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# Blended Learning Success: Cultural and Learning Style Impacts

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**Abstract.** Corporate education in international organizations faces a lot of challenges which are hoped to be addressed by using blended learning concepts. However, the heterogeneity of an international workforce in terms of culture and learning style opposes this objective. Therefore, this research-in-progress paper focuses on cultural and learning style impacts on learning success when using blended learning in organizations. Based on first theoretical ideas of a blended learning success model the impact of culture and learning style on learning outcome is theorized and analyzed using an empirical study conducted with 81 employees of an international organization. The results reveal that national culture has an impact on blended learning success and therefore a cultural sensitive design of blended learning environments is necessary. The results are the basis for further research to develop a blended learning success model including cultural and learning style aspects as it is described in the paper.

**Keywords:** blended learning, culture, learning style, success, blended learning success

## 1 Introduction

In recent years, corporate education focuses more and more on blended learning concepts to educate employees of an organization [1-2]. The term blended learning describes a mix of traditional and online learning methods and media often supported by information technology (IT) [3-6]. The scope is to guarantee learning success by combining traditional and e-learning methods as well as an effective and efficient design of learning contents [7]. Concerning the usage of blended learning concepts in corporate education in international organizations, problems arise because of the heterogeneity of employees [8-9]. This heterogeneity of an organization's workforce is on the one side based on employees' different cultural backgrounds.

In regard to corporate education, culture is identified as a factor that influences the success of different learning methods [10-11]. The cultural background of an individual determines his learning preferences, needs and expectations of the instructor's role [12-13]. On the other side, the heterogeneity of an organizations workforce can also be characterized by its employees' learning style. In general, employees' learning style implies their preferences of learning and instructional activities [14]. Research identifies different learning outcome in dependence of their learning style and the

teaching method used [1], [7], [15]. However, most of these prior works have either focused on traditional or e-learning. Therefore, only few insights exist how culture and learning style influence the success of blended learning concepts and which culture and learning style fit best the combination of offline and online teaching methods. Nonetheless, these insights are important especially for international organizations investing in the design and implementation of blended learning concepts to educate their workforce. Consequently, this research-in-progress paper provides a first step towards a blended learning success model by theorizing the impact of the heterogeneity with regard to national culture and individual learning style on an individual's learning success. Therefore we focus on the following research questions:

*RQ: Does the heterogeneity of employees have an impact on blended learning success?*

*Do factors such as culture and learning style have an impact on blended learning success?*

In order to provide an answer to these research questions, first ideas of a blended learning success model are discussed, and the influence of national culture and learning style of net benefits as one example of learning success is analyzed. The results provide the basis for a discussion whether future research and organizations developing blended learning concepts should concentrate more on cultural sensitive design of blended learning environments such as Koh and Lim [16] already claimed for e-learning concepts.

The remainder of the paper is as follows. First, the theoretical background is explained. Second, a theoretical model is developed explaining blended learning success. Based on this model, hypotheses are derived. Third, the design of a first pre-study is explained and the results are presented. Finally, implications and future research are described before the paper concludes with the limitations.

## **2 Theoretical Background**

This section provides an overview of the theoretical background of our research. In addition, we develop a theoretical model of blended learning success based on the e-learning success model [17]. Moreover, we extend the model by national culture and learning style. Therefore a brief literature overview of national culture and learning style and examinations regarding to learning success are provided.

### **2.1 Blended Learning Success**

**Blended Learning Environment.** The term blended learning is often used but according to Trigwell and Oliver ([18], p. 17) is "ill-defined". As a result, we define within our paper a corporate blended learning environment as a learning environment in which traditional and online methods and media are combined and which is supported by IT such as learning management systems. This definition is based on Graham [3] and Reiss and Steffens [19]. The goal of the corporate blended learning envi-

ronment is to ensure continuous education of the employees. Consequently, blended learning environments bundle the strength and avoid the weakness of both traditional learning and e-learning. Traditional learning environments are characterized on a positive side by a rich social context. The instruction takes place in a classroom and face-to-face, learners have the possibility to interact and to get immediate feedback of the instructor or other learners [20-21]. E-learning environments offer the learner flexibility according to time, pace and place. A high amount of learners can be reached. As a negative aspect, social context is missing as communication often takes place through asynchronous discussion forums or through e-mail. The danger exists that online learners get lost in an unstructured learning environment. Moreover learners can feel isolated [21-23]. Dependent on the learning methods and media which are used in a learning environment, the learning environment can be characterized either as instructor- or learner-centered. In instructor-centered learning environments learners have a more passive part and receive the knowledge directly from the instructor. Methods such as lectures are used. In contrary, learner-centered environments include learners more in the learning process. Learners are actively involved and construct knowledge through activities such as group working [24-27].

Learning Success. Learning success can be examined through the evaluation of the learning environment. Often models such as Kirkpatrick's model [28-29] or the e-learning success model of Holsapple and Lee-Post [17] are used [20], [30], [31].

