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Internationalization of eLearning – Consideration of Culture-specific Differences of Self-directed Learning Ability

Research-in-Progress

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Abstract

In the course of globalization there is a world-wide demand for increased use of eLearning, offering a variety of design possibilities supporting self-directed learning. However, a high degree of self-directed learning does not necessarily result in higher learning success. This paper reviews and compiles the current research, and points out how current IS research can be enriched by applying learning psychological approaches. Considering the current limitations, we qualitatively and quantitatively investigate culture sensitive success factors of eLearning with respect to overall satisfaction and learning success, comparing China and Germany. We hypothesize that eLearning outcome, regulated by the offered degree of self-directed learning possibilities, is dependent on a learner's cultural background. The quantitative survey is ongoing, with more than 1.500 completed questionnaires so far. Its purpose is to explore the main cross-culture differences that need to be considered for eLearning arrangements, and how such settings can be optimized.

Keywords: Learning, cognitive psychology, cross-cultural issues, cultural differences, culture, learner-centered design, eLearning, empirical research, success factors, learning service engineering

Introduction

Considering the rapid changes in our stock of knowledge, the field of eLearning research has undergone a fundamental transformation in the last years. eLearning arrangements (e.g. IT-based learning scenarios, web-based trainings or webinars) are able to offer a location- and time-independent qualification of many individuals within a short time period (Garrison 2011). While the first eLearning approaches were mostly designed purely for the conveying of knowledge in a specific country, the demand for culture-sensitive learner-centered learning environments, and consequently the field of eLearning export are increasing (Anakwe et al. 1999). Furthermore, the current situation in the education sector, with a rapid export growth of eLearning due to globalization, reinforces the need for answers on how culture should be

considered. Currently, information system (IS) research is dominated by design-oriented qualitative approaches when transferring eLearning arrangements to another country, focusing on questions about the processes of computer- or web-based learning service creation, or interface design (Anakwe et al. 1999; Chen et al. 1999; Choi et al. 2005; Hall 2010; Harfoushi et al. 2010; Ishii 2004; Kummer et al. 2012; Mushtaha and Troyer 2007; Papp 2000; Singh and Pereira 2005; Swierczek and Bechter 2010). Differences between education systems go along with individual learning styles and influence acceptance and effectiveness of the eLearning arrangement (Fischer and Kopp 2007). These insights lead to a culture-specific didactic structure of an eLearning application (Kamentz and Mandl 2003). Only few studies in the context of eLearning in different cultural settings investigate in depth the learner as an important factor for eLearning success, and only few of those are aiming at explaining how learning success in this context can be optimized (Fischer and Kopp 2007). To achieve this, it is particularly promising to apply concepts of the field of learning psychology. Here, the construct of self-directed learning and performance has received more attention, since eLearning offers more possibilities of self-direction in comparison to traditional classroom-based learning arrangements (Dabbagh and Kitsantas 2004). Furthermore, results of studies investigating this matter showed that a higher degree of self-directed learning abilities is tied to a higher learning success (McInerney 2011). When learners are confronted with eLearning, this can result in higher requirements of learning motivation and -strategies, depending on the learning materials and learning environment within the respective learning unit (Paris and Paris 2001; Pintrich et al. 2001). For this, however, the learning process itself must be designed in a way that the learners can control it themselves (Graham 1997). Learners have to deal with the technology by operating actively and independently, and have to critically evaluate and use contents on the basis of their own expertise. They monitor the effectiveness of their learning methods and strategies. For this reason, culture is likely to play a key role, for example through a differentially developed understanding of learning and different learning experiences as well as habits (Hall and Hall 1990; Hofstede 1986; Hofstede 1991; Hofstede et al. 2010; Huang and Prochner 2003; McInerney 2008). In summary, there is a lot of evidence from comparative learning culture research and learning psychological research highlighting that the consideration of learning conditions as well as cultural experiences has an influence on learning success. A deeper understanding of this could assist organizations in structuring the use of eLearning arrangements and improving learning success. It can also inform eLearning designers about how self-directed learning ability should be considered when thinking about a global use of eLearning systems.

