Student Self-Recording Videos for TVET Competency in MOOCs

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Abstract. Student-based competency assessment in written or practical form is important to confirm that a student has demonstrated the mastery of practical knowledge and skills as well as the basic knowledge required to perform tasks in accordance with certain standards in Technical and Vocational Education Training (TVET). The instructors involved in the Education and training process carry out assessments to determine the effectiveness of the training and new skills they have learned. Assessment is done in written and practical form and is aimed to assess student knowledge based on cognitive domain, student skills based on the psychomotor domain and student attitudes based on the affective domain. In TVET, instructors face difficulties in assessing student competencies due to time, workshop facilities and human resource factors. The competencies of students are usually assessed by the instructor in students’ workspaces either in the workshop or workspaces during industrial training. Previous studies have indicated that self-recording can be used an assessment approach. Thus, in this study, we investigate the use of self-recorded videos in assessing TVET student competencies. In the assessment self-recorded video is performed by the student by recording the work process from beginning to end and is shared on the MOOC. Self-recorded videos not only show practical work conducted by students but also demonstrates aspects of cleanliness, safety and good values while working. In addition, videos uploaded on MOOCs can be accessed via instructors as well as other users. Via public sharing of student’s work, the instructor can assess and certify that a student is competent while other students can collaborate among themselves and learn the steps that have been taken and new techniques that can be tried.

1. Introduction

Student Self-Recorded Videos refers to the recording of student work or practical videos made in the workshop or tutorial room. Vocational students, especially automotive technology students will record the work done in the workshop during the practical process in the workshop. Student Self-Recorded Videos are important for students to review the work that has been done in the workshop as an alternative assessment and as well as for sharing with others friend in the same course. The recording process is usually carried out by the students themselves as a model using a tripod or selfie stick and there are also recordings with the help of other friends to record. This process of student self-recording requires no production equipment but is sufficient to use a web cam laptop, mobile phone, tablet, iPad or digital camera. Student Self-Recording Videos are also done because not all professional videos are produced that provide maximum understanding to the audience. There are times when self-recorded videos are more effective for the audience.
2. Overview

Video recording is very important in TVET especially automotive technology student as it is an electronic medium with dynamic visual display and authentic sounds from the learning environments [1]. Video is the most effective medium for vocational students especially automotive technology courses as they are visual learners [2]. Student learning is most effective when students are able to preview the process of a system, component or operation [3] before the service or repair work is carried out on the vehicle. Previously video recordings for servicing or repairs were carried out on vehicles in the studio or outside with video production. Basically production of an automotive education video development process is conducted via five major stages namely development stage, pre-production stage, production, post-production and distribution stage. These five stages result in automotive education videos being recorded in production consumption rates are rising and that video will take a long time for students to view and use [4].

2.1. Technical and Vocational Education

Students in Technical and Vocational Education and Training (TVET) are given training in order to have the knowledge, skills and attitudes set in the course of the study [5]. Students must have theoretical knowledge of a course in terms of the number of components and the types of components available in the system and operation of each system type if there are several types of systems in the course being studied. Students in the field of TVET should have the skills to decide or determine a system or component to be in good condition or to be replaced. Students in the field of TVET will also be trained in order to have the value and attitudes of working as a mechanic or technician [6]. When an institutions or training centers can educate students undergoing their training skills with high theoretical and skills knowledge, the ability to determine and decide the components or systems in the best possible condition and work well. The institutions or training center has been able to educate competence students in the course. Student competency assessment in written or practical form is important to confirm that a student has demonstrated the mastery of practical knowledge and skills as well as the basic knowledge required to perform tasks in accordance with certain curriculum standards in TVET [7]. Competence refers to the performance that one must have in order to perform the task effectively, especially when it is necessary to play a role or perform a task, mission and measurable. Furthermore, it is noticeable and measured. Therefore, efficiency is not just knowledge, skills, and attitudes, but also dynamic concepts for action [8]. In technical and Vocational Education Training (TVET) institution, the instructors involved in the teaching and learning process will carry out the theory and practical assessment process to determine the effectiveness of the training and skills they have learned. Assessment done in written and practical form is conducted to test student knowledge based on cognitive domain, student skill based on psychomotor domain and student attitude based on affective domain.

