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Performance evaluation of students using online courses

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Abstract

Objectives: The present study was aimed to find the effective method to assess the performance of students and their interest towards e-learning.

Methods: Questionnaire survey was conducted among Indian students and their response were identified on various aspects; assessment, interaction, evaluation and feedback. **Statistical analysis:** The responses were collected and the data were analyzed with statistical software. **Results:** Interaction and evaluation aspects had high impact; signifying 40% of the students agree that online learning is more effective, innovative and convenient than the conventional way of learning. Assessment and interaction showed the highest positive correlation (0.564) when compared to the evaluation and feedback (0.440). The evaluation has attained significant value in the statistical analysis of ANOVA.

Keywords: Internet; Assessment; e-learning; Statistical software; Correlation

1 Introduction

The development on the internet in the course of the most recent decade has been incredible. Developing institutions and organizations utilize the vehicle of the internet for increasingly organized evaluation forms. It is presently normal for candidates to be approached to finish tests and polls on the web, especially for introductory filtering purposes. This direction takes a gander at a portion of the great practice and moral issues in this improvement in the utilization of tests⁽¹⁾. Traditional assessing methods have created hassles for all institutes, universities and organizations, and a logistical nightmare for the individuals who need to design and sort out it. This is a brilliant open door for all establishments and organizations to locate that one treasure waiting to be discovered.

In India alone, around 3,934 students from VIT University were given employment bids by three driving IT companies Accenture, Wipro and Cognizant, in 2013. Other significant ground recruiters incorporate Microsoft, Zoho, Intel, VmWare, Alcatel Lucent,

Mahindra, ComViva, Broadcom, Netapp, Cisco, Capital IQ, Texas Instruments, Trimble, Google and Honeywell. Passing by these figures, on a normal, a multinational company evaluate around 7,000- 10,000 campus hires every year. This is an immense figure believing the quantity of hires to be evaluated through customary way (i.e.), utilizing pen and paper tests. Organizations, foundations depend significantly on location testing and group discussion activities to evaluate the gauge of understudies. Despite the fact that the procedure is compelling, it is likewise tedious. Not to overlook the cost appended with removing managers from their key execution territories and the probability of awful hires.

Conventional techniques for evaluating students have turned out to be difficult on the grounds that (i) they are pointlessly long, and they don't pursue a scientific methodology that will guarantee selection of better up-and-comers. (ii) The present campus interview procedure doesn't recognize if there is a social and employment fit with the organization, to dodge weakening rates. (iii) It is still significantly a dismissal procedure than a target selection process. "Most of those involved in college recruiting (both employers and career centers) are extremely conservative and resistant to change. Universities have a well-earned reputation for sticking with tradition but an over reliance on tradition also unfortunately applies to corporate college recruiting functions." - Dr. John Sullivan, ERE Media, Inc. ⁽²⁾. A run-of-the-mill grounds recruitment procedure includes presentations, written tests, group discussions, and technical rounds. This procedure takes a whole day of recruitment endeavors. Aside from the immediate expense related with grounds recruitment, backhanded expense are likewise caused, similar to your time (a major donor), extra faculty cost, travel, convenience, logistics of directing test, group discourse and so on.

Overview of cost that incurred for a candidate who is residing away from the examination centre and overseas. (i) Travel cost (ii) Accommodation cost (iii) Administrative Costs (iv) Cost of preparing question paper (v) Test delivery (vi) Test distribution and (vii) Invigilation and evaluation. In the study we used online survey to know the actual use of internet in assessing the candidates. We selected the population from India with random sampling.

