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Factors Affecting Academic Integrity in E-Learning of Saudi Arabian Universities. An Investigation Using Delphi and AHP

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ABSTRACT In the last few years, most of the public universities in the Kingdom of Saudi Arabia (KSA) have adopted electronic learning (e-learning) as an evolutionary educational platform both by choice and by demand. Despite its many advantages, it has increased the ethical and moral challenges faced in the form of the violations of academic integrity that exist in traditional education. Universities all over the world are struggling to overcome these issues. Keeping this in mind, the purpose of this paper is to investigate and priorities the factors of violating academic integrity within Saudi Arabian universities. Based on the previously published literature and using Delphi - based discussions with e-Learning experts, this paper has identified twelve major factors which were related to e-Learning environment, Awareness on Academic Integrity, and e-Learning guiding principles. Analytic Hierarchy Process (AHP) was used to prioritize these factors. It was concluded that inappropriate guidelines provided to students was the most contributing factor while Shortage of feedbacks was least contributing factor among all the identified factors.

INDEX TERMS E-learning, ethics, challenges, academic integrity, AHP, Delphi.

I. INTRODUCTION

Developments in the field of Information and Communication Technologies(ICT) have brought about a sea change in the lifestyles of everyone. ICT has become an essential part of higher education institutions in the form e-Learning, both by choice as well as due to the rising demand in environment. Whilst academic institutions have come to realise the numerous benefits and advantages of e-Learning, they cannot ignore the ethical and moral challenges with respect to the violations of academic integrity that exist in e-Learning. Unfortunately, e-Learning has exacerbated the problems of cheating, plagiarism, procrastination, and violations of privacy [1]–[5]. Temptations for unethical behavior among students is higher in e-Learning compared to traditional learning, meaning that the chances for a learner to deviate from their academic objectives and to behave unethically are higher in the e-Learning environment [1]. Moreover, the elements of convenience, flexibility, and accessibility provided by academic institutions also serve as the major impetuses influencing students to commit academic dishonesty. Furthermore, students who are studying by way of e-Learning courses are likely to act unethically due to little exposure, improper guidance, and a lack of face-to-face meetings with their teachers [6], [7].

It was stated by Dee and Jacob [8] that the majority of students are not entirely aware of the real meaning of academic integrity and therefore do not know while violating academic integrity in their e-Learning activities. Academic institution of higher education are facing the problems related to academic integrity even in traditional learning. These problems are growing more rapidly in e-Learning because of integration of ICT in teaching and learning. Many researchers have already realised that there is need for a more appropriate course design, a focused and supervised learning

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environment, and the formulation and implementation of guidelines and policies to address the moral and ethical issues in e-Learning [9], [10]. Saudi universities are embarking on e-Learning because of the intrinsic needs of the country (e.g. geographic spread and female education).Moreover, it was found in [2] that Saudi universities are moving towards e-Learning and away from traditional face-to-face learning, where ethical and moral challenges are also among the major difficulties faced by the Ministry of Higher Education.The Ministry of Higher Education of the KSA has started paying more attention to the trends of e-Learning to compete with the trend globally. Based on the problems and difficulties stated earlier, the current study seeks to examine and assess the local environment in Saudi Arabia, to see whether the violation of academic integrity is higher in e-Learning, what the major causes of these violations are, and what strategies can be adopted to discourage students from violating academic integrity.

Although the problem of academic integrity violation for higher education has existed since its advent, limited work related to violations of academic integrity in e-Learning are available in the literature. Moreover, most of the major works and literature are concentrated on the general challenges about e-Learning instead of the ethical challenges. Although some researchers have already highlighted the critical success factors (CSFs) and barriers in e-Learning using different analysis techniques like structural equation modelling [11]–[13]. we have used the Delphi and AHP technique to explore the issue because of the novelty and nature of study that is different from the already published works.It is hoped that this study will be the base and a point of reference on this topic for future researchers in the Arab world and beyond.

In the remaining part of paper, Section II will review the literature and Section III will elaborate on the methods used in the study. Section IV will highlight the findings of study while the discussions and implications will be discussed in Section V. Finally, the conclusion and suggestions for future work will be mentioned in closing.

