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THE RELATIONSHIP BETWEEN DEMOGRAPHIC FACTORS AND LECTURERS' EFFICACY BELIEFS IN PROJECT-BASED LEARNING

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Abstrak

This study attempted to investigate the relationship between demographic factors (gender, academic qualification, teaching hours and formal training received) and lecturers' efficacy beliefs in project-based learning (pbl). A validated scale consisting of 9 items measuring lecturers' efficacy beliefs in pbl was administered to 354 lecturers in the 23 Teacher Education Institutes (TEI) in Malaysia. In this study, structural equation model approach was used to explain the interactions between the demographic variables and lecturers' efficacy beliefs in PBL. Significant direct interactions were found between (1) academic qualification and efficacy beliefs in pbl, and (2) Formal Training and efficacy belief. Gender and teaching hour meanwhile did not generate any significant relationship.These findings reaffirmed the past findings stating that two factors affected PBL which could be classified into two broad categories: (a) teacher/lecturer personal factors and (b) school/institution contextual factors.

Keywords: demographic factors, efficacy beliefs, project-based learning, structural equation model

INTRODUCTION

Teacher Education Institutes (TEI) in Malaysia have gone through remarkable curriculum shift. Along with this transformation, came changes in practices and policies in teaching and learning. Its curriculum has been enhanced to match its higher learning institute standing. The present curriculum highlighted student centred learning through project-based learning manifested through project-coursework.

In the event of any curriculum transformation, change or innovation, educators play a major role in the implementation and the role played by educators at any learning institutions in implementing a newly embrace curriculum is various. They are the agents of education transformation (Ball & Forzani, 2009; Chen & Chen, 2010; Razali, Mohamad Hisyam, Fazlinda & Mohd Hasril, 2014; Yahya, Azizah & Yaakob, 2014).

Without their active involvement, the objective of the chartered curriculum may be far-fetched. However, the process of curriculum implementation is rather demanding. These educators are normally confronted with various challenges. The challenges include educator's low efficacy beliefs.

Past research have highlighted the relationship between teacher efficacy beliefs and certain demographic factors. Taylor & Tashakkori (1995) were among the earliest researchers whom investigated the relationship between teacher efficacy and demographic variables such as school climate, gender and working experience (Klassen & Chiu, 2010), age and academic level (Hemmings & Kay, 2009; Wan Nooraini & Mohammed Sani, 2010b; Jingsong Zhao, McCormick & Hoekman, 2008).

However, there has been inconsistent findings on teacher efficacy beliefs and demography (Bailey, 1999; Schoen & Winocur, 1988) .The findings though inconsistent, suggested that demographic factors do influence teacher efficacy. This also suggests that research on teacher efficacy beliefs and demography needs more scrutiny. This study intended to investigate the relationship between the demographic factors namely, gender, academic qualification, teaching hour and formal training and TEI ESL lecturer efficacy.

Efficacy beliefs

The study is grounded in the theoretical framework of social cognitive theory through efficacy beliefs emphasizing that people can exercise some influence over what they do (Bandura, 2006). Efficacy beliefs refers to an individual's beliefs in his/her capability to organise and implement actions to reach or attain designated types of performance and achieve specific results (Hemmings & Kay, 2009). This beliefs or perception proposes that an individual can be instrumental in determining and influencing outcomes. As claimed by Bandura (1989) what people do is often better predicted by their beliefs about their capabilities, than by what they are actually capable of accomplishing. Based on Bandura's claim, a sense of efficacy beliefs, therefore does not refer to actual ability, or skill, but instead to beliefs about competence in using particular skills.

Based on social cognitive theory teacher efficacy beliefs may be conceptualized as individual teachers' beliefs in their own ability to plan, organize, and carry out activities that are required to attain given educational goals. From this perspective, teachers' efficacy beliefs of what they are capable of doing and achieving in class therefore can affect their goals and behaviours. Eventually, this efficacy beliefs will influence actions and conditions in the environment (Schunk & Meece, 2006).Teacher efficacy has been assessed using a few instruments. One of the established instruments is the Gibson and Dembo Teacher Efficacy Scale. In this study, English's adapted teacher efficacy in pbl scale was employed.