2 Development of computer based learning and testing

Personal Computer (PC) innovation has had a huge effect in numerous territories of showing and learning. The presentation of desktop PCs, word- handling bundles and presentation planning devices have significantly enhanced the nature of the material exhibited to understudies and utilized as a part of addresses. The utilization of basic database bundles and spreadsheets have enhanced and disentangled record keeping at all levels inside of the training programs. Be that as it may, the most critical effect has gotten through the utilization of strong learning instruments, for example, PC supported learning, Computer aided learning (CAL), PC based preparing Computer based training (CBT) and web learning. These technologies utilize different types of intuitiveness to draw in the student insufficient and frequently novel learning encounters ^(3,4). The terms used to insinuate the use of PCs in preparing are various and sometimes are conflicting terms that incorporate - computer-aided learning, web-based learning, computer-managed guidance distance learning, online learning, and so forth ^(5,6). Some of these terms have broad underpinnings while others are modestly new and are the subject of advancing investigation. The dogma of this paper lies with the utilization of PC and correspondences advancements when all is said in done keeping in mind these advances can be incorporated under this umbrella, they are not inspected separately.

Until the late 1950s there was generally little enthusiasm for the expenses of education, and for all intents and purposes none in the expenses of educational technology. This disappointment mirrored the way that development in teaching methods was to a great extent negligible movement: as one early examiner put it, education's technology, all around, has gained shockingly little ground past the handicraft organize ⁽⁷⁾. Be that as it may, the rising interest for and raising expenses of education prompted endeavors inside the recently creating sub-control of the economics of education to measure both the proficiency of public expenditure on education and the economic advantages of giving it ^(8,9). Educational technology came to be viewed as a method for improving the proficiency of education through efficiency increments. Accordingly, experts started to examine the costing of educational technology and the genuine expenses of distance education frameworks ⁽¹⁰⁾. A significant part of the early work attempted under the protection of the World Bank, UNESCO and USAID concentrated on the expenses and cost structures of educational broadcasting projects ⁽¹¹⁻¹⁵⁾. Inside the UK different specialists concentrated on the expenses of utilizing educational technology either for distance teaching or as a substitute for study hall teaching on grounds ⁽¹⁵⁻¹⁸⁾. A portion of this work has grown further in Australia inside the setting of colleges blending, this draws the conventional and distance education more towards each other ^(19,20). The advancement of networked learning has by and by brought up comparable issues as arrangement producers and investigators ask both whether networked learning is less expensive or more costly than different ways to deal with education, and what should be considered in costing such frameworks.

ONLINE TRAINING: The term on-line can be characterized from multiple points of view, for example, 'associated with a system' or 'accessible from a system'. As of late, there has been a fast improvement of PC systems, change in the preparing control and progresses in innovation. These advancements have made PC a dynamic power in preparing and learning, giving another and intuitive method for overcoming time and remove boundaries. With the expansion of electronic innovation, new

instructional conceivable outcomes of the web have been made which incorporates; Email, Interior entry, Release sheets, Virtual classroom, White sheets, Webinars, Web talk session, Organization intranet and sites and other media (e.g., satellite telecast, video-meeting). E- Learning is not only about training and instruction but also about learning that is tailored to individuals. E-learning is said to be: ‘pedagogy empowered by digital technology’⁽²¹⁾.

Different techniques have been used to define learning that takes place online a reality that makes it hard to develop a generic definition. Authors agree that a single definition for e-learning has not yet been found. Terms that are generally used to define online learning include e-learning, Internet learning, distributed learning, networked learning, tele-learning and tele-matics distributed learning virtual learning, computer-assisted learning, web-based learning, and distance learning. E-learning covers a wide set of ICT technology-based applications and processes, including computer-based learning, Web based learning, virtual classrooms, computerized coordinated effort and networking. It includes the delivery of content by means of Internet, Intranet, and Extranet, satellite broadcast, audio-video tape, interactive TV and CDROM⁽²²⁾. Nonetheless, the different terminologies point to and also conceived educational experience. These terms infer that the learner is a good ways off from the guide or educator, that the learner uses some type of technology (normally a computer) to access the learning material, and that the learner uses technology to interact with the mentor or teacher and other learners, and that some type of help is provided to the learners⁽²³⁾.