II. RELATED WORK

Advancements in Information and Communication Technologies (ICT) have had a profound impact on almost all facets of life, particularly in the field of education. E-Learning is an evolutionary platform for education, which is growing, and it is expected that it will continue to grow even in the face of a slight recent decline [14]–[16]. It is, however, evident that the violations of academic integrity are on the rise in the e-Learning environment globally. E-Learning is relatively new in the KSA and there has been limited research conducted on the factors which influence academic integrity in e-Learning. There is lot that has been written about the emergence of e-Learning in Saudi universities [17], [18] but a lack of relevant literature on the challenges of the ethical issues in relation to academic integrity does not work in favour of this study.

A. ACADEMIC INTEGRITY

It is clear that nations are only able to attain growth through the development of the social, human, and economic sectors which can be achieved through education [19], [20]. The cultivation of ethical and moral values are among the numerous objectives of education, to be adopted in higher educational institutions [21]–[23]. These institutions are responsible for developing a code of conduct, and to help them understand the appropriate aspects which will go on to help them to lead a satisfactory and ethical life [24]–[26]. This code of conduct is associated with the academic integrity of the institutions, which is an essential pledge adopted by schools, colleges, and universities for their students, the faculty, and administrators to uphold and support. The centre for Academic Integrity (CAI) defined academic integrity as, ''commitment, even in the face of adversity, to five fundamental values: honesty, trust, fairness, respect and responsibility'' [27]. It is dedicated to the belief that integrity lies at the heart of the educational enterprise. It provides a forum to identify, affirm, and promote the values of academic integrity among students, the faculty, teachers, and administrators. Conversely, the violation of academic integrity is deemed as academic dishonesty, which is defined as ''intentionally unethical behaviour in an academic environment'' [28]. Further research research fraud/data falsification activity in the academic world in the scholastic world needs genuineness and profound quality. The examination offers a few proposals for the discovery of copyright infringement and scholarly offense. In the age of the Internet and advanced time, Crossref, iThenticate, the Committee on Publication Ethics (COPE) would recognize copyright infringement. Notwithstanding, the inquiry stays on identifying information misrepresentation in the scholarly world [29].

B. PREVALENCE OF ACADEMIC INTEGRITY VIOLATION IN E-LEARNING

E-Learning is defined as an advanced mode of learning and teaching delivered without the restriction of time or place using ICT tools and techniques [3]. To understand how academic integrity is violated in e-Learning, it is necessary to comprehend academic dishonesty and its various forms. Academic dishonesty happens because of violations of academic integrity. Below are several kinds of unethical behavior which leads to the violation of academic integrity. These attitudes may be classified into separate groups for e-Learning courses by different researchers [30].

- Collaborating with friends over a test.
- Employing illegal substances to obtain help in an assessment.
- Cheating off the paper of another learner.
- Permitting an associate to reproduce work from one's paper.
- Attaining solutions from students who have already taken the test.

The following are various studies whose findings demonstrate the prevalence of the breaching of academic integrity.

- Lanier [31] researched about the extent of the prevalence of dishonest practices adopted by both online students and their regular campus-going counterparts.
- It was also concluded by Stephens [32] that, in general, there is a high degree of dishonesty prevalent within the academic community.
- In a related study, 426 students who were undertaking pharmacy and medical courses at the University of Auckland were evaluated by Henning [33]. Among these, almost 60% agreed that they had colluded in committing unfair actions in the course of their studies, although a lesser percentage of 38% were of the view that copying someone else's assignment was a dishonest act.
- It was also evaluated by Faulkner [30] on the prevalence of students using unfair means within a Californian community college, drawing on responses from 195 students. This study concluded that 40% of students had engaged in unfair practices, including colluding with others even though they had been specifically directed to work on the assignment provided on an individual basis.
- A survey was also conducted by Jones [34] to evaluate the occurrence and prevalence of plagiarism, focusing on the use of Internet resources in this regard. A total of 48 students who were enrolled in an online business communication course at a mid-sized liberal arts publicly-funded institution within the state of Virginia were contacted and took part in the survey. Over 92% of the respondents informed the researcher that they were aware of someone within their social circle who had been involved in some form of plagiarism and dishonest practice.
- Other authors [35]–[37] have also highlighted the issue, challenges and approaches to solve these e-Learning ethical delimma.

