STUDENT-CENTRED OR TEACHER-CENTRED LEARNING ENVIRONMENT: WHITHER SELF-DIRECTED LEARNING (SDL)?

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Abstract: Past research has found that students rejected Self Directed Learning (SDL) as they perceived it wasted much of their time without knowing the results of their efforts. A similar phenomenon has been observed among the teachers. Hence, it raised the need to understand how students and teachers perceive SDL. Furthermore, are our students SDL readied (SDLR) and our teachers SDL lesson readied (SDLeR)? This research used 4 scales (SDLRSbio, SLeRSbio, PLS and TSS) and interviews with Malaysian pre-university students and teachers to investigate understanding of SDL, SDLR and SDLeR in the biology classroom. Qualitative data revealed that pre-university teachers and students neither seemed unaware of nor understand the notion of SDL. Students think that SDL is an extracurricular activity which provides more information in the related subject. Meanwhile, many teachers equate SDL to Student-Centred Learning (SCL). To implement SDL, teachers and students need to understand SDL, SDLR and SDLeR. Nevertheless, statistical findings revealed that SDLR and SDLeR is not confined to learning styles or teaching approaches, that is, both are independent of the environment. Thus, whither SDL?

Keywords: *Self-Directed Learning (SDL), readiness, Pre-university, teachers and students, learning environment*

INTRODUCTION

Much research has been done to understand the implementation of SDL in the tertiary curriculum. Researchers found that many students and teachers disregard the implementation of SDL (Kleden, 2013; Pepper, 2010) and some even rejected the implementation of SDL completely (Ozan, Karademir, Gursel, Taskiran, & Musal, 2005).

Extensive study about SDL has been conducted in adult education. Much past research focused on understanding SDL. Nevertheless, attempts to understand SDL among pre-university students and teachers are comparatively less. In the definition of SDL, Knowles (1975a, pg18) suggested that SDL is a collaborative process between teacher and students. Indeed Knowles noted that SDL has a process structure rather than a content structure (Knowles, 1975b, pg37). Following the definition proposed by Knowles, SDL has been generally understood as students having some degree of control in setting and achieving their learning objectives (Garrison, 1992). This is further supported by Geertshuis, Jung and Cooper-Thomas (2014) that self-directed learners possessed the ability to set and achieve their learning goals. However, many of the curriculum designers and implementers may have misunderstood SDL by the term "Self-Directed" (Garrison, 1992). Nevertheless, how SDL is realised in the actual classroom is as yet unclear. For instance, many has implemented SDL with student-centred approaches (Gregory, Ellis, & Orenstein, 2011) like Problem-Based Learning (PBL), Project-Based Learning(PjBL), Case-based learning, group work, reflective writing, portfolio, and other student-centred learning methodologies (Struyven, Dochy, & Janssens, 2010). Additionally, the term SDL has been frequently used interchangeably used with PBL (Hassan Murad & Parthibha Varkey, 2008; Towle & Cottrell, 1996). This is due to the assumption that PBL and SDL are similar in nature; learners involved in selecting learning resources and strategies, teachers as facilitators rather than as a source of content (Mazmanian & Feldman, 2011), and learners determine the learning objectives by themselves. Indirectly SDL has been matched with SCL approaches, especially in the form of PBL (Kocaman, Dicle, & Ugur, 2009; Loyens, Magda, & Rikers, 2008). Following this SDL has been used widely in the literature to describe various concepts in learning such as self-planning learning, learning projects, self-education, self-teaching, autonomous learning, independent study, and open learning (Aminuddin Hassan, Tajularipin Sulaiman, & Roselan Baki, 2011). The heterogeneity in the implementation of SDL by educators could have contributed to the equation of SDL with student-centred learning approaches (Hassan Murad & Parthibha Varkey,

2008). According to his definition for SDL, Knowles (1975b, pg37) stated that SDL should be facilitated. What can this mean? Could it be the student learning by himself or herself? Or could it be learning with the guidance of the teacher? Do teaching styles and learning styles play a role? These have triggered the need to investigate how teachers and students understand SDL.

Carolinda and Morris's (2014) study showed that, students need to understand SDL in order to be self-directed. It is a result of collaboration between the students, the teachers and the school administration in creating the environment conducive for SDL. Similarly, Cummings (2011) noted that teachers should understand SDL in preparing their lessons. These results simultaneously pointed to the fact that how SDL is implemented is highly related to the understanding of the teachers and the students.