The term E-learning brings together different fields as highlighted in the following definition: ‘E- learning is the unifying term to describe the fields of online learning, web-based training, and technology delivered instruction’. The accompanying definitions of e-learning feature the use of computer and communications technology in this process. E- Learning is a methodology that facilitates and enhances learning through both computer and communications technology. Such devices can include personal computers, CD-ROMs, Digital Television, Personal digital assistants (additionally called PDAs) and Mobile Phones. Communications technology enables the use of the Internet, email, exchange forums, collaborative software and team learning systems. E-Learning may likewise be used to help distance learning using Wide area networks (or WANs), and may likewise be considered to be a form of flexible learning where without a moment to spare learning is possible. Courses can be tailored to specific needs as either synchronous (in real time) or offbeat learning (stored for use later on). Where learning happens exclusively online, this is called online education. When learning is distributed to mobile devices, for example, cell phones or PDAs, it is called m-learning.

3 Growth and role of internet in educational system

The online education sector has seen incredible growth during the increased Internet penetration of the last decade. The quantity of college students taking online course almost multiplied, from 23 percent to 45 percent, in the course of the recent five years according to the 2013 College Explorer, another report from Market Research Company. Students taking online courses are additionally enrolled in two for each term, according to the report. Numerous individuals today are pulled in to online instruction in the light of its natural advantages. Indeed, the developing pattern is to take formal e-learning courses since it enables experts to increase new aptitudes (and at times confirmations) at their very own convenience while as yet seeking after a profession. The upsides of e-learning for training go past the corporate environment. There are numerous educational foundations going for this strategy in both advanced education and in the K-12 space. Strangely, online students are really beating their peers. In traditional instruction, this means getting a passing evaluation and some type of acknowledgement (for example, genuine college credit). For experts preparing associations, this can be as a testament, or focuses towards accreditation (otherwise called continuing instruction units). The point is, individuals are frequently inspired by acquiring prizes or some likeness thereof. So all together for an online course to have satisfactory completion rates, it should be related with some sort of advantage. The 2012 Survey of Online Learning uncovers that the quantity of students taking, at any rate one, online course has now outperformed 6.7 million. Advanced education appropriation of Massive Open Online Courses stays low, with most foundations still as an afterthought lines. “The pace of development in online enrollments remains incredibly hearty,” said study co-creator Jeff Seaman, Co-Director of the Babson Survey Research Group. “This is to some degree astounding given that general advanced education enrollments really declined during this period.” “Institutional suppositions on MOOCs are blended, with positive perspectives on their capacity to find out about online pedagogy and to pull in new students, however concerns about whether they speak to a maintainable technique for offering courses,” expressed his co-creator I. Elaine Allen and key report discoveries include:

- Over 6.7 million students were taking in any event one online course during the term and growth of 570,000 students over the earlier year.
- Thirty-two percent of higher education students presently take one course online.
- Only 2.6 percent of higher education organizations at present have a MOOC (Massive Open Online Course), another 9.4 percent report MOOCs are in the arranging stages.

- Academic pioneers stay unconvinced that MOOCs speak of a reasonable strategy for offering online courses, yet accept that they give a significant way to organizations to find out about online instructional method.
- Seventy-seven percent of academic pioneers rate the learning results in online education as the equivalent or better than those in face-to-face.
- Only 30.2 percent of chief academic officials accept that their faculty acknowledges the worth and authenticity of online education - a rate is lower than recorded in 2004.
- The extent of chief academic pioneers that state 'online learning as basic to their long haul procedure' is at another high of 69.1 percent.
- A greater part of chief academic officials at a wide range of organizations keep on accepting that lower consistency standards for online courses are a hindrance to the wide-spread reception of online education.