C. ACADEMIC INTEGRITY IN THE KSA'S EDUCATIONAL INSTITUTIONS

The trend of e-Learning has also been found in the KSA's higher education system, and is quite similar to the trend in the United States of America and the United Kingdom. The education system in KSA is under stress, which restricts their ability to provide additional and enhanced opportunities for education, to fulfil the increasing needs of KSA's rising population, and to enhance the literacy rate. There have been studies conducted by Saudi researchers [17], [38], [39] on the attitude of Saudi students towards academic dishonesty, which indicates that plagiarism and cheating are prevalent among students. It was found that the violation of academic integrity is widespread among Saudi students even though many of them believe the violation to be unfair, unethical, and against their religious values. On the other hand, studies [38], [40]–[42] also indicate that Saudi universities are moving toward e-Learning from traditional face-to- face learning, where the problem of academic dishonesty can be quite alarming and needs appropriate strategies and tools to tackle.

III. METHODOLOGY

The three-round Delphi method was adopted to identify the e-Learning factors contributing to academic integrity violations, as perceived by experts in the field. Twenty-three e-Learning experts were chosen from all of the Saudi universities through snowball sampling, which is appropriate number of experts for this type of study [43]. To prevent biased responses from the group of experts,AHP was integrated into the third round of the Delphi method to prioritise the factors encouraging the academic integrity violations. There are many examples on the integration of Delphi and AHP in different areas, and it was done to quantify the judgment value provided by the group decision-making process. The technique of combining AHP and Delphi has been extensively used in policy determinations, education and technology [44], [45].

A. DELPHI METHOD

The Delphi method constitutes of group interaction processes that involve a group of experts handling complicated conflicts [44], [45]. Following are different steps to analyze and collect data in Delphi study:

Step 1: Select a Facilitator
Step 2: Distinguish Your Experts
Step 3: Characterize the Problem
Step 4: Round One Question
Step 5: Round Two Questions
Step 6: Round Three Questions
Step 7: Concluded your Findings

The first two rounds of the Delphi method were conducted online through a web-based survey technique. In the third round of the survey, AHP, a paper-pencil questionnaire was used due to the complexity of the AHP questionnaire.In the first round, it asked experts to list at least five factors that encourage students to violate academic integrity in e-Learning. Later in the second round, the experts were asked to rate the contribution of each factor through a five-point Likert scale, using the results from the first round. Before being sent out to the participants, the content validity of the instrument was scrutinised and a pilot test with four experts was also done. The details of the results can be seen in the results section of this paper.Upon completing the second round, the AHP method was adopted in third round of the Delphi method. Three round Delphi process integrated with AHP is shown in figure 1.

B. ANALYTIC HIERARCHY PROCESS (AHP)

It is a decision-making method that involves structured multiple criteria employed to reach an agreement between the clustered decision-makers and experts selected to deal with complex decisions. First, the problem is structured into sub-problems to form a hierarchy that can be systematically evaluated to improve the process of the decision-making.

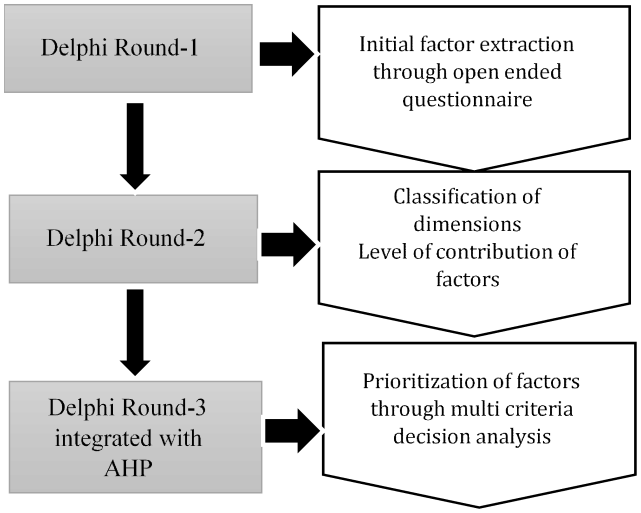

FIGURE 1. Three round Delphi process integrated with AHP.

