



Research Report

Exploring the structural relationships between high school students' Internet-specific epistemic beliefs and their utilization of online academic help seeking



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ARTICLE INFO

Article history:

Available online 4 May 2014

Keywords:

Internet-specific epistemic beliefs
Online academic help seeking

ABSTRACT

The purpose of this study was to examine the structural relationships between the Internet-specific epistemic beliefs (ISEB) and the online academic help seeking (OAHS) of high school students in Taiwan. Data were collected from 342 Taiwanese high school students by utilizing two self-report instruments: the ISEB survey (including *Uncertainty*, *Complexity* and *Self-Source* of Internet-based knowledge as well as *Justification* for Internet-based knowing) and the OAHS questionnaire (containing *Information Search*, *Formal Query* and *Informal Query* in online information searching contexts). The results of the exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) as well as the alpha values indicated that both the ISEB and OAHS instruments possessed adequate validity and reliability. The path analyses with structural equation modeling (SEM) further verified that students' ISEB were related to their behaviors of online help seeking while undertaking academic tasks on the Internet. It is reported that students with naïve beliefs regarding *Uncertainty*, *Complexity* and *Self-Source* of Internet-based knowledge intended to conduct online information help seeking strategies (*Uncertainty*: *Formal Query*, *Informal Query*; *Complexity*: *Information Search*, *Formal Query*, *Informal Query*; *Self-Source*: *Informal Query*). For example, students with naïve beliefs in *Uncertainty* of Internet-based knowledge had a higher tendency to use help seeking relating to Formal Query and Informal Query. However, students who believed that course-related content on the Internet should be evaluated through different aspects of other sources (i.e., sophisticated beliefs regarding *Justification* for Internet-based knowing) were more likely to use *Information Search* and *Informal Query* online help seeking strategies.

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1. Introduction

Epistemic beliefs are defined as learners' beliefs with respect to the nature of knowledge and the process of knowing (Hofer & Pintrich, 1997). Studies have shown that learning processes, comprehension and academic achievements are strongly correlated with the epistemic beliefs of learners (Duell & Schommer-Aikins, 2001; Ferguson & Bråten, 2013; Hofer, 2001). It has been indicated that epistemic beliefs may influence learners' learning strategy

choices and their engagement in learning (Hofer & Pintrich, 1997; Pintrich, 2002). There is also evidence indicating the relationships between epistemic beliefs and learning processes in traditional as well as Internet-based learning environments (Hofer, 2004a; Mason & Boldrin, 2008; Tsai, 2008). For example, it was reported that students' preferences in constructivist epistemology may predict their ubiquitous learning activities (Tsai, Tsai, & Hwang, 2012). As regards the Internet-based epistemology, empirical studies showed that students' Internet-specific epistemic beliefs may be linked to their web-based academic information searching and online self-regulatory learning activities (Chiu, Liang, & Tsai, 2013).

The roles of academic help seeking behaviors in students' learning activities and performances have been explored (e.g., Zusho & Barnett, 2011). In the online learning environments, the Internet-based academic help seeking behaviors in students' learning were also widely discussed (Cheng, Liang, & Tsai, 2013b; Cheng & Tsai,

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2011); however, the relationships between Internet-specific epistemic beliefs and online academic help seeking were only examined in a small number of studies (e.g., Cheng, Liang, & Tsai, 2013a). To sum up, the purpose of this study was to investigate the relationships between high school students' Internet-specific epistemic beliefs and online academic help seeking behaviors while searching information for their course-related tasks on the Internet.

1.1. Internet-Specific Epistemic Beliefs (ISEB)

Epistemic beliefs which are associated with learning practices and academic achievements play an important role in students' learning activities (Buehl & Alexander, 2001; Hofer, 2001, 2004a; Hofer & Pintrich, 1997). According to Schommer (1990), epistemic beliefs could be conceptualized as beliefs regarding knowledge and acquisition of knowledge. Epistemic beliefs also can be regarded as a part of the cognitive processes of thinking and reasoning, evaluating how individuals come to know (Hofer, 2000). Hofer (2004b) proposed that epistemic beliefs can be clarified by four dimensions and be clustered into two aspects, namely the nature of knowledge and the nature of knowing. In the nature of knowledge, the certainty of knowledge regards beliefs in absolute and unchanging knowledge and the simplicity of knowledge concerns beliefs about isolated facts and interrelated concepts of knowledge; the source of knowledge assessing the origins of knowledge as well as the justification of knowledge representing the approaches of evaluating knowledge claims are denoted as the nature of knowing. Each dimension may indicate a continuing scale that ranges from absolutist beliefs about knowledge (i.e., knowledge is certain and stable) to more sophisticated beliefs concerning knowledge (i.e., knowledge is complex, tentative, and actively constructed).