Kirkpatrick's model evaluates traditional learning environments such as corporate education training. The model includes four levels. These levels focus on the satisfaction of learners, the ability to perform the newly acquired skills and also its impact on measurable profits [28-29]. In contrary, Holsapple and Lee-Posts's [17] e-learning success model concentrates on the evaluation of online learning environments. The model is based on DeLone and McLean's [33] information success model. It includes three different parts: design, delivery and outcome. Design has the dimensions system quality, information and service quality. System quality evaluates factors such as the learning system is easy to use or user friendly. Information quality characterizes whether the learning content is well-organized or effectively presented. Service quality considers the quality of instruction such as facilitation of student participation. The success of the delivery stage is measured by use and user satisfaction. The dimension use characterizes the usefulness of different learning methods and elements which are provided. The third stage outcome consists of net benefits. Positive and negative aspects are distinguished. Positive aspects include for instance the enhancement of learning. Negative aspects address things such as the lack of contact as learning takes place online [17], [33], [34], [35].

However, most studies focus on the evaluation of e-learning or traditional learning or comparisons between them (e. g. Joy II and Garcia [32]). In conclusion, less research focusing directly on blended learning environments evaluation is available.

For the evaluation of a blended learning environment we use Holsapple and Lee-Posts's [17] e-learning success model as a basis. As this model focuses on the success of e-learning systems, it has to be adapted to the characteristics of blended learning. For this reason, net benefits consider only positive aspects in our model. Positive aspects focus on enhanced learning, empowered learning and academic success.

Therefore the evaluation of the learning process and performance, the comprehensibility of the learning material and the perceived involvement of the learner in the learning progress are examined. Negative aspects such as lack of contact are removed because blended learning environments have both face-to-face and online learning methods. Contrary to traditional learning environments, blended learning environments are supported by IT. Often learning management systems or content management systems are used. An advantage is that learners have the possibility to manage and monitor their learning process through an overview of passed and still to pass courses. In addition, blended learning environments offer face-to-face components such as classroom learning so that learners can exchange problems regarding the IT-system and do not get lost such as could be the case in an e-learning environment [21], [22], [36]. Consequently the three positive aspects stay in focus, and the negative ones are removed. We use this model as it provides us with three dimensions – design, delivery and outcome – a good starting point for the characterization of blended learning environment. The dimensions can be adapted to the needs of blended learning environments and expanded by additional dimensions or factors in future studies.

In the following, we focus on a first step of the outcome – in other words on the net benefits of blended learning environments – to discuss whether national culture and learning style have an impact on blended learning success and to discuss which cultural setting and learning style fit best with blended learning environments. This is in line with research that highlights that learning success is mostly correlated to learning outcome [7], [36], [37]. The other dimensions (design and delivery) of the e-learning success model are not used. Based on the results of this first step, further theorizing is necessary to also focus on the design and delivery components so that we may to explain blended learning success and the impact of culture and learning style in more detail. We use only the outcome component for our theoretical model.

## 2.2 Learning Style

Regarding the term learning style, a lot of different definitions exist. In this paper, we use the definition of Jonassen and Grabowski ([14], p. 5) who define learning style as “*learner preferences for different types of learning and instructional activities.*” In this context, a lot of learning style inventories and models exist. The aim of these inventories and models is to divide learners in different groups to categorize learning methods that fit best with each group.

In our research, we use the VARK model as it offers an overview of learning style preferences in regards to information presentation and assimilation [38]. Blended learning environments present a mix of traditional and online learning so that the use of learning methods as well as the composition of learning material, in foreground learning material that is presented online, has to be considered. Learners can have different preferences such as the presentation of information mainly through charts and/or supported by text [1], [25], [38]. The VARK model focuses on the sensory mode preferences of learning and is therefore a good approach in regards to discerning preferences of blended learning environments. Learning styles are Visual (V),

Aural (A), Read/Write (R) and Kinesthetic (K). In addition, learners can have more than one preference such as visual-aural (VA) or visual-aural-kinesthetic (VAK). In this regard they are called multi-mode learners [38]. As in the case of the VARK model, each learning style has appropriate learning activities and methods. Learning styles can be characterized according to their preferred sensory mode and activities that take place in their environment. For example, V-learners like demonstrations. They structure and remember thoughts by using lists. They are good in recognizing faces but forget names easily. Concerning the environment, they are less disrupted by noises but easily through movements or activities in their learning environment. A-learners prefer learning through explanations by other learners. They like discussions and dialogues to work out solutions for problems. Noises disturb them quickly. R-learners tend to take notes in lectures or while working on difficult learning material. They draw things for memorizing. K-learners choose learning by doing. Hands-on experiences are very important for them. They need to touch things and be active. In conclusion, traditional classroom learning is less appropriate for them [15], [38].