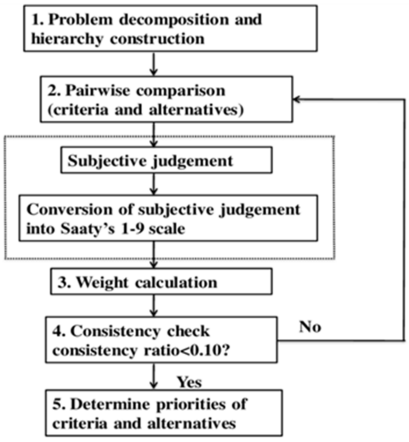

FIGURE 2. Various steps in AHP.

AHP's fundamental functions include the structuring of complexity,the measures of a scale ratio and synthesising [46]. All of these enable the wide adoption of AHP and its varied applications and utilisations in predicting,increasing and prioritising dynamics,improving inter-dependence input-output, the allocation of resources, planning and resolving conflicts [47]. Various steps to perform AHP is shown in figure 2 which were followed in the the last round of Delphi.

IV. RESULTS

To achieve the objective of the study, three rounds of the Delphi method were conducted involving 23 e-Learning experts from the Kingdom of Saudi Arabia. All of the experts were faculty members from different universities in the Kingdom and each had more than five years of teaching, developing, and managing e-Learning course(s) experience through the Blackboard learning management system. Some of experts are almunai of same universities from where they gradauted and have sound understandings of e-Learning system and its challenges. The following are the results of each round:

A. FIRST ROUND

In the first round, the experts responded with 5 to 10 different factors against an open-ended question about what encourages students to violate academic integrity in e-Leaning. These responses were compiled based on their similarities and as a result, seventeen factors were extracted under three dimensions, which were provided by most of the experts based on their experience. This was in order to analyse them in the second round of the Delphi method.

The first dimension is where most of the experts gave their opinion about the e-Learning Environment provided to Students(EES) which encourages them to violate academic integrity. Among these seventeen factors, there were seven factors in first dimension which are as follows:

1) Limited face-to-face interactions among students and teachers in e-Learning (FFI).
2) Various technology-related opportunities provided in e-Learning courses (TCO).
3) Inappropriate technologically-based mechanisms to monitor e-Learning activities among students (TCM).
4) Unsupervised learning environment for the students to conduct academic activities (ULE).
5) Excessive internet-based applications that are accessible to the students (INA).
6) Easy access to illegal support available outside the campus to complete their academic activities (ILG).
7) Various pressures on the students to show outstanding performance (VPR).

Meanwhile, the second dimension on which experts gave their views was about Awareness about Academic Integrity (AAI). There were five factors in second dimension that are as follows:

1) Lack of motivation from teachers to students regarding the importance of academic integrity(MTV).
2) Lack of awareness among family members regarding their children's academic activities (AWF).
3) Lack of ethical-related study material in the syllabus that equips students with academic integrity (CNT).
4) Lack of awareness on the importance of academic integrity among students of e-Learning courses (AWI).
5) Shortage of feedback provided to students regarding their e-Learning academic activities (FDB).

Furthermore, the third dimension highlighted by the experts was about the e-Learning guiding principles provided by the institutions (EGP). There are also five factors in the third dimension which are as follows:

1) Inappropriate guidelines provided to students for studying via e-Learning courses (GDL).
2) Lack of appropriate ethical policies for e-Learning courses (ETP).
3) Lack of e-Learning training among students to perform academic activities (STT).
4) Lack of e-Learning training among teachers to monitor the academic activities of students (TCT).

TABLE 1. The summary of factors of the round 2.

