

# 高等教育における社会風土の役割 —反転学習の実証的文献レビュー—

## Flipped Learning in Higher Education: A Critical Review of the Empirical Literature on Social Climate Factors

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### ABSTRACT

高等教育の学習環境における社会風土は個人の発達に重要な側面である。しかし、反転学習が高等教育の学習環境における社会風土にどのような影響を与えるのかはあまり研究がされていない。反転学習は、その従来の講義形式の授業をまさに反転させたもので、授業外の時間に生徒自らが授業内容を予習し、学校の授業の時間ではアクティブラーニングに関わる学習活動を行うものである。反転学習は学習者中心や協働学習により得られる教育効果のため、高等教育でますます広まってきている。そこで本稿では、高等教育における、反転学習が社会風土にどのような影響を与えるのか文献レビューを行った。その結果、反転学習における社会風土は講義形式のような伝統的な教授法における社会風土とは異なることが明らかになった。特に、人間関係の様相は反転学習においてよりポジティブであることが示されていた。さらに、反転学習の社会風土がどのように学習者のスキルを促進できるか議論をした。

The social climate of a learning environment is a crucial aspect of individual development. However, little

is known of the social climate of the flipped learning environment. Flipped learning pedagogy inverts a lecture which is traditionally taught in the classroom to self-study format during out-of-class hours, and use the time in the classroom for active learning activities. Flipped learning pedagogy is a growing practice in higher education because of the benefits that may be derived from learner-centered and collaborative learning strategies. A review of the literature was undertaken to investigate the social climate where flipped learning environment is used at the higher education level. This review showed that the social climate varies from that of the traditional lecture environment. Particularly, the *relationship* dimension was perceived as more positive when flipped learning was used. The review also discussed how the social climate may promote students' essential skills in a flipped learning environment.

## 1. Introduction

The productive learning environment in the context of higher education is an essential platform for teachers and students before entering the workforce (Newman, Connor, Deyoe, & Lamendola, 2014). One of the factors that would promote essential skills (e.g., collaboration, self-regulation, responsible decision-making) among students is found to be the social climate in which learning occurs (Garibaldi, Ruddy, Kendziora, & Osher, 2015). Rutter (1983) showed that social climate has both short-term and long-term effects on students' well-being, academic achievement, and employment rate after school.

Social climate research in a classroom setting is closely connected to concepts of classroom environment, classroom climate, teacher-student relationships, student-student relationships, and classroom management. Moos (1976) argued that social climate greatly impacts the inhabitants or students themselves in a setting because the environment's unique 'personalities' influences the behavior of those students there. However, past research on the learning environment was mostly done in secondary school settings, and to a much lesser extent in higher education contexts (Coll, Taylor, & Fisher, 2002; Fraser, 1989; Vahala & Winston, 1994). Little has been known about the learning environment of higher education, let alone the determinants or outcomes associated with the learning context itself. For example, some new changes experienced by many

students entering universities or colleges include living together with roommate, managing one's personal life with the absence of parents, leaving behind an old social circle of peers and friends, feeling homesick or lonely, coping with new culture and campus environment (Conley, 2015). Thus, understanding the social climate in the classroom is vital to optimal learning for students in higher education.

A pedagogical approach is undeniably a component of the learning environment, which in turn, affects learning outcomes (Redding & Walberg, 2015). A traditional lecture or didactic teaching approach has been found to be one of the factors that affects the social climate in classroom learning (Coll et al., 2002). The pedagogical approach involving cooperative goal structures was associated with higher achievement and positive relationship among peers (Roseth, Johnson, & Johnson, 2008). A flipped learning pedagogy is gaining more and more attention due to the elements of learner-centered, self-directed and active learning strategies that stand in contrast with the traditional lecture method which is considered as teacher-centered and passive. The flipped learning pedagogy presents changes in the way of how a course is taught, particularly through self-study during out-of-class hours, requiring high level of self-discipline, self-regulation skills, and digital literacy skills from students. In addition, flipped learning pedagogy creates opportunities for active learning activities in the classroom which could develop deeper cognitive engagement (Roach, 2014). Considering the

importance of flipped learning strategy, this review aims to investigate if a flipped learning pedagogy in higher education practices influences the social climate of the learning environment. In addition, this review also aims to explore the differences between the flipped learning environment and the traditional lecture environment.

## 2. Methods

### 2.1 Research Questions

This review was guided by the following research questions:

(i) How does flipped learning pedagogy in higher education practices influence the three dimensions of the social climate construct: (a) relationship, (b) personal development, and (c) system maintenance and change?