In view of the above, the aim of the present research-in-progress paper is to provide a research design that refers to the ideas and findings of prior IS and learning psychology research, and to transfer it to the eLearning field. The theoretical basis of our study is derived from a literature review. To screen the literature on cultural differences of self-directed learning in eLearning arrangements, we used first of all a search string, including several synonymous terms (e.g., self-directed learning, learning strategy, learning motivation, learning success, learning satisfaction in combination with culture, culture identity, social identity and eLearning, web-based learning), consulting several scientific databases (EBSCO, AIS electronic Library, ScienceDirect, PsycInfo; JSTOR). We intend to explore which factors are the most appropriate to investigate self-directed learning abilities within eLearning arrangements in the context of cultural aspects, and to investigate its influences on eLearning success. However, a high proportion of articles mainly relate to theories of engineering, design and implementation of learning applications, and only few focus on educational and learning theoretical basics. Due to this, we identified and included further relevant literature from basic learning psychology research. The results are described in section two and provide the basis for the development of the research design in section three. In the fourth section, the instrument construction, study participants and proposed data analysis are presented. Finally, we describe the expected contributions, the limitations and a short outlook for future work. In summary, we provide an overview of the current state of research on culture-sensitive eLearning, and seek to combine, review, replicate, and expand the findings of previous research by means of a complex qualitative and quantitative research design.

Theoretical Model Development

Culture

In order to evaluate whether culture plays a role in self-directed learning ability, it is necessary to understand the construct culture. Culture is used in the literature in different ways and in different

contexts (Eliot 2010; Leidner and Kayworth 2006); as a result it is difficult to grasp (Herbig 1998). Culture research addresses differences and commonalities of humans from different cultural backgrounds (Straub et al. 2002) to understand influences of culture on social, political, and economic areas (Hills 2002). Generally, culture can be analyzed on several levels (Schein 2010). These include the visible artifacts, the associated values, and unconscious rooted assumptions in the individuals. Thus, culture represents a surface phenomenon, with underlying assumptions that form its actual core. However, these assumptions cannot be observed, but become accessible exclusively through interpretation processes. This led to three approaches dominating the cultural research field, focusing on the national (Hall and Hall 1990; Hofstede et al. 2010; Schwartz 1992), organizational (Reichers and Schneider 1990; Schein 2010), or group- and individual-focused levels (Tajfel and Turner 1979). Group- and individual-focused approaches comprise models of social identity and deal with questions of behavior consequences. Schein stated that basic assumptions on a group- and individual behavior level are much more difficult to study than values (Schein 2010), resulting in an over-proportionate availability of investigations on organizational and national culture. On the organizational level, a wealth of studies (Sackmann 1992; Schein 2010) investigate the anchoring of values and norms in organizational behavior. National culture research primarily deals with dimensions for culture-specific classification and comparison of individual countries (Kummer et al. 2012). A well-known contribution in this field has been established by Hofstede, who identified six cultural dimensions in a large empiric study comprising approximately 60 countries (Hofstede 2001). These dimensions are: power distance, uncertainty avoidance, individualism versus collectivism, masculinity versus femininity, long-term orientation, and indulgence versus restraint (Hofstede 2001). In addition to this, also other researchers are focusing on national cultures and came up with highly similar value dimensions (House et al. 2004; Lytle et al. 1995).

