


## Teacher-Student Interactions, Learning Commitment, Learning Environment and Their Relationship with Student Learning Comfort

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### ABSTRACT

The purpose of this study was to identify the level of teacher-student interaction, the suitability of learning environment, learning commitment and learning comfort among Biology students. In addition, the contribution of teacher-students interaction, learning commitment and learning environment towards learning comfort were also explored. This quantitative study employed a survey method whereby four types of questionnaires were used: 1) Teacher-Student Interaction Inventory, 2) Classroom Learning Environment Inventory, 3) Learning Commitment Inventory, and 4) Learning Comfort Inventory. A total of 400 Form Four Biology students from Perak were involved in this study. Data were analysed using descriptive and inferential analysis. The findings showed that the level of teacher-student interaction, the suitability of learning environment, learning commitment and learning comfort were high. There were significant relationship between teacher-student interaction, the suitability of learning environment and learning commitment with learning comfort. In addition, the results of multiple regression analysis revealed that students' learning commitment and learning environment provide significant contribution towards learning comfort.

**Keywords:** Teacher Student interaction, learning commitment, learning environment, learning comfort.

### INTRODUCTION

The peaceful and comfortable school atmosphere are very important to students and teachers to ensure effective teaching and learning. This is because students spend most of their time in school. Teachers need to be more creative and innovative in carrying out teaching and learning approaches or strategies so that students could acquire knowledge effectively. According to Akçay1 & Doymuş (2014), the selection of appropriate teaching methods and techniques are vital to ensure students' understanding of issues and concept at the highest level. In the classroom, there are various factors that determine the success of students' learning. Teachers, students and environment are among the determining factors that



contribute to the success of the learning process in the classroom. Thus, it is argued that evaluation of all aspects in the learning environment is crucially important because by doing so will not merely providing information for measuring the learners' performance, but also information on teachers' competencies in planning positive learning outcomes (Che Ahmad, 2010).

Good interaction between teachers and students will create positive relationships in the classroom and contribute to effective learning. In fact, effective teachers can assess changes in students' behaviour and understand the needs of students in the classroom. According to Bucholz and Sheffler (2009), teachers can shape the classroom environment to be comfortable and therefore improve the ability of students to learn. Conducive classroom environment emphasizes cooperation and openness between teachers and students. Therefore, in learning and teaching especially science subjects, students should be allowed to interact with teachers, classmates and surroundings. Interaction with the environment during learning process will stimulate all students' senses and encourage students to learn in a creative and innovative way. This phenomenon will trigger students' thinking and refrain them from simply memorizing fact and knowledge. Furthermore, interesting learning experiences will stimulate students' interest in science. Hence, the students will be excited to do various of active and encouraging learning activities. Active involvement in the learning process such as performing an investigation to solve a problem will provide more positive impact on students. According to Ergin, Kanli, & Ünsal (2008) effective teaching by teachers enable students to establish a relation between previous experience and daily life, to apply the information learned in solving problems, to defend their opinion and to take responsibility during his life. Thus, the teacher is a key factor in determining whether students' learning is a success or a failure. According to Telli et al. (2007), there is a general argument that teacher-student interpersonal behaviour is a crucial element in the teaching learning process in any country. Several other studies also showed that teachers' behaviour such as compliments and punishment have a strong impact on students' learning (Walberg, 1984).

Besides teachers, the classroom environment also influences the learning and teaching process. According to Che Ahmad (2013), the physical aspects (size and shape, space, interior light, colour, thermal conditions, noise levels, furniture and seating arrangements, technological facilities) and psychosocial aspects (interaction between students, students and teachers, students and environment) of classroom will contribute to teaching and learning satisfaction and have a significant impact on students' learning. Furthermore, the learning environment and classroom management can enhance productivity and comfort among teachers and students. Comfortable learning is important as discomfort feeling could affect students' motivation to learn. Therefore, classroom learning environment should meet the needs of teachers, students and learning activities conducted, able to stimulate learning, and encourage active participation and more importantly it could be easily facilitated and monitored by the teacher. Bartlett (2003) noted that the effectiveness of learning will be increased if the learning environment is comfortable. Hence, a conducive learning environment, a good student teacher relationship and high learning motivation will increase the learning comfort and improve student achievement over time. This is a very important aspect to be emphasized through the school.