Dimension	Factors		Level of contribution					Mean of Factor	Standard deviation
			Not at all contributes	Slightly contributes	Somewhat contributes	Moderately contributes	Extremely contributes		
e-Learning Environment provided to students (EES)	FFI	N	0	0	1	12	10	4.261	.6192
		%	0.00	0.00	4.35	52.17	43.48		
	TCO	N	0	3	6	9	5	3.783	.7952
		%	0.00	13.04	26.09	39.13	21.74		
	TCM	N	1	2	3	10	7	3.826	.8869
		%	4.35	8.70	13.04	43.48	30.43		
	ULE	N	0	0	7	10	6	3.870	1.0998
		%	0.00	0.00	30.43	43.48	26.09		
	INA	N	0	5	5	6	7	3.652	.8847
		%	0.00	21.74	21.74	26.09	30.43		
	ILG	N	1	1	1	12	8	3.696	1.0196
		%	4.35	4.35	4.35	52.17	34.78		
	VPR	N	2	4	5	6	6.00	3.435	1.1610
		%	8.70	17.39	21.74	26.09	26.09		
Awareness on Academic Integrity (AAI)	MTV	N	0	0	2	12	9	3.609	1.2336
		%	0.00	0.00	8.70	52.17	39.13		
	AWF	N	0	0	3	13	7	4.087	.8482
		%	0.00	0.00	13.04	56.52	30.43		
	CNT	N	0	1	7	11	4	3.913	1.0835
		%	0.00	4.35	30.43	47.83	17.39		
	AWI	N	0	2	4	9	8	3.522	1.0816
		%	0.00	8.70	17.39	39.13	34.78		
	FDB	N	1	3	6	8	5	3.565	1.1995
		%	4.35	13.04	26.09	34.78	21.74		
e-Learning guiding principles provided from institution (EGP)	GDL	N	0	0	0	13	10	4.043	.7674
		%	0.00	0.00	0.00	56.52	43.48		
	ETP	N	0	3	7	6	7	4.174	.5762
		%	0.00	13.04	30.43	26.09	30 .43		
	STT	N	0	0	12	10	1	3.957	.9760
		%	0.00	0.00	52.17	43.48	4.35		
	TCT	N	0	2	8	10	3	3.522	1.0816
		%	0.00	8.70	34.78	43.48	13.04		
	FDD	N	0	6	10	6	1	3.478	1.1229
		%	0.00	26.09	43.48	26.09	4.35		

5) Flexible deadlines provided to students for submitting assignments (FDD).

B. SECOND ROUND

The second round of the Delphi method used a five-point rating scale survey to determine the expert's perspective on the contribution of each factor towards academic integrity violations, as collected in the first round. The responses were recorded and then analyzed statically through the Statistical Package for the Social Sciences (SPSS). The mean, frequency distribution, percentage, and standard deviation of each factor was determined. The summary of the Delphi survey for each dimension in the second round is shown in Table 1. The results show that the mean score of all of the factors was between 3.43 and 4.26, which places all of the responses in the range of moderately contributing to extremely contributing. Based on the mean value, FFI was the most contributing factor with 4.50, while VPR was the lowest contributing factor with a mean value of 3.43. Inherently, for the second round, a cut-off mean value was imposed where only items with a mean value of 3.5 and above were examined. Consequently, two factors (VPR and FDD) were discarded and 15 selected factors from the three dimensions were finalized for round three.

Correlations were also computed among different factors in each dimension i.e., EES, AAI and EGP. In dimension EES, there was a significant positive correlation between TCM and FFI (r =.417*, p =.05) and ULE and INA(r = 0. 465*, p =.05). Moreover, a significant negative correlation between TCM and ULE(r = −0.537**, p =.01) was also observed in same dimension. Likewise significant positive correlation between SST and ETP(r = 0. 661**, p =.01) was found in EGP dimension while none of relation among factors was significant in AAI dimension.

C. THIRD ROUND

The aim of the final round was to prioritise and rank the factors based on their contribution towards academic integrity violations in e-Learning. This was done by an integrated decision-making approach (i.e., AHP) to provide optimal problem-solving based on multiple criteria [48]. It also prevents biased responses from the group of experts. AHP compares and ranks the factors based on their pair wise contributions to find their exact contribution towards

TABLE 2. Satty's nine-point scale for AHP analysis.

Scale	Definition	Explaination
1	Equal contribute	Two elements contribute equally to the objective
3	Moderate contribute	Experience and judgment slightly favor one element over another
5	Strong contribute	Experience and judgment strongly favor one element over another
7	Very strong contribute	One element is favored very strongly over another, its dominate is demonstrated in practice
9	Extreme importance	The evidence of favoring on element over another is of the highest possible order of affirmation
Note: 2,4,6,8 can be used to express intermediate values		