2.2. Student Based Competency

Student based competency assessment is an accepted evaluation method that suits the present learning theories [9]. One of the tools have been used for evidence gathering and assessment in Competency Based Assessment (CBA) is portfolios. A portfolio approach to evidence collection involves the collection of a variety of evidence of competence into a structured format for assessment. Evidence is collected by the learner into a file, indexed, and mapped to the performance criteria, ranging in statements, critical evidence, and underpinning knowledge of the qualification [10].

2.3. Alternative Assessments

Assessments are seen as a support for student learning and help students bridge the gap between their current achievement and their intended learning goals [11]. The assessment design process starts with
deciding for the mode of an assessment. Based on the assessment purpose, appropriate assessment settings and competency types have to be considered and evaluated with respect to their cost-benefit ratio in terms of economic cost and testing time. According to the evidence-based assessment design assessment will begin with the starting point of any test whether to test the knowledge or test the skills of the students outlined in the content standard. Teachers will then provide a process for testing students theoretically or practically [12].

Today, many vocational educators are advocating the wider use of alternative assessments such as portfolios, assignment, quiz, test and practical test for measuring their knowledge or skills. Providing alternative assessment for vocational students becomes innovative equipment of teaching and learning is in order to fulfill learners’ competencies in the workplace. The concept of alternative assessment using more creative, innovative and up-to-date methods has been stated by [13]. It is based on the concept and forms of assessment in order to be consistent with the 21st-century student learning style changes.

As such, a new digital alternative assessment is based on the need to provide an alternative to future assessments in line with technological advances [14] [15] [16] states that there are three generations of digital assessment, the first generation uses designs based on paper-pencil assessments; The next generation is the generation that will be using new formats including multimedia-based responses, automated item builds and scoring automatically; while the next generation is a generation that implements complex simulations and smart tutoring applications and artificial intelligence.

3. Method
This study was conducted with students enrolled in supplementary restrain system class (SRS) course in the open enrollment course at MOOC. The research process consists of two stages. In the first phase, students will learn all the skills from beginning to end in a designed MOOC that is student-centered and self-paced learning[17][18]. Students record dismantle works, service components and assemble the supplementary restraint system. Secondly, lecturers view student self-recording video upon completion. Students Self-recorded video can be recorded on various devices by using a computer webcam, mobile phone, tablet, iPad and digital camera [19]. When using this technique, a computer's webcam needs to be enhanced so that the screen is level. Cell phones or tablets can also be used to record student self-recorded videos by placing them horizontally and placing them at eye level. Make sure the phone or tablet is stable to avoid shaking and Video self-recording can also be recorded using a digital camera by placing it at eye level. Using a tripod is ideal or placing it on a pile of books to lift it to the right height.

There are a few things to keep in mind when making a video with clear audio by choosing a space that is not too big, otherwise there may be an echo in the audio. Recording can be done in the tutorial room or other appropriate room. Ensures external sound is limited. Recording can also be done using an external mic to improve the sound quality. However, students need to be sure not to hold the microphone too close to your mouth as this will cause interference with the recorded audio.

To enable high quality student self-recording video quality, lighting will greatly impact viewers’ ability to view and enjoy video content. The combination of overhead lamps and table lamps creates the best lighting for your own recorded video. If possible the following should be avoided by using a fluorescent lamp, sitting next to the window and there is a light source behind the recorded subject. In order to avoid the distribution of a grainy, low-quality video, it is best to record raw video in HD (1080p, 720p) and or the highest resolution the equipment will allow. Student must save the file as a mp4 or .mov.

