International Journal of Science and Research (IJSR)
ISSN: 2319-7064
SJIF (2019): 7.583

Developing a Multi Purpose Emergency Remote Teaching Tool during COVID Crisis for Partial Credit Assessment Using Digital Scratch-off (PCA-DS) Technique for Immediate Feedback and Readiness Assurance Test

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Abstract: ***A major issue in teaching and learning has been the assessment in emergency remote situation like COVID019 pandemic. Assessment collated at multiple point of time towards assessment as learning approach can be used for triangulation and for summative decision of student's fate if the crisis continues. Next to assessment as learning approach adopted would be awarding the students for their performance with partial credit system to encourage them taking assessment online. Partial credit in assessment adopted during the CORONA-19 crisis is motivating for students to take tests with fun. Receiving partial credit for achieving completely correct answer has the opportunity of immediate and direct feedback. A successful technique to provide an alternative to Immediate Feedback Assessment Technique (IF-AT). The scratch card system has been designed and developed by the authors as Partial Credit Assessment using Digital Scratch-off (PCA-DS) technique guided by ADDIE instructional model with user-friendly steps to follow. PCA-DS in a four options, One Best Answer (OBA) items may decides 0-100% score depending on number of attempts students may take to achieve the correct answer. A first attempt correct answer is usually awarded 3 marks, two attempts equal to 2 marks, three attempts equal to 1 mark and last attempt equal to 0 marks. The PCA DS technique has been successfully used by the authors in multiple modalities of teaching and Faculty Development Activities (FDA), Team Based Learning (TBL), Virtual Medical Clinic (VMC) and Task Based Learning online with encouraging faculty and students remarks. PCA-DS is presented for its design and user-friendly steps in an easy to follow technique.***

Keywords: Emergency remote teaching and learning, Online sssessment, Partial credit, Immediate feedback, Digital scratch-off, Team-based learning

1. Introduction

COVID-19 pandemic crisis has left the world with unprecedented challenges [1] particularly in the field of teaching and learning. There has been a mixed response by different institutions at global level from suspending to partial and complete delivery of curriculum depending on their preparedness to face those challenges. Albeit, teachers in particular have been given additional responsibilities to researching and publishing besides teaching and assessing the students in the programme [2]. This many have found an opportunity to do research and document their work as formal or informal projects applied for funding and research and ethic committee approval. There is room for those interested to innovate and bring forward conceptual models based on authentic pedagogy and technology principles for sharing and disseminating the knowledge and skills from their own experiences during the COVID- crisis. A major issue in teaching and learning has been the assessment in emergency remote situation to continue and accomplish the curriculum delivery online in a new normal teaching and learning environment.

Assessment that have been widely practiced as assessment of learning and assessment for learning [3] and less often assessment as learning. To keep moving forward in new normal and assisting students graduation on time assessment as learning approach may work well to document students performance of self-assessment, team assessment and formative or continuing assessment along with learning experiences. Assessment collated at multiple point of time in learning can be used initially for triangulation and if the crisis continues for summative decision of students fate. This concept is close to programmatic assessment for learning [4], which rather explores assessment as learning approach in new normal that on reliability aspect of a single one time online assessment activity may contribute to a better choice of assessment method in making logical decision. In assessment varied thinking and yet to globally agreed upon assessment model, assessment as learning approach will have important implication for conceptual framework with research agenda, an additional responsibility of teachers in COVID-19 and other in future likewise crisis.

Next concept and approach to emergency remote or online assessment would be awarding the students performance with partial credit to encourage them taking assessment online. This might compensate the frustration and stress of online assessment and fear of unlikely result in a locked down situation of current crisis. The principle applied to awarding partial credit in assessment is thought of learning from mistakes, the milestone of formative assessment. Receiving partial credit for achieving completely correct answer has the opportunity to provide immediate and direct feedback another characteristic of formative assessment that

students like and need to know about what they perform. In partial credit assessment practice students get 100 points for full credit and 0 point on no credit. A partial credit means somewhere 0-100 points. Author may recommend 3-points for a right answer in first attempt, 2-points for 2nd attempt and 1-point for third attempt and 0-point on their fourth attempt in a four option multiple choice question (MCQ) such as in one best answer (OBA) format. To implement partial credit however, needs an alternative system of Immediate Feedback Assessment Technique (IF-AT) system [6] of F2F sessions using silver coated manually scratched option. Current study is the outcome of the project authors have designed and developed as the Partial Credit Assessment using Digital Scratch-off (PCA-DS) technique.

