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2U2i AND WBL-BASED PROGRAMS STUDENT-CENTERED LEARNING EFFICACY IN MALAYSIAN HIGHER EDUCATION

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Abstract

The Malaysian education system must adapt to the 21st-century paradigm change to produce quality graduates who are holistic, balanced, entrepreneurially ready, bright, skilled, and knowledgeable. Student-centered learning (SCL), a teaching-and-learning (TnL) method, is being adopted in the system to develop students' inclinations and higher thinking capacity, revealing individuals' talents in a certain sector meanwhile, 2U2i and work-based learning (WBL) study modes were established to lessen students' reliance on traditional learning by emphasizing particular industrial in-field learning and continuous learning. The purpose of this study is to verify the reliability and validity of the instrument that will be used to determine the efficacy of SCL in 2U2i and WBL programs among participating local higher education providers (HEP) aside from confirming the existence of SCL elements within the programs. The initial data collection procedure involved questionnaires with students as well as industry players with whom the students are currently affiliated. The results suggest that the instrument used is viable and easily understandable by respondents. However, it is insufficient to formulate a truly effective instrument due to the small sample size and differences in the implementation of 2U2i and WBL programs, suggesting a complete data collection involving all related parties in future studies.

Keywords

Student-Centered Learning, SCL, 2U2i, Work-Based Learning, WBL

1. Introduction

Education is very important in producing a generation that is knowledgeable, skillful, and efficient in the field they are engaged in to drive the growth of the nation's prosperity. In line with that desire, the TnL methods need to be diversified and refined to create an atmosphere that attracts students' interest in addition to the latest program offering that is closer to the real industrial working environment. Existing TnL methods focus more on the needs of the teaching staff in determining the direction and knowledge requirements as well as methods of knowledge acceptance by students. This method makes students passive in the learning environment, with less interaction between students and the teaching staff and among themselves in digesting, knowledge bridging, and exploration based on the foundation built by the instructor. The student's desire for knowledge needs to be prioritized. Variability in teaching methods is a feature that allows students to learn well which enables optimal knowledge transfer (Rosenshine, 1973), putting students at the forefront in managing knowledge transfer within the learning environment, and thus SCL was

introduced and implemented in the field level. SCL thus provides a foundation for a more conducive and interactive learning environment where teachers act as facilitators and injectors of ideas, while students act as implementers in developing and exploring those ideas.

Although there are strict requirements for the provision of appropriate and up-to-date TnL facilities that need to be ready for every program offered by higher education providers, it still cannot match the speed of technological change adopted by the industry. Not only that, the level of supervision and problem-solving practiced by the industry is more hands-on and changes at times accordingly. Therefore, the digestion of knowledge obtained by students not only at least need to be in line with the industry, but also need to adapt it naturally. Therefore, programs based on 2u2i and WBL are introduced as an option and pioneer to a learning process that is more practical based in the industry compared to more theoretical or practical in the classroom. Programs like this allow students to gain knowledge closer to the real working environment where they can put their knowledge into practice during their study period. It also helps increase the efficiency of students to digest the theory learned into practice in addition to facilitating the absorption of students into the working environment immediately after graduation. The industry players can be gathered to provide feedback on the performance of students and the program for the improvement process in the future.

This study discusses the SCL application effectiveness in 2U2i and WBL-based programs through a survey method in several involved higher education providers (HEP). Aside from other stakeholders, students' feedback on involvement in curriculum content, teaching methods, and assessment methods is essential to provide a clear answer related to the quality of the TnL process (Md Osman et al., 2015). In determining the effectiveness of SCL in the 2u2i and WBL programs, this study first determines the applicability of the research method that will be used in the study and discovers the existence of the implemented SCL elements. Although the SCL TnL method has been applied in 2u2i and WBL-based programs since its launch dates, the level of effectiveness has not been tested and recorded until today. There are as many as 26 running 2u2i and WBL-based programs offered by various HEPs, only two will be selected for this preliminary study as they are the pioneers and had completed the cohort cycle. The results will then be used as a benchmark for programs in line with the 2U2i and WBL study mode in which the industry is involved for a long period. Furthermore, this will allow the Malaysian Qualification Agency (MQA), a governance body that accredited and certifies the quality of programs offered by HEPs,

and the Malaysia Ministry of Higher Education (MOHE) to revise or amend the existing guidelines for both modes to ensure the optimum implementation of SCL.