To analyze learning culture, it can be observed and described with regard to hierarchies between teachers and students, instructional learning design, learning material, the organization of group work, or classroom discussions, amongst others. To explain, for instance, why interaction with equal eLearning arrangements in the classroom are more successful in one compared to another culture, one must immerse into the hidden layer, according to Schein (1992). Here, the national-, organizational-, and individual-levels are also to be distinguished. Depending on the interpretation level, culture is a national phenomenon, an organization phenomenon, or a phenomenon of individual identities. At the national level researchers attribute varying success rates to the different values and norms of a culture. At the organizational level they would argue that its abundance depends on the different roles and interaction patterns in a class. However, to really be able to understand and explain the impact of culture, one should – according to Schein (2010) – focus on the individual level. Last but not least this is needed, because cultural values from the national or organizational level simultaneously influence an individual's identity. A mere investigation of cultural values will not do justice to the complexity of the construct of culture (Straub et al. 2002). Thus, learning behavior, habits, strategies, and motivations of learners are analyzed to causally explain why the success of a learning arrangement is varying from one culture context to another. This approach forms the basis for the present research. We focus on the investigation of cultural differences on an individual-level, for we intend to compare the behavior of learners from German and Chinese cultural background. It is reasonable to assume that there are huge differences between these two learning worlds, which affect the interaction with technology-mediated learning. For example, education in China is much more teacher-centered than in Germany, which leads to a decreased use of learning strategies and learning schedules (Fischer and Kopp 2007; Huang and Prochner 2003). Our study is thus inspired by the introduced theoretical perspectives on motivation, learning and self-directed learning.

Self-directed Learning

Besides the categories self-directed vs. non-autonomous, you can find other definitions such as self-regulated vs. non-autonomously regulated, or auto-didactic vs. environmental learning. There are important differences between these concepts, but overlaps also exist (Paris and Paris 2001). Different authors highlight that learning processes are neither completely self-directed nor completely non-autonomous, but can be found between these two poles (Hiemstra 1994; Konrad and Traub 1999). In an eLearning arrangement close to the self-direction pole, the learners can choose contents and objectives, for they are interested in the contents and intend to deepen their knowledge. Learning success is evaluated in their own responsibility. However, in eLearning arrangements close to the non-autonomous pole there are pre-defined contents, which are hierarchically structured and parsed in small, linear

presentation units with increasing difficulty. At the end of each unit, learning success is evaluated by means of a test (Fischer and Kopp 2007).

Self-directed learning is not only a feature of the learning process; it can also be defined as a skill or ability of the learner. Therefore, the exploration of self-directed learning processes must also consider the learners' learning habits, learning goal orientation, and so on. Studies have shown that habits, for example printing of documents, note taking, glossary entries, or an active participation in the class are a function of a student's capability and can be shaped by the context in which students live and work (Corno 2011; Rogers and Swan 2004; Turner and Patrick 2004; Winne et al. 2006). There are a lot of studies supporting the relationship between self-directed learning ability and learning success (Camahalan 2006; Shih 2005). Research on meta-cognition aspects of learning success showed that a well designed learning process does not necessarily imply good performance (Cleary and Zimmerman 2004; Paris et al. 2001; Schunk and Ertmer 2000). In short, knowledge about adequate learning strategies as well as motivational and volitional components play an important role, too (Corno 2011; Pintrich 1991; Pintrich et al. 1993; Straka 2000; Zimmerman 2000; Zimmerman and Schunk 2011). Learning motivation, for example belief in the value of effort, fear of failure, as well as learning strategies, for example memorization, are most salient to particular cultural groups (Braten and Olaussen 1998; Pillay et al. 2000; Zusho et al. 2005). For this reason, self-directed learning is likely depending on the cultural context of the learner (McInerney 2008). However, a strong self-directed eLearning arrangement requires that the learner also has the possibility to make use of this open way of learning. This requires on the one hand that the learning process offers such self-directed learning possibilities, and on the other hand, that the learners realize it and make use of the opportunity. According to Strake (2000) the learning structure needs to be coupled with at least a moderate amount of autonomy support to have a positive association with self-directed learning. In teacher-centered learning arrangements, students who experienced their teachers as offering structure were not likely to use self-directed strategies (Reeve and Jang 2006; Straka 2000). Last but not least, it has been shown that there are individual preferences for specific types of reception, processing, and reproduction of novel information (Felder 1993; Kolb and Hay 1999; van Zwanenberg et al. 2000). However, preferences for certain learning types can change over the course of life, and can be influenced by acquired knowledge, experiences, and situations. This is in line with research showing differences of learning between the young and the elderly (Piolino et al. 2002), between genders (Barnfield 1999), and in different environments (Peisner-Feinberg et al. 2001). But across cultures, self-directed learning ability seems to be an important predictor for learning outcomes and achievement, even when the effects of sex and age were controlled for (Pintrich et al. 2001).

