

# DESIGNING INSTRUCTION FOR ACTIVE AND REFLECTIVE LEARNERS IN THE FLIPPED CLASSROOM

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## ABSTRACT

**Purpose** – This paper proposes a framework of instructional strategies that would facilitate active and reflective learning processes in the flipped classroom. It is aimed at allowing one's maximum potential to be reached regardless of any individual learning style. As tertiary classrooms increasingly need to be as active and social as possible, the needs of the more introverted student could have been unintentionally overlooked. Therefore, the objective of this study was to produce an instructional design that could accommodate different learning styles and preferences in the flipped classroom.

**Method** – A design-based research approach was employed in three phases (preliminary research, prototyping phase and assessment phase) in a flipped communication studies course of 24 students. The instructional design, based on a literature review on the flipped classroom and Felder and Silverman's active-reflective learning style dimensions, was tested and refined over six iterative design cycles to produce a final design framework.

**Findings** – Qualitative findings via observation showed that despite a learning curve, the finalized instructional design was able to facilitate different learning styles satisfactorily. Added benefits included learner empowerment, engagement, motivation and improved communication and thinking skills.

**Significance** – As a design-based research, this study may be significant from the perspectives of both educational research and practice. Besides adding to the existent literature on different implementations of the flipped classroom, the proposed instructional design may serve as a practical guide for instructors who wish to flip their classrooms and spend face-to-face class time with their students on a more meaningful and personalized level.

**Keywords:** Flipped classroom, active-reflective learners, Felder and Silverman's learning style dimensions, design-based research

## INTRODUCTION

The flipped classroom is an increasingly popular approach where content is delivered outside of class via technology to keep students actively engaged during class. This approach is supported by learning theories derived from student-centred learning, which includes active learning, peer-assisted learning, problem-based learning, priming and learning styles (Bishop & Verleger 2013; Hamdan, McKnight, McKnight, & Arfstrom, 2013). One drawback of this approach is that it favours more active and collaborative learning activities which, while having positive effect on learning, leaves little space for individual reflection (Strayer, 2007). The literature has long suggested that more social learning environments can be too stimulating for the more reflective learner and possibly hinder their learning (Schmeck & Lockhart, 1983; Felder, 1996; Dewan & Ho, 2013). In the dominantly active flipped classroom, the needs of the introverted or more reflective student can be easily and unintentionally overlooked. Therefore, the instructor is responsible for creating a climate where all students, regardless of any individual learning style, will feel comfortable enough to contribute and excel in their preferred ways (Monahan, 2013; Honeycutt & Warren, 2014). This study was aimed at assisting the instructor in tapping into the different learning styles of their students in the unique learning environment of the flipped classroom.

### *The Flipped Classroom*

Classrooms have been “flipped” since as early as 2000 (Baker, 2000), and many definitions exist for the term “flipped classroom”.

This study referred to Bishop and Verleger (2013) who attempted to adequately represent the nature of the flipped classroom as “*an educational technique that consists of two parts: interactive group learning activities inside the classroom, and direct computer-based individual instruction outside the classroom.*” There are many examples of different implementations of these two parts in the literature. The individual instruction can range from a simple activity, such as watching freely-hosted videos at home, to complex ones, such as accessing videos and other supplementary materials, joining discussions and completing assessments on a learning management system (LMS) (Bishop, 2013; Engin, 2014, Lavelle, Stimpson & Brill, 2013; Hodkiewicz, 2014; Overmyer, 2014; Chen & Chen, 2014). A more complex model is often recommended; as flexible options, different formats and opportunities for sharing and reflection can enhance participation and engagement (Felder & Silverman, 1988; Strayer, 2007; Graf & Kinshuk, 2008; Franzoni & Assar, 2009; Liyanage, Gunawardena & Hirakawa, 2013). For group learning activities, problem-based and project-based learning have been deemed most effective in nurturing knowledge application (Hamdan et al., 2013; Hodkiewicz, 2014; Mason, Shuman & Cook, 2014; Siti Zuraidah, Rozinah & Nur Eliza, 2014). Discussion sessions are also useful to clarify content (Marks & Ketchman, 2014; Bormann, 2014), and Strayer (2007) and Linga and Wang (2014) have suggested that group learning activities be scheduled into segments. Despite the many ways a flipped classroom could be conducted, it is considered most important to ensure seamlessness and connectivity between the two aspects of the flipped classroom. This would enable students to be sufficiently primed before applying learning in the face-to-face sessions (Basal, 2010, Bishop & Verleger, 2013; Hodkiewicz, 2014).