Three fundamental reasons why educators wish to instruct MOOCs: being spurred by a feeling of interest, the longing to increase some close to home (prideful) rewards, or a feeling of philanthropy. Four key difficulties of educating MOOCs are likewise surfaced: trouble in assessing understudies' work, having a feeling of talking into a vacuum because on the nonappearance of understudy quick criticism, being troubled by the substantial requests of time and cash, and experiencing an absence of understudy support in online gatherings⁽²⁴⁾. Logistic regression affirmed more significant levels of understudies' self-viability and fulfillment in learning results for the individuals who participated in (completely) online instead of the individuals who took a crack at half and half courses⁽²⁵⁾. The flow discoveries have broadened past research in virtual conditions recommended that understudies' confirmation and fulfillment can be significant for learning results in online circumstances and likely may influence their choices on whether taking further courses in online settings⁽²⁶⁾. Understudies take an interest in exercises that just identity with assessment and will in general rival each other to accomplish a decent last imprint. Notwithstanding the instructional endeavors made by couple of eager educators, such assessment approach and social conditions may have effect on understudies' LMS usage patterns and movement support. Later thematic analysis on blended learning led by Halverson, et al., 2014⁽²⁷⁾. demonstrated that, during the ongoing decade, 41% of blended learning examination had inquiries regarding instructional plan including models, techniques, best practices, usage, condition and course structure. LMS Moodle helps to create electronic courses empowers us to show instructive materials in different structures utilizing interactive media, assess the nature of preparing by methods for tests and checking apparatus just by considering the individual learning styles of understudies while dealing with the homeroom and free work. Understudies' learning inspiration takes off when they see that the substance of the controls is associated with their future expert movement⁽²⁸⁾. It can be anticipated that great after effects of web based learning, as all types of value learning are centered on information, appraisal, and understudy network⁽²⁹⁾. Comments on data about courses, video addresses, assignments, understudies, educators, and so on can be created from heterogeneous sources, including commitments from the networks in the gathering space. These explanations, joined with heritage information, manufacture establishments for progressively proficient data revelation in MOOCs' foundation^(30,31) (Leyla Zhuhadar, 2015; Spector, 2014) accepts that not many MOOCs today have been planned by proficient instructors or exposed to stringent assessments and examinations. Be that as it may, the organizations of guidance on MOOCs have experienced critical changes and speakers have abandoned teachers to course planners. With this change came the acknowledgment that course configuration must fuse components that will attract students to continue learning so as to support their learning inspirations. The examination found that Rich course substance, Real-time exchange stage, Video guidance, Qualification and Homework and companion survey to be the properties that students underscored. Instructors can utilize these five characteristic factors as impetuses for learning and in this manner fortify their inspiration for learning and the improvement of learning condition structure. Grown-up understudies experience more requirements in time and booking⁽³²⁾. In spite of their clashing perspectives on the connection between online instruction and grown-up understudies, the grown-up understudies are turning into the dominant part student group of spectators in online settings. Given the development of grown-up commanded online courses, the more educationalists comprehend the idea of internet learning for grown-up understudies can comprehend the idea of powerful online course structure⁽³³⁾.

4 Methods of assessment in online courses

Any course, online or face-to-face, ought to have clear, quantifiable destinations. Evaluation procedures are best in the event that they duplicate something that the understudy will do in his or her calling, that is plainly important to the course, and that is helpful in exhibiting his or her insight and capacities. This type of assessment strategy, known as authentic assessment, actively engages students and demonstrates to the instructor that they not only understand the concepts but can also apply them in real-life scenarios⁽³⁴⁾.

Building successful guidelines include multiple tasks; yet planning is a standout amongst the most basic. For online courses, planning is particularly vital on the grounds that even under the best of circumstances, online learners regularly battle with

understanding what's anticipated from them. At separation, they can get extraordinarily disappointed (or more regrettable) and quit attempting. That is one of the best purposes behind utilizing a methodical way to deal with planning guidelines.

Planning assessments ought to ideally happen directly subsequent to recognizing learning destinations. That is on account of assessments ought to gauge if the goals were met. In the event that the learning targets are elegantly composed, suitable methods of appraisal are by and large entirely clear.

