

REFLECTIONS ON PRACTICE

Enhancing Undergraduate Students' Learning of Ethics Through Lecturer-developed Skits, Plays and Comic Strips For Longer Term Learning

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ABSTRACT

There is a plethora of literature which supports the employment of active learning techniques to sustain authentic learning beyond the classroom. This study investigates the effectiveness of a novel technology-driven active learning strategy to teach ethics to undergraduate engineering students at NUS. It involved creating scripts incorporating potential real-life ethical situations that these students may face in the workplace. These scripts were subsequently converted into comic strips and educational cartoons with the eventual goal of enhancing authentic and longer term learning. The lecturer evaluated the effectiveness of this strategy through a combination of student and instructor feedback and reflections as well as supporting comments from esteemed colleagues and conference reviewers. It was encouraging to note that an overwhelming majority of students responded positively to the strategy and were able to apply it to potential real-life situations they may face which underscored the novelty and effectiveness of this pedagogy.

Keywords: Educational cartoons; scenario-based learning (SBL), innovative teaching, skits and plays, active learning, student feedback, ethics, authentic and long-term learning, technology-enhanced learning (TEL)

INTRODUCTION AND LITERATURE REVIEW

It is important for students to be equipped with a robust understanding in ethics prior to entering the professional workplace. A strong background in ethics is essential in ensuring that students are able to cope with potential ethical dilemmas they may encounter in their jobs. The conventional methods of teaching ethics involve traditional didactic lectures and tutorials. However, considering the fact that learning ethics may involve discussions, touch on subjective issues and encompass 'grey areas', these may prevent students and teachers alike from forming absolutely correct 'model' answers. Thus, ethics lessons should go beyond simply studying rigid ethical rules and referring to conventional old case studies. Instead, instructors could help students construct and reinforce a strong ethical mindset and framework that can serve the latter in making ethical decisions (Keiler, 2017; DeNeve & Heppner, 1997; Druckman & Ebner, 2008).

There have been previous studies which examined the use of educational cartoons to teach various topics including social responsibility, science, engineering, law and medicine among other disciplines (Mills, Robson, & Pitt, 2013; Cheesman, 2006; Fleischmann, 2004; Newberry, 2004; Perlman & Varma, 2001; Quinn, 2006; Shallcross & Parkinson, 2006). Nonetheless, to my knowledge, this is the first study that examines the long-term learning effectiveness of lecturer-created ethical scripts, plays and cartoons on undergraduate engineering students, as well as simulated, real-life situations that the students may potentially face in the workplace. One reason for the lack of such studies may be the difficulty of creating such novel and relevant scripts to teach ethics. Many of these scripts and skits were inspired by real life ethical issues I have faced (or heard of) in my professional career as an engineer, researcher and the professional experience gleaned during my tenure in the medical device/pharmaceutical industry. Adding a touch of humour to the cartoons provided additional flavour to the learning of ethics, which at times can be 'dry and boring', and thus helped entice students to actively participate in the proceedings (Nestel & Tierney, 2007; Roberts, 2011).

The approach implemented encompasses active learning pedagogical techniques that impart students with an authentic learning experience and has been recommended by educators and students as an alternative to passive learning (Druckman & Ebner, 2008; Simonneaux, 2001; Beaton, 2009). In fact, according to Dale (1969), after two weeks of learning we tend to remember only 10-30% of what we read, hear or see, compared to 70-90% retention of what we do or practice, which forms the active learning component.

CONTEXT AND APPROACH

Research question and hypothesis

The fundamental questions I asked was whether we could create a platform where learning ethics may be fun and enjoyable, and students would be active participants in the lesson rather than passive listeners, which would help me attain my module and student learning outcomes. The fundamental hypothesis of this study was that creating real-life ethical scenarios that students may face in their careers and getting students to apply the ethics concepts they learnt within such scenarios would help them appreciate the relevance and importance of ethics and its implications in the engineering profession. Moreover, converting these scenarios into educational cartoons and engaging students in open-ended discussions on whether they may potentially face such situations in their professional careers, would stimulate independent thinking and allow them to be active participants in the learning process. Cartoons may also infuse a sense of fun/entertainment during the lesson and help attain the eventual student and module outcomes.

