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Research Article

The role of pre-class asynchronous online video lectures in flipped-class instruction: Identifying students' perceived need satisfaction

Thanthawi Ishak[1], Rudi Kurniawan[2], Zamzami Zainuddin[3] and Cut Muftia Keumala[4]

[1]*Sekolah Tinggi Ilmu Administrasi Nasional, Indonesia (ORCID: 0000-0001-9290-520X)*
[2]*Sekolah Tinggi Ilmu Administrasi Nasional, Indonesia (ORCID: 0000-0003-3624-0025)*
[3]*Sekolah Tinggi Ilmu Administrasi Nasional, Indonesia (ORCID: 0000-0001-6436-4469)*
[4]*Sekolah Tinggi Ilmu Ekonomi Lhokseumawe, Indonesia (ORCID: 0000-0002-3729-6592)*

This study aims to develop and understand what motivates university students to use asynchronous pre-class online video lectures (AOVL) for flipped classroom instruction. The study was conducted using a mixed-method research approach. A post-questionnaire survey and a focus group interview were employed in collecting qualitative data. A total of 31 respondents answered questionnaires and 10 respondents were interviewed in a focus group discussion. The quantitative result of the descriptive analysis indicates that students had positive perceptions in terms of intrinsic motivation and self-efficacy. Besides, Pearson r correlation analysis shows a strong correlation between the whole constructs (i.e., between perceived autonomy and competence = 0.618, autonomy and relatedness = 0.939, and competence and relatedness = 0.747). Consistently, the interview discussion also reveals that the use of AOVL had successfully promoted students' learning motivation both in and outside of the classroom. Data were analyzed using thematic analysis and three key themes were identified, namely; (a) students' mastery of content materials outside of the classroom (b) students' interaction with peers and instructor, and (c) students' learning autonomy. Conclusions from this study confirmed that the use of AOVL in the flip-class setting had successfully promoted students' intrinsic needs based on self-determination theory (SDT) perspectives, namely: perceived competence, relatedness, and autonomy.

Keywords: Flipped classroom; Asynchronous online video lectures; Students' motivation; Self-determination theory; Information management and e-administration

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1. Introduction

Video has become one of the most influential components of learning sources in higher education and particularly employed in the blended learning context or flipped-class instruction (Dey & Bandyopadhyay, 2019). The employment of traditional chalk and talk lectures are now been replaced by some sort of digital technology such as online asynchronous video lectures and other means of innovative instructional pedagogies (Hasse, 2019). Flipped learning instruction with online asynchronous video-recorded lectures is one of those alternatives implemented in current

teaching and learning practices or contemporary industry 4.0 era (Yusuf & Nur, 2019). Bergmann and Sams (2012) claim that the flipped classroom instruction has become a new culture of learning, which has extensively been researched and adopted by many higher education institutions worldwide.

In the flipped classroom environment, students learn the contents outside of the classroom by means of video-recorded lectures and subsequently, more hands-on and discussions and subsequently are practiced during class hours. Video lectures prepared by the instructor or adopted from the third parties such as YouTube, Khan Academy, BBC News, or VOA News, and afterward administered to students as pre-class delivery content. Nguyen (2018) notices that there are plenty of attractive video lectures from websites that can be adopted by instructors in the flipped classroom context such as TED-Ed or YouTube videos. Students may watch the video outside the class and prepare some notes for in-class activities. During the class hours, students may learn through hands-on learning activities or discussions, and limited time is dedicated to the lecture's talks as they have watched the asynchronous online video lectures (AOVL) outside the class (Bergmann & Sams, 2012).