eLearning Success

eLearning, also described as IT-supported learning or technology-mediated learning (Gupta and Bostrom 2013), is specified as an environment, in which the interaction of learners with learning material, co-learners, and trainers is supported by technology (Alavi and Leidner 2001; Volery and Lord 2000). An eLearning-based learning arrangement includes for example web based trainings, virtual classrooms, or serious games, (Rosenberg 2001). It enables job-related simultaneous learning for many individuals, and also provides an exchange of experiences at any time and place (Katz 2000; Katz 2002). Since this paper does not focus on one specific manifestation, these will be subsumed in the following under the terms 'eLearning', or 'eLearning arrangement'. To ensure learning success in an eLearning arrangement, its quality needs to be studied closely. According to studies on service quality measurement and service engineering, it is important to analyze not only the objective aspects of the learning outcomes (Leimeister 2012; Zeithaml 2000). eLearning success is, besides knowledge increase, subject to learner's satisfaction, which is for example reflected by the enjoyment of use of such applications within the learning process. There are various theoretical perspectives and research, including a wealth of articles covering the topic of eLearning success. Significant influence factors are: the learner, the trainer, the course, the technology, the design, the learning environment and the possibility of personalization (Benson Soong et al. 2001; Ozkan and Koseler 2009; Shee and Wang 2008; Sun et al. 2008; Volery and Lord 2000).

Theoretical and Methodological Limitations of Prior Research on Cultural Differences of Self-directed Learning

Taking all this into consideration, the available study results are wide-ranging, and the models used are discussed at various abstraction levels. Currently, there is no in-depth quantitative research available that considers culture, self-directed learning, and eLearning success. It can be concluded that most IS studies consider only basic pedagogical and psychological issues to investigate the influence of self-directed learning abilities. Most of the studies focus on Hofstede's approach, by measuring the values of subjects in a qualitative fashion (Kummer et al. 2012), and infer cultural characteristics based on the aggregation of these values. Although this approach is appropriate for conceptualizing and operationalizing culture, it offers limited explanatory power (McInerney 2008). Learning psychology research focuses strongly on traditional classroom-based learning arrangements. The measurement methods are diverse, covering for example in-depth interviews, surveys, evaluation of learning diaries, and observations (McInerney 2008). The displayed interconnections in the models show that self-directed learning on the one hand depends on learner abilities and knowledge. On the other hand, self-directed learning is only possible, if the learner is given opportunities for such a learning strategy within a learning process. This latter aspect is given too little attention in the available research (Straka 2000). Regarding the measurement of the variables, quite a lot of studies (McInerney 2008; Pintrich 1991; Straka 2000; Zimmerman 2000) made a distinction between learning motivation and learning strategies. Learning motivation takes cultural differences of motivational and volitional components of learning into consideration, and the assessment of learning strategies includes meta-cognitive aspects of different cultures. The variables "learning strategy" and "learning motivation" are mostly measured self-reported, using scales with Likert response format. A lot of the studies focus on one cultural setting (McInerney 2008). Furthermore, the role of the influence of culture and cultural identity on learning success can be considered a) as a direct effect on learning success, which could be explained by an impact of cultural capital on learners' success (DiMaggio 1982), b) as an indirect effect mediated by self-directed learning ability, which also implies that culture has an influence on learners' motivation and strategy (Braten and Olaussen 1998; Gieve and Clark 2005; McInerney 2008), or c) as a moderator variable on learning success, which influences the effect of self-directed learning ability on learning success (Klassen et al. 2008). Furthermore, culture is often used as a proxy to label e.g. Asians, Germans, Norwegians, and so on, without taking within-group effects into consideration (McInerney 2008).

