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READY OR NOT: STUDENTS WITH SELF-DIRECTED LEARNING?

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Abstract

Beyond doubt, lack of readiness for self-directed learning indicates a need to work on developing these skills earlier in the student-centered curriculum. Therefore, this study is conducted to measure the self-directed learning readiness (SDLR) level among first semester students of the Faculty of Engineering and Built Environment, Universiti Kebangsaan Bangi (UKM). An SDLR questionnaire, using a Likert-type scale of 5 points, which consists of 32 items, was distributed to target groups through an online system in December 2013. Statistical test of Mann-Whitney U at significance level of 5% is used when comparing SDLR scores by taking gender, ethnicity, type of secondary school, and mode of entry into UKM as comparison factors. A total of 112 (33.5%) respondents agreed to participate and completed the questionnaire; 72 (64.3%) of the respondents were female and the remaining participants were male. The study reveals that 90 students (67 female and 23 male) employ self-directed learning (SDLR score> 96). In addition, median of overall SDLR score for females is greater than males (102.7> 97) and this difference is statistically significant (p value = 0.0285). It is suggested that the other three demographic factors do not affect the SDLR scores. Therefore, specific training should be given to the other half of the male respondents in an effort to equip them with the skills that are necessary for self-directed learning. This in turn could increase their confidence and satisfaction in learning, especially for courses that practice a problem-based learning approach.

Keywords: Self-directed learning, Statistical analysis, Student survey.

1. Introduction

In an effort to ensure that students have the skills to work in groups, as outlined in importance by the Engineering Accreditation Council as one of the learning

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Abbreviations

FKAB	Faculty of Engineering and Built Environment
PBL	Problem-based Learning
SDLR	Self-directed Learning Readiness
UKM	Universiti Kebangsaan Malaysia

outcomes-based education program results [1], the local engineering education community has begun to shift towards teaching methods that provide a learning environment that encourages knowledge exchange among students. Various pedagogical approaches based on group assignments have been proven effective for engineering education [2] such as cooperative learning, collaborative learning, problem-based learning, and so on. Compared to other approaches, problem-based learning (PBL) provides a meaningful learning experience in which students try to build knowledge through interaction with the environment.

PBL was purposely introduced by Barrows [3] in the mid-60s, to assist medical students specifically, but PBL is now widely used in the field of engineering education [4] including in the Faculty of Engineering and Built Environment, UKM, Malaysia [5]. The PBL approach can be seen as a closed loop learning system with many possible solutions. Working as a team under minimum supervision from facilitators, students determine their own learning needs and conduct investigations for those purposes in seeking solutions to a given problem, which is usually unstructured but realistic. Although the majority of studies agree PBL promotes lifelong learning, and stimulates problem solving, critical thinking, and teamwork [6] it can be controversial if diversity factors among students are not taken into consideration.

Students are not born with the same level of thinking skills, the ability to make and receive decisions, communication skills, time management, etc. Additionally, teacher-centred learning dictates students always need teachers to identify their learning needs, design and implement learning plans, and carry out learning assessments [7].

Simply placing these students who are completing PBL assignments is likely to invite frustration and feelings of guilt for the decreased effectiveness of the group they represent [8]. Conversely, students who prefer and ragogical orientation tend to be satisfied with the PBL learning approach. Therefore, early detection of pedagogical students enables instructors to equip them with the necessary skills and training before switching to andragogy [9]. It is preferable to use the level of readiness of self-directed learning as an indicator to detect pedagogical students [10].

The readiness level of self-directed learning refers to the extent to which a person is to have the attitude, talent, and personal characteristics necessary for independent learning [11]. Knowles [12] defines self-directed learning as a process in which individuals take initiative, either with the help of others or not, to identify their own learning needs, develop learning goals, identifying the sources of raw materials and human resources for learning, selecting and implementing appropriate learning strategies, and assessing learning outcomes. Self-directed learning is a skill which can be improved through specific activities subject to the current readiness level of self-directed learning. Assuring students are on a good level of self-directed learning in early learning stages allows them

to prepare for the end of semester projects, thereby ensuring a smooth transition to a professional working environment later.

The implementation of PBL in engineering mathematics courses in FKAB, UKM is considered to be at an experimental stage. To minimize the negative perception and dissatisfaction towards the implementation of PBL in teaching mathematics courses, this study is thus conducted to assess the level of self-directed learning of students. The SDLR scores and demographical information of the respondents were analyzed together to observe any significant patterns to improve.