The flipped classroom instruction with online video lectures has provided numerous benefits which are inaccessible in conventional classrooms (Shi, Ma, MacLeod, & Yang, 2019). Students may watch the video lectures asynchronously outside the class at their paces and according to their preferred time. Students can also pause and stop video lectures if they need a break or rewind if they miss something. The class learning time will become more available for students to interact with peers, engage, and obtain immediate feedback from the instructor (Kim, Kim, Khera, & Getman, 2014). Furthermore, the most meaningful aspect of applying the flipped classroom is to enhance student-centered learning. Awidi and Paynter (2019) note that students in the flipped learning environment may confidently participate in-class activity since they have learned the content at home, whereby the class time is more valuable for discussing and exchanging ideas.

1.1. Students' Learning Motivation

Motivation is defined as willingness, enthusiasm, and initiative, forcing people to take action and achieve a goal (Wlodkowski & Ginsberg, 2017). In education, motivation is confirmed as one of the essential factors to support students' learning performance. The rise of digital technology in education has also approved to promote students' motivation and learning engagement. For example, Chaiprasurt and Esichaikul (2013) claim that the adoption of technological means is useful to stimulate students' learning and especially in terms of students' involvement in learning or the so-called students' engagement.

The American Association for the Advancement of Science (1993) notices that the discovery of some sort of technological device aims at developing human life and making life more accessible and better. Technology has evolved the learning environment to be better and efficient. Students can now obtain several learning sources not only from the instructor but also from the internet such as video lectures, which serve to promote levels of student participation in class and autonomous learning outside the class (Yu, 2019). Numerous motivational theories have widely been researched and practiced in an educational context, particularly in advancing students' autonomous learning skills (Deci & Ryan, 2002). However, little is known regarding the use of Self-Determination Theory (SDT) in terms of flipped classroom implementation, particularly related to perceived needs for competence, autonomy, and relatedness.

The concept of SDT has been widely realized in discrete levels of education including schools and universities to examine the way to motivate students and instructors in the teaching-learning process. In self-determination theory, motivation is classified into intrinsic and extrinsic motivation (Abeysekera & Dawson, 2015). On the one hand, intrinsic motivation commits to students' enthusiasm to produce actions because of pleasure, interesting, engaging, delightful, exciting, and interesting (Deci & Ryan, 2002). On the other hand, extrinsic motivation leads to the desire to accomplish the reward and incentive and avoid being criticized or punished. Students

with external motivation are more likely to expect a reward for what they do, and they are inherently non-autonomous personalities.

Figure 1 depicts the conceptual framework designed in this study adapted from the study of Zainuddin and Perera (2019). The design of this conceptual framework is based on three principles of Self-Determination Theory, namely; competence, autonomy, and relatedness. In a competent skill, students are expected to master the knowledge or concept. In a relatedness skill, students are assumed to form social interaction with peers and instructors. While in an autonomous skill, students are supposed to learn independently at their own pace or learning autonomously.
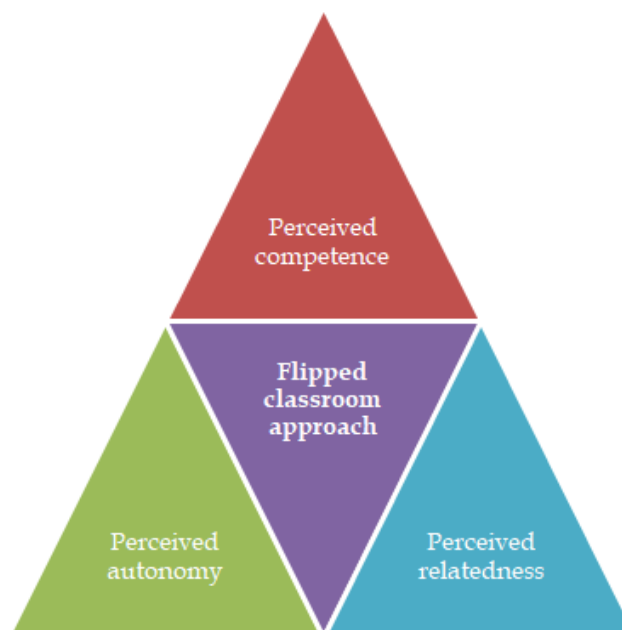