After completing each of the competencies included in the standard curriculum, in the traditional learning method, the instructor will conduct a session evaluation to evaluate the learning outcomes for the competency. It needs to be done after each learning ability. Students have theoretical knowledge of what they have learned, skills to perform, change or diagnose defective actions and restrictions while practicing the skills they have learned.
For the courses that carry out student assessment using this self-recording video, students will do practical work at the end of the learning session as per the curriculum. During this course practical work, the recording of student work will be done using a computer web-cam, mobile phone, tablet, iPad or digital camera. Students need to be a model by doing the work from start to finish. The technique of recording is either individually recorded or with the help of another friend. While using work recording techniques, students must perform all the steps according to the work procedures and adhere to safety standards and attitude while performing the work as per the curriculum standards. Students are free to choose what types of recording strategies to use either the recording of scripted behavior (role playing) or the recording of naturalistic behavior [20]. Recorded video footage can be edited using free video editing software such as a videopad that can be easily downloaded from the web browser. For android users free apps like VivaVideo can be downloaded from the Google Play or iMovie for Apple iOS users which can be downloaded from the Apps Store.

The edited video footage is just under 4 minutes long because most youtube viewers tend to view the video produced at this length. Once the video footage has been edited and analyzed, the students will log in and upload the edited video into the MOOC as shown in figure 1. The process for uploading your edited video depends on your internet access speed.
Figure 2. Student video footage and comment given from instructor

Videos uploaded to the MOOC vehicle safety system (SRS) course as shown in figure 2 can be viewed by instructors as well as other students. From the video produced, the instructor can view the service and repair of the vehicle safety system performed by the students participating in the course. In general, there will be many variations of the video as there will be video differences if students use different hand tools, vehicle types, vehicle manufacturers and different vehicle models. The learning process occurs when students view uploaded videos. They can ask the questions they face, provide feedback on the work they do and post comments on the videos they watch[21]. Here it can be seen that the process of learning through connectivism has taken place.

4. Results
Several assessments of the phases for developing MOOCs have been conducted for automotive student as shown as table 1. During this study, MOOCs underwent a process of evaluation by experts. There is a component of assessment that will be conducted on students. For item no. 2 ratings in MOOC, experts have agreed student assessment can be done online. Next for item assessment no. 9 in the MOOC, experts have agreed on self-assessments of student performance. Lastly for item number 20 in MOOC, experts have agreed that students can submit video clips for teachers to review.

| Item | Percentage of expert agreement (%) | Threshold Value (d) | Fuzzy Score |
|------|-----------------------------------|---------------------|-------------|
| Evaluation 2. | 100% | 0.108 | 0.891 |
| Evaluation 9. | 100% | 0.130 | 0.887 |
| Evaluation 20. | 100% | 0.092 | 0.902 |

Through the practical sharing of the student's work, the instructor can evaluate the work done [22], has been in accordance with the established work procedures as contained in the curriculum, is the practical work of the student has complied with the prescribed safety regulations, is the practical work done by the students achieving the work that has been set and whether the practical work done practiced the attitude and work culture [23] of mechanics or quality technicians. After the instructor viewed the video footage that was produced, the authentic assessment could be made based on the video footage seen. The instructor can score in the student portfolio or online and
subsequently confirm that the student has competence in competency or competency of the module [24].

5. Discussion
By using Open Education Resources (OER) in learning this TVET field, the learning of automotive technology students in vocational colleges will be effective when other students can work together among themselves and learn the steps taken together, new techniques that can be tried and various tools which can be used when doing practical work.

6. Conclusion
In conclusion, the student competency skills could become the driving force of TVET organizations’ performance. Competency is measured in accordance with Competency Based Assessment (CBA) assessment methods that are in line with current learning theory [25]. Competency enables the production of high-skilled workforce if it is developed in line with TVET organizational objectives, mission, and vision [26]. It also serves as performance tools in the technological revolution-taking place at the global stage. Technology in Education not only helps in the vocational learning process of students but also benefits in the assessment process [27]. The expected result of this paper It is hoped that the findings of the paper could assist future researchers it would have implications on the student competency model of efficiency in Malaysia Technical and Vocational Education (TVET). It also provides evidences and the most competencies required by from students and by organizations.

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