

Exploring the impact of using alternative assessments on students' learning during the pandemic

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Abstract

Most of us are aware of the circumstances in which the learning has happened during the COVID-19 affected years. In this research paper we have taken up case study of one module named Data Structure and Algorithms to demonstrate the effects of new policy on this module. The main challenges faced while adopting to the new policy on alternate assessment design was retaining the quality of assessments to the tune of earlier appreciated levels. The appreciated efforts include the design of assignments that avoid similarity issues arising due to plagiarism, memorization, and coding against the clock. An effort has also been made to identify and utilize an on-line evaluation tool which is of immense help for the teachers involved in the evaluation process. A comparative analysis has been done to clearly distinguish between the top performers and the average performers. Further analysis and comparison of overall performance with the respective CGPA have shown exceptionally accurate results, which clearly indicate that the overall learning during the special semester is equally comparable with earlier semesters.

Keywords: COVID-19, Alternate Assessment, Plagiarism

1. Introduction

Pesha A.V Et al presented a paper that describe the findings of a survey conducted among students from 28 universities in the Russian Federation regarding the challenges and advantages of online learning. The study's findings demonstrate that a significant portion of respondents are dissatisfied with the standard of online education. This study also mentions that students and teachers under preparedness for the shift to online learning also affected the process of learning. This study also notes that Teachers did not have time to create digital tools that would fully develop both professional and supra-professional abilities within the current conditions mandated by the worldwide COVID-19 pandemic's impact on the education system. (Pesha, and Kamarova, , 2020). One of the key challenges is to train the teachers to make them competent using an electronic assessment system. (Akçayır, G and Akçayır, M , 2018). This papers emphasis the need of online learning by concluding the paper with this statement " It would be terrible if IHEs, like other sectors of business and society, did not take advantage of this crisis's opportunity to rethink how

learning, teaching and assessment are delivered in the future. (Jones and Sharma, 2020).

Long before the start of pandemic the culture of sharing and implementing best and innovative practices in teaching and learning which was nurtured by MEC ensured smooth transition to online learning. LMS provide the administrators and teachers the resources to alter each step of the learning process, from knowledge dissemination to assessment. (Morze, Varchenko and Smyrnova, 2020). This paper introduces Moodle , which is a course management system (CMS) or Learning Platform as a technology tool that can improve participation and performance of students. (Wood 2010).This feature of LMS(Moodle) was in use from long time in middle east college, which proved to be the backbone of online teaching and learning. Flipped learning is also an innovative strategy which is used in many educational institutes including MEC. The authors proved that student learning performance is the greatly enhanced because of the flipped classroom. (Akçayır, G and Akçayır, M, 2018). This concept of flipped learning was implemented in most of the modules long before start of pandemic in MEC. The paper presented by devgun emphasizes how developing nations may change education and offer chances for lifelong learning that will give access to learning resources, innovative learning technology, higher engagement, and collaborative learning with international counterparts using Massive Open Online Courses(MOOC).(Devgun 2013).This concept was also implemented in MEC for most of the modules. Gamage Et al presented a paper which discuss the academic integrity violation, especially plagiarism as one of the main challenges in design of online assessments. This paper also refers about challenges in designing alternate assessments when the original test cannot be finished in the conventional manner.(Gamage, Silva and Gunawardhana, 2020).

2. Methodology

Quantitative methodology is used in this research. Quantitative research generates unbiased data that can be explained in detail using statistics and figures. The data is taken from student information system of middle east college. However, no identities are revealed in this research.

3. Challenges and Results.

Most of the challenges of online teaching and learning were addressed because of awareness and availability of tools as seen in the previous section. However, the challenge of creating alternate assessments so that the learning outcomes covered by CBT and Lab Exam are efficiently covered in Assignment-1 and Assignment-2 while avoiding the chances of plagiarism remains to be addressed as these are dependent on the individual assessment setter. In this paper the focus is on how this issue is addressed and the results of doing this is presented by taking example of one core module taught in computing department to the level 2 students.

It's a standard practice in MEC to look up to the previous comments from all stakeholders before designing new assessment. Interventions were done after Plagiarism cases were reported in this module and these interventions bore results as can be seen in graph and were appreciated by External examiner's comments. The Challenge was to continue this success in pandemic situation as all assessments were assignments. These were previous external examiner's comments, which are presented below

External Examiner's Feedback - FALL 19 for COMP 20016 Data Structures and Algorithms:

"The review noted the approach of given programs in class convert to solve assignment problems, this is a good strategy which avoids plagiarism, memorization and coding against the clock."