In Malaysia, many studies have recently been carried out on the different implementations of the flipped classroom in local universities (Raihanah, 2014; Zaid, Baloch & Norhasliza, 2014; Lee, Ng, Tan, & Yoon, 2014; Mohamed Amin, Supyan & Ebrahim, 2014; Siti Zuraidah, et al., 2014). Most of the, research have focused on the recommended practices and technologies for flipping a classroom and the resulting perceptions of the instructor and students. However, very little attention has been given to the practice

of accommodating different learning styles in the dominantly active and social environment that is the flipped classroom, as previously highlighted by Strayer (2007), Monahan (2013) and Honeycutt and Warren (2014).

In an attempt to address this gap in research, this study proposed instructional strategies that would address the issue of the flipped classroom being dominated by active and collaborative activities that might sometimes feel “forced” upon the students. Based on previously highlighted issues about the flipped classroom, it was posited that the accommodation of a broad spectrum of learning styles could produce a more personalized learning environment, where students were enabled to learn in their preferred manner while simultaneously encouraged to work and think in new and different ways. Towards this end, a review of the literature on learning styles follows in the next section.

### ***Felder and Silverman’s Active-Reflective Learning Dimension***

Accommodating different learning styles in the classroom is supported by many learning theories such as Kolb’s Experiential Learning Theory, Gardner’s Multiple Intelligences and Felder and Silverman’s Learning Style Dimensions (Felder, 1996; Vincent & Ross, 2001; Cassidy, 2004). Felder and Silverman’s four learning style dimensions theory classified learners according to the *sensory-intuitive*, *visual-verbal*, *active-reflective* and *sequential-global* dimensions. The *active-reflective* dimension was a focus of interest in this study, as it dealt with how a learner preferred to process information, and was in a continuum that ranged from active learners to reflective learners. Active learners worked and learned better when they were able to try things out and engage in hands-on activities collaboratively, while reflective learners worked and learned better by individually thinking first about the information being presented (Felder & Silverman, 1988; Felder, 1996; Graf, Viola, Leo & Kinshuk, 2007).

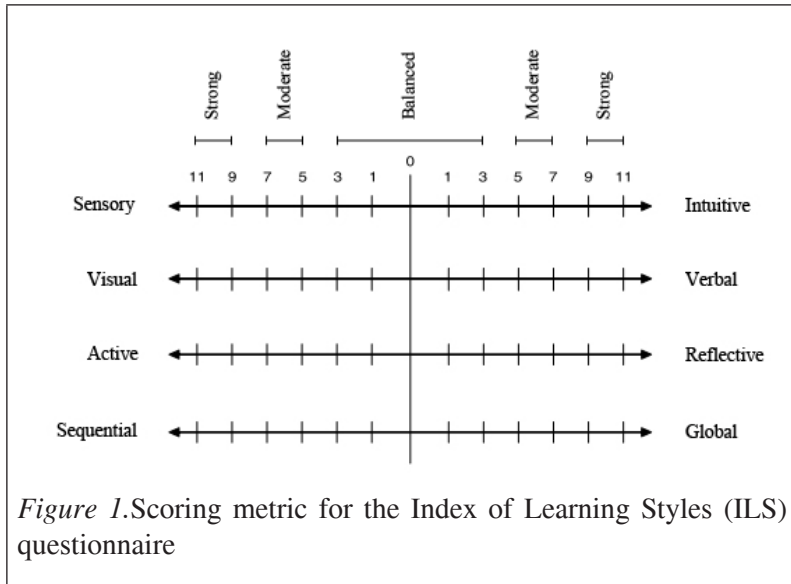
According to Felder (1996), active learners thrived in group work or problem-solving exercises with a small number of peers. Reflective learners however, needed frequent pauses during lectures to allow for reflection and formulation of possible questions, or assigning

of short writing tasks. Deibel (2005) suggested assigning group work according to learning styles, as she found that “involvement, participation and learning of the topic was greatly facilitated when assigning groups of members who generally approach problems with the same style, but not necessarily the same ideas”. Also, she observed that the different groups represented their findings in dramatically different and unique ways.

Graf and Kinshuk (2008) and Graf, Kinshuk and Liu (2009) suggested that learning styles could be indicated by students’ behavioural patterns and sequence of using features in e-learning. For example, more time spent on chapter outlines and examples, or looking at them first before attempting exercises could indicate a reflective learning style. Conversely, longer time spent on doing exercises instead of examples could indicate an active learning style. According to Felder and Silverman’s theory, reflective learners preferred to first see how others have completed a task before attempting it themselves; while active learners preferred just the opposite.