IMPLEMENTATION AND METHODOLOGY

This strategy was implemented in the module EG2401 “Engineering Professionalism”, a core module for all undergraduate engineering students at NUS. The teaching team comprised numerous tutors, including myself. In my cohort, there were 82 students participating. The implementation of this strategy in the ethics module was a multi-step process, described below:

- **Design and development of the script (Key component).** The first step involved the design and development of a relevant script by the lecturer (myself). The script was populated with potential ethical scenarios that students may face during their professional careers. The script and/or cartoons were provided to the students.
- **Enactment of the scripts/ethical scenarios.** The next step involved enactment of the script/ethical scenarios by the students (active and interactive component) in front of other discussion groups in the class and the lecturer (myself). The other groups participated in the post-enactment discussions.
- **Post-enactment activities.** These activities involved students having to identify the ethical issues in the scenarios. This was followed by open-ended discussions between students and the lecturer about possible and probable conclusions that may be derived from the script and enacted ethical scenarios.

- **Conversion of the scripts to comic strip cartoons.** With help from colleagues in the Centre for Instructional Technology (CIT) at NUS, the final step involved converting the scripts into comic strips and educational cartoons for active and authentic learning.

Students' assessment of the technique implemented and learning outcomes achieved

The efficacy of this active learning strategy was evaluated based on three factors: the level of student engagement, the level of argument/open-ended discussions and eventual retention of the essential learning outcome measures, as well as its ability to provide the students with an authentic, relevant and active learning environment. Meanwhile, the effectiveness of the technique adopted was evaluated based on the following criteria:

- Student feedback (qualitative and quantitative). I developed a comprehensive student feedback form specifically for this project (sample enclosed in Appendix C)
- My own reflections
- Individual and focus group discussions
- Comments/feedback from external experts and esteemed colleagues

Through the analysis of the student feedback, it was found that the techniques elicited positive responses in terms of student interest as well as their perceived educational value and relevance to real-life scenarios. One could argue that this approach provided a radical paradigm shift in terms of how ethics has been taught traditionally and proposes a new avenue/means of teaching such concepts. A specimen script and comic strip cartoon are enclosed in Appendices A and B respectively.

Data collection and analysis

Data and feedback from students were collected via a survey questionnaire developed specifically for this project (see Appendix C). It consisted of numerous qualitative and quantitative questions. The quantitative responses were graded on a Likert Scale (1 - "Strongly Disagree" to 5 - "Strongly Agree").

The Percentage (%) Total Score was computed with the following definitions:

The Raw Total Score was first defined as

$$\text{(Number of '5' responses * 5) + (Number of '4' responses * 4) + ... + (Number of '1' responses * 1)}$$

The Maximum Total Score was defined as
(Total number of responses * Maximum value of response, i.e. total number
of responses * 5=90)

With this, the Percentage (%) Total Score can be computed as
Raw Total Score/Maximum Total Score

An undergraduate teaching assistant was hired to compile the data and generate the graphs. No personal or student specific particulars were identified and collected. Most of students in the course willingly participated in the study. I also interacted and discussed the strategy with some of my esteemed colleagues who are also well-recognised educators. Their comments, opinions and feedback are included in the section “Results”.

Focus group discussions

For this study, focus group discussions were also conducted to collect more student feedback. The focus groups comprised 5-6 students who had previously taken the module, were more vocal and had expressed interest in contributing to the project and sharing their experiences/opinions. During the session, most opined that this was a novel and effective means of imparting relevant aspects of ethics that may not be obtained from traditional methods of teaching and learning. They appreciated the time and effort taken by the lecturer to develop the scripts and comic strip cartoons to impart active and authentic learning. Some also mentioned that this strategy should be more widely used across other modules, where relevant.

RESULTS

Student feedback (quantitative and qualitative responses)

The student feedback questionnaire consisted of qualitative and quantitative questions (see Appendix C), with 82 students responding to the survey. This section presents an analysis of a subset of the questions from the questionnaire. The Y-axis in the figures shown represents the percentage (%) of respondents. The questions analysed are:

- Q1: If the scenario-based exercise is a novel way to identify, understand, analyse and address potential ethical issues that they may face in their professional career in the future.
- Q2: The underlying rationale for undertaking the exercise was clearly articulated by the lecturer (myself).
- Q3: Timely feedback and/or encouragement was offered by the lecturer
- Q4: The post-enactment discussion was relevant and engaging

The majority of students responded positively to the questions, with almost 70-80% indicating that they appreciated the strategy. The positive results seem to indicate that students found it a novel method which was beneficial in helping them learn about the impact and relevance of ethics.

The following paragraphs display some of the quantitative and qualitative results collated. The positive qualitative comments from students helped to reinforce the conclusions from the quantitative data depicted in Figures 1 to 4. The results also helped me to achieve the module's learning outcomes.