2. Literature Review

Although WBL-based programs have been implemented first compared to 2U2i programs, the adoption of the SCL method is still considered new in Malaysia involving only a few HEPs. Some studies have been done by some HEPs related to the use of SCL, but they are for conventional programs at HEP and not 2U2i or WBL programs. The studies concluded significant improvements in the TnL process and the effectiveness of program delivery and management. The students were also found to easily absorb the information given in addition to having strength in problem-solving. Based on the information from the study, this research was formed to uncover the information gap on the effectiveness of SCL by involving the industry in non-conventional programs.

2.1. Student-Centered Learning

SLC is defined as focusing on the development of learning towards students as individuals by giving choices to students for what types of knowledge they want to learn, creating collaboration by building knowledge and a positive environment while engaging in continuous assessment. It translates into the attitude of teachers who listen to students' views and involve students in TnL planning. Students are essentially responsible for their learning (Panitz, 1996) by maximizing the resources available to them such as using materials that challenge existing knowledge and deep understanding of new concepts through social interaction in school, work, home, and community or related outdoor activities. In simple terms, SCL is a teaching and learning strategy aimed at creating a learning experience that can amplify students' interest and encourage their involvement in the teaching and learning process by providing opportunities to learn individually or in groups. Students' involvement in forming a learning process through negotiation based on student strengths and weaknesses thus giving freedom to make choices of resource materials and learning activities, in hand with establishing monitoring procedures so that learners are responsible for what they learn (Daniel, 2012). Studies have shown successful implementation of SCL in providing a flexible learning path by considering the use of different delivery modes and various pedagogical methods flexibility by promoting a sense of autonomy in students, respect

between friends and lecturers as well as any related procedures in dealing with student issues (Gibbs,1995; Todorovski et al., 2015).

In contrast, "Teacher Centered Learning" more commonly known as traditional teaching is more geared towards one-way TnL. The teaching staff is the only one who controls the TnL process and rather gives instructions to the students. This environment creates a passive, indifferent, and bored TnP process. On the other hand, SCL is a two-way method of TnL where the power of teaching and learning is more focused on what the students do base on the activities they carry out; monitored by the teaching staff either directly or indirectly (O'neill & McMahon 2005; Mascolo, 2009).

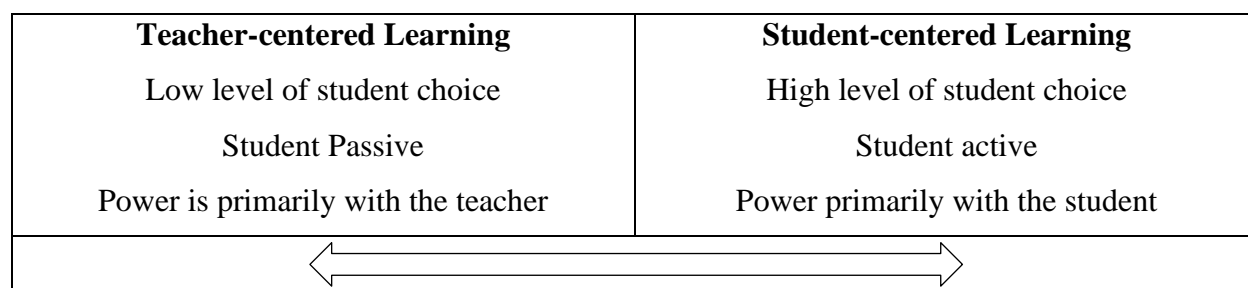


Figure 1: *Student-Centred and Teacher-Centered Continuum*

(Source: O'Neil & McMahon, 2005)

