

IT Governance Impact on Academic Performance Development

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Abstract—This paper produces a comprehensive literature review to evaluate the impact of technology development with IT governance mechanism for enhancing academic performance. This paper includes structure, process, and direct actions of reviewed papers related to IT governance. The aim is to analysis and review the type of Technology Enhanced Learning mostly used in educational field to enhance the academic performance connected to IT Governance of e-learning use. The method proposed here should explains the ideas and the quality assurance standards to enhance the academic performance with approval of IT governance. These studies include any special identifications or criteria for e-learning method and student academic performance. The results of this literature review reveal the side has led to new documentation ways that include written learning outcomes, assessment plans, reports on results and improvement plans.

Keywords—E-learning; IT Governance; Academic Performance; Higher Education; TEL.

1 Introduction

The recent previous years, the use of technology in education has huge improvement and truly trusted by the learners through the whole world [1]. Therefore, the governance emphasis to use this technology infrastructure for information technology governance (ITG). Moreover, the wide use of e-learning systems had impact on the understanding of educational process [2]. Most of the professors these days were using multi technology development with their e-learning, which facilitate the electronic course material uploading to motivate the students towards improving their use of e-learning system for enhancing their academic performance [3, 4, 6]. There were different types of enhancing learning by applying techniques of self-assessment pro-

grams of online quizzes that used by students and their peers within course sessions [5]. The development of internet applications has been increased in the universities which point out that IT directors have a lot of work to do within appropriate governance system [2].

Governments in advanced learning are increasingly exploring the potential of educational development and challenges. In the Danish government, supports teaching innovative with social science approach to create new conceptions of teaching and learning of academic performance [7]. In the Asia region, China, South Korea, Singapore, and India have promoted concepts of teaching and learning in the university through establishing programs of learning management systems [8]. One of the key recommendations was to install the modules at local education institutions and set up efforts in the education system to innovate a useful platform for all students [9].

The advancement of using updated computer technologies increases the student learning outcomes and academic performance. It also allows students to have more self-control over their own knowledge and learning skills to achieve the expected learning goals [10]. The overall use of IT governance could illustrate the level of satisfaction that students may reflect over their grades and learning skills freely [11, 9, 39]. However, legal access could be a management risk that can involve new techniques. They are normally connected to the development of technology enhanced learning (TEL) within a new model that satisfies the university standard outcomes. These traditions consist of addressing the business strategies and IT functions when completing, measuring and running the values acquired from IT.

While ineffective technologies could reflect negatively on university performance and outcomes, most of the pre-studies focused on IT with more emphasis on the industries than higher education institutes [12]. The aim of this work is to determine (IT Governance) with higher education institution, as important factors with their feedback and impact of the learning proceeding and improvement of academic performance effected by TEL used in each work. These factors include type, interest, degree of acceptance and familiarity in the used application. Likewise, academicians such as [13, 14, 40] argued that there are fewer studies that focused on IT Governance framework and its applicability in improving e-learning management in universities [12, 28].

In previous study presented by [13, 27, 26, 41] the authors mentioned “To achieve these goals in today's information technology (IT) intensive environment, a control framework must conceptualize the important aspects of internal control within an IT context in a complete and logically consistent manner. In the absence of a comprehensive and conceptually sound framework, the complexity of modern systems can overwhelm an auditor. This suggests that the quality of the internal control audit assessment depends on the conceptual model upon which a framework rest

The benefits concluded from this paper are:

1. To control more governance for universities of HEI
2. To measure the advantages of TEL in HEI performance
3. To create new mechanism of security and management [5]

In addition, the secondary point wants to accomplished were:

1. What is the state of the colleges and universities in terms of ITG mechanism?
2. How do universities adapt with ITG mechanisms in foundation programs?
3. What kind of experienced ITG is in work with quality and academic performance in the colleges and universities?
4. What recommendations for further change do the Board of Governors, administrators, faculty, and student suggest regarding the e-learning systems?

This paper has many sections, introduction of TEL and IT governance advantages. Second, literature review of TEL usage and achievements. Third, the methodology used in this paper. Fourth, the results and finding of the tested groups at Al-Buraimi University College (BUC).