While differences in learning styles should be acknowledged and considered when designing instruction, we should note that the active-reflective dimension is a continuum and not either/or categories. Learning style profiles should not label or limit students (Schmeck & Lockhart, 1983; Felder & Spurlin, 2005). This is evident in the design of Felder and Soloman’s Index of Learning Styles (ILS), a questionnaire that assesses student preferences based on the four learning style dimensions (Felder & Spurlin, 2005). Scores range from 1 to 11 to indicate moderate to strong preference for a certain style, with 0 to 3 indicating a “balanced” preference (as shown in Figure 1). It can be seen that a learner can be indexed at any point on the continuum.

According to Butzler (2014), we should not simply “match” certain teaching styles with certain learning styles, but rather provide opportunities to take and construct the information in a preferred manner. Therefore, an instructional design that aims to accommodate a variety of learning styles should provide flexible options for the students, as this will encourage them to practice learning processes both in and out of their comfort zone.



The foregoing review of the literature on existing implementations of the flipped classroom and the accommodation of different learning styles as described by Felder and Silverman, suggests that a practical combination of the two might result in a new form of the flipped classroom. This new form may offer new insights into how the flipped classroom, while staying true to its identity as an active and social learning environment, can still encourage contributions and achievements that stem from individual reflections.

## METHODOLOGY

A design-based research approach (DBR) was deemed most suited for this study. The aim of a DBR is to solve practical problems in real contexts through tested and refined design of a technologically-enhanced solution while simultaneously producing design principles, hypotheses or theory that could inform future decisions (Reeves, 2006; Bakker & van Eerde, 2013; Kennedy-Clark, 2013). The DBR gave proof of not only *what* worked (as in approaches like action research), but also of *how* and *why* something worked, and this insight was obtained through the design of a new learning environment based on instructional theory (Bakker & van Eerde, 2013). Furthermore, the DBR was unique in the way that

the researcher could collaborate with practitioners to design the intervention, which was uncommon in educational research.

The sample consisted of 24 undergraduate students in communication studies taking the unit on “Consumer Behaviour” in a Malaysian private university. There were eight local students and 22 international students from seven different countries. A convenience sampling method was used as the instructor of the class and the researcher were acquainted as former colleagues, thus allowing for easier access to the class. Additionally, the course had just entered the second half of the semester after the mid-term examinations, so it was considered at a stage conducive for the study.

### ***3 Phases of Design-based Research***

This study was conducted following the three phases of the DBR: preliminary research, a prototyping phase and an assessment phase (Reeves, 2006; Kennedy-Clark, 2013). The three phases are described as follows.

#### ***Phase 1: Preliminary Research***

A research problem was first identified based on the issues that the instructor faced in her newly-flipped communication studies unit “Consumer Behaviour”. Firstly, the students did not seem to be interacting effectively enough with the course material on the LMS, which caused most of them to be ill-prepared for the in-class activities. This was evidenced by the observation of how many times links in the LMS were clicked on or downloaded, and by the activities conducted in class. The students still aimed to “score” by rote memorization without employing higher order thinking and needed to be pushed to be more active. Secondly, during collaborative activities, it was observed personally by the instructor that most students preferred to stay in their comfort zones. The more introverted students would contribute very little; while the more extroverted ones would do most of the talking, but rarely put thought into their work. This was contrary to the instructor’s previous experience with these students; she knew that some could perform very well individually when left to their own devices. Thus

she sought ways to encourage all her students to excel in any given situation, but also to practice learning processes that were new to them.

The research problem identified for this study is described briefly as follows. Although the instructor had sought to enhance her teaching by “flipping” her class, she felt that her students were still not sufficiently engaged. Also, there was a mismatch among the different personalities and learning styles in the classroom, which led to discomfort, disengagement and unsatisfactory performance during collaborative activities. Based on the instructor’s personal experience, she knew certain students could excel more while being active, while others could excel more by being reflective. As a result, one main research question was considered adequate for this study and was formulated as:

*“How can instruction for the flipped classroom be designed to facilitate active and reflective learning processes in an undergraduate communication studies course?”*

The first step in answering this question was to conduct a needs analysis that would identify requirements for a newly proposed instructional design. It was done based on a review of the theoretical frameworks underlying the flipped classroom (active learning, peer-assisted learning, problem-based learning, priming and learning styles) and studies on previous implementations of the flipped classroom. Felder and Silverman’s active-reflective learning style dimension in different learning environments was also reviewed. The identified requirements were categorised according to the two components of the flipped classroom, as follows:

#### *Direct computer-based individual instruction*

- Sufficient “priming” for recall and application of learning in class, for seamless connectivity between the two components (Basal, 2010; Bishop & Verleger, 2013; Hodkiewicz, 2014).
- Flexible options and freedom of choice instead of a static, pre-determined route (Strayer, 2007; Graf & Kinshuk, 2008; Graf, et al., 2009).
- Different formats of course material to appeal to different learning styles (Felder & Silverman, 1988; Franzoni & Assar, 2009; Liyanage et al., 2013). Videos supplemented



by PowerPoint lectures, web articles, etc. to encourage active learning as opposed to passive watching (Basal, 2010), and to avoid boredom (Triantafyllou & Timcenko, 2011; Chen & Chen, 2014).