2. Methodology

This technique is developed using the ADDIE instructional model (see figure 1).The model consists of the Analysis, Design, Development, Implementation, and Evaluation phases that must be strictly followed for a content and assessment design successfully. ADDIE instructional model assists designers for content design and user-friendly navigation of content and assessment. The ADDIE model is mostly used by instructional designers to create an essential teaching and learning module. In the Analysis phase, the Subject Matter Experts (SMEs) will identify the target student, tools, materials, and development of learning outcomes. A needs analysis is also required to be conducted at this stage. In the design phase, a storyboard will be created to visualise the module interface, navigation and functionality. A prototype is also developed to test the navigation before going into full-fledged development of content and assessment.

In the development phase, the prototype is enhanced to become the full working module using Articulate Storyline 360, top e-learning authoring tool. Additional features could be added using variables, which are enhanced and finalised to navigate between different scenarios using triggers. The user interface is designed to have the look and feel of a digital scratch card to mimic the real scratch card behaviour. Audio is added to engage learners and to make it realistic. Implementation is done once the module is ready and all quality assurances, functionality tests, and troubleshoots are resolved. The module is uploaded into IMU eLearning Portal, Learning Management System (LMS) using MOODLE to be shared for students' access. A feedback form is included in the session for the students to evaluate and give their feedback for improvement.

User-friendly PCA-DS Design

Students engaged in self-assessment as Individual Readiness Assurance Test (IRAT) or team assessment as Group Readiness Assurance Test (GRAT), the PCA-DS provides opportunity for both options unlike GRAT option for partial credit in assessment as learning. Following are the steps for users to use PCA-DS technique either for individual or as a team in assessment as learning approach, so pertinent to current crisis with its important implication of learning as well as assessing student's performance in the same sitting. Following are the steps to be followed by learners in a very user-friendly digital technique combined with pedagogy of partial credit to student's performance in learning (see figure 2).

Step 1:

Students will click enter to open the link and then will write their name or number assigned in the respective box in undertaking their self-assessment or individual rating. The instrument is developed according to the needs and method of teaching such as in lesson plan or module developed based on lesson plan [7], online bedside teaching (BeST) [8], Task-based leaning or team-based learning with GRAT option [9]. Next the student will click to get started.

Step 2:

In this step students will read the lead-in (item scenario) and the options provided to decide on a right answer. Student will attempt the question as an individual or as a team in which case students will be assigned a breakout room online to perform as a team after having discussed the problem and reached to a consensus on what is the correct answer.

Step 3:

Student on his own on individual rating or assigned on behalf of team, will place the cursor on coin, drag it to the answer decided to be right and make up and down or right to left movement in an attempt to scratch the option (instruction in step 2) chosen and wait for the response.

Step 4:

Student/s soon find one of the two responses on scratching either, continue (with a voice indicating correct) or try again in case right answer not picked up correctly. In any case student will click the response to proceed to next attempt.

Step 5:

This is how student/s will mandatorily attempt every question in order to move forward until the last questions shown with continue option to click.

Step 6:

Last step shows the result of student/s performance with detail score of partial or full credit depending upon attempts made to achieve the right answer. Here student/s are advised to take a snapshot of the result before decided to exit. This screenshot of result can be uploaded as evidence in their e-portfolio, which is recommended to be developed in any assessment programme that has multiple point collection of assessment result. From here the students performance score can be picked up for triangulation or decision on student's performance as per the school policy in practice.

3. Discussion

Moving from the assessment as learning to provide solution to some of those issues associated with traditional assessment another move may be to give credit to learners on their partial performance in a formal way. Team Based Learning (TBL) experience of IRAT and GRAT can guide the teachers to create conceptual framework to meet the challenges of suddenly imposed crisis like COVID-19 pandemic. What have been missed by students and shown in most of students survey in current crisis is the major concern of inability to sharing common space, face-to-face meeting

and collaborative team work [10]. What can be a better concept of awarding students with partial credit of their individual and teamwork than TBL practiced IF-AT technique to document student's performance and their learning experiences.

This concept has been worked through in current crisis and has been experienced in many innovative models by the authors [1, 4] and as part and parcel of already available TBL model in literature [11]. Supervisors are always in dilemma of assigning a partial credit when a student makes more than one attempt to achieve the right answer. This concept not only explores learners curiosity and analytic reasoning both as an individual and as a team but also sends an alert to teachers to relook into learners minor and major misconceptions associated with relevant learning experiences, theories and solutions towards problem solving approach in learning. Seeking the right response in multiple attempts though, provides teachers to improve in their next choices of instructional methods and students in rectifying their learning objectives and collating new knowledge.

4. Conclusion

A major issue in teaching and learning has been the assessment in emergency remote situation. Assessment collated at multiple point of time in an assessment as learning approach is adopted to design and develop this digital tool. Another principle to develop this technique is the concepts of partial credit to encourage students taking assessment online during the COVID-19 crisis. The Partial Credit Assessment using Digital Scratch-off (PCA-DS) technique guided by ADDIE instructional model is a user-friendly technique. PCA-DS in a four options One Best Answer (OBA) items may decides 0-100% score depending on number of attempts students may take to achieve the correct answer. The PCA DS technique has been successfully used by the authors in multiple modalities of teaching and FDA, TBL, VMC and Task Based Learning online with encouraging faculty and students remarks.