2 Literature Review

Several previous studies have reported different results on the power of institutional systems and how IT Governance could monitor the whole process of linking quality assurance outcomes reports beside the TEL to combine them with academic performance. The new technologies in holding online examinations encourage the upgrading of IT technology applications and the use of electronic assessment methods through the adding of course materials and use of video-based explanation programs such as Wiki for lessons instead of face to face conversations. With these changes in educational interest and mechanism, the method comes to increase the benefits of using Learning Management Systems (LMS) complementarily with the Technology Enhanced Learning (TEL) as active IT governance to help faculties in the assessment of all individual and group student works under close control. The most important part is how to overcome and determine the weakness of each application from previous studies because of the problem of uploading, missing contacts and lack of experience in technology [19]. Furthermore, how to improve student grades and develop their knowledge skills and academic performance [24, 42].

This part of the paper represents, the main focus on the IT governance effect on e-learning models and academic performance articles. To determine the important factors could be used to test and validate the impact of academic performance with using different types of TEL as video blog, what's App, and any e-learning system. In the previous studies they researchers pointed to use the collaboration work between technologies and the learning outcomes using e-learning to improve the academic performance of the whole learning process [15, 16, 24]. These days, IT Governance has become more effective in the universities for effective performance through a e-learning [17]. The historical study in digital libraries compares more than 138 downloaded papers to analyze the different articles of previously selected papers. The study at some stages in the review of abstracts found related information that used more than 75 articles deeply related to the research method, and 63 articles with indirect related to the ITG and academic performance. These studies considered essential self-evaluations [15], students learning outcomes, teacher satisfactions, curriculum, ex-

ams, evaluation of assessment methods, teaching quality, student placements, graduate destinations and blended learning [16, 17]. The first step of the literature review is to select the decision markers in the universities such as the quality assurance manager and the dean of academic programs [18, 34, 43].

[8] proposed academic expert system, it is a prototype student advising expert system for ITG to control the registration from the Ministry of Higher Educations. The system includes easy user interface to use by the students it created by clips program language that used in expert system. The system main objective is to get an easy model with high expert method used in artificial intelligence algorithms [9]. The method works through an application applied with IT BUC “Al-Buraimi University College” student. The system includes the information required for student registration and login successfully to the portal system of the university in Oman. Many categories and comparisons are used to identify the selected course for each student based on their degree and department to advise them how to improve their academic performance [9].

[3] proposed a UCOM model “University Communication Model”, used as type of expert service systems specially for e-learning advising learners. This model tries to add peer-review partners. In addition, the model has new feature of course moderator, where the important function and the main purpose is to improve the academic performance on assessment services. This model used a survey distribution, where (n=54) sample from IT students at BUC. The model can be expanded to include the post-graduate students as integrated cycle after completing the degree. The model used five different hypotheses, and four of them are significantly positive. The results tested through PLS-SEM software, were Alpha Cronbach’s, CR and AVE are evaluated then checked with the software limitations [8, 10, 20, 25, 44].

[17] shared the experience of "Faculty Course Assessment Report (FCAR)" to assess the courses and program learning outcomes (PLO) for ITG preparation phase. The method splits into multi steps. Firstly, define the typical questions to assess course learning outcomes (CLO) from the ministry; secondly, ignore the students with low grades from the survey of impact Technology on academic performance; thirdly, evaluate how many falls in the CLO categories by the selected LMS; fourth, calculate the average rating based on the number on the scale, if the rating average is 1.5 or above, then, the ITG is successfully met with improving academic performance [22]. Table 1 shows the fields that are considered as guidelines for ITG with improving academic performance as a general criteria's, and the features regarding the individual standard procedures and policies provided by the higher education ministry of Oman.

