, it is very necessary to incorporate a greater number of public and private universities. This leads to a larger sample size, which may lead to various conclusions being drawn.

In addition, the majority of the students in the student sample are enrolled at the College of Business Administration. There is a possibility that the outcomes will change if additional students from other colleges are included.

9. Conclusion

From the above, it is clear to us that there are rapid developments in technology. In the field of education, many governments have begun to invest in technology to improve education in recognition of the importance of using technology in learning, but there are still some factors that hinder the acceptance of technology, so it was necessary to conduct this research to examine the published scientific research articles in the context of the Kingdom of Saudi Arabia between 2019 and 2022. Hence, the primary aim of the research findings is to identify the future substantial variables affecting the understanding and acceptance of advanced technology in Saudi universities in teaching and learning.

Furthermore, we are developing a new conceptual model for effective future tech implementation in Saudi Arabian universities. We chose factors that focused on at least a quarter of the studies, and we discovered four major components that contribute to graduate students' acceptance of technology: These components include ease of use and technical expertise, fully supported training, and high-quality content.

The results of the study will provide empirical data regarding the role of perceived benefit, technical support, training, and content quality components in the effective adoption of technology in Saudi universities, which will help in the growth of teaching and learning in the country. In addition, the results will be used to inform Saudi Arabia's Ministry of Education about ways to improve teaching and learning in universities.

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Compliance with ethical standards

Conflict of interest

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