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ENHANCING ENGINEERING STUDENTS' COMMUNITY SERVICE EXPERIENCE THROUGH MAKING YOUTUBE VIDEOS

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Abstract

The Professional Engineer and Society module is a required module for an engineering programme to be accredited by the Engineering Accreditation Council of the Board of Engineers Malaysia. Its purpose is to educate future engineers on their professional responsibilities. To assist with meeting this objective the School of Engineering at Taylor's University has included community service as an assignment in this module. The students work in teams and make arrangements with various philanthropy or environmental organizations to engage in a one-off community service activity. The activity usually takes an average of three to five hours duration. Following which the students write a report about their experience. Due to its one-off nature and short duration, it was anticipated that the students' community service experience could be reinforced by having them produce a video of their activity and uploading it to the YouTube. This paper explores the enhancement of the students' community service experience as a result of them creating their video of their community service activity. An open-ended survey was conducted subsequent to the upload of their videos to the YouTube to determine this enhancement in terms of overall learning, personal satisfaction and perceived contribution.

Keywords: Community service, Engineer, Service learning, Society, YouTube video.

1. Introduction

Engineering is a profession. As with all professions it is organized to help its members serve others according to certain ideals expressed in its code of ethics [1]. In this professional context the Engineering Accreditation Council of Malaysia (EAC) which is responsible for accrediting engineering undergraduate programmes in Malaysia requires that engineering programmes impart an understanding of ethical, social and sustainability issues in addition to technical knowledge. This emphasis may be delivered throughout the curriculum through relevant modules. However, in addition there is a specific module known as Professional Engineer and Society or some other variation of this name that must be included to specifically address these professional issues. While its inclusion is not directly specified in the EAC manual it is nonetheless regarded by EAC evaluators as a necessity in order for an engineering programme to achieve accreditation. This is because among the programme outcomes mandated the EAC, the following are included [2]:

- The Engineer and Society - Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice and solutions to complex engineering problems
- Environment and Sustainability - Understand and evaluate the sustainability and impact of professional engineering work in the solutions of complex engineering problems in societal and environmental contexts
- Ethics - Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice

Idrus et al. [3] explained that this professional module is intended to address the role and responsibilities of engineers as professionals in a modern society. It would include topics such as engineering professionalism, the pathway to becoming a professional engineer in Malaysia, the professional engineering bodies in Malaysia and related matters such as quality, safety and sustainable development.

In Taylor's University School of Engineering (SOE), this module is known as Professional Engineers and Society (PES). It is a compulsory module offered to engineering undergraduate students in semesters 6 to 8 in the Mechanical, Chemical, and Electrical and Electronic programmes with the semester that it is offered being dependent on the respective programmes' structures. To enhance this module's learning outcomes a service learning component was included. The students are required to perform community service at an organization of their choice and submit an assignment that requires them to reflect and relate their experience to specific outcomes. As the actual service experience is usually takes only 3 to 5 hours in duration, it was decided that an additional video assignment be included to help enhance and reinforce the entire learning experience.

Service learning as defined by the Learn and Serve America National Service Learning Clearinghouse is "a teaching and learning strategy that integrates meaningful community service with instruction and reflection to enrich the learning experience, teach civic responsibility, and strengthen communities" [4]. In view of this although service learning is not mandated by EAC for its professional module nonetheless SOE is of the opinion that it would enhance the PES module by having a service learning component as it would be consistent with the learning outcomes.

There are other avenues of incorporating a service learning element into an engineering curriculum. These can take many forms including developing engineering solutions for non-profit organizations or for companies involved in starting social initiatives [5] and performing building services such as small repairs, and site inspections and building inspections for disadvantaged households living in apartment buildings [6]. Service learning through an engineering curriculum has been used to increase confidence and leadership skills [7] and project-based service-learning experiences can play an important role in preparing future engineering professionals [8]. However, for the PES module which is not specifically about service learning per se and with its required community service activity being of only a few hours duration these approaches could not be carried out.