Project-Based Learning

Project-based learning is one of the teaching methodologies that utilises student-centred projects to facilitate student learning Mergendoller (2006). A number of researchers have defined project-based learning as a teaching and learning strategy that is organized around projects. The projects are complex tasks driven by challenging questions or problems which require students to design, solve problem, make decision, conduct

investigations, work independently and collaboratively over an extended period of time and produce result in a form of products or presentation (Jones, Rasmussen, & Moffitt, 1997; Thomas, Mergendoller, & Michaelson, 1999. In a project based class, students actively search for answers to authentic problems through debate, questioning, data collection, and the creation of artifacts. Learners will work on projects, make connections between new and existing knowledge and finally produce a meaningful end product. The study utilized this definition of project-based learning.

Project-based learning is often flaunted as a more superior alternative to traditional teaching methods. Holm (2011) together with earlier researchers such as Berends, Boersma and Weggeman (2003), Scarbrough, Bresnen, Edelman, Laurent, Newell and Swan (2004) and Tsang (2007) has agreed with that its supremacy lies in its application of improving problem solving, thinking skills, and engaging students in their learning. Despite these reported merits of project-based learning, the success of this teaching methodology nevertheless depends on the lecturers. For lecturers to implement it successfully, they first of all need to have the beliefs that they are capable of implementing the curriculum.

RESEARCH OBJECTIVE

This study intended to examine the relationship between demographic variables (gender, academic qualification, teaching hour and formal training) and lecturers' efficacy beliefs in pbl.Based on the research objectives the following hypotheses were tested:

Ha1: Gender has a significant relationship with lecturers' efficacy beliefs in pbl.

Ha2: Academic qualification has a significant relationship with lecturers' efficacy beliefs in pbl.

Ha3: Teaching hour has a significant relationship with lecturers' efficacy beliefs in pbl.

Ha4: Formal training has a significant relationship with lecturers' efficacy beliefs in pbl.

METHODOLOGY

Research design

This research employed a survey whereby data was collected through questionnaire.

Population and sample

This research was carried out at all the 23 English Language Department or units of Teacher Education Institutes (TEI) in Malaysia.In 2014, the Malaysian Teacher Education Institute's (MITE) statistic indicated a total of 428 ESL lecturers (N=428) were attached to English language department. However 74 lecturers had participated in the pilot study. Stratified random sampling technique was employed.

Based on Krejcie and Morgan's (1970)sampling table, for a population of 354, the number of total sample is 186. Taking into account experts' opinion such as Best and

Kahn (2003), Cohen, Manionand Morrison (2011),Gay and Airasian (2003) and Sekaran (2003)whom stated that bigger sample size is more convincing and trustworthy, the sample size for the study was set at more than 186 TEI ESL lecturers. This also to account for the possibility of incomplete survey being returned (Norasmah,Zamri & Mohamad Sani, 2006).

However, since this research employed Structural Equation Model (SEM) for its data analysis, it is very important that the number of samples drawn fits SEM sampling prerequisites. Hair, Black, Babin & Anderson (2009), Ullman (2007) and Zainudin (2014) have proposed the following guidelines pertaining to determining sample size in SEM analysis:

Table 1 Structural equation model (sem) minimum sample requirement

Model Characteristics (Number of latent constructs and items)	Minimum Sample Required
Five or less latent constructs. Each latent construct has more than three items	100 sample
Seven or less latent constructs. Each latent construct has more than three items	150 sample
Seven or less latent constructs. Some constructs have less than three items (just identified model).	300 sample
More than seven latent constructs. Some constructs have less than three items (just identified model).	500 sample

Since the final instrument for this research consists of six latent constructs with each construct made up of three and more items, thus the minimum respondents should be a minimum of 150. In this study the final respondents count was 231 (n=231). The figure has surpassed the minimum requirement for SEM analysis allowing the SEM analysis to be performed.

Instrumentation

This research primarily gathered quantitative data. In this study, research participants were requested to complete a set of questionnaire consisting of 1) demographic information; and 2) lecturers' efficacy beliefs in PBL. The first part required the participants to provide their personal information such as gender, academic qualification, teaching experience, teaching hour and PBL formal training by ticking the relevant boxes or by filling in relevant information.

To measure lecturers' efficacy beliefs in PBL, the researcher has adapted the lecturers' efficacy instrument developed and used by English (2013). The scale consisted of nine items measuring lecturers' beliefs in PBL. The adapted instrument's reliability ranged between .73 to .95.

Data Collection Procedure

The survey questionnaires were administered by the researcher. Four months were needed to complete the data collection process. 23 Teacher Education Institutes nationwide were visited.