Fleming [38] shows that learner have higher learning outcomes if they are trained by their preferred learning methods and activities. Eom et al. [7] examine learning style influences on learning outcome and satisfaction of online-learners. The results show that online-learners that are V- and R-learners are more satisfied with the online course. A reason for this is that online-learning environments often include less oral learning elements or hands-on experiences as could be provided in traditional learning environments. For this reason V- and R-learners are more addressed with regard to their learning preferences than K-learners who are more characterized as active learners that need to use touch or A-learners who like to discuss or listen to instructions [7]. Rakab [39] reveals also significant results in regards to learning style influences on knowledge acquisition of online-learners. The results of Drago and Wagner [15] indicate that online-learners are mostly V- and R-learners. Moreover, online learning seems more attractive to these two learning styles. Less satisfied are multi-mode learners and especially learners, who prefer all four sensory modes (V, A, R and K).

As blended learning environments combine online and traditional learning methods, we assume that multi-mode learners' preferences can be more addressed than single-mode learners. This leads to our first hypothesis H1:

*H1: The success of blended learning is dependent on different learning styles.*

*H1a: Multi-mode learners have more success than other learning styles.*

### **2.3 National Culture**

In general culture can be defined as “*learned ideas, values, knowledge, rules and customs shared by members of a collectivity*” (Holmes et al. [40], p. 157). In regards to different scopes, culture can be more specialized such as organizational or national culture. As we are interested in employees' heterogeneity of one organization we focus on national culture in the following [41]. According to Hofstede [42], national culture is a set of assumptions, values and behaviors which are shared among members of an ethnicity. It is mostly characterized by different dimensions. Hofstede [42] mentions power distance, uncertainty avoidance, individualism/collectivism and mas-

culinity/femininity. In the deduction of the dimensions different behavior in social and working life such as family, school or working place results. In the following, some examples with regard to education are explained.

Power distance describes the division of power in a society. In low power distance societies, education is student-centered whereas education of high power distance societies is teacher-centered [13]. Uncertainty avoidance focuses on the extent of uncertainty about the future and the corresponding behavior. In societies which have a high index of uncertainty avoidance teachers have to answer everything. Teachers in countries with a small index of uncertainty avoidance do not need to know everything. Furthermore, individualism and collectivism are regarded as opposites. With the help of these two terms the relationship between the individual and the collectivity is explained. Collectivist-oriented societies are characterized by learners who put their hands up if the learning group agrees. In contrary, learners belonging to an individualistic society can decide by their own. The last dimension differentiates between masculinity and femininity. Value differences of working objectives between the genders are characterized. For men, advancement, earnings, training and up-to-dateness are important. Women focus more on friendly atmosphere, position security, physical conditions, manager and cooperation [13].

According to empirical examinations countries are classified according to their index of the different dimensions. Examples of countries that are characterized as low power distance and individualistic are Germany, Norway or the United States of America. France and Spain are classified as high power distance and individualistic societies. Japan and Indonesia can be mentioned as examples for high power distance and collectivist societies. Costa Rica is the only country which is analyzed as a low power distance and collectivistic society [13].

Hofstede's [13] cultural dimensions, 'individualism vs. collectivism' and 'power distance', have impact on the way of learning and behaving in traditional face-to-face learning environments. Learners belonging to a low power distance culture are openly encouraged and express their own opinions. They ask questions and argue against the teacher's opinion if they do not agree. Knowledge is also created through discussions and not only delivered by the teacher. Moreover, learners from collectivistic cultures such as Japan need to observe non-verbal communication such as gestures, facial expressions and timing [43-45].

According to Djojoputro et al. [46], e-learning environments are more suitable for learners from an individualist and low power distance relationship cultural background. Students with a high power distance cultural background expect that the knowledge comes from the instructor rather than building knowledge by themselves through discussion or interaction [13]. Chinese learners, for example, need strong instruction in e-learning environments because they are insecure in regards to discussing their own ideas and opinions. As a result they would not use online forums if problems arise [47].

Nonetheless, less research is available regarding cultural impacts concerning blended learning environments. The focus is on either traditional learning environment or e-learning environments (e.g. Cong and Earl [47]; Hall [48]; Stieghorst and Edmundson [49]). As findings above show that learners from a collectivistic and high

power distance cultural background prefer strong instructional oriented learning methods [13], [47], we imply that these learners have higher success in an instructor-centered blended learning environment than learners from cultures which are characterized as individualistic and low power distance. Consequently, we propose the second hypotheses H2:

*H2: Blended Learning success is dependent on national cultural differences.*

*H2a: In a strong instructor-centered blended learning environment learners belonging to high power distance and collectivistic societies have more success than learners belonging to a low power distance and individualistic society.*

Moreover, Hofstede [13] states that learners from individualist societies have different learning styles than learners belonging to a collectivist society. Dunn and Griggs [50] imply that cultural groups have different learning styles. In addition they notice that learning styles empower the cultural differences. Gao and Raul [51] identify differences of cognitive styles between eastern and western cultures. German and Chinese preferences with regard to social media use are the subject of focus. For Germans the relationship to their social contacts within the system and the authenticity of the system is more important than for Chinese. Eastern cultures such as China think in a concrete, holistic and relational way whereas western cultures think more analytic, functional and abstract [52]. Supplemented by the national culture dimensions individualism/collectivism and power distance as well as related behavior in education of the learners, we deduce the third hypothesis H3:

*H3: Learning style preferences are dependent on national cultural differences.*

*H3a: Learners belonging to a low power and individualistic culture are more A(ural) and K(esthetic)- learners than learners belonging to a high power and collectivistic culture.*

In conclusion, our research model focuses on net benefits as one aspect of blended learning success and the impact of national culture and learning style on net benefits.