In the context of culture, both studies in IS and learning psychology research rarely consider eLearning success as a dependent variable. It is likely that success factors of eLearning, in this context hitherto not investigated, such as the learner behavior also underlie the culture effect (Fischer and Kopp 2007; Gallivan and Srite 2005; Leidner and Kayworth 2006).

Research Model

In view of the above, we assume that eLearning success depends on self-directed learning ability of the learners, and could be described as an individually perceived and an objectively realized knowledge increase. In addition, we suppose that the effect of self-directed learning ability on learning success can depend on gender, age, and educational level. Cultural affiliation could influence the eLearning success directly or indirectly mediated by self-directed learning ability, which also implies that culture has an influence on learners' motivation and strategy. We also hypothesize that besides a high degree of self-directed learning ability, there has to be also the possibility to make use of this open way of learning. This requires that the eLearning arrangement offers such self-directed learning possibilities, which is why we include the learners' perceived autonomy in our study. These considerations result in an analysis model presented below in the section 'Data Analysis' (Figure 1).

Research Design

For our study we compared the German and Chinese cultural context, not only because these cultures are very different (Hofstede et al. 2010), but also because the importance of eLearning is recognized by both, resulting in increased usage (Gilsun 2006). Thus, research objects are German and Chinese vocational academies, which are in a close cooperation and engage in traditional classroom as well as eLearning courses. To ensure that possible identified cultural effects exclude institutional causes such as learning

content, schedule or objectives, we chose to perform both a qualitative and a quantitative study. The purpose of the qualitative pre-study was to analyze in-depth the learning context and the used web-based trainings to ensure the coherence of the comparison of the Chinese and German eLearning arrangements. To assure comparability of the eLearning arrangements, 30 experts were asked to analyze the used web-based trainings. As an interview framework we applied the criteria of the model of Sun et al. (2008) and assumed that comparability is given, if the description of the role of the learner and the instructor, the technical environment, the design, the learning scenario and the course were evaluated as equivalent by the experts. The framework of Sun et al. (2008) was chosen due to its high explanatory power (67% of the variance). The results of the comparison of the German and East Asian learning context show that the used web-based trainings are similar with respect to formalities of interaction with the learner, formulation of instructions and assessment of exercise solutions, as well as patterns of reasoning. Nevertheless the interviewed experts emphasize culture-specific requirements of eLearning success that cater to the specific didactic socialization (Hammer et al. 2014).