Figure 1. Conceptual framework of students' perceived needs satisfaction in the flipped-classroom approach

Besides, according to Deci and Ryan (2002), in addition to intrinsic and extrinsic motivation, SDT also discusses the concept of amotivation and it is defined as the lack of any self-determination or the state of lacking the intention to act. However, this study only takes to explicitly focus on both students' intrinsic and extrinsic motivation in the flipped classroom with AOVL as recommended by Abeysekera and Dawson (2015). Employing SDT as a research framework, this study attempts to answer the following research question:

(1) What motivates the university students to access asynchronous online video lectures (AOVL) in the flipped classroom instruction?

(2) How do students perceive competence, autonomy, and relatedness in their learning behavior?

2. Method

2.1. Research Design and Participants

This study employed a case study design consisting of data from a quantitative questionnaire survey and in-depth qualitative interviews. A mixed-method research approach was used which is in coherence with a statement of Creswell (2013) that it would strengthen both quantitative and qualitative data and support each other in findings and a discussion. The research participants were undergraduate students from a private university in Indonesia –the course was Information Management and E-Administration. The researcher employed a purposeful sampling since it explored a specific time, place, group, community, and person (Creswell, 2013). Since only one class adopted the flipped classroom instruction with the AOVL, and is, therefore, the sample of

this study was selected from this group of participants. Some 31 students completed survey questionnaires and 10 students voluntarily participated in a focus group interview.

2.2. Data Collection Tool and Data Analysis

In order to support the quantitative findings, qualitative data were subsequently collected through an in-depth focus group interview. The interview questions were designed in the form of a list of topic questions focused on students' motivation for learning based on competence, relatedness, and autonomy. In this study, the researcher analyzed both data separately, starting with quantitative data, and followed by qualitative data. This study is considered as an explanatory sequential design, where qualitative findings help explain the initial quantitative results (Creswell, 2013). The questionnaire data were analyzed in descriptive statistics and Pearson r correlation was also employed to analyze a statistically significant association between constructs (e.g., between perceived competence and autonomy).

The questionnaire's 5 Likert scales were interpreted in ordinal data to determine that one score was higher than the others. The focus group interview data were analyzed using thematic analysis. This analysis was accomplished through the process of coding in six stages to discover meaningful patterns, namely: familiarization with the data, generating initial codes, searching for themes among codes, reviewing themes, defining and naming themes, and producing the final report based on themes (Braun & Clarke, 2006).

2.3. Process

The flipped classroom instruction was implemented throughout the semester of study (January 2019 - May 2019) as a way to observe students' perceived competence, relatedness, and autonomy and the progress in their learning activities. In its practice, out-of-class activities are as follows: online video lessons prepared and distributed to students, the students watched video lectures online asynchronously and were required to take notes. All video lectures were recorded and distributed to students' learning before class. The following Figure 2 is a sample of a video lecture recorded by a lecturer.

POAC, Mata kuliah Manajemen Informasi & E-Administrasi

Figure 2. A sample of video-recorded lecture

For in-class activities are as follows: the instructor checked students' notes, a short quiz was also conducted to help ensure that students came to class prepared or have watched the video lectures at home. The instructor then integrated hands-on learning activities and experiential learning events which yield immediate feedback through discussion with peers and/or instructors, so that more class time was available for interactive activities.

3. Results

The processing of findings of this study began with the analysis of survey responses, continued with the focus group interview. According to the response rate analysis, 31 students completed the survey and 10 students were involved in the focus group discussion.

3.1 Quantitative results

This section attempts to answer the research question addressing the students' motivation using the AVOL in the flipped classroom instruction. The preliminary results indicated that the sample comprised 17 female students and 14 male students. Descriptive statistics (percentage, means, and standard deviations) as a preliminary analysis are presented in part of the paper (see Table 1).

