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Instant messenger-based online discourse platform and its impacts on students' academic performances: An exploratory study in art and design education

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ABSTRACT

As an alternative approach to traditional classroom-based learning environment, an online platform based on instant messenger (IM) is developed for subgroup discourses of Principles of Art Pattern Design (PAPD), one of the basic courses in art and design education. To quantify its effects on students' academic performances, the unified final test, including a standardized exam and an artwork rating, was administered to students enrolled in this study. The exam score, rating score, and their association were used as indicators to measure students' knowledge, skills, and abilities (KSA) of art pattern design, respectively. Because this study adopted multilevel hierarchical study design, linear mixed models were employed to evaluate the effects of IM-based online discourse on students' KSA at three levels – TEACHER-, CLASS- and STUDENT-level. Compared with classroom-based face-to-face discourse, IM-based online discourse slightly lowered students' performances on average. However, the effects of IM-based online discourse on students' KSA varied with different levels, and were inconsistently inferior to those of classroom-based face-to-face discourse. Considered the complex processes of teaching and learning involved, therefore, IM-based discourse platform should learn from the strengths of traditional classroom-based learning environment to further upgrade, and be thoroughly examined under different conditions.

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1. Introduction

At present, art and design is widely used in many fields, such as industry, advertising, retail, jewelry, interior decoration, television, film, computer graphics, and so on. For art and design education, it led to a wide range of subjects and their combinations, including classical fine arts, design arts, media arts, digital arts, visual designs, public art projects, etc. And, art designers not only create something that is novel and functioning, but also convey their perspectives and ideas that affect users' views. More importantly, art design is often a team activity that involves all participants in exchanging their ideas, analyzing all possible solutions from various perspectives, and then reaching a consensus. Besides basic knowledge and

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essential skills of art and design, therefore, art and design education is required to help students more efficiently develop their comprehensive abilities (e.g., collaborative ability, transformability from knowledge to skills).

The needs for high quality teaching and learning of art and design are increasing sharply (Design Council, 2011). Learners of art and design desire for a wide variety of accesses to education owing to changes in sites of art and design learning from classroom-based college settings to self-paced learning environments (Souleles, 2011). E-learning is teaching and learning process utilizing information communication technologies (ICT) to access courses outside traditional classroom. In the past decade, it has been progressively accepted by educators as a feasible approach to coping with the social and pedagogical challenges noted above. Due to the lack of sufficient and appropriate professional development and training opportunities in e-learning, however, teachers of art and design usually adopted traditional classroom-based face-to-face teaching and learning methods (Souleles, 2011). On this ground, we proposed an e-learning system named project-based integrated learning environment (PILE) for one of the basic courses of art and design – principles of art pattern design (PAPD) (Cheng & Jiang, 2013; Cheng & Zhang, 2010; Cheng, Zhang, & Jiang, 2011). Subgroup discourse is a key step that enables undergraduates to improve their knowledge, skills, and abilities (KSAs) for art and design. Instant messenger (IM) has a series of attractive features, including multiform messaging (e.g., text, electronic file, audio, and video), instant access to messages (e.g., timely transmission, recordation, storage and retrieval of messages over the Internet), cross-device sharing (e.g., personal computer, tablet computer, and smart phone). As one core infrastructure component of PILE, therefore, online subgroup discourse platform is built currently on a typical IM - QQ. Additionally, considered the teacher-class-student top-down teaching and learning hierarchy, this study implemented a multilevel hierarchical study design to clarify the differences between IM-based online discourse and traditional classroom-based discourse at three levels - TEACHER, CLASS, and STUDENT.

The paper is organized as follows. In Section 2, we offer a literature review that covers KSA model, e-learning and its influential factors, and then, raise three research questions. In Section 3, we describe this study protocol, including experimental design and implementation process. Based on study results and discussion in Section 4 and 5, we summarize and conclude in Section 6.

2. Literature review

2.1. KSA/competency

The concept of competence or competency, first defined by White and later refined by McClelland, is used to assess students' performance improvement (Lasso, 2010). As a structured guide, a competency consists of a set of predefined descriptors for identifying, assessing, and developing individual KSA (Draganidis & Mentzas, 2006; Kang & Ritzhaupt, 2015; Phelan & Mills, 2011).

Person quality results from an integration of KSA that contribute to superior performance in a special job (Landy & Conte, 2004; Roth, Purvis, & Bobko, 2012). And they argued that individual KSA should meet future job requirements. KSA/competency model was successfully implemented at various levels, such as organization, team, individual, and so on (Amos & Klimoski, 2014; Williams & Haslam, 2011). KSA was categorized into two main types, i.e., technical/academic KSA, and behavioral KSA (Raven & Stephenson, 2001).

Competencies are the definable and measurable knowledge, skills, and abilities (Draganidis & Mentzas, 2006; Kang & Ritzhaupt, 2015). Knowledge is defined as an organized understanding of a subject, including facts, descriptions, principles, processes, which is obtained through experience, investigation or education. And skill is referred to as the proficient application of knowledge and process to a task (Butler, 1978; Lysaght & Altschuld, 2000). As the result of repeatedly applying knowledge, skills can be measured by a pre-specified task test usually within a given time limit. Ability is an innate potential to perform an activity, which determines the speed and depth of skill acquisition (Nakabayashi, 2013; Ritzhaupt & Kumar, 2013). Spencer & Spencer (1993) proposed an iceberg model to describe the structure of competency. They believed that as the visible components of an iceberg of competency, knowledge and skills are output of work or individual performance, and can be directly obtained and examined; as the hidden components beneath the surface, a range of underlying abilities play a fundamental role and cannot but be reflected indirectly from the visible components. From their point of view, abilities can be inferred from knowledge and skills. It is self-evident that applying knowledge and skills is a key ability of a student. And, skill proficiency depends on an intimate knowledge (Anakwe, Hall, & Schor, 2000; Turk, Krexner, Otto, Wrba, & Löffler-Stastka, 2015). Therefore, the association between knowledge and skills is an index that measures the ability of transforming knowledge into skills.

The recent studies explored the importance of KSA in a number of areas, including convention and meeting industry (Phelan & Mills, 2011), accounting (Chen, Damteaw, Banatte, & Mapp, 2009), international business (Prestwich & Ho-Kim, 2007), and medicine (Strom et al., 2003). They proposed several frameworks to develop and improve students' KSA for success within a specific work in the future. However, many prior studies just only provided qualitative lists of KSA in several ways, and focused too little on quantitative indicators of KSA to understand what happened under individual performances (Campion et al., 2011).

Graduates from colleges of art and design lacked adequate knowledge, skills and abilities to take required job tasks (Souleles, 2011). Some researchers considered that as an outcome-based approach, competency-based education should emphasize what students had known and could do well, rather than what had been listed in curriculum (Moon, 2007; Wesselink, de Jong, & Biemans, 2010). One plausible way of improving students' KSA is to rebuild traditional learning environment of art and design by introducing e-learning/online teaching and learning approach.

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