In Malaysia, one of the important classroom is the biology classroom. Biology classroom consist of good students in terms of achievement and the biology learning is important in increasing the students' interest to pursue their studies in medicine. Therefore, the biology classroom environment including the physical properties, teachers and students are very crucial to explore. Hoping by knowing factors that contribut to comfort learning, we might be able to increase their interest and motivation to learn dan consequently more successful in their learning.

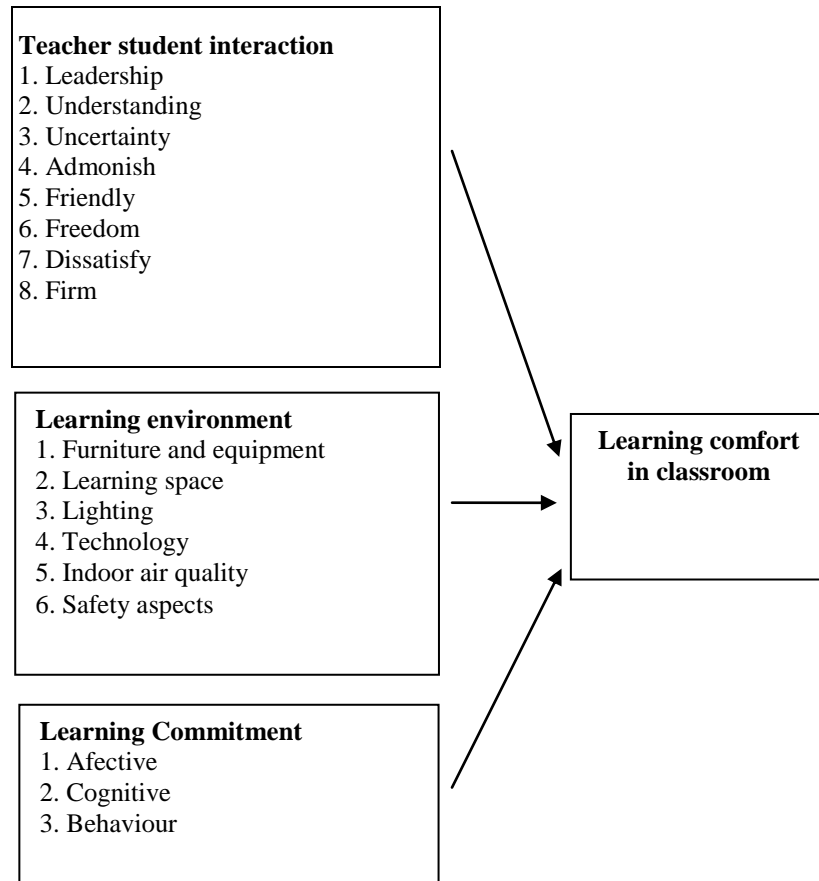
## **Problem Statement**

Malaysia Government targeted to produce 60% science stream students has not yet reached its goal (MOE, 2012). Study by Lee and Kamisah (2013) revealed that students' interest in science were declining. This phenomenon occurred not only in Malaysia but also in the whole world (PISA, 2009). There are various possible factors that contribute to the issue of declining student interest in science. Among them are the teacher factor, learning environment, learning motivation and learning commitment.

Teacher-student interaction is essential to establish good relationship between teacher and student. However, Den Brok, Fisher and Scott (2005) and Dhindsa (2006) argued that teachers dominated the interactions in the classroom. According to Kamaruddin (2007), a total of 60.7% of students said that teachers rarely treat students friendly and the mastery of interpersonal skills and communication practices between teachers and students was unsatisfactory. Besides that, the learning environment is also crucial for students' learning. Research showed that changes in local climate will affect microenvironment, such as plants, people and buildings including a school environment and might causes discomfort during the learning process in the classroom, especially for teachers and students (Puteh et al., 2014). In relation to that, Khadijah and Azimin Samson (2013) found that most classrooms were not comfortable and did not meet the needs of teachers and students. Uncomfortable classroom environment can cause many discipline problems and affect effective learning. According to Sahin, Tantekin-Erden & Root, (2011), there were many studies that associated with classroom management and physical environment in the school however, the focus of these studies only focused on one dimension only, such as class size or the physical environment and academic achievement. Not many studies were carried out considering aspects such as student involvement and learning comfort even though it is argued by Cavanagh (2012) that student involvement in learning was also an important consideration in the assessment of the learning environment and instructional design. Furthermore, there were not many studies done combining several aspects and their impact on students. Thus, there was a need to explore several elements that contribute to the learning such as teacher-student interaction, learning environment and learning commitment.