- Enforcement (weekly assessments) to motivate students to self-learn (Herreid & Schiller, 2012; Raihanah, 2014).
- Channel for students to reflect and share, and for questions and feedback by instructor (Strayer, 2007).

#### *Interactive group learning activities*

- Scheduled into segments with a dedicated Q&A session (Strayer, 2007; Linga & Wang, 2014).
- Varied learning activities for student engagement and motivation (Hawks, 2014) and to encourage cooperation, collaboration and peer learning (Fulton, 2012; Hamdan et al., 2013; Maloy, Edwards & Evans, 2014).
- Opportunities to be both active and reflective by prompting individual reflection before sharing of ideas (Graf et al., 2007; Honeycutt & Warren, 2014).
- Inclusion of instructor-assigned groups based on student learning styles in group activities (Deibel, 2005).

#### ***Phase 2: Prototyping Phase***

The second phase was divided into two sub-phases: (i) prototype instructional design and (ii) iterative cycles of the instructional design in the classroom. As the DBR calls for data to be analyzed immediately, continuously and retrospectively (Wang & Hannafin, 2005; Kennedy-Clark, 2013), the data collection which begun during this phase and the methods used are reported in this section. However, the actual results of the observation of the iterative cycles (sub-phase ii) are reported as part of the findings in this paper.

##### *i) Prototype instructional design*

A prototype instructional design was developed based on the requirements identified in the previous phase, and a basic course structure was designed as follows.

The individual instruction would employ two platforms: the university learning management system (LMS) and Facebook. The

latter was used due to the limited features of the university LMS which had no channels for the students to collaborate, discuss or upload their own work. According to Hamdan et al. (2013), learning modes in a flipped classroom should be flexible and students should have the opportunity to demonstrate mastery, and interact or reflect as and when necessary. Also, social media can potentially enhance learning (Meishar-Tal, Kurtz & Pieterse, 2012; Friedman & Friedman, 2013). Features of Facebook such as wall posts, discussions, photo and link sharing, etc., were considered conducive to the learning of the course, and as all the students were already registered and familiar with Facebook, it was chosen as a suitable supplementary platform for the individual instruction.

In the LMS, vital course information such as the course outline, objectives, and schedule was made permanently available. Subsequently, the weekly lesson would be presented with three links, namely learning objectives and outlines, course materials, summary and reflection. The course materials included a variety of formats such as videos, narrated lecture slides and web articles. As suggested by Felder (1996) and Felder, Woods, Stice & Rugarcia (2000), the slides in the narrated lectures were interspersed with reflective questions and prompts. The summary and reflective questions at the end of the lesson allowed the students to reflect and self-assess their learning, enhancing retention and ideally priming them for the group learning activities in the face-to-face session.

As the learning process may differ according to different student learning styles and preferences (Felder, 1988; Graf & Kinshuk, 2008), materials were presented in clickable links and separate files to give some freedom of choice to the learner as to how they want to regulate their self learning. The more reflective learners could opt for starting with the topic outlines or examples, while the more active learners could start immediately on the course materials.

After reviewing the lesson in the LMS, the students were guided to the Facebook page to do a weekly assessment: either a short online quiz or simple task (e.g. *“Post a photo of what you think is a motivational message in advertising”*). These assessments would

enforce and motivate the students to be familiar with the content. The tasks were both active and reflective and attempted to get the students to think more about the topic while applying what they learnt. However, the tasks were simple enough to not be perceived as adding to the workload. In addition, all tasks related to a real-world context and further discussions and sharing were encouraged. Sharing and viewing answers, commenting on a peer's post or even clicking "like" could indicate active learning and peer-assisted learning. The instructor could also elicit student opinions to gauge their level of interest and receptiveness, or provide timely feedback to student queries.

The face-to-face session was scheduled into three segments: discussion/Q&A (45 minutes), collaborative learning activities (1 hour) and project-based learning (1 hour and 15 minutes). The collaborative learning activities, like the Facebook tasks, encouraged both reflective and active processes by getting the students to think individually about their solutions first, before sharing with a partner, group or class. The instructor alternated between forming groups based on learning styles and letting students form their own groups. The project-based learning allowed the students to use class time to work on their group project while being monitored and coached by the instructor. Furthermore, other students in the class were also able to observe and even participate, thus greatly facilitating peer-assisted learning. Using this method, students could be both active and reflective.

### *Data collection methods*

According to Kennedy-Clark (2013), observation is a consistent data collection strategy in the DBR as researchers are directly involved in the interventions. Observation provides a rich source of data that can help identify subtle shifts in classroom dynamics.