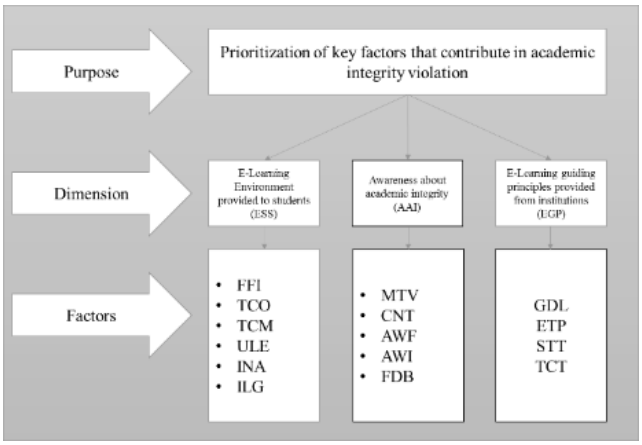

FIGURE 3. Hierarchical structure of factors for AHP.

academic integrity violations. This is instead of ranking them based on the mean values obtained in the previous round. To finalise the three investigation steps and to prioritise the factors, the following steps were employed based on the AHP guidelines provided by Satty [45].

1) Establishing structure by defining the purpose, dimensions and relevant factors.
2) Constructing pair wise comparison matrices (judgment matrix) for each expert.
3) Calculating the priority weights of each dimension and its factors by testing the consistency of each decision makers' judgments.
4) Aggregating judgments.
5) Ranking the factor based on the priority weights.

At the start of the third round, the results of the second round Delphi survey were, arranged in the format of AHP pairwise comparisons by following the above mentioned steps.A three level hierarchical structure was established by defining the purpose in the first level, dimensions in the second level and the relevant factors under each dimension in the third level as seen in figure 3.

After making the hierarchical structure, the next step was to determine the relative factor's contribution towards academic integrity violations in the main dimensions and in the related factors at each level by constructing a pairwise judgment matrix for each expert. The AHP Questionnaire was designed in the form of a pairwise comparison based on the hierarchical structure. The experts were asked to carefully compare each hierarchy level (dimensions and factor) by arranging the relative scores in a pair wise fashion with respect to the purpose of the phase. This is based on the AHP nine-point relative scale provided by Satty [47], as mentioned in Table 2.

Later, aweighting process was made that was dependent on the response from the data received on the expert's ratings. The priority weight of each factor and dimension was calculated using AHP online software and a Microsoft Office Excel spreadsheet. The study followed Satty's [47] guidelines so that the inconsistency index was no greater than the acceptable value of 0.10. Furthermore, the weighted geometric mean method was applied to aggregate the multiple values provided by the different experts in the relevant matrix into a single value.

To finalise the ranking in the last step, the factors were ranked based on their priority weights, which were determined as being their relative contribution towards academic integrity violations in e-Learning. These weights are categorised into ''local weights'' and ''global weights''. Local weights refer to the priority weights with respect to the preceding hierarchical level, which is dimension. On the hand, global weights are the priority weights with respect to the highest hierarchical level, which refers to the purpose. To achieve the exact ranking, the AHP technique combines the priority weights of the dimension with the comparison ratings for the factor in order to find the local and global ranking [49]. This is performed by the following equation:

$$\text{Global weights} = \sum(\text{Local weight for dimension i} \times \text{local weight for factor j with respect to dimension i})$$

Based on AHP method, the factors and dimensions were prioritised.The factors were listed down sequentially in ascending order, based on each dimension's perceived degree of contribution, starting from the most contributing factor that encourages the students to violate academic integrity and ending with the one with the lowest perceived contribution. The complete list can be seen in Table 3.

Based on the results that have been obtained, EES (e-Learning Environment provided to students) is the dimension that is the most contributing dimension (40.83%)out the three dimensions, while the AAI (Awareness on Academic Integrity) dimension is the least contributing (23.27%). Regarding the individual factors, it was observed that FFI (45.03%), MTV (30.60%) and GDL (59.35%) were at the top of the local ranking in their respective dimension. In this regard, the ranking given by the decision makers' experts in

TABLE 3. Overall weights and rankings after aggregating all dimensions and factors.