Table 1.
Descriptive statistics of students' positive attitudes toward needs satisfaction (motivation) (n = 31)

Constructs	M	SD
Perceived autonomy		
1. Using online video outside the class enabled me to pause, stop, rewind and fast-forward according to my learning needs	4.48	0.51
2. I was able to watch the video lectures independently at my own time	4.23	0.42
3. I would have more control in my coursework while using online video lecturers	4.13	0.34
Perceived competence		
4. Using the video lessons outside of the classroom enabled me to better understand the subject	4.16	0.37
5. After watching online video lectures outside the class, I felt prepared for in-class activities	4.64	0.49
6. I am confident in my ability to learn through online video lectures	4.19	0.40
7. I felt very competent after watching video lectures outside the class	4.22	0.42
Perceived relatedness		
8. I felt I learned a great deal from other students in this class.	4.23	0.42
9. I was able to share my knowledge and understanding with peers	4.16	0.37
10. Watching online video outside the class made me confident to interact with other students and instructor in the classroom	4.52	0.51

Items 1-3 report students' learning autonomy in the flipped classroom instruction. Item 1 shows students' positive perception toward the controlling of the AVOL, allowing students to control the pace by which they are learning. This reveals that the students confirmed that the use of the AVOL outside of the class enabled them to pause, stop, rewind and fast-forward according to their learning needs or as many times as they wish. Item 2 also confirms that the students could use the AVOL independently to facilitate their learning. It allows students to have more flexible time to study and understand the contents deeply. While the analysis of item 3 reveals that the students had more control in their coursework while using online video lecturers. Students could search for additional materials, if needed, to accelerate learning and mastery of the content before attending class.

Items 4-7 report students' learning competence in the flipped classroom instruction. In item 4, most students believed that using the AVOL outside of the classroom enabled them to better understand the subject. This implies that watching the videos regularly before the class is essential to support students' learning and understand the topic more easily. For item 5, it shows a high

percentage of students' responses, where more than 90% of the students acknowledged that after watching online video lectures outside the class, they felt well-prepared for in-class activities. This implies that the better students are prepared, the more learning that can be achieved. Furthermore, the report of item 6 shows that the respondents consistently mentioned that they were significantly more confident in their skills and ability to deal with anything during the class activities. This finding is in correlation with the report from item 7, where most of the students acknowledged that they felt very competent after watching video lectures outside of the class and were more engaged in in-class activities.

Items 8 reported students' perceived interaction with peers and instructors. This report reveals that most students learned a great deal from other students, particularly in a team-building exercise and a group discussion. Students show their willingness to talk and share knowledge with each other in a conversational or task context. This finding was in correlation with the finding of Item 9, where more than 80% of the students acknowledged that they were able to share knowledge and understanding with peers regarding the content from the video lectures. Finally, as a consequence of viewing online video lectures before coming to class, Item 10 reveals that more than 90% of the students could be more confident to interact with their peers and instructor in the classroom.

From items 1-10, we found three items with a greater percentage and mean of respondents. Firstly, item 5 with the highest percentage and mean (M = 4.64, SD = 0.49), implies that the use of online video lectures as an asynchronous classroom preparation has provided the opportunity for students to address gaps in knowledge preparation and to build a framework for higher-level understanding and control action. This concludes that the better students are prepared, the more learning that can be achieved. This finding confirmed students' philological need for competence based on SDT. Secondly, item 10 reveals that the students could be more confident to interact with their peers and instructor in the classroom (M = 4.52, SD = 0.51). This implies that the use of asynchronous classroom preparation using online video lectures allows students a chance to talk in the classroom, helps them learn from others, views topics from multiple perspectives, and enhances critical thinking and problem-solving skills. This finding confirmed students' philological need of relatedness based on SDT. Thirdly, item 1 confirms that the use of the AVOL outside of the class enabled students to control the lectures, by pausing, stopping, rewinding and fast-forwarding the video according to their learning needs or as many times as they wish (M = 4.48, SD = 0.51). While watching the video, they could also take notes on the material in preparation for class activities and discussions. This finding confirmed students' philological need for autonomy based on SDT. The three intrinsic needs are summarized in Table 2 shows that all constructs are positively returned by students.