SCL has started in 1905 in Hayward and in 1956, based on the work of Dewey's (O'Sullivan, 2003) who believes that humans learn something through practical training where there is a need for interaction in the environment to enable adaptation and acceptance of TnL takes place. In SCL, students are allowed to play their role actively through discussion, analysis, and synthesis (Hannafin et al., 1997; Brush & Saye, 2000). This SCL environment allows students to examine problems in more detail by using a variety of facilities and references in creating strategies to solve problems. There are many previous studies related to SCL that have been conducted in Europe, even in Indonesia and also in Malaysia. The results of the study found that the implementation of SCL makes students more motivated and confident in solving problems as well as easier to understand the input given by the instructor (Yunus, 2018; Chen & Chang, 2014). This can be done by applying the use of teaching aids that are appropriate and parallel to real use such as real-life working simulations (Benclahcene et al., 2020). The variety of teaching methods was also found to help the facilitator in organizing and planning lessons to match the teaching content, the student's needs, and the teaching process by minimizing input while maximizing output and thus encouraging knowledge exploration (Felder & Brent, 2005; Syed Hassan et al., 2021). The

method is compatible with the concept of lifelong learning where the process of digesting knowledge also occurs after formal education.

In Malaysia today, SCL gained serious attention amongst HEP as one of the new ways of the TnL process a top priority for students' continuous learning. Therefore, there are many SCL research and studies carried out by local universities such as Universiti Sains Malaysia (USM), Universiti Kebangsaan Malaysia (UKM), Universiti Putra Malaysia (UPM) and many more (Md Osman et al., 2015; Syed Hassan et al., 2021).

2.2. 2U2i

2U2i study mode was launched in 2016 by the then Malaysia Minister of Education, Datuk Seri Idris Jusoh, are a new learning approach that opens opportunities and space for HEP and the industry to get involved in building curriculum and student assessment in addition to providing extensive early working experience to students (Mohd Yusof et al., 2020). It is a concept that provides two years of conventional study at the HEP's facilities and another two years in the industry (for undergraduate degree level) on a full-time and conventional basis, hence 2U2i. The two plus two could vary in such as three plus one, two plus one, or any other suitable combination depending on the program duration. The assessment process within the HEP is monitored by teaching staff whereas else it is guided by close supervision from academics and practitioners for the industry part (Ministry of Higher Education, 2017). Through this mode, students not only will experience formal in-class education but also will be exposed to real-life working scenarios much earlier before graduating promoting significant improvement in employability. Currently, there are five pioneer HEPs that offer 2U2i study mode which are UPM, Universiti Sultan Zainal Abidin (UnisZa), Universiti Teknologi Malaysia (UTM), UKM and Universiti Malaysia Kelantan (UMK). This mode of study was introduced based on the government's desire to increase the employability rate among graduates by up to 80%, thus enabling more relevant competencies and skills such as soft skills. Student employability is to be polished by building experiences through real industrial working situations through building experience.

2.3. Work-Based Learning

WBL is a teaching and learning method that involves the industry to improve students learning experiences in line with the objectives of PPPM 2015 -2025 (PT) (Malaysian Qualification Agency, 2016). WBL is a term used to describe a class of a program at HEP that brings together universities and work organizations to create new learning opportunities in the

workplace (Boud & Solomon, 2001; Sobiechowska & Maisch, 2006). The students become full-time employees taking the program in which the curriculum is embedded in workplace activities designed to meet employee learning needs and organizational goals.

WBL has introduced 35 years ago at the University of Chester's undergraduate curriculum as a four-week work placement with a pass-or-fail assessment (Department of Employment, 1993). However, in Malaysia, the implementation of the WBL program only started in 2007 with Community Colleges (Watisin et al., 2018). The study structure of WBL is based on the HEP study plan with the application of TnL in the early semester or course. The curriculum that has WBL elements only needs to involve the industry during the planning phase and the course content should be between 30% to 100% of industrial attachment. There is no minimum period for students to be in the industry. In addition, this WBL study is implemented as a Day release or Blocked release. (Malaysian Qualification Agency, 2016)

The implementation of the WBL was due to an unsatisfactory level of knowledge, skills, and attitudes amongst graduates which are required by employers (Ministry of Education, 2018). WBL is seen to enhance students' learning and working experience in the industry (Malaysian Qualifications Agency, 2015) shown by improved soft skills in oneself with positive work culture, good social skills, team spirit, and other skills required by employers. (Munjanganja et al., 2010)

3. Methodology

A quantitative method involving two HEPs and respondents proceeds in this study. Although there are 26 programs from various HEPs that offered SCL implemented 2U2i or WBL programs, only two HEPs gave positive interest in this research as shown in Table 1.