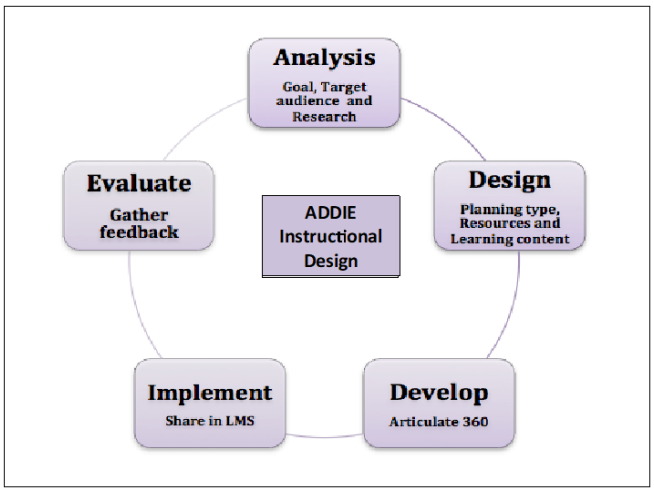

Figure 1: The Addie model of instructional systems design framework used in this project to develop Digital Scratch-off Partial Credit Assessment Technique.

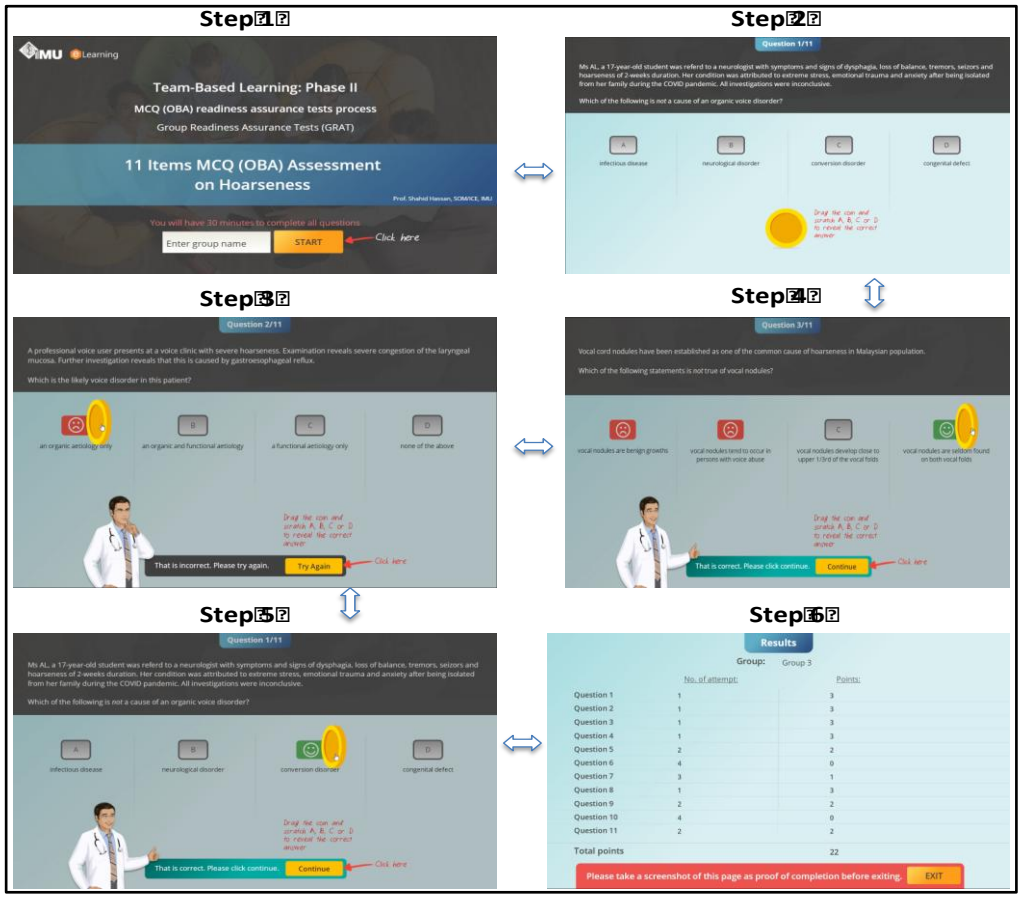

Figure 2: The Addie model of instructional systems design framework used in this project to develop Digital Scratch-off Partial Credit Assessment Technique.

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