2. Methodology

The Self-Directed Learning Readiness Scale (SDLR scale), developed by Fisher et al. [10], was electronically distributed to all first-year students in FKAB through an online questionnaire service provided by the UKM Information Technology Centre. The system immediately informed registered students through e-mail if there were any announcements, memos, lectures, and so on, which are uploaded by the system administrators, e.g., lecturers and tutors. SDLR scale is a Likert-type questionnaire used to determine the extent of a person's skills and attitudes related to self-directed learning. The original SDLR scale contained 42 items that included three factors, namely, self-management, desire to learn, and self-control. The SDLR scale was translated into the Malay language, and a pilot study session was conducted involving a total of 20 volunteer respondents, which is 5% of the student population in FKAB. They were asked if there were any items with almost the same meaning and/or items which they did not understand. Based on the feedback gained, 10 items were removed from the original SDLR scale (3 from self-management, 2 from desire to learn, and 5 from self-control). Cronbach's alpha coefficients of an amended instrument and the new subscale involved were recalculated, and the results were 0.9007 for the whole instrument, and 0.7839, 0.7449, and 0.7623 for the subscales of self-management, desire to learn, and self-control, respectively. According to De Vaus [13], a calculated alpha value greater than 0.7 is considered to have an acceptable level of internal consistency.

Demographic information, such as gender, age, ethnicity, secondary school type, and mode of entry into UKM, were already in the database. This information was used to observe if there were any uncontrolled factors that influenced the SDLR scores.

A total of 334 first-year students of the 2013 batch, representing four engineering departments, were invited to participate in this survey. Respondents were asked to submit their response to each item by clicking one of five numbers below:

1. Almost never true of myself
2. Occasionally never true of myself
3. About halfway true of myself
4. Usually true of myself
5. Almost always true of myself

The reliability and validity of the 5-point Likert scale for SDLR scale has been verified by Fisher et al. [10]. Furthermore, the scale is commonly used to get a response to items associated with the university environment [14].

Questionnaires were statistically analyzed using open source software called OpenStats. Categorical variables are described as median and inter quartile. Comparisons of the overall SDLR score were conducted using a parametric Mann-Whitney U test (present of dichotomous variables) at 5% significance level.

3. Results

A total of 334 students were invited to take part in this study but only 112 respondents participated (44.6% male and 55.4% female) which provides a participation rate of 33.5%. Of these, the majority of 89 respondents (79.5%) are Malay, followed by Chinese 15 (13.4%), Indian 5 (4.5%), and the remainder to other ethnic groups. On average, the age of respondents is in the range of 19 to 21. Among them, 88% of respondents have been in a matriculation program before joining UKM while the other 12% entered either through direct channels Sijil Pelajaran Malaysia or Sijil Tinggi Pelajaran Malaysia leavers or through UKM ASASIPintar program.

As depicted in Fig. 1, SDLR scores of male and female respondents were scattered almost in the same inter quartile range of 17. Median female SDLR scores are clearly higher (102.7) than male respondents (97.0) and the median of difference of SDLR score is statistically significant (p value = 0.0285). The median of SDLR score indicates that 93.5% of female respondents are prepared for self-directed learning. Meanwhile, only 46% of male respondents are expected to have no problems to practice self-directed learning.

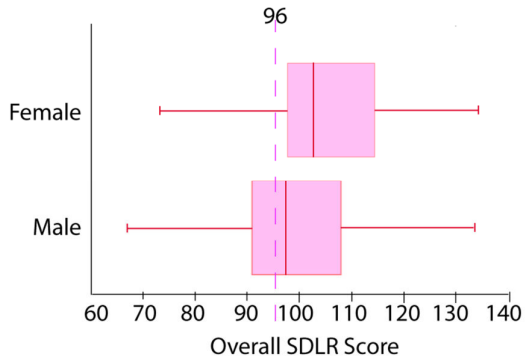
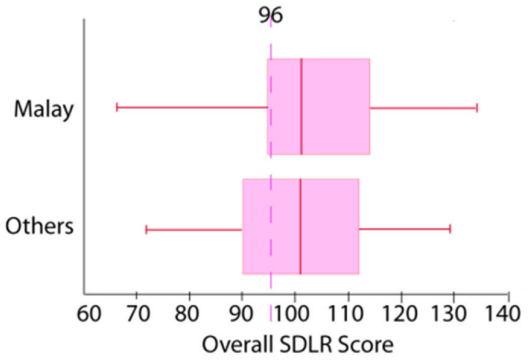