(ii) How does the social climate of the flipped learning in higher education differ from that of the traditional lecture environment?

### 2.2 Scope of Review and Study Selection

This study reviewed the literature that was published between the years 2012 and 2019 on the flipped learning strategy in higher education because it is found that there is a significant number of empirical studies published from the year 2012 onwards (see Uzunboylu & Karagözlü, 2017). In total, 13 journals were carefully scanned for review. Eight journals which are indexed in the Social Science Citation Index (SSCI) were included: *Computers & Education*; *Computer Assisted Language Learning*; *Computers in Human Behavior*; *Innovations in Education and Teaching International*; *Internet and Higher Education*; *Interactive Learning Environments*; *Journal of Science Education and Technology*; and *Learning and Instruction*. One journal from the Emerging Sources Citation Index (ESCI) was selected, namely the *Journal of Education for Business*. In addition, four journals which were indexed in Scopus

were included: *American Journal of Pharmaceutical Education*; *Journal of Further and Higher Education*; *Technology, Knowledge and Learning*; and *Learning Environments Research*.

In total, 16 articles on flipped learning context were selected from 78 articles related to social climate or classroom environment. First, articles which conducted study outside the higher education context were excluded. Second, those articles without empirical results (i.e., critical review paper) were dismissed. Third, articles that studied on areas other than social climate aspects were excluded. This resulted in the selection of 16 articles in this review.

The higher education context included colleges, universities, graduate and professional programs (e.g., business school and pre-service teacher education). In particular, this review focuses on the classroom environment of flipped learning, in which some of the studies contrasted flipped learning with the traditional lecture learning environment.

### 2.3 Methodological Issues

The articles reviewed were the empirical studies that involved quantitative or qualitative assessment, or both. They cover a wide range of subjects, from STEM (Science, Technology, Engineering, and Mathematics) subjects such as Statistics, Biology and Chemistry, to non-STEM subjects such as English and Operation Management. The duration of studies was mostly short-term, ranging from 4 weeks to one semester (some studies did not indicate the exact number of weeks in one semester).

Because an instructor could choose various modalities to design instruction in flipped learning pedagogy, the articles chosen are based on the existence of these criteria listed below, those fundamental components of a flipped learning pedagogy as identified by Abeysekera and Dawson (2015):

(i) most of the information transmission, which is lecture, is moved out of class,

(ii) face-to-face (F2F) session mainly engages learners in active and social activities, and

(iii) learners are required to complete pre- or post-class activities, so to be fully benefited from F2F session.

## 2.4 Social Climate Dimensions

Research in the 1980s places emphasis on organizational climate of higher education institutions, instead of classroom climate (Fraser, 1989). Many of the instruments or methodologies were rooted in organizational climate in the business contexts, such as Stern’s College Characteristics Index (CCI) and Halpin and Croft’s Organizational Climate Description Questionnaire (OCDQ).

Two instruments exist to assess the environment in the higher education setting, which are CUCEI (College and University Classroom Environment Inventory) and CCES (College Classroom Environment Scale) (Fraser, Treagust, & Dennis, 1986; Winston et al., 1994). However, CUCEI remains the most preferred instrument because of its sound validity (Dorman, 2014), whereas CCES was reported to

contain vagueness in the items which lacks objective measurement (Williams, 1997). Hence, our study adopts the social climate dimensions of CUCEI for the review of literature.

CUCEI measures the perceptions of small group or tutorial class, typically up to around 30 students (Fraser et al., 1986) on seven areas: personalization, involvement, student cohesiveness, satisfaction, task orientation, innovation, and individualization. The seven areas of social climate can be organized into three dimensions, as found in Moos’ social climate measures (Moos & Trickett, 1987): (1) relationship, (2) personal development, and (3) system maintenance and change. Table 1 shows the dimensions and areas of social climate in the review. The description is adopted from CUCEI scale (Dorman, 2014) that measures the social climate aspects of classroom environment in the higher education level. Not all of the reviewed literature studied on all the seven areas, but for each area there is at least two empirical studies conducted on it.

Table 1  
*Social Climate Dimensions and Corresponding Areas in this Study*

Dimension	Area of social climate	Description
Relationship	Involvement	Extent to which students participate actively and attentively in class discussions and activities.
	Personalization	Emphasis on opportunities for individual students to interact with the instructor and on concern for students’ personal welfare.
	Student cohesiveness	Extent to which students know, help and are friendly towards each other.
Personal development	Task orientation	Extent to which class activities are clear and well organized.
	Individualization	Extent to which students are allowed to make decisions and are treated differentially according to ability, interest, and rate of working.
	Satisfaction	Extent of enjoyment of classes.
System maintenance and change	Innovation	Extent to which the instructor plans new, unusual class activities, teaching techniques and assignment.