External Examiner

The above feedback was a result of setting up the assignment questions whose answer could not be obtained directly from any of the online/offline resources. Despite many students in the module, no cases of plagiarism could be traced.

During the Spring-2020 special semester, the policy adopted by MEC towards the assessments was that the type of Assessments was restricted to "Assignments" only; Assignment-1 and Assignment-2. The intension here was to achieve a well-balanced coverage of topics which include characteristics of CBT, the Lab Exam, and the Individual Assignment; and avoid plagiarized submissions. Further, the appreciated best practices/approaches of the earlier semesters to be carried forward during the current semester.

Taught in Class: For example: Matrix operations - How to read, print, find the result of the common operations on matrices such as sum/average of all elements, sum of major diagonal elements, sum of squares of diagonal elements; Building the logical steps for obtaining a desired solution.
What is asked as question in the Assignment:
Consider a $N \times N$ matrix where N is odd number; Print the resultant matrix based on some condition say if (central element > median element) then the resultant matrix is same as the given matrix else, Replace all upper diagonal elements with lower diagonal elements.

Figure 1 Sample question from the Assignment of Fall-2019

The Innovative aspects:

To incorporate the challenges, I have adopted following strategies.

- The first strategy was the adoption of a Massive Online Open Course (MOOC) which must be understood thoroughly to solve one of the tasks of the assignment. A MOOC that covers the prescribed syllabus using a different programming language (Instead of Java, C was used) was selected and discussed in the class. Students were compelled to register for the said course as there was a question based on this MOOC in the given assignment. The assignment question was carefully chosen to continue the best practices to avoid plagiarism, memorization, and coding against the clock. By this, some of the characteristics of the Lab Exam were achieved.
- The next strategy applied in setting up the SPRING 2020 assessments were to cover the CBT component which used to be theoretical in nature though it was problem-based. Few direct questions were asked in the CBTs and answers to these questions used to be mostly identical, which is permissible in CBTs. However, it is seen as plagiarized in the case of assignments. To ensure uniqueness in answers, each student was asked to have his own set of input numbers for the given problem which must be generated randomly using a random number generator, and hence the output will be different for every case. However, it poses a lot of challenges with respect to managing time for evaluating the individual answers. A solution to this issue has been provided using a freely available online tool . ("Infix to Postfix Converter | Dynamic Step-By-Step Stack Tutorial", 2022) (please refer to Fig.2) which takes the given input and produces the equivalent output. There is a chance that students too could get access to this tool.

However, the equation has been modified in the question by using some special characters, and the students even if they type the same equation will not be able to get the answer. Further solving the answers step after step in a specific way was expected. The image given in Fig.3 provides the glimpse of the tool used in evaluating.

- A small portion of the assessment has been set in such a way that only those students who are bright and active in all classes will be able to solve it effectively. This is to clearly demarcate the outstanding students from normal students.
- Work proposal and draft submissions were used effectively to guide the students for finishing their assignments apart from lab programs which were designed very close to assignment questions.
- Viva was conducted make sure that no malpractices were done while writing assignments.

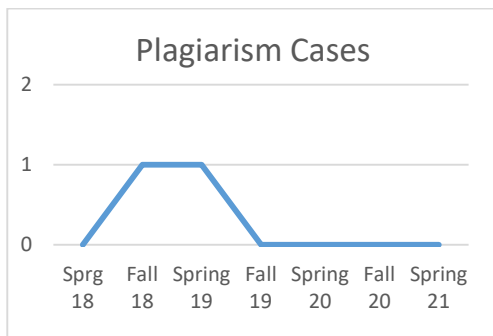


Figure 2 Comparison of plagiarism cases in different semesters.

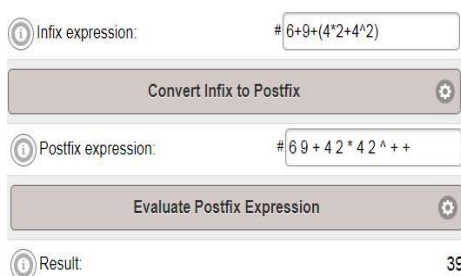


Figure 3 Tool that helps in evaluating a question from Assignment..

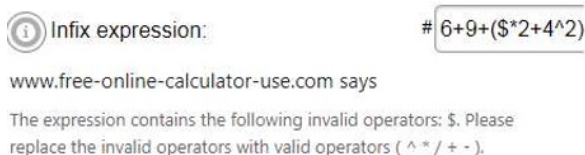


Figure 4 Introducing special characters as operators so that students could not get direct answers from the tool.