The model of epistemic beliefs has been discussed in diverse studies which have examined discipline-specificity (e.g., Conley, Pintrich, Vekiri, & Harrison, 2004; Liang, Lee, & Tsai, 2010; Tsai, Ho, Liang, & Lin, 2011), topic-specificity (e.g., Bråten & Strømsø, 2010; Bråten, Strømsø, & Samuelstuen, 2008; Strømsø, Bråten, & Samuelstuen, 2008), and culture-specificity (e.g., Bråten, Gil, Strømsø, & Vidal-Abarca, 2009; Karabenick & Moosa, 2005). More recently, the epistemic beliefs have also been explored in the Internet-based learning contexts (e.g., Bråten, Strømsø, & Samuelstuen, 2005; Kammerer & Gerjets, 2012; Strømsø & Bråten, 2010).

Along with the rise of the technology-based learning, Internet-based learning is in widespread use and is recognized as an influential role in the daily practice of contemporary education. The Internet, as an important information source, has drawn the attention of researchers who are investigating epistemic beliefs in technology-based learning environments. Based on the viewpoint of Internet-specific epistemic beliefs, Hartley and Bendixen (2001) argued that the importance of epistemic beliefs in new technology-based learning environments might be greater than in traditional ones. It is said that learners have more control over the information retrieved on the Web than in traditional learning contexts, and the Internet-based information will be justified through their own discretion. The role of epistemic beliefs in students' online learning is of concern among educational researchers (e.g., Bråten, 2008; Conley et al., 2004). Hofer (2004a) has proposed that if college students perceive knowledge as simple and certain, they may find it unnecessary to search additional websites to integrate information or to reflect on the credibility and accuracy of the online sources. On the other hand, Whitmire (2003) explored the relationships between epistemic beliefs and information seeking behaviors. The interview results revealed that undergraduates' epistemic beliefs might affect their choice of thesis topics, the use of mediators during the searching process, the types of searching techniques, the evaluation of information,

and the ability to recognize authority. In addition, Whitmire (2004) applied the epistemic reflection model and the reflective judgment model to examine the relationships among epistemic beliefs, reflective judgment, and information seeking behaviors. The results indicated that learners with more sophisticated epistemic beliefs had greater ability to handle conflicting online information and to identify important online information. By using thinking-aloud protocols, recent studies have suggested that learners' epistemic beliefs may correlate to their assessment of the Internet-based information (e.g., Mason, Ariasi, & Boldrin, 2011; Mason, Boldrin, & Ariasi, 2010). For instance, Mason et al. (2010) found that university students with sophisticated views concerning the justification of online knowledge had better performance from online learning.

By using questionnaires, Bråten et al. (2005) and Strømsø and Bråten (2010) had assessed university students' epistemic beliefs about Internet-based learning activities. They extended existing research on epistemic beliefs and constructed a measurement which focused on Internet-based epistemic beliefs. Adapted from Hofer and Pintrich's (1997) theoretical model of personal epistemology, they developed an instrument to assess students' beliefs relating to Internet-based knowledge and knowing, namely the Internet-Specific Epistemological Questionnaire (ISEQ). The thirty-six items of ISEQ were used to evaluate four hypothesized dimensions: *Certainty of Internet-based knowledge*, *Simplicity of Internet-based knowledge*, *Source of Internet-based knowledge* and *Justification for Internet-based knowing*, respectively.

The ISEQ was administered to undergraduates in order to clarify the dimensions of Internet-specific epistemic beliefs. However, the study of Bråten et al. (2005) indicated that students' Internet-specific epistemic beliefs may be less differentiated than what was suggested by Hofer and Pintrich's (1997) epistemic model, with only two dimensions. The dimensions of *Certainty*, *Simplicity* and *Source* were integrated into a new dimension, namely *General Internet Epistemology*, while the *Justification for Knowing* was alone separated.

Strømsø and Bråten (2010) replicated the four-factor structure using university samples to examine the relationships between Internet-specific epistemic beliefs and Internet-based learning activities. Based on Bråten et al.'s (2005) ISEQ, which contained two factors with 18 items, the results of Strømsø and Bråten's (2010) study yielded a three-factor solution. Two initial factors were mixed and combined, namely *Certainty and Source of Knowledge*. The other two factors were separately identified as *Structure of Knowledge*, i.e. *Simplicity of Knowledge* identified in Bråten et al. (2005), and *Justification for Knowing*. In sum, there is still a need to further examine the dimensionality of Internet-specific epistemology particularly on other groups such as teens rather than undergraduates.

According to Tsai (2004a), the Internet can be viewed as an epistemic tool due to its rich and extended information connections. The findings of Tsai's study showed that learners with advanced epistemic beliefs may better utilize the Internet for learning and knowledge construction. Also, Tsai (2008) indicated that the Internet as an instruction tool may help students to reshape their epistemology. Moreover, it was proved that eighth grade students with advanced epistemic beliefs had better information searching outcomes while encountering open-ended tasks in Web-based environments (Tu, Shih, & Tsai, 2008). Bråten et al. (2005) found that students holding the belief that the Internet is an essential source of accurate facts were more skilled in searching for relevant information on the Internet and using the information they located when doing their course work. Particularly, the role of Internet-specific epistemic beliefs in students' self-regulated learning was also investigated (Cheng et al., 2013a; Chiu et al., 2013). In conclusion, epistemic beliefs were viewed as a crucial factor in acquiring Internet-based knowledge and engaging in learning processes.

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