During the iterative cycles of this study, the students were observed on how they worked and interacted in both components of the flipped classroom and the instructional design was refined and retested until the end of the implementation period. For this study, the researcher was an outside observer and generally, only able to take notes of

each session remotely. The instructor, who was aided by a tutor, conducted on-site observations, and the field notes taken were separated into different categories of objective observational notes and speculative personal reflections, as suggested by Shatzman & Strauss and Burgess (as cited in Newbury, 2001), and Fetterman, (as cited in Brodsky, 2008). Video recordings were also made and analyzed by the researcher. In the two days after each face-to-face session, the instructor and researcher would have a brief online meeting to share and compare notes. For the data analysis, the researcher's remote observational notes were first compared with the on-site observational notes taken by the instructor. These were then analyzed to find issues that the researcher thought were important to the study, such as "anticipated themes", and new issues raised by the participants, or "emerging themes" (Anderson, 2010). Another additional data source was the dedicated class Facebook page, where the student posts and activities were also analyzed qualitatively.

### ***Phase 3: Assessment Phase***

In this phase, reflections on the analyzed data were carried out to produce a finalized instructional design framework that was considered effective in achieving the research objective, which was facilitating active and reflective learning processes in a flipped undergraduate communication studies course. This final proposal is reported in the findings section of this paper.

## **FINDINGS**

### **Iterative Design Cycles**

The data from the observation was analyzed and classified into anticipated themes and emerging themes as suggested by Anderson (2010). The results of this analysis, and refinements made to the instructional design, are as described in Tables 1, 2 and 3.

Table 1

*Anticipated and emerging themes during weeks 1 – 2*

| Week | Anticipated themes   | Emerging themes  |
|------|--|--|
|      | <p><i>Out-of-class:</i><br/>Students observed to be hesitant in joining Facebook activity</p>  | <p><i>Out-of-class:</i><br/>Students said they would prefer more guidance and be able to ask questions during the individual instruction. The instructor needed to highlight the use of the Facebook page to ask questions.</p>  |
| 1    | <p><i>In-class:</i><br/>Students were unsure how to self-regulate their studies and were not fully engaged or exercising both active and reflective learning processes yet.</p>  | <p><i>In-class:</i><br/>Students were clearly separated into active participants, reflective observers and disconnected non-participants.</p>  |
|      | <p><b>Refinements:</b> Introduction to the flipped classroom and guidelines for self-study were added to the permanent post in the LMS for easy reference.</p>   |  |
|      | <p><i>Out-of-class:</i><br/>A steep learning curve was observed for the self-regulated learning.</p>   | <p><i>Out-of-class:</i><br/>The chapter summaries were removed from the LMS to avoid direct memorizing and to train the students to construct their own summaries with the aid of key points and reflective questions. The quiz as a weekly assessment was found to be suitable for testing student knowledge and encouraged some reflective thinking. However, this did not encourage active learning satisfactorily. Also, many students perceived it as adding to their workload.</p> |
| 2    | <p><i>In-class:</i><br/>Students discussed individual learning patterns so as to enable them to reflect on and improve their own learning patterns. To involve the whole class in the project-based learning segment, the students were told to “assess” the researching group referring to a checklist, thus using both active and reflective learning processes.</p> |  |
|      | <p><b>Refinements:</b> Peer assessment added to the project-based learning segment to involve all students. Key points replaced full summaries in the LMS.</p>   |  |

Table 2

*Anticipated and emerging themes during week 3 – 4*

| Week | Anticipated themes   | Emerging themes  |
|------|--|--|
| 3    | <p><i>Out-of-class:</i><br/>Some students were observed to not click at all on the links to the chapter outlines. Otherwise, overall the class seemed to be more receptive towards the individual instruction as seen by their activities on Facebook. Many said that the reflective questions and prompts “forced” them to think, even though they were self-studying at home. Facebook discussions were livelier and students were seen to motivate each other to contribute. They started to take initiatives, like sharing related links and photos of themselves studying.</p> <p><i>In-class:</i><br/>It was decided to make the discussion time more flexible, depending on the topic.</p> <p><b>Refinements:</b> In the LMS, graphical topic outlines were added to supplement textual outlines, and pdf lecture notes were also added to supplement the slides, and to appeal to different learning styles and preferences.</p> | <p><i>In-class:</i><br/>A strong grasp of the topic and active prior discussions seemed to sufficiently prime the students for the in-class learning activity. Students were beginning to make meaningful connections between the priming and the application of learning. Most of the class members were engaged in the learning activity (active role-play and presentation) and students previously perceived as introverts made efforts to get themselves heard and understood. A positive increase in communication skills was observed in both face-to-face and online sessions.</p> |
| 4    | <p><i>Out-of-class:</i><br/>Student feedback on Facebook showed that they liked having control over their learning process, and many appreciated having the choice of different formats and versions of the outlines and course material.</p>  | <p><i>Out-of-class:</i><br/>The level of thinking skills used seemed to be getting higher as observed by interactions on Facebook. Students would not only read and comment on peers’ posts, but also analyze the answers given by the others, these they would debate or argue. Students were getting engaged in the discussions and wanted to contribute to other group discussions, showing more use of active and reflective learning processes as compared to in previous discussions.</p>  |