*Note.* Adopted from “Development of an Instrument for Assessing Classroom Psychosocial Environment at Universities and Colleges,” by B. J. Fraser, D. F. Treagust, and N. C. Dennis, 1986, *Studies in Higher Education*, 11(1), p. 48. Copyright 2006 by Taylor and Francis Group.

## 2.5 Selected Literature

The 16 articles selected for this literature review are listed in the table below.

## 3. Findings and Discussion

This section reveals the findings from the critical review of literature on the seven aspects of social

Table 2  
An Overview of the Selected Literature in this Study

	Study	Context	Subject	Sample size	Grade level
1	Strayer (2012)	USA	Mathematics	TC (28) FC (27)	Mostly freshmen and sophomore
2	McLaughlin et al. (2013)	USA	Pharmacy	2 campuses (22)	Freshmen
3	Kim et al. (2014)	USA	Engineering Humanities Sociology	3 classes (115)	Mostly freshmen and juniors
4	Hung (2015)	Taiwan	English	NFC (25) SFC (24) FC (26)	Freshmen
5	Prashar (2015)	India	Management	TC (25) FC (25)	Undergraduate (level not indicated)
6	Tawfik & Lilly (2015)	USA	Mathematics	24	Undergraduate (level not indicated)
7	Hao (2016)	Taiwan	IT & Education; Classroom Observation	2 classes (84)	Freshmen (~68.1%)
8	He et al. (2016)	USA	Chemistry	TC (343) FC (334)	Freshmen (86.1%)
9	Jovanović et al. (2017)	Australia	Computer	300	Freshmen
10	Sletten (2017)	USA	Biology	76	Freshmen (33) Sophomore (32) Junior (6) Senior (5)
11	Thai et al. (2017)	Vietnam	Invertebrates	TC (22) BC (22) FC (23) EC (23)	19 - 21 years old
12	Yilmaz (2017)	Turkey	Computer	236	Undergraduate (level not indicated)
13	Choi & Lee (2018)	South Korea	Technology Integration	TC (40) FC (39)	Freshmen (~66%)
14	Kurban (2019)	Turkey	Introduction to Educational Sciences	29	Not indicated
15	Zainuddin & Perera (2019)	Indonesia	English as Foreign Language	TC (30) FC (31)	18-21 years old
16	Eryilmaz & Cigdemoglu (2019)	Turkey	Introduction to Computers and Information Systems	FC (27) CFC(30)	Freshmen

Note. TC: Traditional class; FC: Flipped class; NFC: Non-flip class; SFC: Semi-flipped class; BC: Blended-learning class; EC: E-learning class; CFC: Cooperative-flipped class

climate, and discusses in detail the factors, benefits or challenges of each aspect in the flipped learning environment.

### 3.1 The Relationship Dimension

#### 3.1.1 Involvement

Involvement is one of the most studied aspects related to flipped learning. Flipped learning encompasses two critical phases that are interconnected, which are the pre-class (usually online) phase and the in-class (or F2F) phase. For effective in-class activities, students are expected to understand the pre-class online lectures or readings, and participate in online quizzes or discussion forum prior to the class. Failing to do so will adversely affect their involvement in the in-class activities (Hung, 2015; Strayer, 2012). Traditionally, student involvement is measured in an in-class setting only. For the flipped learning pedagogy, it is also essential to take into account of student involvement at the pre-class phase.

Most of the out-of-class involvement are self-reported, except for one study (Jovanović, Gašević, Dawson, Pardo, & Mirriahi, 2017) that reveals students' learning patterns via learning analytics data analyzed from a learning management system (LMS). Most of the studies on the first-year students reported mixed polarized feelings in their perceived level of involvement, particularly at the pre-class phase of online learning of flipped learning. He et al. (2016) reported that some of their first-year students struggled in understanding pre-class materials, or relating the materials to in-class activities. Moreover, Jovanović et al. (2017) revealed that 64.14% of the first-year students failed to regulate their learning effectively at the online learning phase in a flipped learning course. Results analyzing on online learning behavior through analytics data showed that the students exhibited performance goal-orientation, but with low cognitive engagement with the content, and ultimately low examination scores. Others confirmed that the students either found flipped learning very useful for deep

learning or struggled in engaging in the pre-class content and in-class activities (e.g., He, Holton, Farkas, & Warschauer, 2016; Strayer, 2012).