## **Conceptual Framework**

Classroom climate can affect the students' learning comfort. According to Moos (1979), there were four factors that can contribute to a classroom climate. These factors were the characteristics of teachers, physical characteristics and architecture, the student aggregate and organizational factors. All of these four factors were related to each other in forming classroom climate. Based on the Moos model (1979), a conceptual framework was constructed. Within this conceptual framework (Figure 1.1), the inclusion of teacher-student interaction represents the teachers characteristics, the learning environment represents physical features and architecture and student commitment represents the learning aggregate. Components of organizational factors are removed from the conceptual framework with regard that this study does not involve changes to the existing learning environment.. The comfort level of learning is included as outcomes in describing the learning atmosphere that occurs in the classroom climate.



**Figure 1** *Conceptual Framework*

### Objectives:

- i. Identify the level of teacher-student interaction, the suitability of the learning environment, students learning commitment and classroom learning comfort among Biology students.
- ii. Identify the relationship between teacher-student interactions, the suitability of the learning environment and students leaning commitment with learning comfort among Biology students.
- iii. Identify the contribution of the teacher-student interaction, the suitability of the learning environment and commitment towards learning comfort among Biology students.

## METHODS

### a) Population and sample

The target population of this study is the form four biology students in Larut Matang and Selama District, Perak, Malaysia. Overall, there were 15 secondary schools located in the urban area and 12 secondary schools in rural areas. The form four students were selected due to the fact that they have been in school for fer years already and are considered mature enough to give realible feedback (Che Ahmad et al, 2010).

For the sample, the researchers used stratified ramdom sampling to choose 10 school in rural area and 10 school in urban area. Twenty biology students randomly selected from each school. Therefore, a total of 400 biology students were involved in this study. The student

are of 165 (41, 2%) were males and 235 (58.8) were females. Approximately 196 (48.92%) students were from rural area and 204 (51.08%) students were from urban school.

## **b) Instruments**

The study used four questionnaires to measure classroom climate that were 1) I Teacher student Interaction Inventory (TSI), 2) Physical Classroom Learning Environment Inventory (PCLEI), 3) Learning Commitment Inventory (LCI) and 4) Students' Learning Comfort Inventory (SLCI). These questionnaires are in the form of a five-point Likert scale with 1 for strongly disagree, 2 for disagree, 3 for less disagree, 4 for agree and 5 for strongly agree.

The first inventory, the Teacher-student Interaction Inventory (TSI), adapted from Questions of Teacher Interaction (QTI) by Wubbels and Levy (1993) was employed to obtain students' view about the teacher-student interaction in the Biology classroom. The TSI consists of eight constructs: leadership, understanding, uncertainty, admonish, friendly, freedom, dissatisfaction and firm. Each scale consists of six items and the entire instrument has 48 items.

The second inventory used was the Physical Classroom Learning Environment Inventory (PCLEI), adapted from the Physical Sciences Laboratory Environment Inventory (PSLEI) developed by Che Ahmad (2011) to identify the suitability of the physical aspects science laboratory learning environment. Amendment was made whereby the word 'science laboratory' in PSLEI was changed to 'classrooms' in PCLEI. PCLEI consists of six constructs: furniture and equipment, learning space, lighting, technology, indoor air quality and safety aspects. Each scale consists of five to eight items and the entire inventory has 28 items.

The third inventory, the students' learning commitment inventory (SLCI), adapted from Rohani et al. (2010) was used to identify the learning commitment among students in the Biology classroom. SCLI consists of three constructs namely cognitive, affective and behavioural. Each construct consists of four to eight items and the entire instrument has 16 items. The fourth inventory, the learning comfort inventory (LCI) was adapted from the scale of Enjoyment of Science Lessons in the Test Of Science - Related Attitudes (TOSRA) by (Fraser & Walberg, 1981) to gather information on students' view concerning student's comfort in the Biology classroom. LCI consists of nine item. The TSI, SLCI and LCI are originally written in English, and for this research, all these three inventories were translated into Bahasa Malaysia using the back to back translation procedure as recommended by Brislin (1976) and Newmark (1988) to make sure that the Bahasa Malaysia questionnaires conveyed the same meaning as the English questionnaires.