(continued)

| Week   | Anticipated themes   | Emerging themes  |
|--|--|--|
|  | <p><i>In-class:</i><br/>                     Instead of online, an interactive quiz was held in class using the gaming learning platform <i>Kahoot</i>, which was more active and engaging for the students. Reflective thinking was also evident due to the competitive element. Also, having their results displayed for others to see seemed to be a motivating factor for the students to do better.</p> | <p><i>In-class:</i><br/>                     A pattern emerged in the level of engagement and motivation of the students: an interesting topic actively discussed on Facebook would lead to higher engagement in the in-class learning activities, and vice-versa.</p> |
| <p><b>Refinements:</b> Online quizzes alternated with interactive quizzes held in class.</p> |  |  |

Table 3

*Anticipated and emerging themes during week 5 - 6*

| Week                            | Anticipated themes  | Emerging themes  |
|---------------------------------|---|--|
| 5                               | <p><i>In-class:</i><br/>                     Students completed the ILS questionnaire as part of a problem-solving activity and were assigned into groups based on their scores. Differences in learning styles and working methods were anticipated and observed. Students seemed to work effectively and comfortably when working with their peers of similar learning styles. Unlike in other weeks, this activity allowed the students to practice their own learning style preferences in a group.</p> | <p><i>In-class:</i><br/>                     The method of working and re-presentation of solutions by the different groups were very different, especially by the strongly active and strongly reflective groups, which were almost completely opposites (sketches versus a written step-by-step process). Students showed positive reception to the new and different way of assigning groups, but still preferred forming their own. Also, learning styles were found to be not good predictors of behaviour, as the students' ILS scores did not totally match with what the instructor had expected, expectations which were based on prior experience with the students.</p> |
| <p><b>Refinements:</b> None</p> |   |  |

(continued)

| Week                     | Anticipated themes   | Emerging themes  |
|--------------------------|--|--|
| 6                        | <p><i>Out-of-class:</i><br/>The carefully constructed Facebook tasks were able to facilitate both active and reflective learning processes. Peer-assisted learning was greatly facilitated, as there was opportunity for the students to observe their peers, reflect on and improve their own work.</p> | <p><i>In-class:</i><br/>A few students were still not participating satisfactorily even in this final week. The reason for this was, as observed there was a lack of interest or initiative on the part of the student and was difficult to address. However, obvious progress and change of attitude was perceived in many students; from being hesitant or confused to being motivated, engaged and taking lots of initiative in the collaborative activities.</p> |
| <b>Refinements:</b> None |  |  |

Figures 2, 3 and 4 show screenshots of student posts on Facebook. These showed evidence of motivation, engagement, higher order thinking skills, communication skills and positive reaction to activities in the flipped classroom.

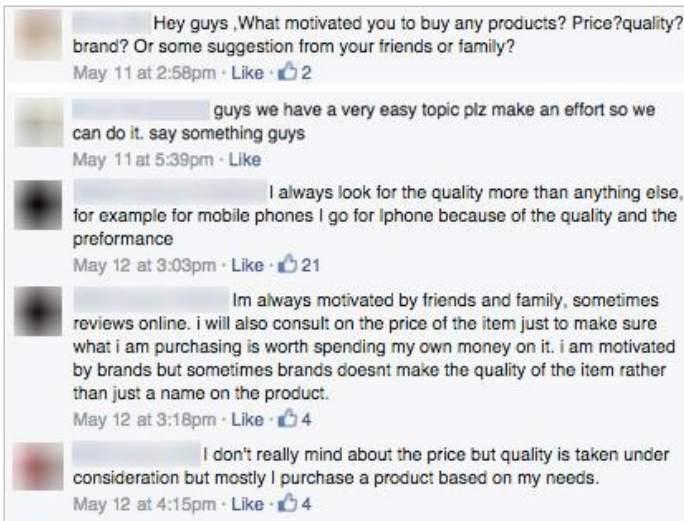


Figure 2. Week 3 discussions showing motivation and encouragement among peers when posting answers to a weekly task





Figure 3. Week 4 discussions showing higher order thinking skills being employed in a group discussion activity