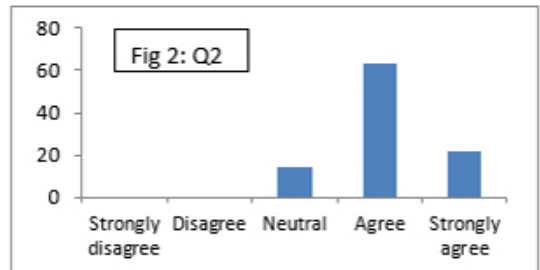
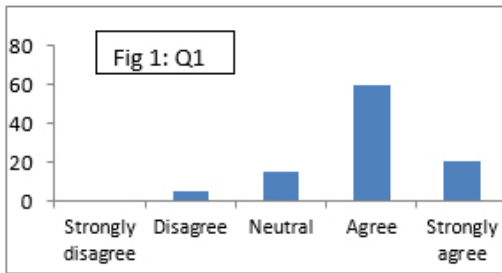


Figure 1. Results for Q1 “The scenario-based exercise is a novel way to identify, understand, analyse and address potential ethical issues that they may face in their professional career in the future.”

Figure 2. Results for Q2 “The underlying rationale for undertaking the exercise was clearly articulated by the lecturer (myself).”

According to the results shown in Figures 1 and 2, about 80% of the respondents indicated that they “Agreed” and “Strongly Agreed” to Q1 and Q2. Similar sentiments were found in the students’ qualitative comments:

- “I learnt many different ethical theories like whistle blowing and bribery and what to do or not to do during these situations. I also learnt how to analyze these situations properly and justify whether each scenario is ethical or not.”
- “I would suggest this to be more widely implemented as it will be useful to give students [a] more in-depth perspective of what it is like to deal with ethical problems.”
- “In a way, this is like an industrial attachment into the field of ethics.”

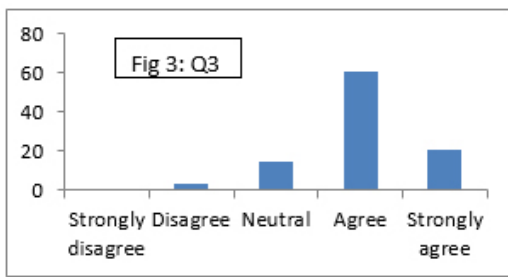


Figure 3. Results for Q3 “Timely feedback and/or encouragement was offered by the lecturer.”

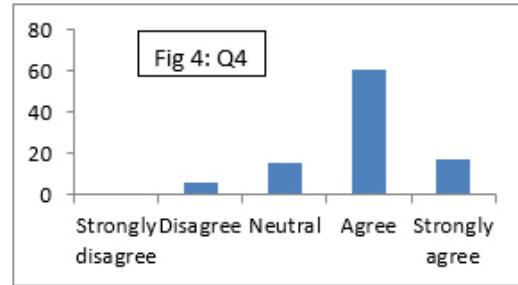


Figure 4. Results for Q4 “The post-enactment discussion was relevant and engaging.”

The results shown in Figures 3 and 4 were also positive, with at least 75% of respondents indicating that they “Agreed” and “Strongly Agreed” to Q3 and Q4. The students’ positive responses to the learning activity was also reflected in the qualitative comments:

- “It is engaging and a very innovative way to learn ethics. It allows me to learn about ethical issues through a fun-filled way and hence, enhances my learning experience.”
- “It was interactive so that I can know more about ethics from not only the tutor but also from peers. We were able to put ourselves in the shoes of whichever role we were playing, which was a fun experience. We also thought about what we were most likely to say if we were in that situation.”

I also received positive comments from colleagues and external experts when I shared about the development and implementation of this classroom activity with them, as shown below:

- “Innovative approach to using technologies to learn formally, with potential to develop the comic strip and/or more videos.”
- “The paper is original and identifies broad and insightful implications for the discipline.”
- “A useful contribution to the design of meaningful ethics education for tertiary students. Written in a manner that allows the ideas presented to be adapted and integrated by others.” (*Reviewers’ comments, Ascilite conference*)

- “I remember attending your talk at TLHE conference where you presented your pedagogical innovation in the field of dramatization in education. I found your presentation very interesting and, decided to try a similar experiment in my own GEM module. I designed a scenario and have some of the students act the scenes in front of the rest of the class. it was very well received by the students. More importantly, the discussion among students that I had planned benefitted significantly from the skit: it turned out to be more very lively and engaging than usual.” (*Anonymous; NUS ATEA award winner*)
- “Your teaching approach is innovative as it provides the students a “simulation” into a real-life situation where engineering ethics issues and concern could arise and how it could have been handled properly. It requires the student to self-internalise the role he/she is playing.” (*Anonymous, NUS FoE Innovative teaching award winner*)