In each of the visits, English language department lecturers were gathered. The purpose of the data collection was explained and the questionnaire were later administered. According to Lau, Cheung and Ransdell (2007), this method of data collection allows wider coverage. Important to note that this method eliminate researcher's influence. Above all, the respondents had more time to think of the proper response for the questionnaire items. This method also safeguarded the researcher against some drawbacks in this form of data collection among which were lower response rate, prone to bias and incorrectly answered questions (Lau et al., 2007). Data collection was completed in four months.

Data Analysis Techniques

The research questions were answered through the quantitative analysis of the survey data. Data were analysed using structural equation model. Hypotheses were tested and were answered through standardized regression weight and critical ratio (CR) values. In cases where the CR value exceeds 1.96 and the significance value (P) is smaller or equal to 0.05, significant contribution is established. This indicates that the independent variable contributes significantly to the dependent variable.

Since this study employed SEM and focused on lecturers' efficacy beliefs in pbl at the Teacher Education Institutes (TEI), thus first the measurement models needed to be investigated to confirm the model unidimensionality, validity and reliability of all the latent constructs involved (Zainudin, 2014).

Unidimensionality is achieved when the factor loadings for each construct exceeds 0.5 (Zainudin, 2014). To confirm the validity, a few validity aspects needed to be examined namely convergent validity, construct validity and discriminant validity. Convergent validity was achieved when the Average Variance Extracted (AVE) values for each construct was at 0.5 or higher (Zainudin, 2014). Construct validity on the other hand required the fitness indices to be fulfilled while discriminant validity was achieved when the measurement model was free from redundant items and the correlation between the exogenous constructs was less than 0.85.

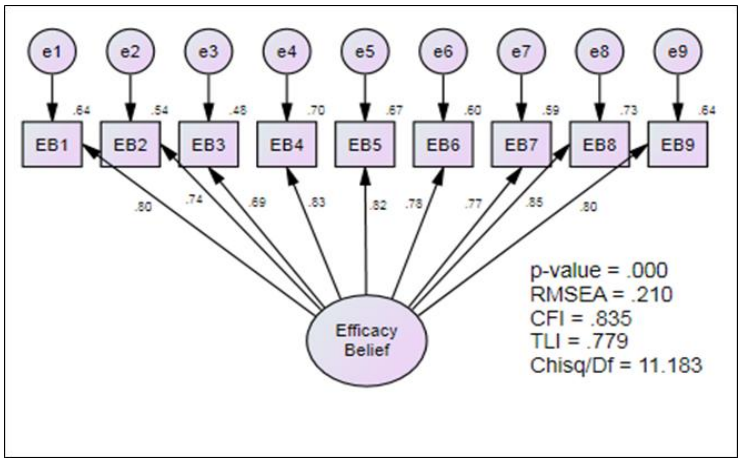
The fitness indices were divided into three category namely the Absolute Fit, the Incremental Fit and the Parsimonious Fit. In this study, The Fitness indices referred to throughout this study were Root Mean Square of Error Approximation (RMSEA), CFI (Comparative Fit Index) and Tucker-Lewis Index (TLI) as well as Chi Square/ degrees of freedom (Chisq/df). The level of acceptance for each of the fit indexes varied: RMSEA<0.08, CFI>0.90, TLI>0.90 and Chisq/df<5.0.

Next, the model was tested to determine the constructs intercorrelation. This is performed to ascertain the existence of correlation between or among the construct occur prior to structural model testing. The final stage involved structural equation model testing.

Measurement Model for Efficacy Beliefs

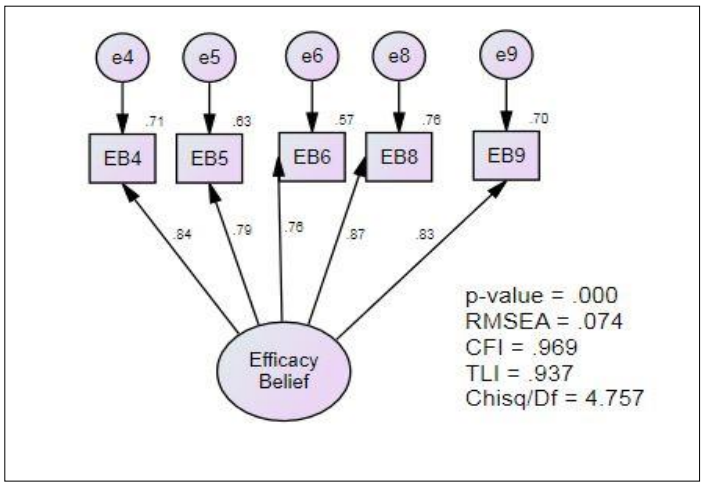
The efficacy beliefs measurement model was investigated. Figure 1.1 below showed that the initial analysis of the measurement model indicated factor loadings well above 0.5 for each items. Nevertheless the fitness indices were not achieved.