The validity of these inventories, TSI, CLEI, SLCI and LCI were determined by three experts in their respective fields. The experts' percentage agreement for all items in the inventories used (TSI, PCLEI, SLCI and LCI) were more than 80% as required to be valid (Hamzah et al., 2013). The inventories were amended and improved according to the comments made by the experts. Then, a pilot study was conducted to check the reliability of the questionnaires. The reliability (Cronbach alpha coefficient) for the TSI, PCLEI, SLCI and LCI ranged from 0.65 to 0.92. This range was regarded as acceptable to good (George and Mallery 2001; Hair et al. 2006, 2010), because the closer alpha is to 1, the greater the internal consistency of the items. Hence, the reliability of the TSI was confirmed for this sample.

## FINDINGS

### a) Teachers students interaction

The mean value of teacher-student interaction from the perspective of the students are shown in Table 1. Overall, the findings indicate that the understanding construct has the highest level of practice (mean = 4.37, SD = 0.62), followed by a friendly construct (mean = 4.29, SD = 0.62), admonish construct (Mean = 4.28, SD = 0.84), uncertainty construct (mean = 4.27, SD = 0.77), dissatisfaction constructs (mean = 4.23, SD = 0.87), leadership construct (mean = 4.22, SD = 0.67), firm construct (mean = 3.99, SD = 0.66) and freedom construct (mean = 3.32, SD = 0.89)

**Table 1.** Mean value and standard deviation for teacher student interaction

| No. | Construct       | Mean | SD   | Interpretation | Level of practice |
|-----|-----------------|------|------|----------------|-------------------|
| 1.  | Leadership      | 4.22 | 0.67 | Positive       | High              |
| 2.  | Understanding   | 4.37 | 0.62 | Positive       | High              |
| 3.  | Uncertainty     | 4.27 | 0.77 | Positive       | High              |
| 4.  | Admonish        | 4.28 | 0.84 | Positive       | High              |
| 5.  | Friendly        | 4.29 | 0.62 | Positive       | High              |
| 6.  | Freedom         | 3.32 | 0.89 | Negative       | Moderate          |
| 7.  | Dissatisfaction | 4.23 | 0.87 | Positive       | High              |
| 8.  | Firm            | 3.99 | 0.66 | Positive       | High              |

Findings also show that the constructs of leadership, understanding, friendly, uncertainty, admonish, firm and dissatisfaction are positive. This shows that students perceive their teachers of having a high level of leadership whereby they are able to draw students' attention, care for students, friendly assists the students and exhibit firmness to ensure students conform to the rules during the learning process. Students also perceive that their teachers look confident, patient in advising student and also exhibit satisfaction during learning conducted in the classroom. On the other hand, students perceive freedom construct practices are at moderate level meaning that the students assume teacher of providing them less opportunities to take over the responsibility of their own learning.

### b) The suitability of learning environment

The mean value of the suitability of the learning environment from the perspective of the students are shown in Table 2. Overall, the findings indicate that the learning space construct have the highest level of suitability (mean = 4.28, SD = 0.57), followed by lighting constructs (mean = 4.18, SD = 0.62), furniture and equipment construct (mean = 3.86, SD = 0.73), safety aspects (mean = 3.68, SD = 0.76), technology construct (mean = 3.12, SD = 1.06) and indoor air quality construct (mean = 2.23, SD = 0.80)

**Table 2.** Mean value and standard deviation for the suitability of learning environment

| No. | Construct               | Mean | SD   | Interpretation |
|-----|-------------------------|------|------|----------------|
| 1.  | Furniture and equipment | 3.86 | 0.73 | High           |
| 2.  | Learning space          | 4.28 | 0.57 | High           |
| 3.  | Lighting                | 4.18 | 0.62 | High           |
| 4.  | Technology              | 3.12 | 1.06 | Moderate       |
| 5.  | Indoor air quality      | 3.54 | 0.80 | Moderate       |
| 6.  | Safety aspects          | 3.68 | 0.76 | High           |

The findings show that the learning space, lighting, furniture and equipment, and safety aspect have high level of suitability from students' perspective meaning that students thought

learning space, lighting, furniture and equipment, and safety aspects provided in the classroom is suitable and can be adapted with various learning activities in the classroom.