When compared to the traditional learning environment, students in flipped learning class were reportedly more willing to participate in the activities (Hung, 2015; Prashar, 2015; Strayer, 2012). Hung (2015) pointed out that students who were more involved in pre-class activities were more likely to adopt deep learning approaches than those in traditional lecture environment. Similarly, McLaughlin et al. (2013) reported that students enjoyed deeper discussions in the class because they were more prepared after previewing online video lecture. One study that examined how perception toward flipped learning was associated with various study strategies revealed that students who valued active learning strategies felt greater enhancement in learning (Sletten, 2017). Conversely, the opposite could happen that students may disengage themselves quickly in flipped learning if they fail at the pre-class phase.

In addition, Strayer (2012) reported long moments of silence to questions asked in the traditional lecture class, in contrast to the more socially-open atmosphere in the flipped learning environment. This further transpires the possibility of how a difference in social climate of both pedagogies could affect students' behavior and level of involvement in the class.

#### Factors that affect involvement.

Some possible reasons behind the challenges faced by the first-year students in the flipped learning class could be attributed to the factors related to the transition from high school to higher education level where students generally experience a heightened sense of nervousness, anxiety, and stress due to new experiences (Conley, 2015). Students who are accustomed to classes taught in the traditional lecture method throughout their high school years are likely to face greater challenges with the changes in the learning environment (Liu, 2005), which is the flipped learning

in the first year of college or university. This adversely affected their participation in the course and, in turn, their learning experience.

Hao (2016) revealed an interesting aspect of the students' readiness for flipped learning. Despite the high level of technology efficacy reported, students showed a low readiness level on communication self-efficacy. This phenomenon could be explained by the fact that students are digital natives but expressed the lack of disposition for active learning, such as expressing ideas in a group. However, if an active learning session is well-integrated with pre-class material, it can substantially reduce the anxiety of students. This is supported by a study conducted in Indonesia (Zainuddin & Perera, 2019) where students felt more prepared to participate in discussions because they were able to preview the video content prior to that.

### 3.1.2 Personalization

Personalization, which includes teacher support, facilitation, and interaction with students, seems to indicate an important role in the flipped learning environment. Flipped learning pedagogy is able to free up class time for in-depth active learning activities and increase student-teacher interaction. The general perception of students in flipped learning seems to lean towards the need for greater personalization when compared to a traditional lecture environment. A study on students' perception towards flipped learning by Kim, Kim, Khera, and Getman (2014) discovered that teacher support plays a critical role in students' learning, where teaching presence had the highest association to cognitive presence. Admittedly, a high level of personalization could potentially produce deeper cognitive engagement and higher motivation to counter challenging tasks such as complex problem solving. This finding is consistent with those of other studies as well (e.g., Strayer, 2012; Tawfik & Lilly, 2015), which emphasized the role of teacher as a facilitator in the flipped learning environment. The

results reveal a somewhat important finding about the role of teacher for the flipped learning class. In the traditional lecture environment, the teacher is the center of the classroom with lecture as the main component. But in the flipped learning context, the teacher takes on the role as a facilitator in the learning process. This does not diminish the teacher's role, as some may assume, but on the contrary, has greater importance (Kim et al., 2014; Tawfik & Lilly, 2015).

In comparison to those in the traditional whole class instruction, students reported feeling less intimidating to seek help from teachers to gain feedback on their work in the flipped learning context. Flipped learning may seem to be an advantage for students from the Eastern culture which is said to be verbally inhibited and assertive, especially in cross-cultural groups (Sue, Sue, & Ino, 1990). Observation by Strayer (2012) in a group of first-year students of a US university found that the students in the traditional lecture did not want their participation solicited during the class. Pedagogical design may be the main factor that builds the social climate of passivity.

### Factors that affect personalization.

Among the reasons identified from the studies about the increased need for teacher support are the absence of a familiar learning environment (i.e., direct instruction), unable to understand pre-class content, poor self-regulation skills, reluctance to take responsibility over own learning, and seeing the teacher as the authority figure (Hao, 2016; He et al., 2016; Jovanović et al., 2017; Kim et al., 2014; Sletten, 2017; Strayer, 2012; Thai, De Wever, & Valcke, 2017; Yilmaz, 2017). The absence of direct instruction which students are very much accustomed to is a major change that requires adaptation with proper guidance (Forsey, Low, & Glance, 2013; Wilson, 2013; Yilmaz, 2017). Students reported feeling lost and disoriented when they could not understand pre-class online material, or they could not align the pre-class content with the in-class activities (Kim et al., 2014). In



addition, the reluctance of taking responsibility over own learning is one of the resistances for flipped learning pedagogy as well. Students assumed that a teacher's job is to teach and when the teacher becomes the facilitator instead, students felt the lack of support and authority figure in the learning process (He et al., 2016). In such an instance, students may be seeking for personalized guidance from the teacher.