Implications of the practice on the overall operation of the college, Additional Resources / Optimal Use of Available resources:

College is striving hard to eradicate plagiarized submissions by adopting various tools, strategies, and

stringent policies to curb it. Despite all the efforts the number of cases evolved during the Spring-20 special semester was of major concern. In this context, design of exceptional assessments that are unique to the individual student as far as possible and identification of automatic mechanisms to evaluate them is of very much relevance. This can be achieved with the available infrastructure at no additional cost.

Replication of the practice outside its Initial Setting: Since the replication of this practice can be considered as part of the duties and responsibilities of Individual module leaders, implementation of it can be a matter of keeping ourselves updated with the advancement of teaching, learning and evaluation tools.

3.1 Measuring Effectiveness of the Practice:

Results depicted in the graph shown in Fig.4, compares the plagiarism cases and their respective semesters. The chart clearly states that the cases were reduced.

Results depicted in the graph shown in Fig.5, which compare the marks scored by the students for this part of the question and their respective CGPA, clearly indicate that the strategy has been very much effective.

To get an idea about the overall effectiveness of the designed assessments, a graph which is shown in Fig.6 compares the overall marks obtained against the respective CGPA. Results indicate that the student learning has not been affected due to the situations arising out of COVID-19. Further, failure in the graph clearly indicate that the quality of designed assessments is good enough. There is a slight change in pass percentage with respective to the semesters, it's because of the cohort size as seen in Fig 7.

When we look at the module statistics, it is very much evident that the adopted strategy in fact has resulted in zero AIV cases. This is of very much significance in the present context where the reported AIV cases have shot up.

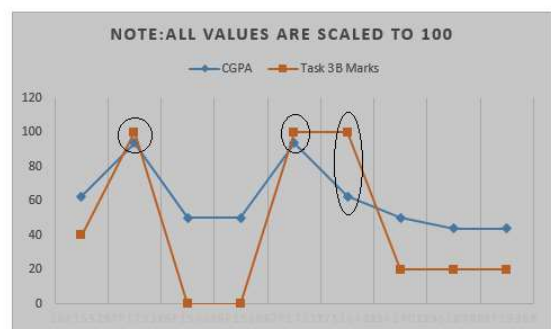


Figure 5 Comparison between CGPA and the mark obtained for a specific challenging question

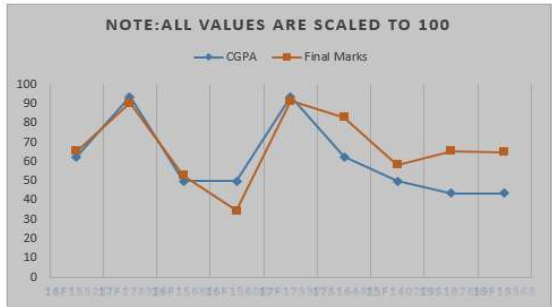


Figure 6 Comparison of overall marks with the CGPA of all students.

External Examiner's Feedback – Spring-2020:
 Good topic coverage across the assignments with nice reflection ...

Mick Ridley, External Examiner

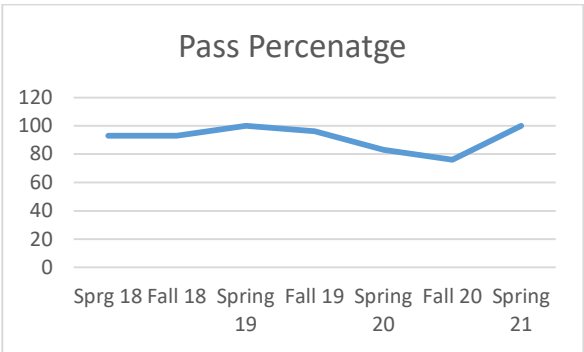


Figure 7 Comparison of pass percentage of COMP 20016 over the semesters.

4. Conclusion

A successful effort has been made in designing the ideal assessments for the special semester. Results indicate that despite challenges posed by the COVID-19 situation, the learning has remained identical to the normal semesters. The designed individual assignments have been successful in incorporating the blend of CBT and Lab exams. Continuing of best practices and strengthening it with tools to generate random questions and the tools to evaluate the answers of thus generated random questions have resulted in a novel approach towards assessment design and evaluation. It is worth to note that the assessments designed have in fact ensured zero AIV cases. It is hoped that the current research will open a new direction of identifying and utilizing various tools for setting/evaluating the assessments in every module. Further, it may add to a new feather to the field of data analytics. The main weakness of the research is that it may not be possible imitate Assessment design strategy in every module. But most of the programming modules can use this strategy. One of the concept demonstrated in this strategy is Personalized question, which may not be possible in other modules where numerical values are not present.

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