### c) The Biology students' learning commitment

The mean value and the level of students' learning commitment are shown in Table 3. As a whole, the findings indicate that students have a high level of commitment to learning in all three sub-constructs which are behaviour (Mean = 4.14, SD = 0.67), followed by cognitive constructs (Min = 4.13, SD = 0.60) and affective construct (Min = 4.04, SD = 0.67).

**Table 3.** Mean value and standard deviation for students' learning commitment

| No. | Construct | Mean | SD   | Interpretation | Level of practice |
|-----|-----------|------|------|----------------|-------------------|
| 1.  | Cognitive | 4.12 | 0.60 | Positive       | High              |
| 2.  | Affective | 4.04 | 0.78 | Positive       | High              |
| 3.  | Behaviour | 4.14 | 0.67 | Positive       | High              |

Students rate their learning commitment as positive in the aspect of cognitive, affective and behaviour. This shows that students' learning commitment is higher than their thoughts, emotions and physical actions. The findings of this study suggest that students are very committed to the learning in the classroom

### d) Comfort learning

The mean value and comfort level of learning from students' perspective are; mean, 3.99 and SD, 0.73 as shown in Table 5.

**Table 4.** Mean value and standard deviation for learning comfort

| No. | Construct        | Mean | SD   | Interpretation |
|-----|------------------|------|------|----------------|
| 1.  | Learning comfort | 3.99 | 0.73 | Positive       |

The learning comfort construct has a positive level from the view of students. This shows that students are comfortable with the learning in the classroom. The findings indicate that the process of learning and teaching biology in the classroom are at a pleasant situation. Students feel very satisfied with the learning environment in the classroom.

### e) Relationship between teacher student interaction and comfort learning

Table 5 shows the results of Pearson correlation between teacher-student interaction and learning comfort.

**Table 5.** Pearson correlation between teacher-student interaction and learning comfort.

| Variable                        | 1 | 2      | Sig. ( 2-tailed) |
|---------------------------------|---|--------|------------------|
| Teacher student interaction (1) |   | 0.568* | 0.000            |
| Learning comfort (2)            |   |        |                  |

\*significant at level  $p < 0.05$

Based on the Table 5, analysis reveals that the teacher-student interaction correlate significantly with the learning comfort in the classroom ( $r = 0.568$ ;  $p < 0.05$ ). This shows that there is a strong positive relationship between teacher-student interactions with the learning

comfort. Its means that when interaction between teachers-students are good, the learning comfort will exit.

**f) Relationship between the suitability of learning environment interaction and comfort learning**

Table 6 shows the results of Pearson correlation between the suitability learning environment and learning comfort.

**Table 6.** *Pearson correlation between the suitability learning environment and learning comfort*

| Variable                 | 1 | 2       | Sig. ( 2-tailed) |
|--------------------------|---|---------|------------------|
| Learning environment (1) |   | 0.359** | 0.000            |
| Learning comfort (2)     |   |         |                  |

\*\* Significant at level  $p < 0.01$

Based on the Table 6, the analysis shows that the suitability of learning correlate significantly with the learning comfort in the classroom ( $r = 0.359$ ;  $p < 0.01$ ). This shows that there exists a simple positive correlation between learning environment with learning comfort. In addition, it indicates that the suitability of the learning environment have a significant relationship with the comfort learning in Biology classroom meaning that when the learning environment is suitability, in good condition and conducive, students will feel comfortable to learn in the classroom.

**g) Relationship between learning commitment and learning comfort**

Table 7 shows the results of Pearson correlation between learning commitment and learning comfort.

**Table 7.** *Pearson correlation between learning commitment and learning comfort.*

| Variable                | 1 | 2       | Sig. ( 2-tailed) |
|-------------------------|---|---------|------------------|
| Learning commitment (1) |   | 0.563** | 0.000            |
| Learning comfort (2)    |   |         |                  |

\*\* Significant at level  $p < 0.01$

According to Table 7, analysis revealed that the learning commitment correlate significantly with the learning comfort in the classroom ( $r=0.563$ ;  $p < 0.01$ ). This shows that the learning commitment to learn has a significant relationship with the learning comfort in biology classroom. This means that when students' committed in their learning, then students will be more comfortable with the learning and teaching in the classroom.