### **3 Research Setting**

The next section describes a first research setting including the sample and methodology which has been used to test the three derived hypotheses. For the evaluation a pre-study has been conducted in an international organization. In this pre-study a first research model for blended learning success is created and tested.

#### **3.1 Sample**

The survey, which is described in the next section, has been handed out to employees of an international company in the medical sector. The target group has a continuous need of education resulting from their job activities and tasks. Employees' job activities and tasks are primarily to train customers on the product portfolio of the company. Therefore employees work at various sites worldwide/from different departments worldwide and spend most of their working time with the customers or participating in training on new products. Due to their working experience and their

former jobs employees have different experience with regard to blended learning. In general, they are used to blended learning as a result of the huge amount of continuous training. Education is offered through a blended learning environment including classroom-training and different online learning methods such as webcasts, e-learning or web-based-courses and virtual classrooms. In addition, an IT-system is used. Each employee has an account to the IT-system in order to book courses and to get an overview of his completed and outstanding courses to ensure his knowledge is up to date. In summary, the blended learning environment can be characterized as more instructor-centered. The learning methods used focus on an efficient delivery of knowledge.

### 3.2 Methodology

A survey is developed and distributed in classroom courses and through the intranet of the company. In this survey learning style is evaluated through the VARK questionnaire of Fleming [53], which is free and available online. In our study, we use the version including 16 items. These items describe daily situations of the learner and their preferences of reaction. For each item four possible reactions are available. The learner can then mark all his preferences such as one, two, three or all four. In order to figure out the learner's national culture, his/her nationality is asked. Then a classification to a cultural group has been made based on Hofstede's [13] analysis of 50 countries and three regions in regards to the national culture dimensions individualism/collectivism and power distance. The results identify six society clusters (Hofstede [13], p. 217). The blended learning success is measured through a selection of six items focusing on the net benefits of the blended learning environment (e.g. 'the blended learning environment enables me to control when and where to learn') of Holsapple and Lee-Post's [17] based on the third dimension of the e-learning success model, [34] using a seven-level Likert-scale from strongly disagree to strongly agree. The items are adapted to the requirements of a blended learning environment.

Of the target group of approximately 160 persons, 81 respond to the survey (response rate = 50.6 %). 39 male and 42 female participants from 25 different countries are reached by the survey. Participants from the different countries are added to five clusters. Cluster one (Australia, Canada, Great Britain, Netherlands and USA) and two (Austria, Germany, Norway, Sweden and Switzerland) are characterized as 'low power distance/individualistic'. Cluster three (Belgium, France, Italy, South Africa and Spain) is classified as 'high power distance/individualistic', cluster four (Arab Countries, Brazil, Greece, Japan) and five (Hong Kong, Indonesia, Portugal, Singapore, Taiwan) as 'high power distance/collectivistic'. The learning style is evaluated through the manual of Fleming [53]. Of the 81 participants six V-, 26 A-, 15 R-, 23 K- and 11 multi-mode learners are identified. Ten of the multi-mode learners are bi-mode learners (one VR-, two VK-, one AR-, four AK- and two RK-learners) and one is a tri-mode learner (ARK).

## 4 Results

For the analysis of our hypotheses, IBM SPSS statistics (version 21) is used. To ensure consistency of the measurement instrument net benefits, we conducted tests regarding the reliability and validity (see Table 1). The factor loading tests reveals that all items are above the recommend threshold of 0.7 [54]. Therefore indicator reliability is confirmed. In order to operationalize construct reliability, we calculate Cronbach's Alpha which is above the recommended value of 0.7 by Hair et al. [55] and indicates construct reliability.

To test the first hypothesis (H1) mean values of blended learning success of different learning styles (V-, A-, R-, K- and multi-mode learners) are compared and Kruskal-Wallis test is performed. These methods are chosen as a result of the characteristics of the variables. Learning style is a nominal variable and net benefits are interval scaled [56-57].

**Table 1.** Loadings and Cronbach's Alpha of measurement net benefits

Net benefits	Loadings	Cronbach's Alpha
	0.926	0.948
	0.906	
	0.897	
	0.894	
	0.887	
	0.840	

In addition, normality and homogeneity of variance are tested. Whereas the results of Levene test ( $F= 0.441$ ,  $p= 0.779$ ) shows homogeneity of variance, the results of Shapiro-Wilk test (see Table 2 above) reveals no normality of variables.