Table 2.
The summary of the three intrinsic needs analysis (n = 31)

Constructs	M	SD
Perceived autonomy	4.28	0.34
Perceived competence	4.31	0.33
Perceived relatedness	4.30	0.34

Besides the descriptive statistics presented above, pearson *r* correlation was employed to determine the relationships between the three constructs. Table 3 exposes that all constructs are positively correlated with each other. For instance, a strong correlation reveals between students' perceived autonomy and competence (0.618), perceived autonomy and relatedness (0.939), and perceived competence and relatedness (0.747). This finding implies that students in this instruction have achieved a greater level of intrinsic motivation since the three intrinsic needs were satisfied and positively correlated with each other.

Table 3.
Correlation coefficients between constructs (n = 31)

	1	2	3
1. Perceived autonomy	-		
2. Perceived competence	0.618**	-	
3. Perceived relatedness	0.939**	0.747**	-

**. Correlation is significant at the .01 level (2-tailed).

3.2 Qualitative results

The qualitative approach aims for an in-depth understanding of students' perceptions of learning motivation using the AOVL in the flipped classroom. This analysis explains in more detailed and comprehensive information to support the preliminary quantitative finding. Findings indicate that the students in this study were in general motivated to learn through online video lectures outside of the class. They believed that this instruction could help improve their autonomous learning, accelerate learning, and increase students' engagement and interaction with peers during classroom activities. From the focus group interview data, students' motivations to use AOVL were captured in three main themes comprising, (a) students' mastery of content materials outside of the classroom (b) students' interaction with peers and instructor, and (c) students' learning autonomy. The following section describes each of the themes.

3.2.1 Mastery of content materials outside of the classroom

Several students (S1, S3, S6, and S10) reported positive perceptions with the use of video lectures as the pre-class lecture materials. They acknowledged that the use of online video lectures let them move at their own pace, rewind to review portions and skip through sections they already understand the meaning. Students come to class with some active learning activities such as a discussion or presentation. One stated that they could replay or pause the video when missing some points. She indicated her opinion as follows:

> "*I can learn a difficult topic step-by-step. Sometimes, I need to pause and replay the video when I find the lecture speak very fast. I try to pause the video and look for the meaning in a dictionary, and after finding the meaning I write it down on my note and continue listening to the video. I watch and repeat several times until I get the whole points from the lecture*" (S1).

Similarly, another student remarked:

> "*Yes, different videos have different lecturers, so when I find a lecturer give a talk with unclear words, I need to pause and repeat it to catch the point. But, anyway, I like this way of learning because I could prepare to learn and master some materials before coming to the class. You know, if the lecture is delivered in the class, not all students could get the pint in a single explanation; different students have different capabilities in understanding the lectures. So that by watching the video we can learn according to our needs*" (S6).

With the online video lectures, instruction used to occur in class is now accessed at home. The interview data also revealed that the students felt confident to talk in-class discussion and they came to class prepared. One of the participants in the focus group commented as follows.

> "*By watching video lectures outside the class, I feel confident to speak in the class. I have prepared some notes at home and I have a concept of what I should say in the class. Also, I feel confident to ask a question during a discussion*" (S6).

Related to this issue another student also noticed this during a focus group's discussion.

> "*This class gave me more time to understand learning materials outside the class and this is very helpful for me, help me to perform better in the class, I believe that the more I practice, the more makes me perfect. I think, if all students have good preparation outside of the class, they will also be great and*

awesome during the class activities. All students will be active and confident to share the idea and ask a question because they have prepared a note before coming to class" (S10)

Another student noticed that she could formulate questions about subject points that might need further explanation in the class.