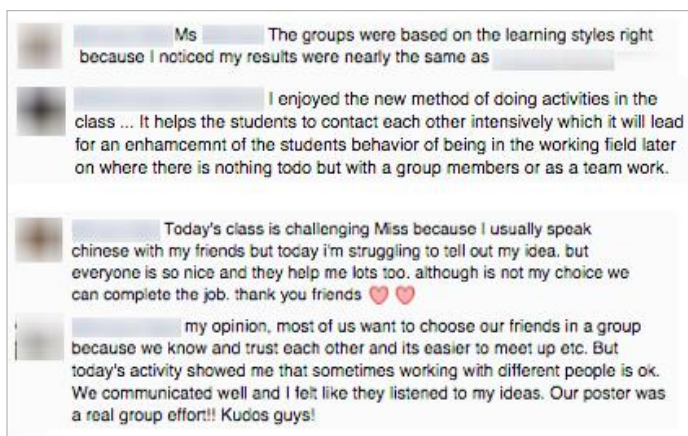


Figure 4. Positive comments made by students about the instructor-assigned groupwork based on learning styles in week 5

### Final instructional design framework

At the end of the six weeks, reflections were carried out on the refinements made during the iterative design cycles and the insights gained into how the students were able to learn and interact within the newly designed flipped classroom. This resulted in a final instructional design framework with characteristics found to be effective in facilitating active and reflective learning processes in the flipped classroom. See Figure 5.

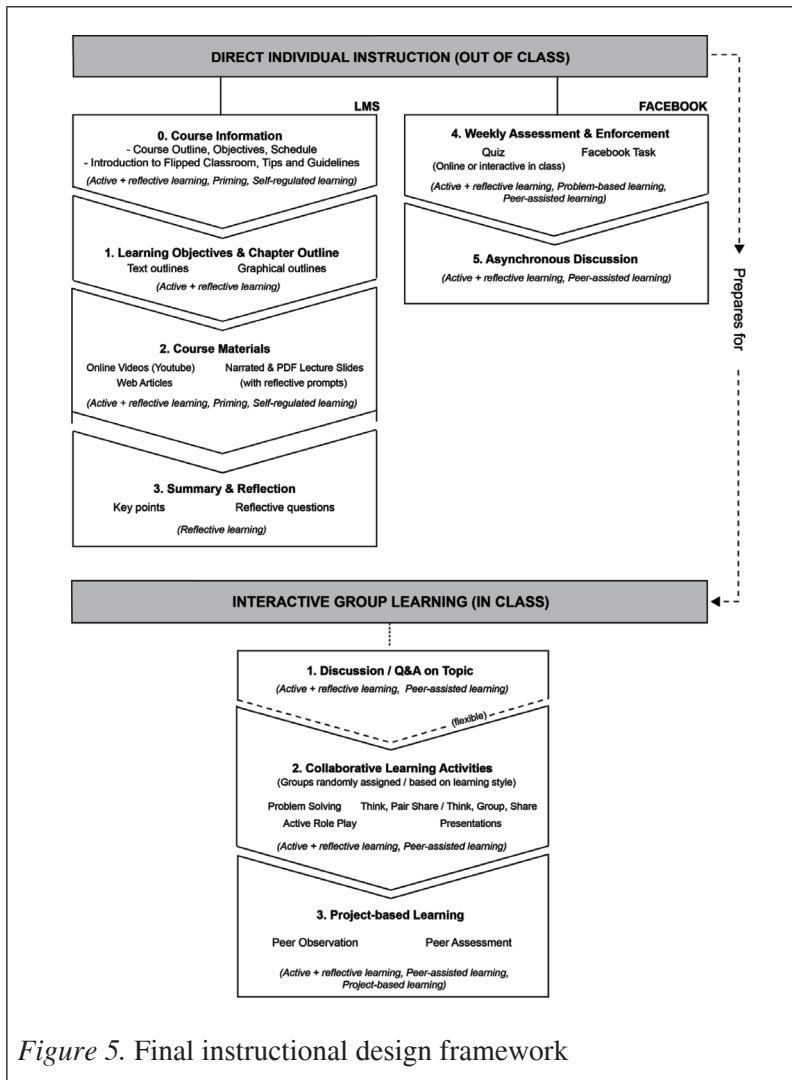


Figure 5. Final instructional design framework

As can be seen in the final instructional design framework (Fig. 5), the most important features that effectively facilitate active and reflective learning processes in the flipped classroom were:

- Variety of formats of chapter outlines and course materials (textual, graphical, video) for freedom of choice and to cater to different learning preferences.
- Lecture slides interspersed with reflective prompts.
- Individual instruction which concluded with a summary of key points and reflective questions for students to self-assess their own learning.
- Weekly assessment to be posted on Facebook for active discussion and peer-assisted learning which would also allow students to reflect on their own answers. Tasks to be problem-based and related to real-world context so students were actively engaged.
- Students were encouraged to discuss, comment or “like” peer postings. Also, sharing of helpful links, additional materials and photos were encouraged for both active and reflective learning.
- Quizzes alternated between online quizzes and interactive quizzes in class for different levels of active engagement and individual reflection.
- Seamlessness and continuity between the two separate components through discussions and Q&A during face-to-face sessions, allowing students to recall learning done in the individual instruction. Discussions could be considered active and thinking about unanswered questions or issues faced during the self-learning could be considered reflective.
- Collaborative learning activities provided the opportunity for individual reflection before active collaboration and sharing with other members of the group or class. Examples were paired or group problem solving, think-pair-share or think-group-share, and active role-plays and presentations.
- Alternating between randomly-assigned group work and group work based on learning styles provided students the opportunity to experience working with different people and practice learning processes both in and out of their comfort zones (can be either according to the instructor’s perception or through actual evaluations like the ILS questionnaire).

- Project-based learning activities provided students the opportunity to be personally coached and monitored by the instructor while indulging in peer-assisted learning through peer observation and peer assessment. These activities were both active and reflective in the sense that students needed to actively participate while observing and reflecting on their own work practices.

## DISCUSSION AND RECOMMENDATIONS

In this study, an instructional design framework was proposed to enable students to practice both active and reflective learning processes through a flipped classroom in an undergraduate communication studies course. The requirements and features for the instructional design were supported by established learning theories underlying the flipped classroom approach and Felder and Silverman's learning style dimensions model. The instructional design was first tested in the classroom in prototype form, and then it was refined over a period of six weeks which resulted in a final instructional design framework.

It was found that the proposed framework was able to effectively facilitate active and reflective learning processes during instruction in the flipped classroom. The instructional strategies were designed in such a way that there were ample opportunities for all students to learn and contribute in ways that were most familiar or comfortable for them, despite the heavy tendency towards active and social learning in a flipped classroom. Firstly, the individual instruction succeeded in priming the students for the application of learning in class (Basal, 2010; Bishop & Verleger, 2013; Hodkiewicz, 2014). Presentation of content using flexible options empowered the learner (Strayer, 2007; Graf & Kinshuk, 2008; Graf, et al., 2009; Nicolosi, 2012; Mehring, 2014) and the different formats accommodated different learning styles and preferences (Felder & Silverman, 1988; Franzoni & Assar, 2009; Liyanage, et al., 2013). A Facebook page allowed students to both reflect and share, and as for the instructor, to elicit feedback (Strayer, 2007). Online or interactive quizzes and simple tasks acted as enforcement and motivation (Herreid & Schiller, 2012; Raihanah, 2014). The group learning activities were

varied to engage and motivate the students (Hawks, 2014) and to encourage cooperation, collaboration and peer-assisted learning (Fulton, 2012; Hamdan et al., 2013; Maloy, et al., 2014). The activities incorporated both active and reflective learning processes by allowing for individual reflection before the sharing of ideas with members of the group or class (Graf, et al., 2007; Honeycutt & Warren, 2014).

While the designed instruction was considered to be successful in meeting the objectives of the study, it was nonetheless observed that there was quite a steep learning curve in this new approach, which may occur in future implementations. In the earlier weeks, the students needed more guidance and found it difficult to construct individual learning patterns (Siti Zuraidah et al., 2014; Lee et al., 2014). Also, it took time to get used to the highly social, engaging and collaborative environment in the face-to-face class and students were obviously separated into groups of participants and non-participants (Johnson & Renner, 2012; Larsen, 2013). However, by the end of the course, the students were familiar and comfortable with the flipped classroom approach and the required sharing, collaborating and communicating became almost second nature. Perhaps the most telling evidence that students had grown comfortable enough to properly engage with the materials in their preferred manner was that overall they voiced out positive perceptions towards the new way their class was being flipped. Also, the instructor was able to perceive several positive changes in her classroom, which included learner empowerment, engagement, motivation and improved communication and thinking skills. It is hoped that the resulting instructional design framework may be a useful and practical guide for instructors to flip their classrooms and spend face-to-face class time with students more productively, while encouraging their students to practice both active and reflective learning processes.

Recommendations for future research should include a closer study and monitoring of student activities, possibly by new techniques like data mining and learning analytics. Specific empirical data on how active and reflective learners learn and work differently with a variety of formats can also be helpful in producing more effective individual instruction for the flipped classroom. Also, quantitative data on the different learner styles and preferences of students may

give additional insights into how important facilitation of active and reflective learning processes are in the flipped classroom.

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