Table 1. Standards of student learning with IT governance

Criterion Title	General features of HEI
1. Graduate Attributes and student Learning Outcomes	<ul style="list-style-type: none"> -The program applied systematically -Ensure the full consideration for all aspects of programs -Set academic standards -The aims and outcomes are matching with all HEI goals -Ensure from stakeholder feedback this relevant to the needs -Maintain a record program and lead -Define outcomes after complete the program -Attributes are clearly for developing across different programs -Review embedding attributes within programs
2: Curriculum	<ul style="list-style-type: none"> -Ensure the revision include all objectives -Ensure all program curricula fit the expectations of relevant fields -Ensure that ongoing is appropriate to its content -Role of academic affiliates in developing and implementation -Ensure the programs used in cycle revisions -The effective of reviews to develop it
3: Student Entry Standards	<ul style="list-style-type: none"> -Implement policy for student admission -Clearly standards stated, accurate and effectively -Exam student English language before entry to the program -Fit the context of support -Allowed mobility, transfer for entering and leaving -Regular review to be sure of study successfully
4: Teaching Quality	<ul style="list-style-type: none"> -Qualifications, experience of academics to deliver with outcomes -Mix in nationality and genders -Appropriate in teaching with reflection to use technologies -Develop independent learner with a teaching student -Evaluate teaching method to ensure student achieve attributes
5: Research Components of Coursework Programs	<ul style="list-style-type: none"> -Ensure take a substantial research component with supervision -Student research assessment and maintenance -High level committee approval -Regular review
6: Academic Integrity	<ul style="list-style-type: none"> -Uphold academic integrity -Promote a culture step -Follow the standards of plagiarism avoidance -Plagiarism detection methods -Understanding cheating constitution -All work must be student own -Copyright respecters -Reviews case consideration
7: Student Placement	<ul style="list-style-type: none"> -Developed strategies and support for Study Program -Managing Study Program provision -Mechanisms of health protection -Regular review of Study Program
8: Assessment Methods, Standards and Moderation	<ul style="list-style-type: none"> -Clear and fair assessment -Create an effective mechanism for assessment against best practice -Measuring effectively of achievements -Assessment validity, reliability in maintenance -Ensure of well establishing of moderation -Needing for constructive feedback on results -Student appeals of assessment results -Regular review for assessment and moderation
9: Academic Security and Invigilation	<ul style="list-style-type: none"> -Governing of academic security to assessment -Governing of invigilation -Confirm student identity in exams -Ensure of exam on line security

	-Handling of managed and stored securely -Regular review of examination procedures
10: Student Retention and Progression	-Aggregate yearly progression and finish rates -Results assessed and identify action when problems come. -Improvement strategies to complete rate -Analysis results for reviewing program -Complete data for external benchmarked to consistent between institutions -Regular review to ensure progression and completion.
11: Graduate Destinations and Employability	-Specify graduate targets -Actions improvement for design and assess programs from destination data -Periodically external benchmarked -Regular review to monitor employability

In the next step, the analysed data from all above points built a proposed relationship among ITG to improve the academic performance. Table 2 that illustrate all the relationships and cross points between them as reflection of major criteria in cross with 11 point of academic standards.

Table 2. Relation crosses between standard majors reviewed points in IT field

Major reviewed criteria	1	2	3	4	5	6	7	8	9	10	11
Self- Evaluation	*	*		*			*	*	*		
Student Achievement	*		*	*	*		*	*			
University Performance	*		*	*				*		*	*
Curriculum Program	*	*		*	*			*	*		*
Faculty Performance	*			*	*		*	*	*		
Blended Learning Affect	*			*		*	*	*	*		
Faculty Practices	*			*	*			*			
Total affect	7	2	2	7	4	1	4	7	3	1	2

The results show that graduate attributes and student learning outcomes, teaching quality, and assessment methods, standards and moderation marked as 1, 4, and 8 are the criteria that gave the highest relationship across the major steps of related work analysis.

3 IT Governance Structure

Given the significant function of universities in the improvement of societies, determining and assessing the universities' performances becomes critical for a variety of stakeholders, including administration, production, and humanity [16, 32]. [28] admitted that faculty council, leaders, and academic vice presidents operate professionally and smoothly in the academic domain; he also posited that the natural history of higher education is changing quickly and may entail a governance constitution that operates in a timelier, business-like method. Structures are safety ways presented by the executive systems; responsible for guiding IT. The outcomes give an idea of the usefulness and importance of the approach for student's motivation [20, 14]. There is

a need to show the assessment comment provided through the critical design review process, to give the mechanism of results evaluation in the university departments and to provide a successful feedback to students. This process could be a characteristic of the scope to which IT governance communicates and contact IT technology with TEL techniques [20, 15, 45]. ITG actions illustrate the design of the technical communications, the application management forms, and the strategic alignment of the organization with integrated information practices [19].