Table 1: *The HEPs That Were Involved with This Preliminary Study*

Name of HEP	Program Name	Program Mode	No. of Student	No. of Teaching Staff	Nu. of Industrial Supervisor
Politeknik Metro Johor Bharu	Diploma in Logistics and Supply Chain Management	WBL	26	2	2

East West International College	Diploma in Hotel Management	2U2i	14	9	2
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(Source: Authors' Own Table)

The two mentioned HEPs are used as a preliminary study to assess the reliability and validity of the instrument and as a method to confirm the existence of SCL elements in the TnL process. A preliminary questionnaire was crafted beforehand to verify the level of understanding and gathers early information regarding the choice of the instrument which involved 55 respondents (40 students, 11 teaching staff, and 4 industrial supervisors) were interpreted through Cronbach Alpha values as shown in Table 2. Cronbach's alpha coefficient is used to measure the survey items' reliability in which higher values indicate the consistency of response for each participant across a set of items. A value of Cronbach above 0.6 is considered high reliability and acceptable whereas else any lesser is considered low (Hulin et al., 2001; Pallant, 2001; Nunnally & Bernstein, 1994). The formula for Cronbach's Alpha is shown in (1).

$$\alpha = \left(\frac{N * \bar{c}}{\bar{v} + (N - 1) * \bar{c}} \right) \quad (1)$$

N = number of items.

\bar{c} = mean covariance between items.

\bar{v} = mean item variance.

Table 2: Cronbach Alpha Value

Cronbach Alpha Value	Interpretation
$\alpha \geq 0.9$	Excellent
$0.7 \leq \alpha < 0.9$	Good
$0.6 \leq \alpha < 0.7$	Acceptable
$0.5 \leq \alpha < 0.6$	Poor
$\alpha < 0.5$	Unacceptable

(Source: Sekaran, 1992; Mohd Majid, 2005; Creswell, 2012; Pallant, 2001)

The results will then be used as a benchmark to refine the final questionnaire circulation to complete this research. The validity and effectiveness of the questionnaire developed will go through a review process by academic panels from the quality assurance and educational field before it is disseminated amongst the participating HEPs. A preliminary survey form was given to

students, teaching staff, and industrial supervisors through online forms because it facilitates the distribution and collection of data. The number of questions or items shown in Table 3 that were asked covers several specific domains to understand the SCL effectiveness level in related programs.

Table 3: The Number of Items for Each Domain and Respondents

Stakeholder	Student	Teaching staff	Industrial supervisor
Domains			
Demographics	5	8	5
SCL Comprehension	-	-	2
SCL teaching methods used by lecturers	10	13	-
Teaching methods based on SCL in the industry	11	-	11
SCL achievement and student learning outcomes through 2U2i and WBL programs	7	10	10
Achievement of goal through the SCL method	4	4	7
Instructional strategy	6	6	
Student assessment	7	7	7
Lecturer's role	10	10	-
Industrial supervisor role	10	-	8
Student/Trainer role	6	6	9
Learning environment	6	6	7
Obstacles or problem	7	6	7

(Source: Md Osman et al., 2015)

Each domain explains the need for specific justification in determining the existence of SCL or not in addition to determining the level of effectiveness of SCL itself (Table 4). A Likert scale was used as an evaluation for each item asked. The Likert scale is a five (or seven) point scale that will allow individuals to express how much they agree or disagree with a particular statement. Five-point Likert scale has been recommended that would minimize the frustration level of patient respondents and increase response quality and response rate (Sachdev & Verma, 2004; Trofimov et al., 2017; Al zefeiti & Mohamad, 2017)