Videos have been used extensively to teach by having students view them. However, using the production of videos by students as a learning experience is far less frequent. This activity should not be confused with assignments where students are required to produce a video as a proof of their participation in an activity. The difference is that the assignment investigated by this study intends to use the video making itself as a pedagogical tool.

Based on studies by Spires et al. [9], video making is encouraged as a pedagogical tool to engage students in learning especially considering that video viewing and video production have become routine in today's media-rich society. It is safe to assume that nearly every student possesses a mobile phone with video recording capabilities hence such an opportunity should not be overlooked. One area where student produced videos have played an important role is that of learning a foreign language where the video is produced in the language being taught [10].

Much has been written on the benefits of service learning within an engineering curriculum. While at the same time, video production by students is being encouraged as a means to engage students in learning. Since there does not appear to be any study concerning the enhancement of the service learning experience of engineering students through video making, the authors decided to explore this possibility and address the knowledge gap. Considering that this service learning activity is only of a 3 - 5 hours duration, it was anticipated that the students' community service experience could be enhanced and reinforced by having them produce a video of their community service activity and then uploading the video to the YouTube.

The scope of this study is limited to the investigation of the benefits of including a video making assignment into the service learning component of a module in an engineering curriculum that focuses on engineering professionalism.

2. Methodology

There were 31 students in the cohort of the Professional Engineer and Society module being investigated. They were required to work in groups not exceeding 5 members. Each group was required to submit a video of their service learning activity. This video submission was embedded into the case study assignment where they had to reflect on how they were able to achieve their learning outcomes. The marks for the video represented 5% out of the 15% allocated for the entire case study assignment.

The video was not meant to be just a random collection of images. The students were instructed to make a video that is coherent that could tell their story effectively. They were also encouraged to be creative in their story telling.

For the activity, the students were required to form their own groups and to arrange their own community service engagement. They were limited to selecting from either philanthropy organizations, which involves social responsibility and charity or from environment organizations concerned with reducing the carbon footprint. This was required in order to align with the module learning outcomes.

Table 1 shows a description of the type of organization and activities that the students participated in. The were 8 groups comprising a total of 31 students.

Table 1. Type of organizations and activities including the number of students and respondents

Type of organization	Activity performed by the students	No. of students/ (Groups)	No. of survey respondents
Street feeding	Assist with food preparation in the kitchen	5 (1)	4
Handicapped children's home	Clean the home as well as organize games to play with the children	14 (4)	8
Orphanage	Teach the children about environmental issues using fun activities	5 (1)	5
Environmental organization	Tree planting and cleaning of the plant nursery	7 (2)	4
	Total	31 (8)	21

Upon completion of their activity, the students were given a deadline to submit their group video. Their submitted videos were reviewed by the authors. Upon approval from the authors the students could upload to YouTube. It was worth mentioning that all the videos were approved for upload without the any need for revision.

As an incentive for the students to produce a good video they were informed that for each 100 Likes received on YouTube they will receive RM 10. They can choose to voluntarily donate to their community service organization. Unfortunately, the highest number of Likes garnered by any group was only 29 after the one-month deadline had expired. However, this was just an added incentive and was not intended to affect learning except to serve as a form of motivation.

Subsequent to the full completion of the video assignment, a survey was conducted using the Google Form. The survey is shown in *Appendix A*. It is a simple survey with four categories of Yes/No questions followed by the reason for the Yes or the No response. The intention was to get directly to the point and also to keep the survey short so that the respondents would be motivated to complete it.

The 4 categories of questions were identified based on the objective of determining if there was any positive enhancement to the students' service learning

experience. Enhanced learning and satisfaction were considered important and likewise perceived contribution. These were regarded as important measures of success. When the students believed that they had learned well and were satisfied with their overall participation and contribution, then the message would have been driven home to them. The question is, did the video making activity help enhance the attainment of these objectives? Hence the 4 categories of questions were as follow:

1. Did making the video enhance your overall learning from the activity?
2. Did making and viewing the video enhance your personal satisfaction derived from the activity?
3. Did you perceive that your contribution was greater because of making the video?
4. Would you recommend making a video of service learning to future students of this module?