4.1 Formative assessment

According to Concord consortium (2002)⁽³⁵⁾, the utilization of one conventional 'high stakes test' to quantify learner accomplishment may be successful and proficient in an observed classroom. In any case, online assessment ought to be a nonstop and progressing process. For example, the Concord Consortium prescribed that educators ought to discover confirmation of accomplishment in individual member's day by day commitments to their online learning to gather, for example, online discussion. Likewise, the educators ought to attempt to figure out every understudies one of a kind movement or way to deal with taking care of learning issues through their posted thoughts on the discussion boards. Then again, when the creators consider continuous assessment as measuring the procedure of learning this type of assessment can be called formative assessment.

Formative assessment serves understudies and additionally teachers in numerous solid ways. Under studies can utilize criticism from formative assessments to offer them some assistance with knowing what they have not yet ached and what they have to concentrate on further⁽³⁶⁾.

4.2 Self-assessment

Self-assessment is a major component in online assessment strategy.⁽³⁷⁾ (Robles et al., 2002), believed that it would be essential for understudies to take an interest in appraisal of their own learning in light of the fact that understudies could quantify their own particular learning process and accomplishment. They additionally underscored that understudies could be able to figure out whether they have touched base at the required instructional destinations, if not, they could rehash the coursework without anyone else, keeping in mind the end goal to accomplish their own particular objectives. Through the pre-tests, students can know their current levels of information before beginning online courses, pick the correct levels of courses, and take the test again to gauge their accomplishment subsequent to completing the courses. These pre-tests can likewise permit students to feel better with the material itself or its instructional destinations.

4.3 Performance assessment

According to Patti Shank, Performance assessments evaluate real or invigorated performance. Online course frameworks make evaluating tests simple. Multiple-choice tests are normally used to survey accomplishment of learning goals on the grounds that they can be proficient. These don't gauge any written work capacity yet do survey perusing capacity. Inquiries to be consolidated are of subjective sort. Learning destinations can be evaluated with multiple-choice things on the grounds that the reaction can be chosen adequately. Ambiguous and inadequately composed or unlikely distracters are exceptionally basic mistakes while composing multiple-choice test items.

5 Materials and Methods

5.1 Population and sampling

In the present study, assessment is done with the help of Multiple-choice tests. These tests can be performed by identifying the population and samples of the study. In statistical point of view, a population can be represented as a complete set of items which shares at least one property in common. Population doesn't have any absolute number. In contrast, a statistical sample is a subset drawn from the population to represent the population in a statistical analysis. If a sample is chosen properly, characteristics of the entire population that the sample is drawn from can be inferred from corresponding characteristics of the sample. We have considered national students as our population and NIT Surathkal, MIT Mangalore, VIT Vellore, SRM Chennai, BITS Goa as national candidate samples.

5.2 Questionnaire survey

A questionnaire is an examination instrument comprising of a progression of inquiries and different prompts with the end goal of social event data from respondents. In spite of the fact that they are frequently intended for statistical analysis of the reactions,

this is not generally the situation. Questionnaires have favorable circumstances over some different sorts of reviews in that they are modest, don't require as much exertion from the questioner as verbal or phone studies, and regularly have institutionalized answers that make it easy to order information. The only disadvantage with the questionnaire is that Questionnaires are likewise pointedly constrained by the way that respondents must have the capacity to peruse the inquiries and react to them.

In the present study, the questionnaire comprised of basic demographic information, assessment characteristics, interaction and evaluation sequences and measures, suggestions and importance of online sources related to assessment of student's performance.

5.3 Statistical analysis

Statistical Package for the Social Sciences (SPSS) is generally the utilized project for statistical analysis as a part of sociology. Notwithstanding statistical analysis, information administration and information documentation are elements of the base programming. Statistics included in the base software are,

- Descriptive statistics: Cross tabulation, Frequencies, Descriptive, Explore, Descriptive Ratio Statistics
- Bivariate statistics: Means, t-test, ANOVA, Correlation (bivariate, partial, distances), nonparametric tests
- Prediction for numerical outcomes: Linear relapse
- Prediction for identifying gatherings: Factor analysis, cluster analysis (two-step, K-implies, various leveled), Discriminant.