Table 4: Justification for Each Domain of Item

Domains	Purpose
[A] Demographics	To allow a better understanding of certain background characteristics of a respondent, whether it's their age, educational background, income, work situation, marital status, etc.
[B] SCL Comprehension	To determine the extent of industrial supervisors' understanding of the SCL approach.
[C] SCL teaching methods used by lecturers	To discover what methods of the SCL approach are used by instructors and what teaching methods are used to achieve the knowledge required by students.
[D] Teaching methods based on SCL in the industry	To discover the SCL teaching methods used by industrial supervisors and if the method can help the achievement of knowledge required by the industrial trainee
[E] SCL achievement and student learning outcomes through 2U2i and WBL programs	To discover the extent of the SCL approach used in 2U2i and WBL programs that can help student learning outcomes.
[F] Achievement of goal through the SCL method	To determine whether the SCL approach achieves teaching and learning goals.
[G] Instructional strategy	To understand the extent of SCL instructional strategies used by instructors in the classroom
[H] Student assessment	To understand the importance of student assessment and what form of SCL assessment is used by instructors.
[I] Lecturer's role	To discover whether teachers play their role in cultivating SCL
[J] Industrial supervisor role	To discover whether industry supervisors play their role in cultivating SCL
[K] Student/Trainer role	To understand the extent to which students play their role in cultivating SCL
[L] Learning environment	To discover whether there are support facilities provided how the level of relationship between

	students and instructors, industry supervisors and peers/industry friends
[M] Obstacles or problem	To determine the obstacles or problems in implementing SCL.

(Source: Authors' Own Table)

Data analysis was done using Statistical Package for the Social Science (SPSS) where the mean score and standard deviation for each item were calculated. The overall mean score and standard deviation for every item were then calculated to justify and explain the level of SCL effectiveness based on each domain. The resulting mean score was divided into three categories: low (1.00 – 2.33), moderate (2.34 – 3.66), and high (3.67 – 5.00). This differentiation was proposed by Pallant (2010) who thought that these three categories were more suitable and convenient for researchers in conducting their research or observations. Mean can be calculated by dividing the sum of all values in a data set by the number of values while standard deviation is a measure of the amount of variation or dispersion of a set of values. A low standard deviation indicates that the values tend to be close to the mean of the set, while a high standard deviation indicates that the values are spread out over a wider range. The formula for both mean and standard deviation is as follows.

Mean

$$\bar{x} = \Sigma fx / \Sigma f \quad (2)$$

\bar{x} = the mean value of the set of given data.

f = frequency of each class

x = mid-interval value of each class

Standard deviation

$$SD = \sqrt{\frac{\Sigma |x - \mu|^2}{N}} \quad (3)$$

Where Σ means "sum of", x is a value in the data set, μ is the mean of the data set, and N is the number of data points in the population.

4. Research Findings

The analysis shows the Cronbach Alpha coefficient reliability value obtained for each variable is between 0.663 and 0.968 which translates into high reliability of the items proposed

except items for domain M (obstacles or problem) for Industrial Supervisor (Table 5) due to the items being drafted in reverse psychology intended to help reduce the tendency of response that has the potential to be biased. Although above 0.75 is excellent, intraclass correlation coefficient values between 0.4 and 0.75 are still good (Fleiss, 1986; Cicchetti, 1994). When quantitative measurements are made on units arranged in groups, it describes how strongly units in the same group resemble each other. Even though it is viewed as a type of correlation, unlike most other measures of correlation, it operates on data structured as groups, rather than data structured as paired observations.

Table 5: The Results of Cronbach Alpha for Each Domain

Stakeholder	Student		Teaching Staff		Industrial Supervisor	
	No. of Item	Cronbach Alpha	No. of Item	Cronbach Alpha	No. of Item	Cronbach Alpha
A	-	-	-	-	2	N/A
B	13	0.941	13	0.963	-	-
C	11	0.949	-	-	11	0.948
D	10	0.952	10	0.954	10	0.979
E	5	0.932	4	0.663	7	0.913
F	6	0.957	6	0.943	-	-
G	7	0.904	7	0.931	7	0.778
H	10	0.968	10	0.930	-	-
I	10	0.956	-	-	8	0.973
J	6	0.918	6	0.895	9	0.975
K	6	0.894	6	0.955	-	-
L	6	0.904	-	-	7	0.962
M	7	0.968	6	0.818	7	0.467

(Source: Authors' Own Table)

The result from this preliminary study was also used to determine the effectiveness of the SCL implementation for the 2U2i and WBL programs implemented by the HEPs involved. Table 6 shows the results for each domain analyzed. The overall results found that the mean value for each domain exceeded 4, indicating that SCL was done and implemented well by all respondents. This result is consistent with the data presented by Chen and Chang (2014) which stated SCL

promotes learners to interact with learning peers more actively and positively in an interactive learning environment that is good and can foster students to be more enthusiastic about cooperation, bridging the communication gap between peers, lecturers, and industrial supervisor in making TnL more active. Furthermore, it also increases students' responsibility and problem-solving skills.

