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Research paper

Modeling factors for industry experts' intention to participate in online scaffolding

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Abstract

The participation of industry experts in problem-based learning (PBL) activities helps in improving university students' problem solving skills considering industry experts have more experiential knowledge. Online scaffolding, a form of assistance provided by industry experts via myriad use of ICT applications allows knowledge to be transcendent beyond the classroom boundaries is seen as an opportunity to improve deterioration of problem solving skills among university students. This study intends to investigate factors that may affect the intention of industry experts to provide structural empowerment of resources, information, support and opportunity for learning in online scaffolding. Modeling the right factors via the application of empowerment theory may help to improve understanding on factors that may motivate or hinder industry experts to provide the structural empowerment. Necessary national education policy can be formulated for higher education institutions (HEIs) prior inviting industry experts to be part in online PBL initiative. Based on existing literature, trust, ICT anxiety and perceived ease of use are identified as factors that may influence industry experts to provide structural empowerment.

Keywords: *Structural Empowerment; Trust; ICT Anxiety; Perceived Ease of Use; Online Scaffolding.*

1. Introduction

Many studies have reported growing concerns over the Malaysian graduates' incompetency in problem solving. There is a gap between the industries' expectation and the actual performance of the graduates' higher-order thinking skills, such as problem solving and creative thinking (Malaysia Education Blueprint 2013 – 2025, pg. 86; Malaysia Education Blueprint for Higher Education 2015-2025). Marthandan et al., (2013) pointed out that, problem solving is among the skills that the Malaysian graduates lag behind when they enter the workplaces. This situation has risen concerned among the industrial practitioners and government on the quality of future managers and leaders that contributes towards the nation development. National Key Economy Area (NKEA)'s Strategic Reform Initiatives under Upskilling and Upgrading the Workforce agenda have urged collaboration of various industry players to develop sustainable NKEA skills among graduates such as problem solving skills.

An academic approach such as problem-based learning (PBL) can enhance students' problem solving ability via the use of ill-structured problems such as the use of business case study, tactical-strategic performance project, system analysis problems and others. The use of ill-structured problems enable students to understand how a problem is related to their career and more effective than memory-based learning, thereby promotes apprenticeship for real-life workplace problem solving (Savin-Baden, 2000).

Due to the "uncertain" nature of ill-structured problems that need domain-specific structural knowledge in several different domains and usually need more information before it becomes clearer which often require individuals with little ill-structured problem solving experience to develop argumentation with others to develop rationales in their problem solving process (Jonassen, 2006), such as with a more experienced peers, instructors and experts (Bixler, 2007, Jonassen, 2006). The use of scaffolding, a process of assisting a person to carry out a task that is unfamiliar or beyond his/her ability but gradually removed when students are familiar with a task can empower learners (Holton & Clarke, 2006) and improves problem-solving performance (Bixler, 2007; Ge, 2003; Pata et al.. 2005).

Holton and Clarks (2006) scaffolding strategies are relevant for scaffolding problem solving. According to Holton and Clarke (2006), scaffolders provide conceptual scaffolding (to provide conceptual understanding) and heuristic scaffolding (methods to derive to solution) are necessary for problem solving. The authors noted that, three types of scaffoldings are involved: expert, reciprocal and self-scaffolding. The scaffold provided by a teacher is called expert scaffolding. On the other hand, scaffolding provided by another student/peer working in a group either face-to-face or online is reciprocal scaffolding and finally self-scaffolding is when a learner is in a situation where he or she is able to scaffold his/her own self. The main limitation in Holton and Clarks' study is, with the advancement of online learning, the source of experts is not necessary limited to teachers/ instructors and peers' assistance in classroom. Students can be scaffolded by experts from industry. These experts can constantly engage with the students and teach skills about research and critical thinking skills in solving problem. This wider access to crowd wisdom helps students to create their own educational experience (Salter, 2013).

In order to address problem solving competency gap, educators and researchers are innovating ways to maximize the new availability of resources in online learning environment into formal

learning (Neo, Neo and Tan, 2012). With the emergence of plethora of ICT applications, online scaffolding problem solving, a form of assistance given by experts to students to master problem solving through online mediated applications, has a great potential for developing conceptual understanding (Majid, 2014). Using online scaffolding, the assumption is learning is not only occurring in a classroom from limited arrays of scaffolders such as from instructors and peers as well from real professional industry experts from disperse locations, time and industries. As industry experts have more experiential knowledge related to their professional career, the use of online scaffolding can greatly benefits students in improving problem-solving skills.