The quantitative study contains two stages and is based on the notion that learning success should be assessed by subjective and objective measures (Zeithaml 2000). Participants of the survey are German and Chinese students of vocational schools. First, a subjective assessment of self-directed learning is acquired using a questionnaire, including self-reported learning success perception, and satisfaction with the learning process. Then, the learning success is estimated using the scores of a final exam. Perceived learning success, learning satisfaction, and the actual final exam score are therefore the central dependent variables of the study. The variable self-directed learning, one of the central independent variables, is included as self-reported variable in the survey, and will be assessed and outlined using the Motivated Strategies for Learning Questionnaire (MSLQ), which is one of the most common measures of self-directed learning (Pintrich et al. 1993). Here, learners rate statements on a Likert Scale which query their motivational orientation and use of different learning strategies for a specific learning setting (Pintrich 1991). Because of our focus on students of vocational schools, the questionnaire was supplemented with additional items from the LIST Inventory (Wild and Schiefele 1994), the MOSLIB Inventory (Nenniger et al. 1996; Nenniger and Wosnitza 1997), and the PALS Inventory (Midgley et al. 2000). Furthermore, some items had to be adjusted to the requirements of the different learning culture, and of assessing eLearning success factors (Benson Soong et al. 2001; Ozkan and Koseler 2009; Shee and Wang 2008; Sun et al. 2008; Volery and Lord 2000). Since an operationalization of culture remains challenging, we use a proxy approach for distinguishing cultures. This approach constitutes a contribution towards capturing this difficult and hard-to-define concept. Culture is therefore not being included here via a value-setting measurement, but only by the label "German" and "Chinese". However, to expose possible within-group effects, vocational schools within both countries are also compared. Although we performed the qualitative pre-study to ensure that the learning arrangements are comparable, there could be a difference between the assessment of the interviewed experts and the perceived autonomy within the learning arrangement of the students. Due to this, the variable "perceived autonomy in the learning process" is integrated as control variable into the quantitative study, not least because research has shown that it has a significant influence on the successful use of self-directed learning strategies (Reeve and Jang 2006; Straka 2000). Learning style research emphasizes that the usefulness of such approaches cannot be generalized to all learners. Thus, socio-demographic characteristics such as age, gender, and educational level are recorded as control variables.

Methods and Participants

Instrument Construction

Questionnaires were prepared in German and Chinese Mandarin language. To optimize operationalization of the variables, only existing validated scales were included, with the exception of the scales to measure "perceived learning success and learning satisfaction", and the independent variable "nationality". For these variables, the scales are self-constructed. The scale to measure "perceived learning success and learning satisfaction" was constructed following several recent publications that measure the quality of IT-based services, and success factors of eLearning (Arbaugh 2002; Sun et al. 2008; Zeithaml 2000). For the variable "nationality", we use a string variable asking about the place of birth and growing up (Steenkamp 2001). In addition to this, we ask about the location of the attended vocational school, to distinguish possible within group effects (McInerney 2008). Table 1 indicates which scale is used to

measure the variables involved. The self-directed items (learning motivation and strategy) are measured on a bipolar seven-point Likert response format, ranging from “1” (not at all true of me) to “7” (very true of me). All items are randomized to avoid possible order effects. All items and scales have been double-blindly translated into German and Chinese Mandarin by native speakers, respectively, to avoid measurement errors caused by translation mistakes. Pretests were conducted, and items prone to misinterpretation or confusion were adjusted.

Table 1. Scales to measure the variables			
Dimension	Variables	Items	Source of scales
Learning motivation	Intrinsic goal orientation Extrinsic goal orientation Task value Control of learning beliefs Self-efficacy for learning and performance	29	(Midgley et al. 2000; Pintrich et al. 1993)
Learning strategy	Rehearsal Elaboration Organization Critical thinking Meta-cognitive self-regulation Time and study environment management Effort regulation Concentration Peer learning Help seeking Literature Control	95	(Nenniger et al. 1996; Pintrich et al. 1993; Wild and Schiefele 1994)
Perceived autonomy in the learning process		6	(Röder and Kleine 2003)
Learning success	Perceived learning success	2	(Satow 1999)
	Learning satisfaction	1	(Arbaugh 2002)
Cultural affiliation	Place of birth / growing up	2	(Steenkamp 2001)
	Location of the vocational school	1	(McInerney 2008)