The high mean value for the role of instructors and industry supervisors in implementing SCL also shows that they have acted as facilitators. They listen to opinions, provide motivation, are open but firm, and respect their students/trainees. Students/trainees are constantly being challenged to further their understanding and improve critical thinking skills as well as make evaluations based on the appropriateness of the assessment. This translates into the existence of SCL elements being practiced and implemented throughout the TnL process by the facilitators as stated by Stanley and Marsden (2012) mentioning that SCL teaching methods are effective in the role of the instructor. However, for the last domain M (obstacles or problems), the mean results were found to be at a moderate level. All the items in this domain focus on things that help in the implementation of SCL, including subject size, number of students/industry trainees, experience in using the SCL approach, respondents' views on the SCL approach, student evaluation, infrastructure and guidelines related to the implementation of SCL.

Table 6: Result for The Effectiveness of SCL Implementation In 2U2i And WBL Program

Stakeholder	Student		Teaching Staff		Industrial Supervisor		Overall Level
	Mean	SD	Mean	SD	Mean	SD	
A	-	-	-	-	2	N/A	N/A
B	4.338	0.552	5.125	0.609	-	-	High
C	4.113	0.717	-	-	4.00	0.816	High
D	4.182	0.65	4.972	0.616	4.175	0.85	High
E	4.295	0.592	5.00	0.487	4.428	0.559	High
F	4.37	0.619	4.833	1.005	-	-	High
G	4.314	0.624	4.831	0.776	4.214	0.589	High
H	4.39	0.649	5.045	0.752	-	-	High
I	4.212	0.725	-	-	4.406	0.799	High

J	4.312	0.594	4.409	0.851	3.916	0.957	High
K	4.354	0.605	4.863	0.962	-	-	High
L	4.32	0.547	-	-	4.071	1.059	High
M	3.442	1.117	3.155	0.939	3.083	0.288	Average

(Source: Authors' Own Table)

5. Conclusion

The SCL teaching method reflects today's society in which choice and democracy are important concepts. Students are trained to be independent through the improvement of soft skills that help self-confidence. Instructors and industrial supervisors as support to help students to improve students abilities by providing motivation, acting as facilitators, listening to students' ideas and opinions, and helping them solve problems and think critically. Lea et al. (2003) and Saunders and Rivers (1996) reviewed several studies on SCL and the overall findings of this preliminary study show an effective approach to avoid the occurrence of complete concentration on individual students to the extent of affecting the needs and interests of the entire class or industrial placement. The chosen instrument is valid and reliable and expected to be performing well in gathering more data in a bigger sampling size involving all valid HEPs that offer 2U2i and WBL programs for this study to be completed. Before that, a final set of questionnaires will be constructed based on this preliminary data and will then be checked and verified again by a panel of academics from the field of quality assurance and education.

The findings found that this study alone is insufficient to conclude the actual level of effectiveness of SCL adaptation in 2U2i and WBL-based programs due to a very small sample size and this is a preliminary study. This situation is due to a large number of HEPs that offer 2u2i and WBL-based programs to date have not yet completed a cohort cycle and their unwillingness to cooperate in this study which may affect the quality of the data obtained. Because of that only two HEPs were chosen as the basis for this preliminary study to establish an applicable and reliable research method for full-scale future research.

However, it still shows positive results where this study can have the potential to be improved with a bigger and more conclusive set of data from all involved HEPs with 2U2i and WBL programs within the subsequent research. Much more focused research should also be considered for conventional, 2u2i, and WBL-based programs since each of the modes offered have different running methods and implementations. These differences in study mode may produce

different efficacy results toward SCL adoption that could alter the SCL implementation guidelines to a non-standard. A more suitable guideline could be crafted specifically for each mode available optimizing the SCL implementation that promotes positive growth within the future educational system.

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