Dimension	Priority weight with contribution %	Factors	Local weightage with contribution%	Local Rank	Global weightage with contribution%	Global Rank
EES	0.4083 (40.83%)	**FFI**	0.4503 (45.03%)	1	0.1839(18.39%)	**2**
		TCO	0.1936 (19.36%)	2	0.0791(7.91%)	**4**
		ULE	0.1270 (12.70%)	4	0.0518(5.18%)	**8**
		TCM	0.1296(12.96%)	3	0.0529(5.29%)	**7**
		INA	0.0506(5.06%)	5	0.0207(2.07%)	**13**
		ILG	0.0489(4.89%)	6	0.0199(1.99%)	**14**
AAI	0.2327 (23.27%)	**MTV**	0.3060(30.60%)	1	0.0712(7.12%)	**5**
		AWF	0.2613(26.13%)	2	0.0608(6.08%)	**6**
		CNT	0.2214(22.14%)	3	0.0515(5.15%)	**9**
		AWI	0.1607(16.07%)	4	0.0374(3.74%)	**10**
		FDB	0.0505(5.05%)	5	0.0118(1.18%)	**15**
EGP	0.3590 (35.90%)	**GDL**	0.5935(59.35%)	1	0.2130(21.30%)	**1**
		ETP	0.2685(26.85%)	2	0.0964(9.64%)	**3**
		TCT	0.0768(7.68%)	3	0.0276(2.76%)	**11**
		STT	0.0612(6.12%)	4	0.0220(2.20%)	**12**

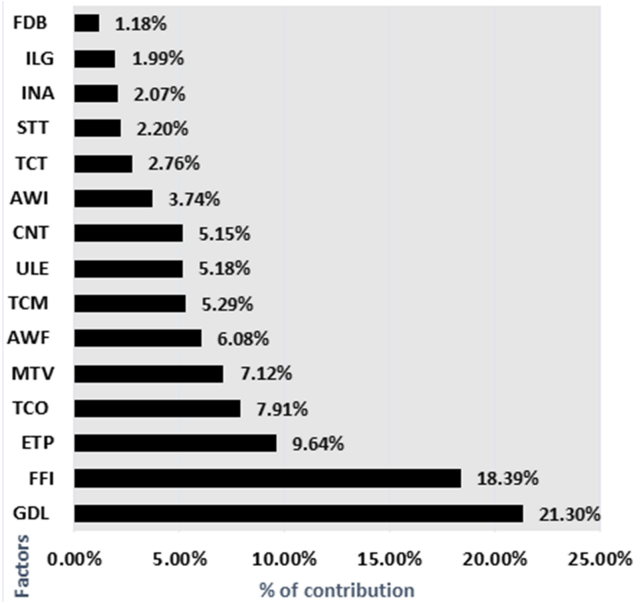

FIGURE 4. Identified factors with their contribution.

third round was almost similar across the sample with little variation between them, as was the mean value of the contribution level given by the experts in the second round. Consequently, the identified factors which encourage the students to violate academic integrity in e-Learning were arranged in ascending order with their contribution towards violation in academic integrity in percentage as shown in figure 4.

V. DISCUSSION AND IMPLICATIONS

This study was conducted to assess the ethical e-Learning environment of Saudi Arabian universities. In this regard, the research study focused around the factors influencing academic integrity violations in e-Learning and sought to identify ways to control the most contributing factors in order to make e-Learning courses and programs more effective, productive and risk-free.This study was sequentially conducted using a three round Delphi method and the respondents were drawn from different universities in Saudi Arabia involved in e-Learning. The data collected started with two rounds of the Delphi method which showed that the experts had identified 15 major factors that contribute towards academic integrity violations in e-Learning. Consequently, through the AHP ranking method in the third round, the most significant contributing factors were prioritised.

The findings of the study indicate that there is a need for an appropriately focused and supervised learning environment. In this regard, teachers, with the help of academic institutions, can play a key role. The teachers have to design and develop the e-Learning course in such a way that it can compensate for the lack of the teacher's physical presence. Moreover, time-based online lectures should be given instead of providing the students with flexible time to do the studies anytime and anywhere. Meanwhile, it is recommended that the universities should adopt authentication and verification tools. There are a lot tools available in the market to invigilate examinations and to monitor the student's online activities to create a focused and supervised learning environment. Another researcher's recommendation is the need for motivation and awareness about academic integrity among the students. For that, the teachers can also play a major role in guiding the students about the importance of ethics and academic integrity. It is recommended that ethical values are taught at the start of each course while online-only teaching courses should include content related to ethics. Moreover, general awareness programs have to be regularly organised by the institutions to promote academic integrity. The last dimension for the recommendations was the need for proper ethical policies and guidelines for the academic institutions. In this light, the institutions should clearly define academic integrity as being one of their main goals. Ethical policies should be implemented in such a way that the stakeholder should strictly adhere to a code of conduct in the e-Learning environment(s) provided to the students. It should also be supportive and highly integrated with the ethical policies and guidelines for the e-Learning courses.