The increase in exchanging information that develops critical thinking and problem solving contributes to a higher level of personalization when compared to the traditional lecture environment (Kim et al., 2014; Zainuddin & Perera, 2019). The flexibility of self-paced learning in pre-class phase and more time freed up for active learning activities were among factors that affect students' involvement in deep learning (Prince, 2004). However, without proper guidance and support from the teacher, flipped learning may not be more advantageous for deep learning. In view of this, teachers who facilitate in the flipped learning pedagogy assume an important yet challenging role to guide the students to succeed. The failure of this part often resulted in frustration, bitter resentment, and lack of motivation on the part of students (Hao, 2016; He et al., 2016).

### 3.1.3 Student Cohesiveness

Student cohesiveness is generally perceived to be higher in the flipped learning environment relative to the traditional lecture environment because students will spend a great amount of in-class time on active learning activities, which are mainly collaborative or group work in nature. Across studies, results in terms of peer interaction, peer support or social presence elements revealed higher level of cohesiveness among students in the flipped learning environment.

In analyzing the preferred and actual learning environment using CUCEI instruments, Prashar (2015) and Strayer (2012) revealed that the flipped learning environment is more unstructured and unpredictable when it comes to active learning activities; thus,

students tend to depend on peer support in the group activities. Strayer (2012) found that students in the flipped learning environment felt supported by the peers through exchange of opinions and inquiries, while in the traditional lecture environment, a more predictable learning environment is reported, which led to lower interaction between peers. Similar results reported by Prashar (2015) that students in the flipped learning environment were more open to association with peers than in the traditional lecture environment.

### Benefits and barriers to student cohesiveness.

The most frequently cited benefits of student cohesiveness are the opportunity to exchange information and opinions that promote critical thinking and problem solving (Hao, 2016; McLaughlin et al., 2013; Sletten, 2017; Strayer, 2012; Zainuddin & Perera, 2019). Acknowledgement of contributions by peers (Kim et al., 2014), willingness to support each other in learning (Strayer, 2012), demonstration of positive attitudes (such as increased involvement, eagerness and preparedness) to interact with peers, and decrease in social anxiety level are also observed through the studies (Eryilmaz & Cigdemoglu, 2019; McLaughlin et al., 2013; Strayer, 2012; Zainuddin & Perera, 2019). Furthermore, Kim et al. (2014) revealed that social presence, an element related to how students feel valued in discourses among peers or teachers, and the openness of the learning environment, is correlated with cognitive presence. Students whose participation and opinions are valued by peers were more motivated to explore issues related to the course content.

Yet, McLaughlin et al. (2013) pointed out that the barriers to student cohesiveness, due to the lack of confidence in the answers shared by other peers. This shows that peer interaction may not necessarily be helpful. Results from one separate study on peer interaction among college students revealed that peer justification tended to be weak, and evidence was rarely or inappropriately used (Anderson, Howe,



Soden, Halliday, & Low, 2001). Another issue found from a study by Hao (2016) is the free-rider problem. Some students expressed discontentment over peers who came to the class without previewing the video lecture and hence, could not contribute to group discussions. This further emphasizes the importance of teacher's role in designing and facilitating in-class activities because the social climate of flipped learning environment may be more disruptive, chaotic, and unpredictable compared to teaching in the traditional lecture environment.

### 3.2 Personal Development Dimension

#### 3.2.1 Task Orientation

Not much had been discussed on the aspect of task orientation in the social climate of the flipped learning environment. The review will focus on two studies in particular (i.e., Strayer, 2012 and Prashar, 2015) which both focused on the social climate of the flipped learning environment and traditional lecture environment. It was revealed that students experienced difficulty in orienting themselves with the pre-class content and in-class activities. They needed to constantly adjust their learning strategies to connect the in-class activities to what they learned prior to the class. In a comparison of first- and third-year students, Hao (2016) revealed that the first-year students felt disoriented in the flipped learning environment when they were given control over their learning, which may be resulted from the teacher no longer sequentially lectured in the class.