**h) Contribution of teacher student interaction, suitability of learning environment and Biology learning commitment towards learning comfort**

Table 8 and Table 9 shows the results of multiple regression analysis for the three predictor variables on Biology learning comfort. Based on Table 8, the analysis shows that there are two predictor variables that have a significant correlation with the Biology learning comfort  $F(2,309) = 261.90$  with significant value = 0.000 ( $p < 0.05$ ). Therefore, there are significant contributions by the predictor variables (learning commitment and learning environments) with biology learning comfort.



**Table 8.** Multiple regression analysis

| Model | Variation  | Total power of two | df  | Mean Squares | F       | Significant        |
|-------|------------|--------------------|-----|--------------|---------|--------------------|
| 2     | Regression | 82.609             | 2   | 41.305       | 261.901 | 0.000 <sup>c</sup> |
|       | Error      | 48.733             | 309 | 0.158        |         |                    |
|       | Total      | 131.342            | 311 |              |         |                    |

\* Significant at level  $p < 0.05$

**Table 9.** Multiple regression analysis (stepwise)

| Predictor            | B     | Standard error | Beta ( $\beta$ ) | T value | Significant level | R <sup>2</sup> | Contribution (%) |
|----------------------|-------|----------------|------------------|---------|-------------------|----------------|------------------|
| Constant             | 0.140 | 0.182          |                  | 0.772   | 0.441             |                |                  |
| Learning commitment  | 0.794 | 0.050          | 0.700            | 15.932  | 0.000             | 0.617          | 61.7             |
| Learning environment | 0.173 | 0.055          | 0.138            | 3.147   | 0.002             | 0.629          | 1.2              |

Dependent: comfort

Double R 0.793

R Square (R<sup>2</sup>) 0.629 Contribution 62.9%

R Square adjusted 0.627

Standard error 0.39713

Primary and utmost predictor for Biology learning comfort is learning commitment factor which contribute 61.7 percent. This situation shows that for every unit increase in score of learning commitment, Biology learning comfort score will increase by 0.7 units. Second predictor is the learning environment factors which contributed 1.2 percent to the Biology learning comfort. This means that when the learning environment increased per unit, the score of Biology learning comfort will increased 0.138 units.

Results of the analysis show that the two predictor variables, namely learning commitment and learning environment are a predictor for the Biology learning comfort. Value R<sup>2</sup> = 0.629 indicates the overall contribution of two predictor variables to Biology learning comfort were 62.9 percent. The contribution of learning commitment is 61.7 percent whereas the contribution of learning environment is 1.2 percent. Overall, these two factors are significant to the biology learning comfort. Thus, from the results of multiple regression, the equation for regression is as follows:

Multiple regression model

$$Y = 0.140 + 0.794X_1 + 0.173X_2$$

$$Y = a + b_1X_1 + b_2X_2 + e$$

Y = Biology learning comfort

X<sub>1</sub> = learning commitment

X<sub>2</sub> = learning environment

b<sub>1</sub> and b<sub>2</sub> are the coefficients for the related independent variables related

Constant 0.140

## **DISCUSSION and CONCLUSION**

### **a) Teachers students interaction**

Overall, students perceived that the teacher-student interaction practices was good and effective. This was important because according to Myint and Atputhasamy (2005) the quality of teacher leadership behaviour was an indicator of the quality teacher-student interaction in the classroom. In fact, the teacher-student interaction was an important element to the students in the context of teaching, learning and assessment (Douglas et al., 2015). Fraser et al. (2010) described teachers who want to improve students' academic achievement should show strong leadership behaviour and understand, and reduce the uncertainty behaviour in the classroom. Ab. Samad & Jamaluddin (2005) also explained that the elements of leadership in the classroom as practiced by the teacher can determine the attainment of a classroom and also effect the students. According Wubbels and Levy (1991), teachers' behaviour in a classroom setting is important because it can influence students' motivation and achievement. Students' perceived moderate practices of freedom due to teachers control and monitor learning in the classroom. Monitoring activities should be done to prevent students from becoming too independent and unmanageable. According to Cruickshank et al. (2009) when the teacher gives freedom to the students to learn by themselves and leave the classroom without proper control, the students will be less motivated to learn and are more likely to exhibit negative behaviors such as not completing the task. Therefore, as a teacher, it is acceptable to be more assertive and monitor the learning so that students are serious and devote more attention to learning.