The topic is about academic integrity, and the results of the study are dependent on the e-Learning experts involved in teaching through an e-Learning environment. They have limited knowledge about ethics and academic integrity. The results may become more interesting if the experts were chosen from the e-Learning industry specifically and included professionals who have strong knowledge of academic integrity and educational ethics. This is even though the e-Learning experts were selected through snowball sampling inside the Kingdom and the results were taken through an online structured and semi-structured questionnaire. To get responses through an online form was easiest for the researchers because of the time and distance limitations,but the study may become more effective if the responses were collected through personal visits with experts and face to face interviews. As the study is limited to e-Learning experts only and asked for their point of view, it is worth noting that students are also a major stakeholder in the academic and e-Learning industry. The study may become more fruitful if the point of view of the students was also listened to and then compared with that of the e-Learning experts. Moreover, the issue of academic integrity is universal, but the authors investigated the problem in the context of the KSA. The factors affecting academic integrity may vary from country to country, and culturally. It should be studied globally and then compared.

This research study can be taken as a base study for the e-Learning domain, as this study only focuses on academic integrity in e-Learning. Future researchers can explore the dimensions and relevant factors developed by the researchers by developing tools and models for them.

VI. CONCLUSION AND FUTURE WORK

The purpose of study was to identify and prioritise the major factors in the e-Learning environment that contribute to violations of academic integrity. The input for this study was obtained from experts in the e-Learning field through the Delphi method and later prioritised the most influential factors affecting academic integrity within Saudi universities through AHP. Through these findings, the researchers have highlighted the issues in e-Learning that should be taken to improve and manage academic integrity at university level. The researchers has initiated a comparatively novel idea to maintain academic integrity into e-Learning.

Further investigation is required and more work needs to be done to make the idea fully workable. Meanwhile, as the researcher has also realised the need for a focused and supervised learning environment in order to maintain academic integrity, the areas for future researchers to look into include the incorporation of techniques for monitoring and controlling the online activities of students. Moreover, an investigation can be done into tools and instruments which can be used to monitor the adherence to or violation of academic integrity. As found out by the researchers, there is a need for universities to adopt ethical policies and guidelines for e-Learning for maintaining and promoting academic integrity. The areas to look into for future researchers are what policies and guidelines are minimally required for academic integrity. Future researchers should also develop models, methods and tools for the implementation and monitoring of these policies. Moreover, a punishment and reward system can be developed based on these policies.Future researchers may also develop models to make the students more aware of academic integrity, keeping in mind that if students understand and adopt general ethical values, they would then naturally be able to avoid committing violations of academic integrity. It is anticipated that future related work can be carried out in the aforementioned directions. This study is a part of a massive project initiated by the researchers and most of above mentioned directions will be covered by the development of an e-Learning academic integrity model.

TABLE 4. Correlations of first dimension EES.

	FFI	TCO	TCM	ULE	INA	ILG	VPR
FFI	1						
TCO	.120	1					
TCM	.417*	.395	1				
ULE	-.282	-.242	-.537**	1			
INA	.007	.146	-.312	.465*	1		
ILG	.131	.027	.140	-.078	-.173	1	
VPR	.025	.107	.033	.224	-.112	.002	1
*. Correlation is significant at the 0.05 level (2-tailed). N=23							
**. Correlation is significant at the 0.01 level (2-tailed). N=23							

TABLE 5. Correlations of second dimension AAI.

	MTV	AWF	CNT	AWI	FDB
MTV	1				
AWF	-.096	1			
CNT	.381	.058	1		
AWI	.160	-.151	.040	1	
FDB	-.059	-.095	-.135	.183	1

TABLE 6. Correlations of third dimension EGP.

	GDL	ETP	STT	TCT	FDD
GDL	1				
ETP	.401	1			
STT	.185	.661**	1		
TCT	-.138	.140	.066	1	
FDD	-.183	.076	.269	.047	1
**. Correlation is significant at the 0.01 level (2-tailed). N=23					
*. Correlation is significant at the 0.05 level (2-tailed). N=23					

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APPENDIX

See table. 4,5,6. here.

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