3. Results and Discussion

21 out of the 31 students who participated in the community service activity responded to the survey as shown in Table 1. This represented a response rate of 67.74%. Table 2 shows the survey results of these 21 respondents.

Table 2. Survey results.

Category of survey question	Yes (Number)	Yes (%)
Enhanced overall learning	18	85.7
Enhanced personal satisfaction	20	95.2
Perception of greater contribution	13	61.9
Recommend future students of the module to make video	18	85.7

3.1. Enhanced overall learning

85.7% (18/21) of respondents felt that their learning from the activity has been enhanced through making the video. The 3 respondents who did not agree gave the following reasons:

- *"Wouldn't have noticed any obvious difference if no video was required in the first place"*
- *"Making video is okay, but it's just the process of taking the video is interrupting the activity"*
- *"The video seems to serve as a purpose for the sake of getting assessment marks rather than enhancing the overall learning"*

There appeared to be no common reason for disagreement as each of these reasons differ substantially. Although only 3 out of 21 respondents disagreed, yet to ensure that all students would benefit from the activity, more thought in planning the assignment and in giving guidance to students would be needed in future assignments.

Those who found their learning enhanced gave various reasons, among them:

- *"The video clearly captures the overall situation of the activity."*

- *"It helps to review all the task carried out during the activity."*
- *"Some of the moments missed were captured by making the video"*
- *"It helps us to reflect the importance of what we did"*
- *"It helps in giving us the overview of what activities that we managed to do in contrary to the one we plan earlier"*

The main learning benefit derived from the making the video is the opportunity to review it later and to reflect on what has transpired. Experiencing the activity and reflecting upon it are two different matters. Reflection takes place after the experience. Based on Kolb and Kolb [11] experiential learning theory, concrete experience preceded reflective observation. Through reflective observation, the student would be able to make new meaning of the experience. This is called abstract conceptualization. With this new meaning conceptualized, they then proceed to actively experiment on the newly acquired concept. This is known as the Kolb's experiential learning cycle.

It is hoped that the last stage of the Kolb cycle will result in the involvement of the students in future community service activities as a form of active experimentation thus completing the experiential learning cycle. The video helps to enhance the second stage of the Kolb cycle, i.e., reflective observation stage. If the second stage is enhance then a flow through effect can be expected into the third and the fourth stages of the Kolb cycle.

A secondary benefit was that the students had experienced fun and team bonding in making the video.

- *"Had fun making, editing the video which is meaningful and can create awareness to society to care for these less fortunate."*
- *"Because it provides an extra activity for team members to bond and interact."*

3.2. Enhanced personal satisfaction

It was obvious that making the video and uploading it to YouTube made a huge impact on enhancing the personal satisfaction of the students with 95.2% (20/21) of the respondents agreeing. The only respondent who disagreed gave his reason as this: "*Felt that there was not enough time to make a good video*." In other words, if he had enough time to produce a good video then his response would have been positive.

Those who agreed gave various reasons, which included the following:

- *"Looking back at the moments shared with the orphans made me happy as I was able to bring joy to another one's life."*
- *"Seeing the children happy face is a bless"*
- *"Of course! It showed the work done and the expression of happiness from the kids were priceless"*
- *"It made me feel like I have done some good"*
- *"By watching the video it makes me happy"*
- *"Since the video was done after finishing the activity, the satisfaction of knowing that it was successfully completed."*

- *"It allows myself to appreciate and review what we have achieved together with the children"*
- *"We can better understand what we were doing"*
- *"To spread out and promote the mission of organization so that more people can help the poor people."*

The main reason for their satisfaction derived from the fact that the video served as a form of concrete evidence of the good that they had done. Memory may be unreliable, incidences easily forgotten and important details might be overlooked or went unnoticed. However, producing a video made a permanent record of their contribution. They can review this at any time to recreate the "feel good" experience all over again. Through this their satisfaction is enhanced. Therefore, it is hoped that this feel good factor which is easily accessible at the click of a button on YouTube will motivate them to contribute again and again to various community service causes in the near future and beyond.