Research shows that students reject SDL in the form of PBL (Ozan et al., 2005) because of a lack readiness for SDL (Chakravarthi & Haleagajara, 2010). Could this lack of readiness be due to students deliberately not wanting to be self-directed (Van Den Hurk, Dolmans, Wolfhagen, & Van Der Vleuten, 2001), or is it because they lack awareness about SDL? Similarly, could the rejection of SDL in the form of PBL by students be due to teachers who are unprepared for SDL, or is it lack awareness of SDL? The beliefs and awareness of one will affect the way one conducts the teaching and learning processes (Maggioni & Parkinson, 2008). Hence, this article will discuss a research aimed to find out the understanding of Malaysian pre-university teachers and students about SDL. In addition, it was also the aim of the research to investigate if learning styles and teaching styles played a part in students and teachers being readied for SDL. In order to achieve these aims, this research investigated the correlations of students' readiness for SDL and teachers' readiness for SDL lessons with their learning styles and teaching styles respectively.

THE KNOWLEDGE GAP

In past research, SDL was defined as a process through which learners initiate, diagnose, formulate, implement, and evaluate their learning. Students were expected to possess the attitudes, abilities and personality needed for SDL. Similar expectations were projected on to the teachers who conducted SDL lessons. However, review of past research has revealed a lack in the study of SDL readiness among the teachers and students. This gap channelled the researchers' interest on the perceptions of teachers and students about SDL. The perceptions which one has towards the learning process contributes to the choice of learning processes (Dennis, 2016). Hence, the current research put the focus on understanding the perceptions of teachers and students towards SDL. Figure 1 shows the research gap identified from the literature review.