### **b) The suitability of learning environment**

The findings indicated that the learning space, lighting, furniture and equipment, and safety aspect have high level of suitability from students' perspective. In other words students perceived learning space, lighting, furniture and equipment, and safety aspects provided in the classroom is suitable and can be adapted with various learning activities in the classroom. The suitability of this learning space may be due to the wide classroom area that was appropriate to carry out various learning activities. Thus, allowed the students in the classroom to move around freely and perform the learning activities either individually or in groups. Besides that, lighting in classrooms was found to be good and appropriate due to combination of natural and artificial lighting. According to Barnitt (2003), combination of natural light and lamp provide quality lighting. Furthermore, the brightness of the classroom can also be controlled with the use of a separate switch, blinds or curtains as required by learning activities conducted. Furniture and equipment and the safety element were also perceived suitable by students. The suitability may be attributed by the improvement of infrastructure facilities and equipment in the classroom studied. This was in line with the government's efforts to upgrade the facilities involved in all schools to support the educational needs of students from time to time (PIPP 2013-2025). However, this contrasted with the findings from Parveen Khan (2012) and Che Ahmad who found that the suitability was at the moderate level and must be addressed in order to provide a positive impact on students' learning and teaching.

Furthermore, students also perceived technology construct at moderate level. It implied that there was insufficient number of computer or no computer in the classroom. Study by Che Ahmad (2011) also found that there were no computers for students' use in the learning space. The classroom should be equipped with technology such as computers and accessible to internet in order to facilitate the search for information during the teaching and learning process. Therefore, technology equipment in classroom needs to be improved from time to time to meet the needs of students. In addition, Rawlins and Kehrwald (2014) argued that ICT

is an effective pedagogical tool and potentially in assisting teachers learning and teaching in classroom. With the flexibility and help of the technologies, teachers can design learning environments in which students can manage and construct their own representations of knowledge in their minds (Koç, 2005). In addition, the learning environment should create a good atmosphere to support the learning and teaching process. According to Zakaria et al. (2012) learning environment can impact students' behaviour and self-esteem. The physical characteristics of learning environment could also influence teacher-student communication and have an impact on cognitive and affective domains (Che Ahmad et al., 2014). Thus, in order to create a conducive learning environment, student-centred and fulfil the needs of teacher and student, the environment must be assessed and improved to enhance the effectiveness of learning. The characteristics of a classroom will impact overall satisfaction (Hill & Kathryn 2010). Therefore, students will be more enjoy and satisfy in a well-designed classroom. In fact, the quality of education not only be assessed by the subjects taught and the level of students' achievement but also the evaluation of the classroom learning environment.

### **c) The Biology students' learning commitment**

Findings also revealed that students rated their learning commitment in the aspect of cognitive, affective and behaviour as positive. This showed that students' learning commitment is higher than their thoughts, emotions and physical actions. The findings of this study suggested that students were very committed to learn in the classroom. These students were very interest in learning and motivated in completing the tasks assigned by the teacher. The findings were in line with Wonglorsaichon et al. (2014) which stated that students who have learning commitment in terms of behavioural, cognitive and affective will produce more quality learning. It was also supported by Covell et al. (2009), which explained that the commitment of student learning will benefit various parties involved, directly or indirectly. According to Mohd Nihra et al. (2012), students who were less commitment likely to abandon a task, less preparing for exams and all sorts of things that can interfere with the ongoing learning and teaching session in the classroom. It seemed that students who fail to adapt to the learning will likely face many problems in terms of academic, social, emotional, and commitment to learning. Students involved and committed to learning when they felt appreciated, understood and engaged in learning that occurs.

### **d) Comfort learning**

Students viewed the learning comfort construct as positive. This showed that students were comfortable with the learning in the classroom. The findings indicated that the process of learning and teaching biology in the classroom are at a pleasant situation. Students felt very satisfied with the learning environment in the classroom. However, Marzita et al. (2014) found that the classroom comfort was at moderate level. This may be due to the study's location which was carried out in urban areas with high population density. The high population density in urban areas may contribute to the high number of students in a class. Too many students will lead to congestion in classroom and thus reduce the comfort of learning. Students allocate most of their time in the classroom. Therefore, comfort is the key in encouraging learning effectiveness. Comfortable learning environment which meet the needs of students will encourage active participation and enhance the understanding of the concept. Learning effectiveness can be strengthened if the physical and psychological comfort is taken into account. The comfort environment are also related with learning productivity and it's also depend on the building's design and pararell with student's activities (Vale'ria Azzi

da GRAC Collet et al., 2007). Thus, according to Weilin et al. (2013) learning comfort could increase students' motivation to learn in the classroom