The comparison of mean values and the results of the Kruskal-Wallis test are illustrated in Table 2. The Kruskal-Wallis test does not indicate any significant difference ( $p = 0.418$ ). In addition to this, the mean values of net benefits of different learning styles show no tendency for strong differences. Hence, H1 has to be rejected.

**Table 2.** Comparison of mean values and results Shapiro-Wilks (above) and Kruskal-Wallis test (below)

Net benefits	Mean	SD	N	Shapiro-Wilk		
				Statistics	df	p
V(visual)	5.167	1.696	6	0.864	6	0.202
A(ural)	5.029	1.277	25	0.892	25	0.012
R(ead/Write)	4.923	1.659	16	0.902	16	0.86
K(inesesthetic)	5.139	1.304	24	0.944	24	0.198
multi	5.153	1.360	10	0.841	10	0.046

  

Net benefits	$\chi^2$	df	p
Learning style	3.915	4	0.418

For the validation of the second hypothesis, mean values of society clusters are compared and a Kruskal-Wallis test is performed. According to first hypothesis, we prove normality (Shapiro-Wilk test) and homogeneity of variables (Levene test). The homogeneity of variance can be confirmed ( $F= 1.803$ ,  $p = 0.138$ ). The results of the Shapiro-Wilk test are included in Table 3 and show no normality of variables.

In order to get a detailed analysis as well as a result of the small samples of clusters, Mann-Whitney test between the low power distance/individualistic and high power distance/collectivistic clusters supplement the analysis [56-57]. Table 3 offers the results of the comparison of the mean values, of the Kruskal-Wallis test and of the Mann-Whitney tests. The Kruskal-Wallis test shows no significance. In contrary the detailed analysis of the individual clusters through Mann-Whitney tests identifies highly significant differences [57] between blended learning success of low power distance/individualistic and high power distance/collectivistic clusters. Consequently, hypothesis H2 in which we assume national culture differences with regard to blended learning success can be supported.

**Table 3.** Comparison of mean values and results Shapiro-Wilks (above), Kruskal-Wallis test and Mann-Whitney tests (below)

Net benefits		Mean	SD	N	Shapiro-Wilk		
					Statistics	df	p
	Cluster 1 (Low power distance; Individualistic)	5.001	1.312	19	0.829	19	0.003
	Cluster 2 (Low power distance; Individualistic)	5.035	1.165	23	0.946	23	0.236
	Cluster 3 (High power distance; Individualistic)	4.857	1.645	18	0.919	18	0.122
	Cluster 4 (High power distance; collectivistic)	6.191	0.710	7	0.923	7	0.490
	Cluster 5 (High power distance; collectivistic)	5.208	1.876	8	0.892	8	0.246

  

Net benefits	$\chi^2$	df	p
National culture	6.678	4	0.154

  

Net benefits		Mean	SD	U	r	p
	Cluster 1	5.001	1.312	22.500	-0.503	0.01**
	Cluster 4	6.191	0.710			
	Cluster 2	5.035	1.165	30.000	-0.454	0.013*
	Cluster 4	6.191	0.710			
	Cluster 3	4.857	1.645			
	Cluster 4	6.191	0.710	28.500	-0.420	0.036*

\*p < 0.05, \*\* p < 0.01, \*\*\* p < 0.001

The third hypothesis H3 is tested through a cross-table including the two nominal variables and complemented by a chi square test [56-57]. Table 4 presents the cross-table. The results of the chi square show significant results ( $\chi^2 = 30.872$ ,  $df = 16$ ,  $p = .014$ ). Concerning the cross-table, tendency of the clusters to learning style preferences are visible. As a result the hypothesis H3 can be supported. Differences between learning style preferences of the national culture clusters are verified.

**Table 4.** Cross-table

		VARK Learning Style					Total
		V(isual)	A(ural)	R(ead/Write)	K(inesthetic)	Multi	
National Culture	Cluster 1	1	4	6	6	2	19
	Cluster 2	1	11	4	8	5	26
	Cluster 3	0	11	2	4	1	18
	Cluster 4	0	3	2	2	1	8
	Cluster 5	4	0	1	3	2	10
	<b>Total</b>		6	26	15	23	11

## 5 Discussion

Our results reveal the rejection of the hypothesis H1 and the support of the hypotheses H2 and H3. Hypothesis H1 implies the differences of blended learning success in regards to learning style preferences and in foreground a higher success for multi-mode learners. The highest value is reached by the visual learners but strongly followed by the multi-mode and kinesthetic learners. In this context, it can be assumed that the sample of different learning styles is too small in order to get significant results. It is also interesting that only a few participants are identified as multi-mode learners. Multi-mode learners present only 13.6 % of the sample. The results of other studies evaluating the VARK learning style show higher proportions (e.g. Brown et al. [58]; Frey et al. [59]). Consequently, we assume that the small amount of multi-learner in our sample is the reason for no significant differences according to the Kruskal-Wallis test. In order to get a clear impression of learning style impacts on blended learning environments, another study including a larger sample is desirable and which shows a similar distribution as indicated as normal by Brown et al. [58] or Frey et al. [59]. Besides, an examination that uses another learning style inventory might be considered as with using the VARK model no significant results can be observed.