"*At least, about fifty percents I knew the main topic that would be discussed in the class.....and although I didn't understand some important points on the video, I could prepare a note and bring to class to ask other students and lecturer*" (S8)

4.2.2 Students' interaction with peers and instructor

The second theme emerged was that flipped learning improves the quality of peer learning and interaction between students. Students acknowledged that the in-class activities provide more opportunities for interaction among peers as well as with the instructor as opposed to traditional lecture.

"*In this class, I have more opportunities to interact and collaborate with my friends, ask questions and discuss some important topics. This is very different from my other class.....we only listen to lectures and doing some exercises. We don't have such activity.....I mean a group discussion or knowledge sharing among students. I think this class is more interactive than the others, yeah, better, according to my experience*" (S6)

Another student emphasized the advantages of watching video lectures outside of the class that she became more confident to talk with other students regarding the topic. This belief is reflected in the following statement from a student participant.

"*After watching video lectures outside the class I feel more confident to express my idea with other students and lecturers. If I don't watch the video, of course, I don't have enough preparation and I feel not confident to interact with others, especially in a discussion session*" (S4).

Students also stated that they could obtain new ideas and problem-solving skills from a peer-learning activity. One stated:

"*During the class session, I listen to other students' talk and I learn many new things, I also learn how to work in a group and solve a problem together, learning in a team is a good idea I think*" (S1)

Similarly, related to teamwork and problem-solving skills, another participant in the focus group commented that they also learn leadership skills through group work in the class. One of the participants in the focus group commented as follows.

"*From a group work in the class, we can exchange ideas and knowledge, and we receive much information from other students. I think through this activity we can learn not only to solve a problem but also we learn about a leadership skill, and this skill is very relevant to our real world in the future, how we work later with other people such in the office, school, or company, and we need to make it as a culture in our learning activities and supposed in other subjects though*" (S5)

4.2.3 Students' learning autonomy

The AOVL does not only support students to prepare lesson outside of the class and interact with peers in the class but also allow students to learn the subject autonomously, accessing the lesson at any time, any place and as many times as they please. As University students, they believed that they could handle independent learning more readily in the flip-class environment. Students enabled to take responsibility for their learning, to be more self-directed, to make decisions about what they will focus on and how much time they will spend on learning the contents or watching video lectures both inside and outside the classroom. The students shared their views regarding

their independent learning outside the class. Most of the students revealed that their flipped classroom experience improved their self-paced learning. Their relevant responses include:

"I could control my learning, study whenever I want and I could replay several times when I need it. If listening to a real lecturer's talk in the class, we probably could not pause and replay the video according to our need, but using the video is very helpful" (S1)

"It is great that the lectures are moved on the video, we can bring home the lecturer. I mean the lecturer is now more flexible to teach me through a video. I can listen to my home and at any time I wish. I think this is a kind of flexible learning" (S3)

"I think such kind of learning method is very important to support our independent learning skills, mmm, because as a university student we need to be more autonomous, not only in watching video lectures in this course but also to train us to become more autonomous to read more books and write more papers after this course" (S4)

Watching online video lectures outside the classroom could strengthen student autonomy leading to more personal responsibility for learning, particularly for improving self-paced learning capability. The following student voiced out this belief. One student recommended further class using additional material besides video lectures to improve reading skills.

"I think in the future of flipped classroom, additional material such as PowerPoint Slide show or PDF also provided. So, besides watching and listening to videos, we also practice reading and reviewing some texts" (S5)

The flipped classroom instruction in this study has fostered students' autonomous learning because they were provided with autonomous instruction employing video lectures. However, one of the students recommended that the future of flipped classroom practice should use various and multiple materials, and not only limited to the video lectures. This implies that additional activities or a variety of instructional tools should be used in future studies instead of just videos to foster students' autonomous learning.