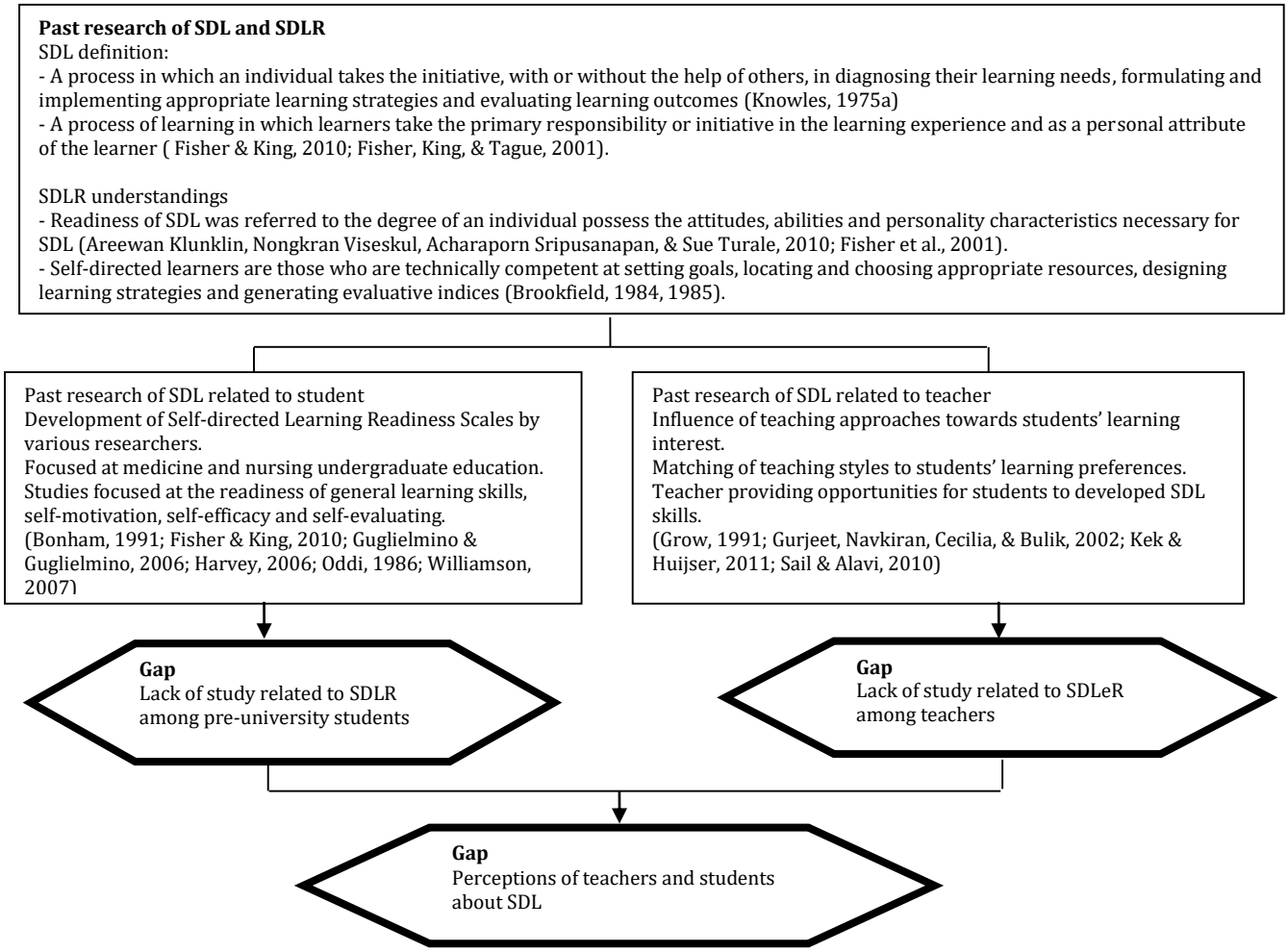

Figure 1. The research gap of the study

METHODOLOGY

This research was a nationwide research which covered both East and West Malaysia. To start, schools that provided pre-university programmes were identified. In this research, only students and teachers involved in the Malaysian Higher School Certificate (known as the *Sijil Tinggi Persekolahan Malaysia or* STPM*)* were selected. This was because STPM is the most common pre-university programme offered by the Malaysian government and biology is one of the fields of study which mostly adopts SDL in its curriculum at the tertiary level (Kek & Huijser 2011).

A list of the schools providing STPM Biology was obtained from the Educational Planning and Research Division (EPRD) of the Ministry of Education (MOE). From the list there were 261 schools providing STPM Biology in Malaysia. The researchers contacted all the 261 schools. The scales were administered and interviews were conducted only with the schools which are willing. The research was conducted with the permission of the school principals, and the consent of the Biology teachers and students.

This research was divided into two stages. In the first stage, the research was conducted to investigate the correlations of students' readiness for SDL with their learning styles, and teachers' readiness for SDL lessons with their teaching styles. This stage of the research was conducted with four (4) scales; Self-Directed Learning Readiness Scale for Biology (SDLRSbio), Self-Directed Lessons Readiness Scale for Biology (SDLeRSbio), Preference of Learning Styles for Biology (PLSbio) and Teaching Styles Survey (TSS).

Both the SDLRSbio and SDLeRSbio were developed utilising the Delphi Technique. Two Delphi rounds were conducted with a panel of 7 experts from the fields of education, medicine, teacher training, and teaching. The rounds of Delphi Technique conducted depended on the experts' review results. The rounds stopped once a congruent review was achieved among the Delphi experts. Cronbach's alpha was used to show the internal consistency and reliability of the scale (Karen & Chen, 2016).

Six (6) constructs were identified with 46 items for the SDLRSbio, and 7 constructs were identified with 53 items for the SDLeRSbio. The Cronbach Alpha reading of the developed SDLRSbio was 0.869 and the SDLeRSbio was 0.971. According to George and Mallery (2003) Cronbach's Alpha value below 0.5 is unacceptable, a value between 0.6 – 0.7 is acceptable and a value from 0.7 – 0.8 is good. Hence both the developed scales had high reliability and were used in measuring the readiness for SDL among STPM Biology students and teachers respectively.

The PLSbio was adapted from the Learning Styles Survey prepared by Honey and Mumford in 2000. The original Learning Styles Survey was adapted specifically for learning Biology. Two (2) Delphi rounds were conducted with the same expert panel in adapting the items of the survey. After the adaptations, the PLSbio yielded a Cronbach Alpha reliability reading of 0.705 during the pilot test. Hence, it was utilised in this research.

The measurement of teaching styles was adopted from the Grasha-Riechamann's Teaching Styles Survey (TSS). The survey is available online at *longleaf.net/teachingstyle.html*. In the pilot test, TSS yielded a Cronbach Alpha reliability reading of 0.625. According to George and Mallery (2003) Cronbach Alpha reading between 0.6 – 0.7 is acceptable. Hence, TSS was used in the research to measure the teachers' teaching styles.