Regarding the hypothesis H2, national culture differences of blended learning success are identified. As our evaluated blended learning environment can be characterized as instructor-centered, the highest mean are stated by society cluster four which is characterized as high power distance and collectivistic. Individualistic and low power distance-oriented clusters have smaller mean values. Hence, national culture can be mentioned as an important aspect which should be considered for effective and efficient design and delivery of learning content. Our results indicate that an instructor-centered blended learning fits best with high power distance/collectivistic cultural background of a learner. However, as cluster three and four identify also significant results regarding the performed Mann-Whitney tests, a closer look to the countries belonging to the two clusters is necessary. Cluster four includes Arab countries, Japan, Brazil and Greece whereas cluster three contains Hong Kong, Indonesia, etc. which should be evaluated by future research.

Mainly focusing on Hofstede [13] and other studies, we also assume the hypothesis H3 which implies national culture impacts on learning style preferences. The chi square test shows significant results. The cross-table identifies tendency of the society

clusters to learning style preferences such as the cluster three is aural-oriented or cluster five visual. Thus, collectivistic-minted clusters are more focusing on visual learning whereas individualistic-minted clusters prefer more aural-supported learning. However, no cultural tendency in regards to multi-mode learners is noticeable. As already mentioned above, this can be a consequence of the small sample followed by small sub-groups. Therefore another study with an enlarged sample is required to further analyze and discuss the effect of national culture on learning style and consequently, the mediation effect of learning style for the impact of national culture on blended learning success.

These first results already have an important implication. As discussed above national culture has an impact on blended learning success. Therefore cultural sensitive design of learning environments such as already required for e-learning by Koh and Lim [16] is necessary. Corporate education has to consider national culture and related learning preferences, expectations and needs.

Nonetheless, this research-in-progress paper is limited by the fact that we focus only on the third stage of the e-learning success model of Holsapple and Lee-Post [17] which we adapt to requirements of blended learning environments. Consequently, the two other stages design and delivery are missing. In order to extend our theorizing and empirical research, further research on this topic will be done in the next months. The influence of national culture and learning style on blended learning design and delivery in corporate education will be examined in order to investigate potential mediation effects through these variables on learning outcome. Furthermore, taking design and delivery into account, an analysis of the effectiveness and efficiency of learning methods and media which enables active, constructivist and collaborative learning especially for learners with different cultural backgrounds and learning styles is possible.

The e-learning success model is applied for the first time in a blended learning-context. As a result items have to be adapted or reduced which can have an influence on validity and reliability. Another limitation can be seen in the small sample of 81 participants. Although 25 different nationalities are identified, the society clusters are small.

## References

1. Harris, P., Connolly, J. and Freaney, L. "Blended Learning: overview and recommendations for successful implementation," *Industrial and Commercial Training* (41:3), 155-163 (2009).
2. O'Connor, C., Mortimer, D. and Bond, S.: "Blended Learning: Issues, Benefits and Challenges," *International Journal of Employment Studies* (19:2), 62-82 (2011).
3. Graham, C. R.: "Blended Learning Systems: Definition, Current Trends, and Future Directions," in *The Handbook of Blended Learning. Global Perspectives, Local Designs*, C. J. Bonk and C. R. Graham (eds.), Pfeiffer, San Francisco, Calif, 3-21 (2006).
4. Guzzo, T., Grifoni, P. and Ferri, F.: "Social Aspects and Web 2.0 Challenges in Blended Learning," in *Blended Learning Environments for Adults: Evaluations and Frameworks*, P. Anastasiades (eds.), Hershey, PA: Information Science, 35-49 (2012).