Students in the traditional lecture environment did not experience such struggles in orienting the tasks between the lecture content and the activities. The social climate in the traditional lecture environment was reported to be more focused and task-oriented, with less disruption in the activities (Strayer, 2012). In other words, students felt more settled in this climate and may not constantly reflect on their own learning conditions as frequently as the flipped learning environment.

#### Challenges in task orientation.

It is interesting to find that results from both studies above showed students from the flipped learning environment perceived task orientation lower than the students in the traditional lecture environment. This noteworthy finding provided greater insights into the social climate of the flipped learning environment.

Lower task orientation in the flipped learning environment may not be a negative thing considering students became more aware of their own learning conditions. Difficulty in orienting between pre-class materials and in-class activities caused them to become more alert to connect what had been learnt to the in-class learning activities.

Confronting the issue of lower task orientation, some studies suggested on the importance of teachers to make connection between the pre-class content with in-class activities, so that students may be able to understand and reinforce what they have studied prior to the class (Kim et al., 2014; Prashar, 2015; Strayer, 2012; Strayer, 2017). Teacher may need to build support structures to assist students and create opportunities for students to reflect upon their learning (Strayer, 2012).

#### 3.2.2 Individualization

The aspects reviewed here include a sense of autonomy and self-regulation that is commonly studied in the literature of flipped learning. Two studies that analyzed the perceived psychosocial climate of the actual and preferred learning environments found that individualization was higher in the flipped learning environment compared to the traditional lecture environment, but not significantly (Prashar, 2015; Strayer, 2012). The lack of difference in individualization between these two environments was not discussed in the studies.

In the analysis of the change in student self-efficacy level in four learning environments (i.e., e-learning, blended learning, flipped learning, and traditional learning), Thai et al. (2017) reported that the flipped

learning course had the highest increase in self-efficacy level compared to the other three learning environments.

Moreover, Hao (2016) found that students' self-regulation skills are associated with flipped learning readiness. Comparatively, this study revealed that the third-year students showed higher preferences for video preview and higher communication efficacy than the first-year students. This is supported by Kim et al. (2014) in which the study transpired that learner presence (i.e., self-regulation and co-regulation) is correlated to cognitive presence.

### Benefits and barriers to individualization.

The lack of difference between the flipped learning environment and the traditional lecture environment on the area of individualization could possibly indicate that the flipped learning environment may not necessarily create higher freedom of decision making in areas students desire to study, although self-study is required in the online phase. Teachers still have a high level of autonomy in determining the content and tasks in the pre-class phase.

Numerous studies showed consistent findings on the higher level of individualization experienced by students from video lecture preview. Among the most frequently noted benefits are affordance of student autonomy through self-paced learning (Choi & Lee, 2018; Kurban, 2019; McLaughlin et al., 2013; Tawfik & Lilly, 2015; Zainuddin & Perera, 2019), and support of student self-efficacy through the flexibility and repeated access of video preview (He et al., 2016; McLaughlin et al., 2013; Tawfik & Lilly, 2015; Zainuddin & Perera, 2019). Students were able to derive the benefits of gaining 'more confident', 'more security' or 'better preparedness' from video preview to engage in active learning during F2F session.

Despite the benefits reported in the above studies, few studies highlighted issues with self-regulated learning. Students who are new to the pedagogy may face greater challenge to learn independently through

video lecture due to lack of regulation skills such as goal setting, monitoring the learning process, and adopting the appropriate learning strategies (Hao, 2016; Jovanović et al., 2017). The lack of readiness for online learning is one of the issues that commonly affects students' active participation in the class (Hao, 2016; Tawfik & Lilly, 2015). Furthermore, readiness for online learning is related most to satisfaction (Yilmaz, 2017). This leads to the possibility of students' feeling more dissatisfied in the flipped learning environment due to the lack of readiness, compared to the traditional lecture environment.

### 3.2.3 Satisfaction

There is no conclusive evidence that students are more satisfied in the flipped learning class or traditional lecture class. Across the studies, there were findings on the positive and negative aspects related to satisfaction. It would be more feasible to discover the factors that affect student satisfaction in the social climate of the flipped learning environment.

Across the studies, students were found satisfied with the flexibility of studying at their own pace, time and place in the pre-class phase. Choi and Lee (2018) reported an overwhelming 72% of students preferred the flipped learning compared to traditional lecture learning because they feel satisfied with the benefits from online learning before class. In the analysis of the relationship between e-learning readiness with student satisfaction, Yilmaz (2017) revealed that online communication, self-efficacy and self-regulation skills predict satisfaction. Ability to understand the culture and language exclusive to the community of learners is important for online discussion.