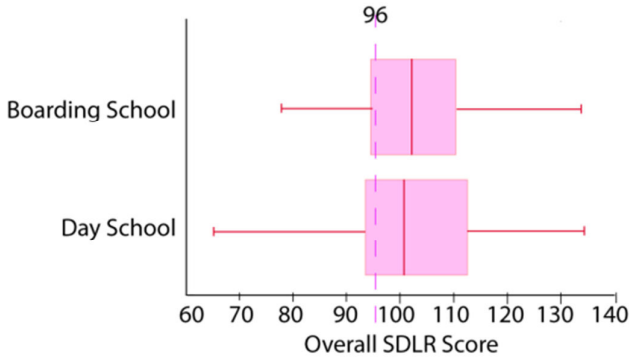
Fig. 1. Comparison of overall score on gender factor related to self-directed learning readiness. 96 is a passing score.

It is also found that the median of SDLR scores between Malays and other ethnic groups (Chinese, Indian, and others) were at about the same level of around 100 (Fig. 2(a)). With p = 0.3843, the different is not significant. In addition, the majority of Malays students are ready with self-directed learning. A total of 39 (34.8%) respondents completed their secondary schooling session at a boarding school while the remaining respondents studied in common secondary schools.

Median SDLR score of boarding school students is 102, which is higher than the daily school students' score (Fig. 2(b)), but the difference on the median was found to have no significance (p value = 0.6171). However, the effect of the matriculation curricular factor is taken out from discussion since only 13 (less than 15) of respondents are former matriculation students.



(a) Ethnic



(b) School type

Fig. 2. Comparison of overall score on (a) ethnic, and (b) school type factor related to self-directed learning readiness.

4. Discussion

The purpose of this study is to gather information about the readiness level of self-directed learning among first year engineering students. It is assumed that low internet coverage in UKM may be the main cause of the low participation percentage of students in this study (approximately 34%). Not having a smart phone, being out of internet quota, knowing nothing about internet service on campus and never experiencing online surveys could be additional factors that contribute to the low student participation. The failure group of students who did not answer the questionnaires could be associated with a lack of responsible

attitude towards their learning progress, especially in mathematic courses. This is because it is clearly stated that the questionnaire will benefit students to some extent if the information is transmitted. Serious attention should be given to this group of students.

Ahmad and Majid [15] states in his study that culture has a potential influence on the level of readiness and on the development of self-directed learning Malaysia. Malay students' lack of interest in interacting in the classroom and a difficulty in communicating with them are factors that are deemed to be the biggest barrier in them enjoying self-directed learning. Interestingly, this was not evident in our study. In fact, almost all Malay students were willing to participate fully in self-directed learning.

In reality, studying in a boarding school provides a better and controlled learning atmosphere and offers various learning approaches [16]. These advantages should make students better prepared for self-directed learning. Unfortunately, the relationship cannot be observed since the difference in median overall scores between respondents and non-former residential school students is not significant.

Almost half of male respondents have been found to be unready for self-directed learning. They are still in the early stages of the university education system and immediate and systematic guides would be able to unleash the potential of learning and positive attitudes. Among the activities that can be carried out are training to ask questions, encouraging them to give an opinion during discussion, emphasizing on aspects of self-management, and exposing the use of technology in search of information. To ensure learning activities for this target group are carried out more effectively, male facilitators should be given preference [17].

5. Conclusion

Measuring of student readiness towards the level of self-directed learning self is needed to be done before distributing group assignments. By classifying them accordingly, students who are not ready with self-directed learning could be trained by the facilitator or placed under the guidance of a more skilled college friend. This step at least gives them the confidence to put themselves in a student-centred learning approach such as problem-based learning. To gain more coverage on the issue being studied, the SDLR scale will be circulated in physical form to those not involved with the first round of data collection. Besides the SDLR score, the integrative effect of other components such as leadership, communication, technology literacy, and other social factors when assigning group/team will be the focus of future study.

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