5. Reiss, M. and Steffens, D.: "Hybrid Toolboxes: Conceptual and Empirical Analysis of Blending Patterns in Application of Hybrid Media," *Technological and Economic Development of Economy* (16:2), 305-326 (2010).
6. Singh, H.: "Blended Learning and Work. Real-Time Work Flow Learning," in *The Handbook of Blended Learning. Global Perspectives, Local Designs*, C. J. Bonk and C. R. Graham (eds.), Pfeiffer, San Francisco, Calif, 474-490 (2006).
7. Eom, S. B., Wen, H. J. and Ashill, N.: "The Determinants of Students' Perceived Learning Outcomes and Satisfaction in University Online Education: An Empirical Investigation," *Decision Sciences Journal of Innovative Education* (4:2), 215-235 (2006).
8. Stevens, G. H. and Frazer, G. W.: "Coaching. The Missing Ingredient in Blended Learning Strategy," *Performance Improvement* (44:8), 8-13 (2005).
9. Johnson, N., List-Ivankovic, J., Eboh, W. O., Ireland, J., Adams, D., Mowatt, E. and Martindale, S.: "Research and evidence based practice: Using a blended approach to teaching and learning in undergraduate nurse Education," *Nurse Education in Practice* (10:1), 43-47 (2010).
10. Bulut, S.: "A cross-cultural study on the usage of cooperative learning techniques in graduate level education in five different countries," *Revista Latinamericana De Psicologia* (42:1), 111-118 (2010).
11. Jarvis, P., Holford, J. and Griffin, C.: *The Theory and Practice of Learning*, Kogan Page, London (1998).
12. Chuang, S.-F.: "The relationship between cultural values and learning preference: the impact of acculturation experiences upon East Asians," *International Journal of Training and Development* (16:1), 1-22 (2011).
13. Hofstede, G.: *Culture's Consequences: Comparing Values, Behaviors, Institutions and Organizations Across Nations*, (2nd edn.) Sage Publications, London (2001).
14. Jonassen, D. H. and Grabowski, B. L. H.: *Handbook of individual differences, learning, and instruction*, L. Erlbaum Associates, Hillsdale, N. J. (1993).
15. Drago, W. A. and Wagner, R. J.: "Vark Preferred Learning Styles and Online Education," *Management Research News* (27:2), 1-13 (2004).
16. Koh, E. and Lim, J.: "A Review of the Development of Information Technology and Education: The Role of Culture," in *PACIS 2006 Proceedings*, Paper 59 (2006).
17. Holsapple, C. W. and Lee-Post, A.: "Defining, assessing, and promoting e-learning success: An Information System perspective," *Decision Sciences Journal of Innovative Education* (4:1), 67-85 (2006).
18. Oliver, M. and Trigwell, K.: "Can 'Blended Learning' Be Redeemed?" *e-learning* (2:1), 17-26 (2005).
19. Reiss, M. and Steffens, D.: "Hybrid Toolboxes: Conceptual and Empirical Analysis of Blending Patterns in Application of Hybrid Media," *Technological and Economic Development of Economy* (16:2), 305-326 (2010).
20. Acton, T., Hill, S. and Scott, M.: "E-education – Keys to Success for Organisations," in *BLED 2005 Proceedings*, Paper 21 (2005).
21. Hill, T., Chidambaram, L. and Summers, J.: "A Field Experiment in Blended Learning. Performance Effects of Supplementing the Traditional Classroom Experience with a Web-based Virtual Learning Environment," in *AMCIS 2013 Proceedings* (2013).
22. Gunasekaran, A., McNeil, R. D. and Shaul, D.: "E-learning: research and applications," *Industrial and Commercial Training* (34:2), 44-53 (2002).
23. Wan, Z., Compeau, D. and Haggerty, N.: "The Effects of Self-Regulated Learning Processes on E-Learning Outcomes in Organizational Settings," *Journal of Management Information Systems* (29:1), 307-339 (2012).

24. Baumgartner, P. und Payr, S.: Lernen mit Software, Österreichischer Studienverlag, Innsbruck (1994).
25. Clark, R., C. and Mayer, R. E.: E-Learning and the science of instruction, Proven guidelines for consumers and designers of multimedia learning, (2nd edn.), Pfeiffer, San Francisco, Calif (2008).
26. Ehlers, U.-D.: Qualität für neue Lernkulturen des „Next Generation“ E-Learning, In: Klimsa, P. and Issing, L. J. (eds.): Online-Lernen. Handbuch für Wissenschaft und Praxis, (2nd edn.), Oldenbourg, München, pp. 339-356 (2011).
27. Issing, L. J.: Psychologische Grundlagen des Online-Lernens, In: Klimsa, P. and Issing, L. J. (eds.): Online-Lernen. Handbuch für Wissenschaft und Praxis, (2nd edn.), Oldenbourg, München, pp. 19-33 (2011).
28. Kirkpatrick, D. L.: Evaluating Training Programs. The Four Levels, Berret-Koehler, San Francisco (1984).
29. Kirkpatrick, D. L.: Evaluating Training Programs. The Four Levels, Berret-Koehler, San Francisco (1998).
30. Sahasrabudhe, V. and Kanungo, S.: “Relating E-Learning Effectiveness to Choice of Media for its Contents: A Quasi-Experimental Approach,” in *ICIS 2008 Proceedings*, Paper 108 (2008).
31. Alsabawy, A. Y., Cater-Steel, A. and Soar, J.: “Measuring E-Learning System Success (Research In Progress),” in *PACIS 2011 Proceedings*, Paper 15 (2011).
32. Joy II, E. H. and Garcia, F. E.: “Measuring Learning Effectiveness: A New Look at Non-Significant-Difference Findings,” *Journal of Asynchronous Learning Networks* (4:1), 33-39 (2000).
33. DeLone, W. H. and McLean, E. R.: “Information Systems Success: The Quest for the Dependant Variable,” *Information Systems Research* (3:1), 60-95 (1992).
34. Holsapple, C. W. and Lee-Post, A.: “How to Design, Develop and Deliver Successful E-Learning Initiatives,” in *Student satisfaction and learning outcomes in e-learning. An introduction to empirical research*, S. B. Eom and J. B. Arbaugh (eds.), Hershey: Information Science Reference, 195-229 (2011).
35. DeLone, W. H. and McLean, E. R.: “The DeLone and McLean Model of Information Systems Success: A Ten-Year Update,” *Journal of Management Information System* (19:4), 9-30 (2003).
36. Al-Busaidi, A.: “Learners’ Perspective on Critical Factors to LMS Success in Blended Learning: An Empirical Investigation,” *Communications of the Association of Information Systems* (30:2), 11-34 (2012).
37. Arbaugh, J. B., Desai, A., Rau, B. and Sridhar, B. S.: “A review of research on online and blended learning in the management disciplines: 1994-2009,” *Organizational Management Journal* (7:1), 39-55 (2010).
38. Fleming, N. D.: *Teaching and learning styles: VARK strategies*, Christchurch: N. D. Fleming (2001).
39. Rakab, S.: “Impacts of learning styles and computer skills on adult students’ learning online,” *The Turkish Online Journal of Educational Technology* (9:2), 108-115 (2010).
40. Holmes, D., Hughes, K. and Julian, R.: *Australian Sociology: A Changing Society*, Pearson, Sydney (2003).
41. Huang, X., Rode, J. C. and Schroeder, R. G.: “Organizational structure and continuous improvement and learning: Moderating effects of cultural endorsement of participative leadership,” *Journal of International Business Studies* (42:9), 1103-1120 (2011).
42. Hofstede, G.: *Culture’s Consequences: International Differences in Work-related Values*, Sage, Beverly Hills, CA (1980).