In the present study, all the statistical procedures were incorporated including ANOVA tests. The data were imported to the standard SPSS software. Types of variables were also specified. The dependent and independent variables were assigned and then analyzed.

6 Results and Discussion

The questionnaires comprising of 25 questions with respect to assessment, interaction and evaluation approaches to online courses (Annexure I) was prepared in online survey software and sent it to students, and research scholars residing in IITs, BIT, MIT, NITs and VIT in India. Two hundred responses have been collected through online in whom 59% were female candidates and 41% were male candidates as shown in [Figure 1](#). Most of the candidates were in the age range of 21 to 40 years (87.7%).

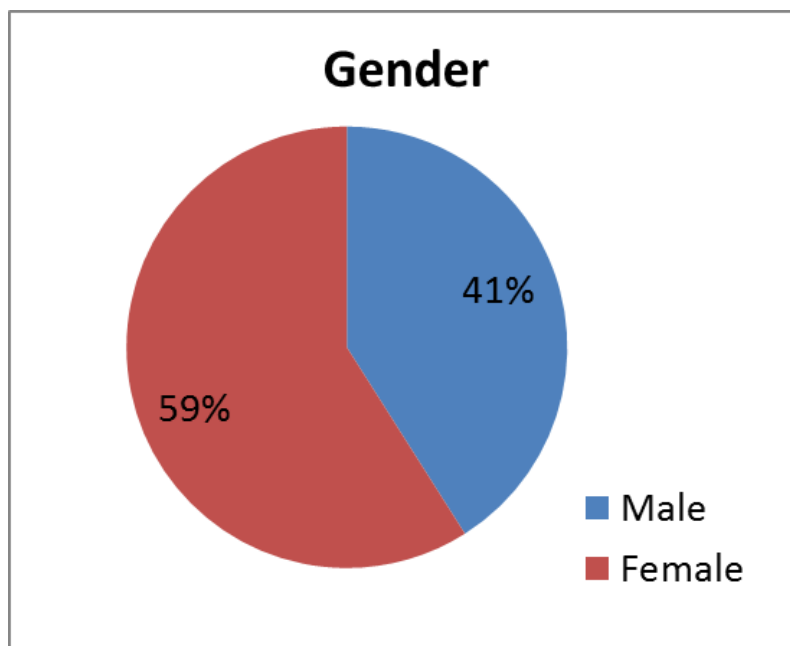


Fig 1. Gender

Around 70% of engineering candidates were participated in the survey. The percentage of technical candidates is of 12% and 3 to 4% candidates are from computing and business schools respectively. The remaining candidates are from social studies, design and architecture as shown in [Figure 2](#).