3.3. Perception of greater contribution

This criterion was considered relevant because if the respondents perceived that their contributions were greater then there would be an increased likelihood of their future contributions. Based on the survey, only 61.9% (13/21) of respondents agreed. This was the lowest percentage of positive response from among the four categories surveyed. Those who disagreed gave the following reasons:

- *"Taking the video required us to set aside time from the given task. As we were dealing with food, we had to wash our hands before/after using the camera. It was slightly inconvenient"*
- *"The video is not directly related into helping the community"*
- *"The video has nothing to do with the contribution as it is only used to show what is done."*
- *"Contributions off camera cannot be seen"*
- *"Personal opinion, despite being the one in the group who worked on the video, its impact on myself regarding my contribution remains unaltered"*

The reasons that respondents did not perceive their contribution was greater because of the video could be categorized into these - video making was inconvenient due to the nature of the community service activity, it did not seem to directly help anyone, and it did not capture all of their contributions equally. This does not mean that the respondents did not believe that they had contributed meaningfully but only that their perception of their contribution had not increased despite the making the video due to the abovementioned reasons.

On the other hand, the respondents who agreed tended to give reasons such as the following:

- *"I do hope other people who watched the video see how fun CSR is."*
- *"Because it is an evidence which will be an example for junior students."*
- *"There is greater contribution in the sense that the video helps to encourage communities around the world to help people in need."*

- *"Sharing the video with others would possible make them want to contribute as well"*
- *"The video was shared in YouTube. So more people have the chance to see it and possibly gain inspiration or motivation to do such work."*

The main reason that the respondents perceived that their contribution was greater was because the YouTube video was regarded as a means to inspire others who watched it. This reason was important to them. There seemed to be an element of pride evident in these statements. Hence sharing the video on YouTube was found to be meaningful as well as purposeful for these respondents and by doing so it managed to increase their perception of their contribution.

3.4. Recommend future students of the module to make similar videos

85.7% (18/21) of the respondents would recommend future cohorts of students of this module to make similar videos. While this may be considered as a high agreement rate however it is still necessary to understand why there were respondents who disagreed. The reasons given by the 3 respondents who disagreed were as follow:

- *"Yes, no, maybe, really depends on what is trying to be achieved, but more no than yes."*
- *"Time consuming."*
- *"I would encourage doing more service learning and a reflective session rather than a video"*

The first statement is inconclusive. The second did not appreciate the extra work and failed to see the benefit of it. It is interesting that these two responses came from students who performed their community service at the environmental organization. This seemed to indicate that the nature of the community service itself may have played a part in their response. Performing tree planting and gardening related activities were more physically strenuous and hence would be considered as less "fun" compared to working with children.

The third disagreed response was from a student who performed community service at a handicapped children's home. This respondent also disagreed on two of the other survey questions and only agreed with the second question regarding enhanced personal satisfaction. The responses from this respondent in disagreeing on three of the four survey questions were as follows:

- *"The video seems to serve as a purpose for the sake of getting assessment marks rather than enhancing the overall learning"*
- *"The video is not directly related into helping the community"*
- *"I would encourage doing more service learning and a reflective session rather than a video"*

Even if one respondent that had these negative perceptions, nonetheless it still warranted thoughtful consideration. Although the majority of respondents had very different perceptions it still required the module coordinator to reexamine the implementation of this video assignment so that all students can appreciate its benefits. The improvement being considered would in all likelihood take the form of a more comprehensive pre and post service guidance.

Those who agreed gave mixed reasons that included the following:

- *"The video assignment was something different and new from other written assessment. Makes the assignment more interesting"*
- *"Taking pictures is just dull"*
- *"Because students will be more committed to community service. If only pictures are needed, there is a chance where students might fake the community service and did not really execute it."*
- *"It helps to show and review the activity carried out for others to view."*
- *"Hoping that the future student able to achieve the same outcome"*
- *"It is helpful in terms of academic work and also enhance an extra skill for students."*

To sum up, the students would recommend this added requirement to future students of this module because they found the video making interesting, it served as a record and a proof of their contribution, they wanted to inspire future students when their turn came to perform similar community services and finally they appreciated the opportunity to learn the new skill of making of a video to tell their story effectively.