The ITG is based on major factors that relate to HEI requirements to improve the academic performance. These factors include a sustainable progress, environmental teaching, teaching progression and environmental executive, learning and environmental expansion, and economic and monetary dependability [19, 24, 39]. This section provides a short review of governance and administration presumptions that have been practiced in IT and management. The purpose of this paper is to classify and compare those standards to the IT field and department as best practices contained in a suitable framework to meet the technology impact on academic performance and ITG management needs of most universities and institutions. Moreover, quality assurance model is responsible for monitoring and controlling the whole mechanism of improving academic performance. The ITG framework is responsible for activating the strangeness of using TEL technology to improve the whole performance [40, 41].

This project produces a comprehensive literature review to link the use of technology enhanced learning used in e-learning with ITG mechanisms such as structure, process, and direct actions. The purpose of this research is to consider the importance of the attributes, and the factors consequential from the academic aspect such as teaching, assessment and management and focus on critical apprehensions [26, 10, 15]. At the end, it gives verity to the type of answer, and the ways of implementation depends on the student interest and knowledge skills. In other models like MOOC, the models' responsibility focuses on being sure of the online connection, student joining, and participation, and this is considered as the only focus of peer observation and faculty evaluation. But in this model, the system adds new techniques by including the teaching method, assessment and students' knowledge based on the mark distribution on each SLO. Also, this system is based on the effectiveness of the students' assessment results. Table 3 shows the survey to evaluate the IT Governance level at the universities of Oman [35, 42].

Table 3. IT Governance survey

Item of Questions	SA	A	N	D	SD
Add more technologies will increase student academic performance even after graduation					
The modification of teaching method helps the need for improving academic performance					
The university performance depends on SLO achievements in course and grade score					
The university performance of evaluations depends on program, faculty, and student academic performance					
Having quality assurance department to monitor the academic departments performance					
Technical development increase with the improve of teacher education skills					
Team work assessment could improve the student grades					
Using e-learning could improve student scores					
Using the old traditional theoretical teaching tools cause a limited graduate skill					

4 Discussion

4.1 Importance of quality assurance as technical knowledge

The protection of information systems and the professionals with the control of quality assurance in each institution both admitted that the scientific IT-related knowledge with the use of TEL techniques, had a significant effect on the relationship of monitoring and directing the activities of e-learning system process.

4.2 IT Governance with "Framework"

ITG and frameworks provide managers with the structures considered necessary to facilitate IT services for academic and business process. IT managers also have a greater number of frameworks to select the best for management practices. The defined process has been institutionalized, and the procedures used are simple and straightforward. The procedures for top management key governance actions such as target background, performance reviews, qualification assessments, and assignment planning and financial support [31, 39, 47].

In progress with survey design, a selected distributed survey was conducted with two different groups which are the undergraduates and graduated. These undergraduate students are selected based on their high-grade point accumulated (GPA). The tested system is used by two different groups which are the undergraduates and graduated whose age range between 21 to 25 years old. The pilot survey was conducted with selected students to measure their level of interest in the e-learning process as they use the adopted technologies and the given course material, as support work to guide students in their home study, and its facilities, techniques, instead of whole theoretical traditional learning method. The study is carried out during a period of one semester and it is applied online with information technology department, where the focus is on students' feedback. The selected sample has a group of (13) students as

shown in Table 4. Table 4, shows the participant geographical analysis for gender, educational level, GPA score, and participant interest of learning [31, 46, 47].

Table 4. : Student demographic Information

Factor	Sample	Percentage	Description
Gender	7	54%	Female
	6	46%	Male
GPA Score	11	84.6%	Above 3.0
	2	15.4%	Less than 3.0
Participant Level	10	77%	interest
	3	23%	Not Interest

5 Conclusion

This study pointed to comprehensive literature review on the IT governance impact on academic performance using e-learning models. The study classified the major standards of learning at HEI. This study identifies the LMS model as the common platform use for e-learning purpose. The study also, defined the three factors that effects on improving academic performance through graduates' attributes, teaching method and the assessment method used through e-learning system. In addition, the real student- teacher interaction through class time of the whole semester. This framework measures the academic performance for students through the improvement of using technology integration as a supported way of teaching method to help students in their studies outside class doors.

6 References

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