Figure 1 The hypothesized measurement model for efficacy beliefs



To achieve the required fitness indices, the item with the lowest factor loading (<0.6) had to be deleted. However since in this case the factor loadings were well above 0.6, therefore the modification indices (MI) were checked. Pairs of redundant items were identified. In this case items eb1 and eb2 showed MI of 63.079. The factor loadings for e1 and e2 were inspected. Since the factor loading of e2 was lower, thus the item was deleted and the model was rerun.The model had to be run a few times to achieve the required fitness indices. Figure 1.2 showed the final measurement model for efficacy beliefs construct. The final model consisted of 5 items with factor loadings >0.5 and fitness indices achieved (Figure1.2).

Figure 2 The final measurement model for efficacy beliefs construct.



Reliability of the measures used in the study was confirmed by Cronbach's coefficient alpha. The coefficient alpha value for efficacy belief was recorded at was .90. These values indicated that all factor were reliable. Also, the estimates of standardized factor leadings were used to determine the convergent validity of the modified indicators. The factor loadings in the confirmatory factor analysis ranged from .74 to .86 for the dimension of Efficacy Belief Scale. The factor loading on the majority of the items obtained an acceptable coefficient alpha above .70, showing that all indicators were reliable and receivable limit for convergent validity.

FINDINGS

Respondents' demography

The respondents consisted of 75 (32.5%) male lecturers while the remaining 156 (67.5%) were female lecturers. From the total of 231 research respondents, 203 of them possessed master degrees (87.9%), while the remaining 14 (6.1%) possessed bachelor degrees and another 14 (6.1%) possessed doctoral degrees.

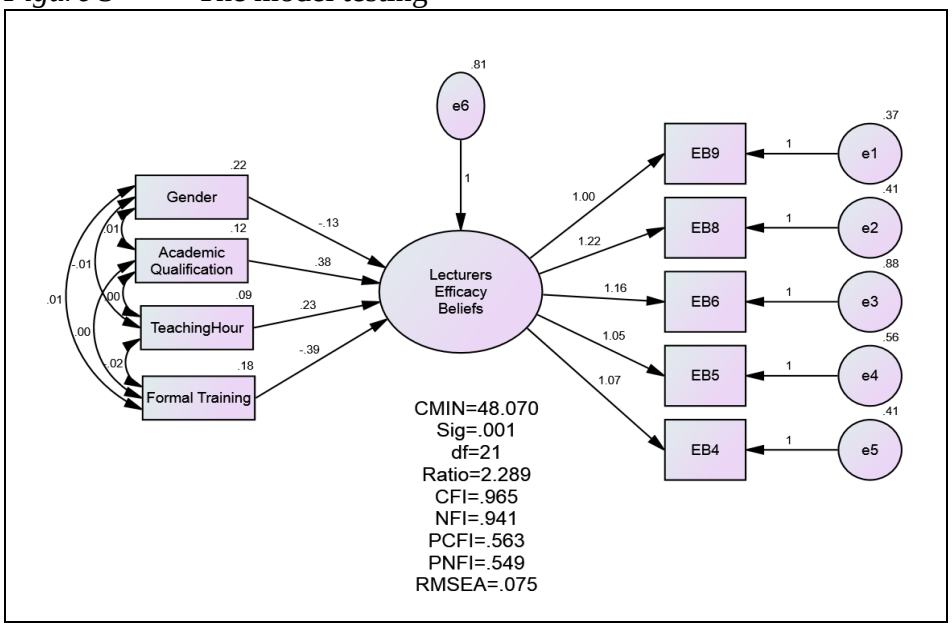
These lecturers' teaching experience in the Teacher Education Institutes (TEI) ranged from one year to more than 21 years. 60% of the respondents (136) had served between one to ten years at the institutions while the rest had served between 11-15 years (16.3%), 16-20 (11%) and more than 21 years (12.85). Their teaching hour or teaching hour also differed. The majority of them were having six to ten hours of lectures weekly(61%). 22.9% was having between one to five hours weekly and 16.1% was having more than ten hours of lectures weekly.