After identifying the schools which were willing to participate in the research based upon the school list provide by EPRD, all the four (4) scales were administered to the students and teachers in the participating schools. The STPM Biology students were given the SDLRSbio and the PLSbio to be completed. The STPM Biology teachers were given the SDLeRSbio and the TSS to be completed. Spearman's Rho correlation in SPSS Version 20 was used to investigate the correlations. A total of 551 students and 55 teachers from East and West Malaysia participated in the research.

In this research there were two types of quantitative data collected. Firstly, the readiness data which was continuous data. Secondly, the teaching styles and learning styles data which were discrete data. In order to look into the correlation of the two types of data, non-parametric statistics were utilised (Balnaves & Caputi, 2001; Creswell, 2012; Ivankova, 2014; Muijs, 2012). Hence, Spearman's rho correlation was used in the study. The correlation results showed the correlation between SDLR and learning styles, and SDLeR and teaching styles.

In the second stage, the research was conducted to find out the understanding of SDL among the students and teachers. Interviews were conducted with selected STPM Biology students and Biology teachers nationwide in Malaysia (East and West Malaysia). Students and teachers who participated in the interviews were selected based on willingness.

The interviews were conducted with an interview protocol as a guide to determine the understanding of teachers and students about SDL from the context of biology teaching and learning. In the protocol, interviewees were asked to give their opinions about SDL and how they carried out SDL. Interviews were conducted until saturation of data was attained. Consent was given by the interviewees prior to the commencement of the interview. All interviews were conducted in the respective school compounds which the interviewees were attached to. Each interview was audio recorded for transcription. The transcriptions of the interviews were triangulated during analysis in order to determine the understanding of SDL among STPM Biology teachers and students.

RESULTS AND DISCUSSIONS

Correlation between students' SDLR and Learning styles, and teachers' SDLeR and teaching styles were conducted with Spearman Rho correlation in SPSS version 20. The results from the quantitative surveys revealed that there were weak correlations between students' readiness for SDL and learning styles. This is seen in Table 1. The correlations showed minimum variation when compared. This strongly indicates that all learning styles had equal significance correlating to students' readiness for SDL. Indeed in past research, students were found being able to keep pace with the current discoveries of knowledge through SDL (Blair, Maharaj, & Primus, 2016). Based upon the correlation

between learning styles and SDLR, students most probably could be readied for SDL regardless of which learning styles they preferred.

A similar result for teachers' teaching style and readiness for SDL lessons is found in Table 2. Teachers' readiness for SDL lessons is moderately correlated to the teaching styles. The correlations showed minimum variation when compared. Hence, teachers' readiness for SDL lessons could be said to be independent to the preferred teaching styles.

Both the correlation results between students' SDLR and students' learning styles, and teachers' SDLeR and teaching styles, indicated that regardless of which learning styles or teaching styles students or teachers are exposed to or utilise, both students and teachers could be readied for SDL. This result further explained the findings of Arunodaya, Rogayah, and Ahmad Fuad (2009) saying that students learned better with a combination of learning environment. Indeed Swailes and Senior (1999) found that high performing students applied more than one learning style. In addition, SDL can occur in a wide variety of situations in a formal setting (Gyawaii, Jauhari, Shankar, Saha, & Meraj, 2011). Gyawaii et al. (2011) further explained that readiness exists in all individuals innately along a continuum. Hence, students could be readied for SDLregardless of which learning styles they preferred.

Table 1
Spearman's Rho Correlation of Students' SDLR and Learning Styles

	Theorist	**Pragmatist**	**Activist**	**Reflector**
Correlation Coefficient	.219**	.244**	.241**	.317**
Sig. (2-tailed)	.000	.000	.000	.000
N	437	437	437	437

** Correlation is significant at the 0.01 level (2-tailed)

Table 2
Spearman's Rho Correlation of SDLeR and Teaching Styles

	Expert	**Formal Authority**	**Personal Model**	**Facilitator**	**Delegator**
Correlation Coefficient	.591*	.508**	.569**	.606**	.480*
Sig. (2-tailed)	.000	.001	.000	.000	.001
N	42	42	42	42	42

** Correlation is significant at the 0.01 level (2-tailed)

Past research shows that the teacher is the crucial element in determining the success of a SDL curriculum (Finucane, Shannon, & McGrath, 2009; Monika, Jacobiene, Drielc, & Jan, 2017). In this research, the correlation has shown that teachers' teaching styles are significantly related to the readiness for SDL lessons among the teachers. However, there were no particular teaching style which was more significantly related to the readiness. What can this mean? It can be that the statistical data points to the fact that although the teacher is a crucial element in identifying the success of the SDL curriculum, students can be readied for SDL whatever teaching styles they are exposed to.