Table 1. Scales to Measure the Variables

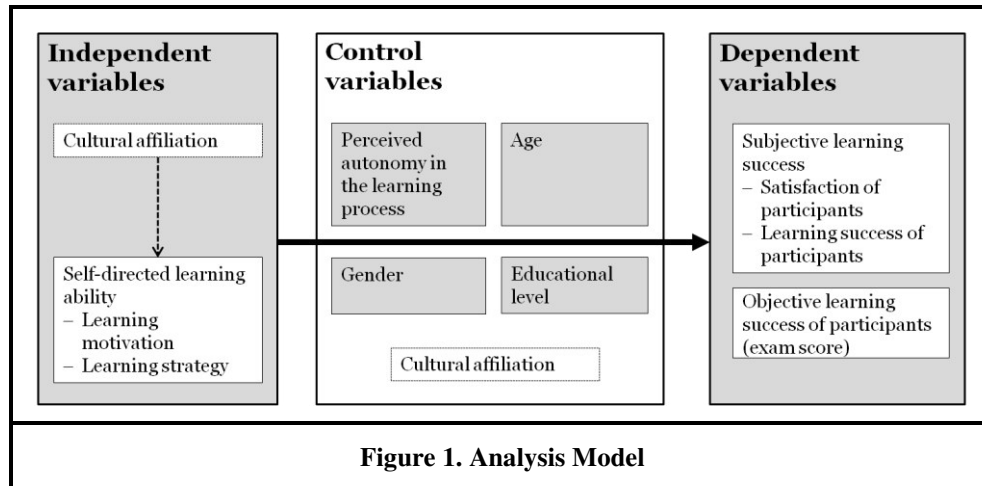
Study Participants

The study started on September 1, 2013. The questionnaires were designed as a paper pencil version to reach as many students as possible, and take about 15 to 25 minutes to complete. In China, teachers distribute the questionnaire during class hours, to guarantee a high percentage of completion. It is underline in the introduction part of the survey that the students should refer to their eLearning experiences. So far, more than 1,500 students have participated in the survey. The same approach will be followed in German schools and is currently in preparation. The sample consists mainly of students of vocational schools; hence, it can be assumed that the age of our participants will range largely between 14 and 17 years.

Data Analysis

Following a detailed descriptive analysis, the distribution of the data will be analyzed, and transformations will be applied where necessary. A confirmatory factor analysis will determine, whether dimensions and constructs taken from the available literature are replicable and can be aggregated for

further analyses. Items will be grouped according to their load. Analyses of reliability and correlation patterns will also be conducted to determine the suitability of the items and aggregated factors for measuring self-directed learning ability. Multiple regression models will be applied (1) to examine the influence of the predictors “culture affiliation” and “self-directed learning ability” on “learning success”, correcting for control variables (Figure 1), and (2) to determine the explanatory power of each single variable with respect to the total variance. In addition to this a mediator analysis will be performed to determine whether culture has only a direct effect on learning success or also indirect effects via self-directed learning ability. By structural equation modeling the overall model will be tested. Finally, a cluster analysis will be performed to achieve a distinction of vocational students of varying age, gender and cultural background with regard to learning motivation and applied learning strategies. The goal is to stimulate the development of a typology of culture-specific self-directed learning ability.



Expected Contribution, Limitations and Outlook

The described project constitutes an attempt to integrate previous interdisciplinary research results, and to improve limitations of prior research on cultural differences of self-directed learning through a complex research design. Our study focuses on the learner in the learning process, representing a central success factor for export of eLearning arrangements (Leidner and Kayworth 2006). We intend to expand the presently available research findings, and to derive a general model to explain the cultural influences on learning success in eLearning arrangements. As for limitations, besides possible language barriers in cross-cultural research, culture is a complex, multidimensional, difficult to operationalize construct, in spite of our multi-measure approach to assess its influence. In addition, our data collection could be affected by validity issues caused by group dynamics and social desirability. Based on comprehensive descriptive and inferential statistics, we intend to draw firm conclusions regarding the correlation between self-directed learning, culture and learning success within an eLearning arrangement. Our overall aim is to optimize the internationalization of eLearning by offering a learner-centered deeper understanding of the role of culture identity (the individual needs and expectations of learners in different cultures) in an eLearning arrangement. A central practical implication would be the empirical based creation of guidelines (including didactic structure, navigation, user interface, design, and more) for culture-sensitive eLearning arrangement development to optimize internationalization efforts for eLearning providers.

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