In terms of PBL training, out of 231 respondents, 175 (75.8%) responded that they had attended formal training for PBL while 57 (24.2%) had not. Most of the respondent (62.3%) had received a minimum of one to twice of formal training on PBL. The amount of training hour received by the respondents ranged from 1 hour to 40 hours whereby 65.36% had received between 1-10 hours of formal training.

The model testing

This study investigated the relationship between lecturers' demography and their efficacy beliefs in pbl. Four hypotheses were tested. Figure 3 below presented the model tested and the findings.The following results were found. (1) Gender did not have any significant relationship with lecturers' efficacy beliefs in PBL based on the standardized regression weight (Estimate= .162, C.R= .992, p=.32, $p>0.05$). (2) Academic qualification had a direct significant relationship with lecturers' efficacy beliefs in PBL practice based on the standardized regression weight (Estimate= .440, C.R= 2.044, p=.04, $p<0.05$). (3) Teaching hour did not have a direct significant relationship with lecturers' efficacy beliefs in PBL based on the standardized regression weight (Estimate= .428, C.R= 1.685, p=.092, $p>0.05$). (5) Formal training had a significant relationship with lecturers' efficacy beliefs in PBL based on the standardized regression weight (Estimate -.503, C.R= -2.873, p=.004, $p<0.05$).In summary, efficacy beliefs were found showing significant direct interactions with academic qualification and Formal Training.

Figure 3 The model testing



DISCUSSION

This findings reaffirmed the Social Cognitive Theory used in this study whereby the theory identifies human behavior as an interaction of personal factors, behavior and the environment (Bandura 1977; 1986). Efficacy beliefs is the outcome the triadic reciprocal interaction among these three factors.

In this theory, the interaction between a person and behavior involves the influences of a person's thoughts and actions. The interaction between the person and the environment involves human beliefs and cognitive competencies that are developed and modified by social influences and structures within the environment. The third interaction, between the environment and behavior, involves a person's behavior determining some aspects of their environment and in turn their behavior is modified by that environment.

This study showed that formal training in pbl is significantly correlated to lecturer efficacy beliefs. Taking into account lecturers heterogeneous number of working experience at the Institutes of Teacher Education (TEI), a slow transition into PBL is believed necessary especially for those who have just joined the Institutes of Teacher Education (TEI). These new lecturers were not only challenged with the demands of ensuring that their students were learning while they themselves were learning a new way of teaching namely PBL.

More formal trainings on pbl would help them build up their efficacy beliefs in pbl. This study used the empirical findings to suggest continuous professional development sessions for enhance lecturers efficacy beliefs in planning, implementing and assessing pbl. Additionally, Tschannen-Moran and McMaster (2009) proposed that all the three different sources of efficacy beliefs identified by Bandura: verbal persuasion (lecture, information), vicarious experiences, (modeling, demonstration) and mastery experiences (group practice)) should be integrated in the training sessions.

The lack of significant relationship between gender and teaching hour with efficacy belief in this study added to the inconsistent findings literature on teacher efficacy and demography (Sharma, Loreman& Forlin, 2011; Taylor& Tashakkori, 1995; Tejeda-Delgado, 2009). Generally study on efficacy beliefs indicated that female teachers possess higher efficacy level as compared to male teachers (Ross& Horner, 2007; Sharma et al.). Such finding was not observed in this study probably due to the fact that male and female lecturers were relatively of equal academic qualification and equally exposed to PBL practice. Gender difference thus make little impact on their PBL efficacy belief.

It is interesting to note that in this study, teaching hour did not generate any significant relationship with efficacy beliefs. It was postulated that this study demonstrated insignificant relationship between teaching hours to efficacy belief due to the fact that teaching hour in this study only account for lecture hours and not taking into account other nonteaching responsibilities.

CONCLUSION

Generally research have found out that It was found out that efficacious teacher were more positive in embracing innovation and education transformation (Buehl & Fives, 2009).

In order to remain competitive and successful, an organizations have to identify the desirable key competencies pertinent to the organisations (Kessler, 2008). However, according to McClelland (1973) competency alone is not enough. The ability to perform a task, is not solely dependent on knowledge and skills in a particular field rather, it depends largely on one's self-quality one of which is efficacy belief.

Efficacious and competent lecturers make engaging and meaningful learning possible. They help develop and enhance students' long list of positive attributes such as critical thinking, deeper understanding, ability to communicate, tolerance, teamwork spirit, responsibility, fun and motivation to learn. These are the much needed 21st century skills which are very salient in character-building and career development.

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