Following the statistical analysis of the correlations, the research continued with interviews to find out the teachers' and students' understanding of SDL notion. The interviews were conducted in each regions of Malaysia including the East Coast and West Coast of Peninsular Malaysia, and Sabah and Sarawak of East Malaysia. The results from the interviews conducted among the teachers and students showed that both teachers and students of Malaysian STPM Biology had different understandings of SDL.

Students' Understanding of SDL

Students seemed to lack awareness of SDL. Indeed, by the word "self", students perceived SDL as a study done by oneself. Past research of SDL has shown that students conceptualized SDL as a process of learning in which one takes the primary responsibility or initiative in the learning experience and as a personal attribute of the learner (Stockdale & Brockett, 2010). Hence, students will be assumed to be readied for SDL only when they exhibit student-centred learning skills and knowledge.

From the interviews with pre-university Biology students from Malaysia, some students perceived SDL as self-study to supplement the mainstream education. SDL was made equivalent to the revision and self-study activities carried out by the students. Excerpts below showed some of the feedback recorded during the interviews.

Researcher (R): What do you know about SDL?
Student (S)2: What is that? Study by myself?... *(Sarawak, SI2 R78-79)*

S2: Maybe in Form 6 (pre-university) I was not exposed to this kind of learning…
(Sarawak, SI2 R99)

S4: SDL is basically sort of like self-study where we will read up our own material and search the internet and based on whatever we had gather and we will just maybe form a conclusion from there…
(Kuala Lumpur, SI 4 R15 – 17)

S5: SDL is like after school, after class, you go back home and you have time so you take out the books and you revise what you have learned. Is like you are directing yourself to know more about what you have learned during the class.
(Johor, SI 5 R 8 – 11)

S5: …What I meant is by self-directing can be an addition of what we have learned from teacher.
R: It is an addition of what?
S5: It is like an extra curriculum.
R: Extra from the school curriculum that we have?
S5: (Head nodding) Ya. *(Johor, SI5 R28 – 37)*

During the interviews, some students assumed that SDL is about obtaining extra information in the subject for them to pass the examination. They believed that self-study and learning on their own is SDL. This finding seemed to echo Stockdale & Brockett's, (2010) findings that students perceived SDL as personal attributes in achieving their learning goals.

S6a: …. Self-learning means we just need to read the books…
(Kuala Lumpur, SI6 R100)
S6a: SDL is like learning at home or no need to go to school. Find resources of research just own self. At home, no need to go to any tuition or teachers…
R: What do you think (turning to other students)?
S6b: also the same.
R: That means?
S6b: That means just repeat reading and try to understand what's the meaning of it.
R: Anyone has any other ideas about SDL?
S6d: Study through the group discussion. Like study group.
(Kuala Lumpur, SI6 R206 – 217)

Students seemed to assume that, this SDL refers to only when they are doing revision after formal school hours. A research by Blair et al. (2016) also found that students thought of SDL as to obtain extra knowledge by conducting research or study outside formal lecture hours.

Another finding generated from the interview showed that students were unaware of SDL. The students revealed that they were not exposed nor have heard of SDL before being mentioned by the researcher.

R: How much do you know about SDL?
S3a: Not really…
S3b: Me too, not really know about SDL.
R: You mean before this, you don't even know what SDL is?
S3a: Ya, it is a new term
S3d: Ya. *(Selangor, SI3 R70-75)*

Apparently Malaysian STPM students lack an understanding of SDL. Hence, students have difficulties in identifying SDL (Ozan et al., 2005). The term "Self-Directed Learning" seemed to gear their understanding towards efforts by themselves in getting more knowledge. This understanding is different from what has been defined by Knowles (1975b) or Garrison (1997). Both Knowles (1975b) and Garrison (1997) have mentioned that SDL is a process of learning with or without the help of others in setting, achieving and evaluating the learning objectives. Obviously, the learning process could be accomplished by the student alone, or with the help of others like teachers.