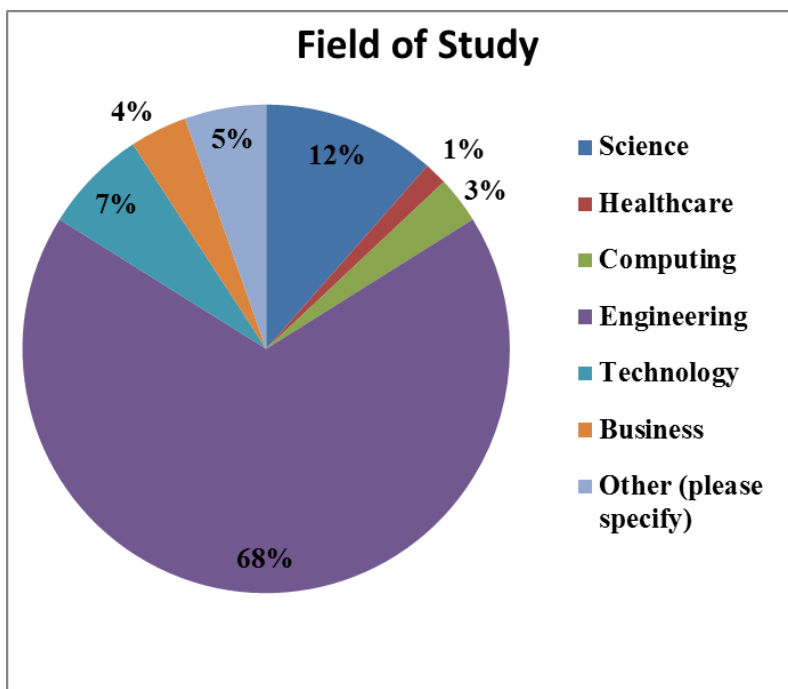


Fig 2. Field of Study

The study has been undertaken by undergraduate, postgraduates and doctorates. Among which the maximum responses were from post graduates (63%), followed by undergraduates (25%) and doctorates (12%) as shown in Figure 3. Survey questions are categorized into four parts; assessment, evaluation, interaction and feedback, where each part contains 5 questions. Each question is in MCQ format with 5 options namely strongly agree, agree, neutral, disagree, strongly disagree, from which the respondent can pick any one option.

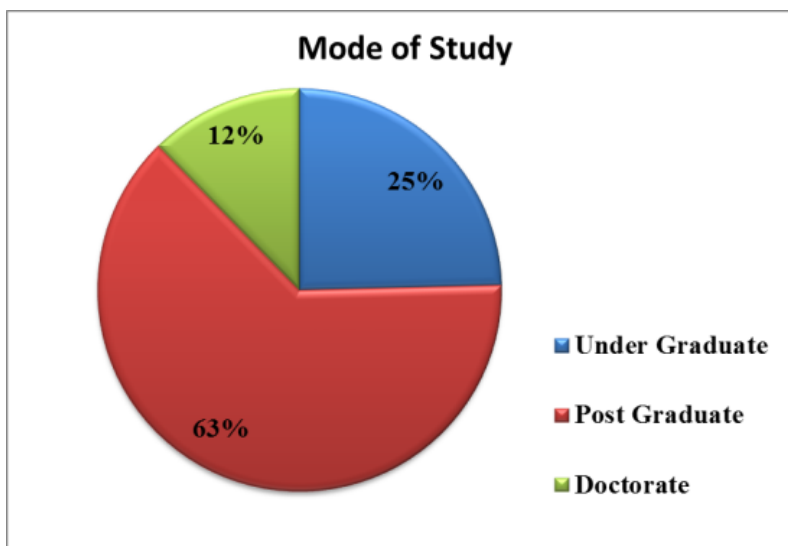


Fig 3. Mode of study

Around 30% of respondents agree that learning through online is very challenging and almost equal percentage students find those learnings does not make a difference from online courses. Further, 15% students facing difficulty in online mode of

learning as shown in Figure 4.

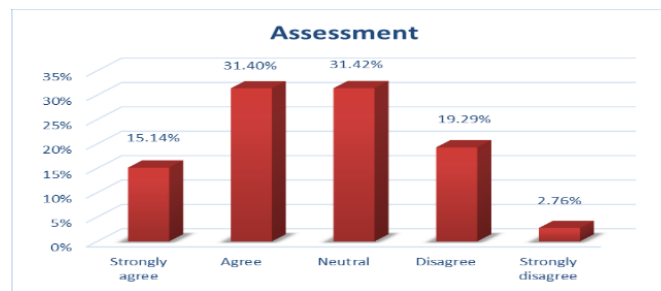


Fig 4. Assessment on online courses

Interaction plays a vital role in the assessment of student performance in online courses. From the questionnaire, it was noticed that 40% of the students facing problem to interact with their instructor and 15% of students have strongly agreed on that as shown in Figure 5.