Dissatisfaction over the increase of workload among the teachers and students is an issue that was commonly reported in studies. Teachers in the flipped learning pedagogy spent a considerable amount of time devoted to designing and developing the learning material for pre-class preview and activities for in-class deep learning (McLaughlin et al., 2013).

Compared to the traditional lecture environment, teachers in the flipped learning pedagogy may experience a notable increase in workload during the first preparation for a flipped course. From the perspective of students, they voiced concern over the amount of time needed to preview learning material for every class beforehand and was reluctant to join if each class is flipped (Hao, 2016).

Another issue of great concern is the non-compliance with pre-class study, that inherently affects the overall pace of in-class learning, and caused dissatisfaction from students in group activities (He et al., 2016). As a result, students complained of having 'free-riders' in the group activities (Hao, 2016).

#### Reasons on satisfaction and dissatisfaction.

Satisfaction was related to a myriad of reasons, among those reported were sense of competence in independent learning (Zainuddin & Perera, 2019), self-regulation skills (Hao, 2016; Jovanović et al., 2017; Tawfik & Lilly, 2015; Thai et al., 2017), interaction in online or F2F environment with peers or the teacher (Hao, 2016; Prashar, 2015; Strayer, 2012; Zainuddin & Perera, 2019), material design (Hung, 2015; Yilmaz, 2017), type of active learning activities (Hung, 2015; Tawfik & Lilly, 2015), student workload (Hao, 2016; He et al., 2016; McLaughlin et al., 2013), and teachers' facilitation (Kim et al., 2014; Strayer, 2012). The perceptions of students on their satisfaction of the above factors reveal insights about the social climate in the learning environments, and hence, their learning. An independent study revealed that what students say about their learning environment will affect their learning (Ramsden, 1979).

As explained above, students were more confident with engaging in active learning because they feel more prepared, apart from a greater sense of security due to repeated access to video viewing. The positive results of video preview could be explained from the perspective of cognitive load theory. Self-preparatory phase could result in better management of students'

working memory compared to the traditional lecture (Clark, Nguyen, & Sweller, 2011). Consequently, students also felt that they could develop self-discipline and self-study disposition (Hao, 2016) through flipped learning pedagogy.

Another positive aspect of satisfaction is the increased interaction with the teacher and peers. Because flipped learning pedagogy allocates a large amount of time for cognitive and social engagement in active learning activities, students had more opportunity to receive personalized feedback and guidance during the class time from the teacher, which resulted in the development of inspiration in learning (Hao, 2016; Hung, 2015). Among the peers, students reportedly appreciated the opportunity to participate in the exchange of knowledge and ideas, and hence, developed critical thinking and problem solving skills (McLaughlin et al., 2013). Others felt that learning in flipped classes with peers was stimulating due to the discourse that prompted them to think on different aspects (Hao, 2016).

With regard to dissatisfaction, excessive teacher workload may increase stress level and thus affect the social climate of the learning environment (Moos & Moos, 1978). However, it was said that the workload could reduce significantly for the recurring courses in the future (Loo et al., 2016). On the aspect of student workload, a surprising finding was reported by He et al. (2016) that flipped learning pedagogy did not appreciably increase the amount of preparation time required in pre-class phase. Students might benefit from better cognitive load management due to the ability to manipulate learner pacing during video preview (Clark et al., 2011).

Among reasons provided for non-compliance issue were difficulty in understanding the content, poor material design, low motivation in online learning, and the lack of self-discipline in learning. Teacher may need to provide incentive for pre-class learning to ensure students preview the content (Kim et al., 2014), give guidance to students in developing self-regulation

skills (Jovanović et al., 2017), and design learning content that increases interactivity, usability, quality and suitability (Yilmaz, 2017). Previous studies found that the learning content and material design in online learning have a direct effect on student satisfaction and motivation (Hung, 2015; Kauffman, 2004).

### 3.3 System Maintenance and Change Dimension

#### 3.3.1 Innovation

Little focus had been given to the area of innovation of the social climate after a comprehensive review of the articles. The aspects covered under innovation include the extent of innovative teaching techniques, creative thinking, varied and new activities attempted in the learning process. Consequently, two articles are found to have studied about innovation in the social climate of the flipped learning environment. The studies from Strayer (2012) and Prashar (2015) were consulted because both of them investigated students' perception on the preferred and actual degree of innovation in learning environments of flipped and traditional classes.