Teachers' Understanding of SDL

How teachers interpreted and understand SDL would influenced the implementation of SDL (Hassan Murad & Parthibha Varkey, 2008; Kleden, 2013). Therefore, interviews were conducted in the current research to investigate the teachers' understanding of SDL.

According to the interviews, the researchers found that some teachers understood SDL as a process which does not involve teachers. They understand SDL from the term "Self-directed", that it was the learner's sole responsibility in the process of learning. Teachers are not involved at all. SDL should be totally student-centred and students should be the ones to take charge of their own learning process. This was explained in the following excerpts from the interviews.

> *Teacher (T)2: In SDL they (students) should study on their own.*
>
> *(Kuala Lumpur, TI2 R145)*

> *T4: From the term itself, SDL like they (students) all doing their own study. Maybe, because from the term self-directing that means maybe they do on their own study and everything…*
>
> *(Sabah, TI4 R9-11)*

> *T3: SDL, I suppose to be learning by yourself beyond the text book and what you (teacher) teach in class. It is your (students') interest and knowledge itself.*
>
> *(Selangor, TI3 R94-96)*

In addition, the results of interviews also showed that teachers perceived SDL as a kind of team work where teachers should give instructions and guidance for the students to complete the work. Teachers perceived that they need to take charge of the implementation of SDL so that the students will achieve the learning objectives. This result seemed to echo Chakravarthi & Haleagajara's (2010) findings that monitoring and guidance from teachers were needed.

> *T2: …SDL is team work. That means you (teacher) assign a student one topic. So that let them (students) go and find out certain things to present.*
>
> *(Kuala Lumpur, TI2 R169-171)*

> *T3: I think would get better SDL in class with teacher in control. If go back home then it is definitely… I don't know… I think they (students) will lost.*
>
> *(Selangor, TI3 R94-96)*

From the interviews with teachers from Malaysia, teachers seemed to have two extreme views of SDL. First, the teachers thought that SDL is some sort of student-centred learning, where students shall take sole responsibility for their process of learning and that teachers shall not be involved and have no responsibility in the process of learning in SDL. Indeed some think that teachers should change their delivery method from being teacher-centred to student-centredness in order to embrace SDL (Neville, 1999).

Second, teachers thought that SDL implementation should be closely monitored by providing guidance and instruction along the process of learning to ensure students did not go astray from the learning objectives. This result was also recorded by Mohamad et al. (2009) that close monitoring from teachers could ensure that students did not deviate from their learning objectives. Finucane et al. (2009) also found that teachers are important in determining the success of the implementation of a lesson. Hence, the current research found that teachers were having two extreme concepts of SDL. Louwsa, Meirinka, Drielc, and van, (2017) mentioned that teachers conducted lessons with the pedagogies they are

familiar or understood better. Therefore, the perception of a teachers towards SDL contribute to the implementation of SDL.

CONCLUSION

Students and teachers seemed to have misinterpreted SDL due to a lack of understanding. Students perceived that SDL is solely an approach in which the students conduct learning all by themselves. Whereby other teachers believe that guidance is needed. Perhaps an absence of proper understanding of the SDLR and SDLeR notion, could have been the cause of students and teachers rejecting SDL as reported in the past research (Kleden, 2013; Ozan et al., 2005; Pepper, 2010). Hence, it is important to ensure that teachers and students comprehend SDL. Perhaps teachers should be exposed to SDL, and develop a proper understanding of it before being posted to schools. Similarly, students need to be exposed to what SDL means in order to gain the skills and knowledge needed for SDL. Enhancing the understanding of SDL among the teachers and students could improve the implementation of SDL in the process of teaching and learning (Blair et al., 2016; Mirna Duarte Barros, Silva, Pinto, Pereira, & Liquidato, 2016).

While understanding of SDL is essential, the current research showed that being readied for SDL be it SDLR or SDLeR, is apparently independent from teaching styles and learning styles. The statistical correlation between learning styles and students' SDLR, and teaching styles and teachers' SDLeR, indicated that no particular learning style or teaching style contributed more to the readiness for SDL among students and SDLeR among teachers. What can this mean? Whither SDL if no particular learning or teaching style has significant effect upon being SDL readied? Possibly these results indicate that one can be readied for SDL in any learning and teaching environment. In other words, SDL can possibly be conducted in any form of teaching and learning approach. Perhaps SDL readiness is the outcome of any teaching-learning environment be it student-centred or teacher centred as long as there is deep interaction between the student and the teacher.

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