**e) Relationship between teacher student interaction and comfort learning**

Analysis showed that there was a strong positive relationship between teacher-student interactions with the learning comfort meaning that when interaction between teachers-students are good, the learning comfort will exist. Teacher-student interaction was the most important element to a successful relationship during school (Robert & Bridget, 2009). Furthermore, two-way communication between students and teachers play an important role in student's academic achievement (Solmaz et al., 2013). The interaction that occurred between teachers and students will increase the learning comfort because students felt that they were heard, understood and appreciated.

**f) Relationship between the suitability of learning environment interaction and comfort learning**

The learning environment had a significant relationship with the comfort learning in Biology classroom meaning that when the learning environment is suitable, in good condition and conducive, students will feel comfortable to learn in the classroom. This is because the suitability of a learning environment will influence students' acceptance and promote effective learning process. This result is in line with Basey et al. (2008) statement that the environment can positively influence students' attitudes. The availability equipment, rules of safety, management and learning environment can also increase students' productivity and promising comfort in the classroom. Khadijah and Azimin Samson (2013) found that many classrooms did not provide a comfortable learning environment and meet the needs of teachers and students. This situation might reduce students' concentration and commitment in classroom learning sessions. Teachers need to shape the learning environment with regard to the design of the physical environment in terms of learning space equipped with the technology facilities to ensure students' comfort and increase the effectiveness of teaching and learning (Lei, 2010). According to Veal and Jackson (2005), the design of learning environments affects the level of students' interaction and involvement. This is because when the learning environment meet the needs of teachers and learning activities, various strategies and approaches could be used in learning and teaching. In fact, the physical environment of the classroom is an effective catalyst for the learning and therefore producing quality human capital.

**g) Relationship between learning commitment and learning comfort**

The learning commitment also had a significant relationship with the learning comfort in biology classroom. This means that when students were committed in their learning, then they will be more comfortable with the learning and teaching in the classroom. The findings reflected that students having passion for learning will tend to feel comfortable in learning in order to success in their life. This is supported by Dallimore et al. (2008), who stated that there is a relationship between learning comforts with a students' commitment. Students who are comfortable in their learning will be actively involved in the learning process. This involvement extremely beneficial in improving their discussions, negotiation of meaning and ultimate motivation in wanting to study Biology (Solas & Wilson, 2015). The involvement of students will increase their mastery in content knowledge and further enhance student

learning commitment. In fact, according to Ghorbani et al. (2013) student learning commitment will inculcate discipline and a greater sense of responsibility in them.

#### **h) Contribution of teacher student interaction, suitability of learning environment and Biology learning commitment towards learning comfort**

Finally, analysis revealed that learning commitment and learning environments were the two predictor variables that contributed significantly to students' learning comfort in Biology classroom. The finding is supported by Serafimova and Zdravkovska (2013), who argued that in order to increase the motivation, involvement and students' learning commitment, the students' confidence, mutual respect, active communication should be strengthened over time. This is also consistent with Ghafouri (2014) findings whereby students built their own learning experience involving emotion and cognition. In summary, the analysis found learning commitment and learning environments were predictor variables that contribute significantly to the variations of Biology learning comfort. Thus, in order to improve the effectiveness of the learning and teaching, teachers need to use the existing environment wisely in order to guide and educate students and enhance their knowledge.

## **CONCLUSION**

The findings showed that the level of teacher-student interaction, the suitability of learning environment, the student learning commitment and the biology learning comfort were positive. There were also a relationship between student teachers interaction, the suitability of the learning environment and learning commitment with the learning comfort. Further analysis also showed that the two main factors that contributed to the learning comfort were learning commitment and the learning environment. Therefore, teachers should employed multi methods and strategies in teaching biology in a more attractive way in the classroom. In addition, teachers could have group activities to improve communications and interactions among students and also promote active participation during lessons. Student-centred teaching should be emphasized so that students are more confident and motivated to learn in the classroom.

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