Both of the studies found similar findings about innovation in the flipped learning environment and the traditional lecture environment. Students in the flipped learning environment experienced higher innovation compared to those in the traditional lecture environment. Study from Strayer (2012) revealed that students were more open to learning with a variety of learning activities in the class.

The overall perception of students on innovation in the flipped learning environment was found to be positive (Hao, 2016). Students appreciated the flexibility of self-paced learning during the pre-class phase, and the greater opportunity to explore and communicate their ideas during in-class activities (Choi & Lee, 2018; Hao, 2016; Strayer, 2012).

#### Benefits of innovation.

There is potential for the flipped learning environment to create the innovative space for teachers

to implement varied activities in learning due to the greater amount of freed up time allocated. Hence, students are not confined to the same old way of sitting and taking notes during lectures, with occasional group discussions. The innovative space of the flipped learning environment could build a more open social climate of learning that encourages greater innovation, of which students had indicated in their preference of higher innovation, as compared to the traditional lecture environment. This is coherent with Prasha (2015) which he confirmed of the students had greater opportunity to 'try things out themselves'. It should be reasonable to say that flipped learning is capable of creating a social climate that is more open for association, freer to share ideas, and greater flexibility to try out or make mistakes in the learning process.

## 4. Conclusions and Implications

### 4.1 Conclusions

The potential benefits of flipped learning pedagogy have yet to be understood through the perspective of social climate. This review of flipped learning pedagogy from the perspective of classroom social climate draws significant contributions to the existing literature. First, there are differences in the social climate of flipped learning environment from that found in the traditional lecture environment. The open and less controlled atmosphere, greater flexibility, higher disruptions, and socially-oriented learning community experienced by the students in the flipped learning environment may arguably provide more opportunities for students to develop social and emotional competencies such as relationship skills and self-management throughout the process of learning.

Second, despite the effects found in the three aspects of relationship dimension (i.e., involvement, personalization, and student cohesiveness), there is no conclusive evidence as to whether the social climate of the flipped learning environment is more positive than the traditional lecture environment in general. The

literature is full of mixed or polarized findings, especially in the area of satisfaction.

Third, the first-year students experienced a more heightened sense of challenge studying under the flipped learning pedagogy. The social climate of a first-year students' class under this pedagogy may need greater monitoring to ensure that they are mentally and emotionally ready to study.

Fourth, the teacher's role as a facilitator is found to be very crucial in the flipped learning pedagogy; otherwise, students' learning experience will not be better but bitter. Teachers who desire to adopt the flipped learning pedagogy should have a certain level of readiness and understanding of the possible challenges and effective ways to resolve them when problems occur.

#### 4.2 Implications

This critical review of literature shows that flipped learning pedagogy has the potential to promote a connected learning community (Hao, 2016; Kim et al., 2014) that helps students to collaborate with each other (Garrison & Kanuka, 2004). In addition, active learning strategies in the flipped learning pedagogy with a greater sense of autonomy through self-paced online learning can promote various skills such as self-management, social awareness, teamwork, interpersonal skills, and decision making. As noted in the review, students find themselves more open to interaction and cooperation in the flipped learning environment, something that the traditional lecture class may fall short of.

This critical review also provides a greater revelation of how a teacher should re-define their role as facilitator to provide the necessary support, in terms of structured guidance, social and emotional adaptation, just-in-time feedback (Thai et al., 2017) and setting a classroom climate where students feel comfortable to seek help when needed. Moving ahead, teachers are facing great challenges to handle issues and disruptions faced by the students in the flipped

learning pedagogy, but at the same time reaping the benefits discussed in this literature review.

## 5. Limitations and Suggestions for Future Research

### 5.1 Limitations

The findings and discussion of this paper need to be interpreted with caution. The study did not analyze classroom social climate by stream-based, such as science courses or arts courses. Different findings may emerge if further course classification is employed. Furthermore, the analysis of this paper did not consider the cultural contexts that may be an important determinant of classroom social climate.

### 5.2 Suggestions for Future Research

Future research can explore the differences of classroom social climate of specific courses, for instance, STEM and non-STEM courses of the higher education. Subject matter may have effects on teaching pedagogy and learning strategies of students, hence, may reveal different findings in both cases.

More research is necessary to understand the social climate of the flipped learning environment in highly specific cultural contexts to compare and contrast the social climate of these learning environments. The results might provide valuable insight on best practices of the flipped learning pedagogy in a specific cultural context.

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