Although the Blueprint for Higher Education 2015-2025 has outlined on the need to make online learning as an integral component in teaching as ways to improve graduates' problem solving competency, it worth to note that, higher education institutions (HEIs) in Malaysia have ignored students and industry experts in its e-learning policy design who have vast interests in any e-learning implementation and many had implemented it in ad-hoc manner (Embi et al., 2011).

In addition to that, past studies asserted that structural empowerment is essential to be given to a student in a PBL environment (Siu et al., 2005). It is expected that a learner will be empowered in an online environment if they received a proper structure that essential for empowerment such as getting access to information, support, resources and opportunity (Ledwell et al., 2006).

However, to the researchers' best knowledge, a study that investigates factors that promote structural empowerment to be given from industry experts in online scaffolding is scant. Realising the importance of structural empowerment to be given to students, this paper aims to review the antecedents of structural empowerment that may influence the industry experts' intention to provide it in online scaffolding for problem-solving.

2. Literature review

2.1. Empowerment theory

Empowerment theory was pioneered by Kanter (1977). Notably, this theory has a longstanding history in organisation setting for more than 50 years. The extant studies cover multifaceted approach ranging from empowering individuals, organizations, and communities (Zimmerman, 1995). The underlying assumption in this theory is before one's experiencing empowerment, the person must be given proper structural empowerment initiatives where ones are able to mobilize resources to get the job done, to get and use whatever they need for the goals they are attempting to meet. The most reported structural empowerment in the literature is information, support, opportunity and resources (Ledwell et al., 2006). In organization settings, this theory measures the extent the agents of empowerment such as the employers empower their employees by providing those structural empowerment.

In recent years this theory has gained popularity in various educational research settings such as in classroom (Siu et al. 2005), internship (Sinclair, 2000) and distance education (Ledwell, 2006). The notion is when students are given the right structural empowerment they will perform better. Despite attempts were made to apply this theory in PBL setting (e.g Siu et al., 2005), none has applied this theory in online PBL setting.

Table 1: Structural Empowerment Elements

Structural Empowerment Elements
• Access to information means to empower people need to get access to knowledge and information necessary to carry out their jobs. This includes information directly related to their own work, as well as information about task as a whole. In PBL, information is key to interpret problem situations and understand its potential solutions.
• Access to support can be derived from feedback and guidance received from experts. Learner support is important for motivating learners in instruction, and cognitive and metacognitive prompts may serve a motivational scaffolding role in online learning environments as well.
• Access to resources means, there is an ability to obtain materials, and rewards necessary for achieving the demands of the job.
• Access to opportunity means chances to advance to develop knowledge and skills. For instance, expectations and future hope for learning , mobility and growth.

2.2. Antecedents of structural empowerment

In empowerment studies, a few consequences of structural empowerment were identified such as psychological empowerment (the feeling of being empowered) (pioneered by Spreitzer, 1995) and self-efficacy (Avolio, 1998; Hatcher & Lashinger, 1995). Nonetheless, these studies were conducted from the perspective of the one who received the empowerment, not the provider of the empowerment. Mostelfelder and Al-Sulaiti (2015) noted that, by identifying the antecedents of structural empowerment carries equal importance as it helps to understand what allows structural empowerment to be delivered. The authors believe one of the antecedents of structural empowerment that is important to be studied is individual characteristic. Factors such as knowledge and skills of the provider of structural empowerment may influence the capability of the individual to provide structural empowerment.

In Communication privacy management theory (CPM) (Petriono, 2002) identified how individual characteristics may influence the degree of information to be provided to people outside organization. CPM theory addresses issue with regards to privacy using interactive communication technology and factors influencing dialectic relationship of privacy and information disclosure (Jin, 2012). The amount of disclosure is vital in online scaffolding. Considering PBL is an experiential learning whereby the effectiveness is warranted by constructivist principles that knowledge is gained via active co-construction with individual and others (Savery, 2006). Nonetheless, by identifying individual characteristics of the industry experts may help to improve understanding on factors that may motivate or hinder their intention to scaffold students in problem solving. In CPM studies, factors such as trust, ease of use and ICT anxiety play roles on the amount of information granted to people outside organization.