MY REFLECTIONS

Scenario-based learning (SBL) as a strategy to enhance teaching-learning efficacy

As an educator who has been involved in teaching ethics and associated research, a fundamental concern for me has been how I might make the learning of ethics more fun and enjoyable for students, as well as make it more relevant to future ethical scenarios that they may face. One way to do this may be to create real-life incidences and encourage students to participate in scenario-based learning (SBL) activities which students would find interesting, fun and relevant as well as provide ample scope for active and interactive learning. Initially, the idea was to restrict myself to the skits and plays, but as I introduced this idea, I felt that students expected more, and I decided to make it a more interesting learning activity for them. That was when the idea of converting the skits and plays into comic strip cartoons dawned upon me. I felt that the comic strip cartoon format would be more effective in encouraging greater student participation in the learning activity. Thus, I took help from colleagues at CIT to convert the skits into comic strip cartoons and added some humour to promote them as educational tools to my students.

Challenges encountered and how I overcame them

A few students were concerned about the time commitment needed to identify and understand the ethical context depicted in the skits. To address these concerns, I ensured that they were fully aware of the rationale behind this learning activity and also emphasised the practical relevance of this

endeavour in the workplace. They were encouraged thereafter and participated wholeheartedly. In my opinion, it is the lecturer's responsibility to clearly articulate to student how they may benefit from this learning activity and thereafter it becomes much easier to bring them on board. Another challenge was developing a comprehensive story from a simple incident or observation into a comic strip cartoon, which included identifying the various characters involved in the skit and providing some background information. This process required some thinking on my part. However, once I conveyed my idea to colleagues at CIT, they did a wonderful job of fleshing out the storyline and characters in the comic strip cartoon that was developed. During the post-enactment discussions, students were more at ease once they knew the context. This approach of teaching ethics differs from traditional methods as the ethical scenarios presented in the skits and comic strip cartoons are more relevant and set in real-life situations which our students may potentially face in their professional lives. My role during the learning activity was that of a facilitator, mainly to ensure students stay focused during the activity and not veer off in a different direction, as well as to get them to understand the ethical concepts which are addressed within the scenarios. It was encouraging to note that students exhibited an enormous amount of initiative, sense of ownership and participation during the learning activity.

Assessing student understanding

The learning activity was voluntary and ungraded. The idea was to encourage greater student participation and open-ended discussion, which were comprehensively realised. I provided my feedback to students and helped them as and when it was needed to comprehend the underlying meaning behind the script with minimal handholding. It turned out to be an excellent learning experience for them.

In an interview which I conducted with one of the participating students 8 months following the conclusion of the module, this student was still able to recall and relate to what he learnt during the SBL learning activity, as well as apply what he learnt appropriately, indicating the longer term effectiveness of such novel teaching strategies.

CONCLUSIONS AND FUTURE DIRECTIONS

Based on the positive survey results collated for this study, one can conclude that this novel active learning strategy brought both the lecturer and students closer to attaining the module's outcomes. At the same time, it provided the students with an enriched learning experience which incorporated real-life scenarios and an active learning component which promoted long-term learning. In future, I plan to convert these comic strip cartoons to animations and use them as flipped classroom activities to further promote teaching-learning efficiency.

ACKNOWLEDGEMENTS

This Reflection is an extension of a previously published article [Musib, M. (2019). Creating and integrating relevant educational cartoons with scenario-based learning strategies to impart long-term ethics learning, *Int. J. Innovation and Learning*, 25(1), 50–63]. This Reflection specifically emphasises the qualitative feedback from the various stakeholders involved and my own reflections of the study, especially the challenges I faced during the implementation of the strategy and how I overcame them as well as how this approach enhanced the teaching-learning efficiency of the module, with specific reference to enhancing longer-term impact on students' learning process.

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APPENDIX A. [SAMPLE SCRIPT TO LEARN ETHICS](#)

APPENDIX B. [SPECIMEN COMIC STRIP DEVELOPED FOR THIS PROJECT](#)

APPENDIX C. [STUDENT FEEDBACK FORM DEVELOPED FOR THIS PROJECT](#)

ABOUT THE AUTHOR

Mrinal K. MUSIB is a Senior Lecturer in the Department of Biomedical Engineering at the National University of Singapore. His research and teaching interests include biomaterials, tissue engineering, regulation of medical devices and ethics. He is interested in integrating technology-enabled, novel pedagogical techniques to enhance students learning experiences, thus facilitate attaining both module and student learning outcomes. He has presented his work at various conferences and published in peer-reviewed international journals.