3.5. Further discussion

It was apparent from the results that the disagreements mainly came from those who did their service activity at the environmental organization. Out of the 4 respondents who served at this environmental organization, all 4 had responded "no" on at least one or more of the questions, with one of them registering 3 no's. Hence it can be inferred that the nature of the activity is an important factor in the successful deployment and positive outcome of the video making assignment. Therefore, if video making is introduced as an assignment to enhance learning then the activity has to be carefully chosen. Ideally it should be an activity with some elements of fun and where the video making would not interfere too much with the service activity.

Apart from that, the respondents who answered with all yes's came up to slightly more than half of the total number of respondents at 52.4% (11/21). Those who responded with only one "no" were at 33.3% (7/21) and this represented respondents who served in all four organizations. One (4.8%) respondent registered two no's and unsurprisingly served at the environmental organization. There were two respondents with 3 no's (9.5%). One of them served at the environmental organization while the other served at the handicapped children's home as mentioned in section 3.4. No respondents responded with all four no's to all the survey questions.

4. Conclusion and Recommendations

A group video making assignment was introduced to students in the Professional Engineer and Society module. The students carried out their community service assignments at various charity or philanthropy organizations. Upon completing and uploading their videos to YouTube, a survey was conducted to assess four outcomes, namely, enhancement of learning, enhancement of personal satisfaction, perception

of contribution, and recommendation to continue with the video assignment to future cohorts. The survey results were positive in all these four areas surveyed.

Being able to review and reflect on their activity, having fun and team bonding, serving as a permanent record of their contribution, providing a "feel good" experience when viewing the video, inspiring others through the video, it was interesting and was an opportunity to learn a new skill were among the reasons cited by the respondents as positive outcomes. All of these positive experiences produced enhanced learning, personal satisfaction, perception of greater contribution and the willingness to recommend the same assignment to future students.

On the other hand, those who disagreed felt that their activity was interrupted if they had to make a video, failed to see the benefit of it but considered it merely as a means to get marks, felt they did not have enough time to make a good video, found it to be inconvenient, did not feel that it directly helped anyone, the video made did not capture their contributions equally, it was time consuming, and one of them had preferred more activity and reflection. However, these comments represented only a minority.

Hence it can be concluded that making a YouTube video of a short duration community service experience has managed to enhance the students' experience despite its short duration. One important aspect of making a video is that it helps the students review and reflect on the activity. This would not be possible while they were busily engaged in the activity but can only be done after the activity. This reflection process is enhanced by the video. Reflection is an important stage of the Kolb Experiential Learning Cycle. The video-making and subsequent reviewing adds to this stage. Nonetheless the activity can be further enhanced by adopting the recommendations suggested.

Recommendations in going forward would be to continue with the YouTube video assignment but with some enhancements. Providing more comprehensive pre and post service guidance would be one of these enhancements. This would include carefully explaining the rationale for making the video as a form of pre-service guidance. It would also include having a formal reflection on the video as an assignment and guiding the students through this reflection as a form of post service guidance. Finally, more careful selection of the type of community service that is amenable to video making would need to be considered

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Appendix A

A section of the survey

PES Video Assignment Survey

Dear all,

This survey is carried out to determine the effect that making a video of service learning while participating in it has on you.

I would appreciate if you would take some time to answer the questions below and provide me with some insight.

This study is intended for publication if the results prove to be meaningful. However your names will not be revealed if it is published. Your names are requested only because it may be necessary to contact you in case any clarification is needed.

Thanking you in advance for your participation,

DT

* Required

1. **Your name:** *

2. **Name of your service learning organization:** *

3. **Describe the service learning activity that you carried out:** *

4. **Q1. Did making the video enhance your overall learning from the activity?** *
   Mark only one oval.
   - ◯ Yes
   - ◯ No

5. **Q2. Please explain your answer for Q1.** *