2.3. Perceived trust

Understanding issue related to trust has long been argued as the best way to explain antecedents of structural empowerment in face-to-face setting (Wagner et al., 2010). Trust is a person's readiness to open up themselves vulnerable to another party despite of uncertain about the party's actions and motives (Mayer et al.,1995). Typically, trust that lead to open and intimate information exchange must be built prior before any face to face interaction occurs Amichai-Hamburger, McKenna, Tal, 2008). In online setting where relational cues is almost absence, individuals develop their own interpretation codes when presenting themselves online based on several factors such as interest, preferences, link of networking with the others (Fono & Raynes-Goldie, 2005. Salo and Karjaluoto (2007) asserted that trust is important to improve perceive ease of use as it is earned based on their past experience using the Internet. By incorporating trust as the antecedents to structural empowerment provides a promising explanation on the level of structural empowerment given by the industry experts to students.

2.4. Perceived ICT anxiety

Another personal trait which is relatively under-researched in the field of e-learning acceptance is ICT anxiety. Anxiety can be defined as the uncontrolled occurrence of an anxious or emotional reaction when it comes to performing behaviour (Compeau & Higgins, 1995), in this specific case, using an e-learning application for scaffolding. Some people may resist or limit their willing-

ness to try out any new information technology despite of having vast knowledge in scaffolding problem solving, industry experts may resist in providing structural empowerment to students when they have ICT anxiety.

2.5. Perceived ease of use

Perceived ease of use was originated from Technology Acceptance Model (TAM) that been widely used to examine people's intention to use a system or technology (Van Raaij & Schepers, 2008). Perceived ease of use may influence people intention to do an action in an online environment when they are exposed to different types of ICT technology.

However, a few factors may influence ICT perceived of use such as industry experts' familiarity with the Internet. When their trust towards the internet increases as a result of accumulative past experience in using the Internet may improve their degree of perceiving an ICT application as easy to use. In sum, ICT anxiety and trust as a result of prior experience with the Internet may shape beliefs on the perceived ease of use of the internet subsequently affect the industry experts' intention to use it for scaffolding and the level of structural empowerment given to students? All proposed antecedents of structural empowerment for this study are illustrated in the proposed model below in Figure 1. Subsequently, the following hypotheses are developed:

H1: Trust improves access to structural empowerment
H2: ICT anxiety improves access to structural empowerment
H3: Trust improves perceived ease of use
H4: ICT anxiety reduces perceive ease of use
H5: Perceived ease of use improves access to structural empowerment.

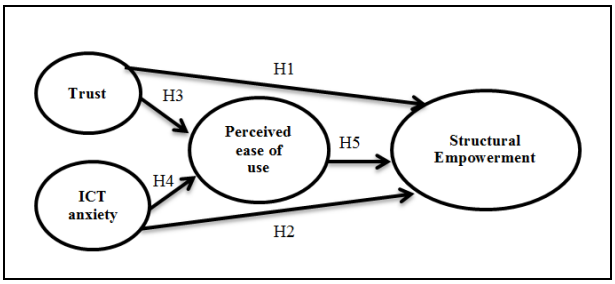

Fig. 1: Proposed Model.

3. Methodology

A quantitative research approach is utilized in undertaking this research. Initially, findings from extant studies were used to guide the present study and to clarify research issues. Then, a few series of preliminary interviews with the industry experts from Multimedia Super Corridor (MSC) status companies were conducted to identify pertinent variables to be included in the study and to validate the quality of the questionnaire. Based from the preliminary interview, promising insights were gathered. The companies are currently establishing industry linkages with universities by offering online scaffolding in PBL activities such providing weekly real case studies via online video tutoring and online conferencing. The utmost issue that they are concerned with is trust towards the use of information delivered towards the students in case they are misuse. The respondents are in general comfortable with online platforms to scaffold students given the ubiquitous nature of online applications in daily life hence reduces ICT anxiety. However, the findings from these limited interviews need to be harnessed with more data. Pilot study is currently conducted towards 40 companies towards Multimedia Super Corridor (MSC) using 7 point likert scale to validate the reliability of the questionnaire items. A full scale distribution of survey questionnaire will be carried out subsequently to confirm relationship between the constructs via the use of the structural equation modeling of partial least square (PLS).

4. Conclusion

The foundation of the framework hinges on empowerment theory to measure the extent industry experts' willingness to empower students in a PBL activity. The results from this study will shed light on factors such as personality traits of the industry experts in term of the level of perceived ease of use, trust and ICT anxiety that they have if they were asked to scaffold students in online PBL platform. It is expected that the results from this research will help educators and policy makers to design an effective problem-based learning pedagogy that is in line with the national aspiration to have a future skilled workforce by 2020, with the notion, online scaffolding by the industry experts provides richer learning experiences that can improve students' higher order thinking skills such as problem-solving skills that are not possibly available in classroom environment.

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