4. Discussion

Students were positive regarding their motivations for learning Information Management and E-Administration course with the flipped classroom approach. The findings of the study confirm that students have fulfilled the three basic psychological needs of SDT. These results support recommendations made by Abeysekera and Dawson (2015) that the use of SDT in the flipped classroom environment might improve student motivation to produce basic psychological needs of competence, autonomy, and relatedness. In terms of students' competence, the findings reveal that all students felt competent with tasks and activities, and able to control learning outcomes. In the focus group interview, students acknowledged that they came to class prepared and felt confident to talk in a class discussion. One student noticed that she could formulate questions about subject points that might need further explanation in the class while another acknowledged that using video lectures had motivated her to listen to the topic step-by-step and sometimes replay or pause the video when missing some points. Besides, students also come to class with some active learning activities such as a discussion or presentation.

In line with this, several studies about the flipped classroom approach have been done and reveal that the participants have fully engaged in the learning tasks, making them more active and competent in the whole learning process. Students take ownership of their learning and are thoroughly prepared before coming to the class to work in pairs (Hung, 2015). Kim et al., (2014) also notice that students feel motivated to attend class and engage in in-class activities because of having prepared beforehand at home. In this stage, students also would not be bored, restless, disruptive, and disengaged in learning activity because they would no longer be listening to the teacher's talk all the time in the class. According to Deci and Ryan (2002), the more competent

individuals perceive themselves in an activity, the more intrinsically motivated they will be at that activity. The flip-class in this study also recorded students' learning autonomy. The flipped model had successfully integrated a flexible learning environment, established student-centered learning, and advanced responsibility, active and autonomous learners. Most students considered that learning in the flip-class had encouraged them to study independently at their pace. They were aware that, as adult learners, they needed to explore their knowledge independently and not always depend on the instructor as the center of knowledge and information.

By assigning small group activities, instructors can engage students in multiple levels of critical thinking. The findings of this discussion were supported by a current study reported by Zainuddin and Perera (2018) that the flipped classroom setting have successfully constructed students' problem solving and critical thinking skills and enabled students to interact with each other in a small group discussion and gain higher levels of understanding in learning. This implies that students in a group learning situation are the best way to foster critical thinking or higher-order thinking skill. This finding of this study was also alike with the results reported that the flipped classroom instruction enables students to get out of their seats and interact with each other, to build learning communities and exchange ideas to solve problems (Kim et al., 2014; Love, Hodge, Corritore, & Ernst, 2015; Little, 2015; Sun & Wu, 2016). This can be assumed that the more interactive individuals perceive themselves in activities, the more intrinsically motivated they will be.

5. Conclusions and Recommendations

This study summarizes that the flipped classroom creates the potential for student-centered learning, peer interactions, and personalized instruction. They have a greater opportunity to work at their own pace outside of class hours. Consequently, it has promoted students to develop self-management skills, and allow them to engage in interactive learning in the class through a presentation or discussion activity. Students in this study also reported that they were more likely to engage in collaborative decision making with other students and engage in problem-solving and critical thinking. Students in this study are given autonomy to choose time, place, speed and access times to master the content outside of the class. This is in coherence with the previous study, reported that students in the flipped classroom can pause, rewind, fast forward or skip any parts of a lecture video in an attempt to better manage their working memory (Abeysekera & Dawson, 2015). The use of online video lectures outside of the classroom improved students' self-paced learning skills. Students are then more confident in their ability to communicate effectively in front of a large audience in the class (Loveys & Riggs, 2019). This implies that providing more practice for independent learning tasks outside the class could lead students to increase their intrinsic motivation during classroom activities.

However, this study has a small sample (n = 31) in responding to a questionnaire survey. Hence, future research should consider a big sample in terms of size. The interview for data generation was also voluntary with a small sample (n = 10). Those who were culturally timid and passive in-class activities may not have been confident enough to volunteer themselves in the interview sessions. Hence, there probably remain other views that were not included. Future research should also consider using a big sample in the interview or focus group discussion.

Acknowledgments

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