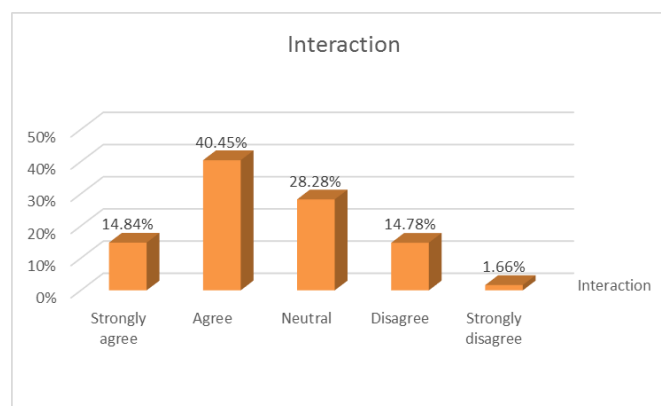


Fig 5. Interaction in online courses

Evaluation in case of online course is a challenging task. Students may attend the online courses from various streams and regions which makes the work further difficult. It includes standard, utility of instruction and candidate's satisfaction. From the respondents 40% felt that they are not satisfied in the evaluation process in the assessment and expecting more accuracy. 15% of respondents have the strong opinion that the evaluation process should be revised as shown in Figure 6.

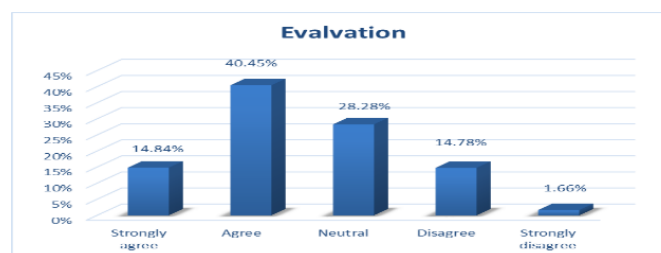


Fig 6. Evaluation of online courses

Feedback is the factor which determines the efficiency of any process. In the present study, 38% candidates have positive opinion on online courses and 35% felt more comfortable with online courses. Only 6% students dissatisfied about the online courses as shown in Figure 7.



Fig 7. Feedback on online courses

6.1 Statistical analysis

The collective responses from the questionnaire survey were analyzed in statistical software (IBM SPSS). Bivariate correlation (Pearson correlation) and one way ANOVA were performed from the arrived data. From the analysis, assessment has the greater positive correlation with the interaction (0.564) with the level of significance of 1% ($\alpha = 0.01$). Eventually, evaluation and feedback also shows the positive correlation of 0.440 (Table 1)

Table 1. Correlation Matrix

	Assessment	Interaction		Evaluation
Assessment	1			
Interaction		.564**	1	
Evaluation		.297**	.276**	1
Feedback	1	.117	.116	.440**

** Correlation is significant at the 0.01 level (2-tailed).

From the ANOVA, evaluation has more significant value on online courses hence it has low t value (0.002) which is less than the level of significance ($\alpha = 0.01$) (Table 2).

Table 2. ANOVA Table

		Sum of Squares	df	Mean Square	F	Sig
Assessment	Between Groups	8.200	14	.586	1.255	.246
	Within Groups	53.672	115	.467		
	Total	61.872	129			
Interaction	Between Groups	9.565	14	.683	1.483	.128
	Within Groups	52.984	115	.461		
	Total	62.549	129			
Evaluation	Between Groups	14.347	14	1.025	2.726	.002
	Within Groups	43.236	115	.376		
	Total	57.583	129			

7 Conclusion

Conventional methods of assessing students have become oppressive because it is time-consuming, ineffective and uneconomical. From questionnaire survey, the assessment and interaction were positively correlated in comparison with the evaluation and feedback. So, the evaluation seems to be more challenging task which has to be structured properly. Thus, online assessment system can provide full control to the evaluators over the instruction, test creation, distribution, invigilation, evaluation and report generation.

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