43. Anakwe, U. P.: "Distance Learning and Cultural Diversity: Potential User's Perspective," *International Journal of Organizational Analysis* (7:3), 224-243 (1999).
44. Francesco, A. M. and Gold, B. A.: *International Organizational Behaviour*, Prentice Hall, Upper Saddle River N.J. (1998).
45. Tupchiy, A. and Hornik, S.: "Toward an Explanation of an Individual's Culture on Learning Outcomes in a Distance Education Environment" in *Proceedings of the 7th Annual Conference of the Southern Association for Information Systems* (2004).
46. Djojoputro, L., Nguyen, L. and Pesynski, K.: "Cultural Dimensions in Online Learning," in *ACIS 2005 Proceedings*, Paper 28 (2005).
47. Cong, Y. and Earl, K.: "Chinese Postgraduate Students Learning Online in New Zealand: Perceptions of Cultural Impact," in *Cases on cultural implications and considerations in online learning*, A. Edmundson (eds.), Hershey: Information Science Reference, 48-70 (2013).
48. Hall, A.: "Designing Culturally Appropriate E-Learning for Learners from an Arabic Background: A Study in the Sultanate of Oman," in *Cases on cultural implications and considerations in online learning*, A. Edmundson (eds.), Hershey: Information Science Reference, 1-23 (2013).
49. Stieghorst, R. and Edmundson, A. L.: Cultural Adaption of E-Learning Courseware: An Ethics & Compliance Example, in *Cases on cultural implications and considerations in online learning*, A. Edmundson (eds.), Hershey: Information Science Reference, pp. 192-209 (2013).
50. Dunn, R. and Griggs, S. A.: *Multiculturalism and learning style: Teaching and counseling adolescents*, Prager, Westport, Conn (1995).
51. Gao, Q. and Rau, P.-L. P.: "Understanding Online Sociability: Investigations on Sociability Determinants and Cultural Differences in Sociability Perception," in *Social media tools and platforms in learning environments*, B. White, I. King and P. Tsang (eds.), Springer, Heidelberg, New York, 219-244 (2011).
52. Nisbett, R. E., Peng, K., Choi, I. and Norenzayan, A.: "Culture and systems of thought: holistic versus analytic cognition," *Psychological Review* (108:2), 291-310 (2001).
53. Fleming, N. D. 2011. The VARK Questionnaire, <http://www.vark-learn.com/english/page.asp?p=questionnaire> (Accessed 02.08. 2013).
54. Hulland, J.: "Use of partial least squares (PLS) in strategic management research: a review of four recent studies," *Strategic Management Journal* (20:2), 195-204 (1999).
55. Hair, J. F.: *Multivariate data analysis*, Upper Saddle River, NJ: Prentice Hall (2010).
56. Brosius, F.: *SPSS 19*, Mitp, Heidelberg, Munich, Landsberg, Frechen, Hamburg (2011).
57. Buehl, A.: *SPSS 20, Einführung in die modern Datenanalyse*, (13th edn.), Pearson, Munich (2012).
58. Brown, T., Cosgriff, T. and French, G.: "Learning Style Preferences Of Occupational Therapy, Physiotherapy and Speech Pathology Students: A Comparative Study," *The Internet Journal of Allied Health Sciences and Practice* (6:3), 1-12 (2008).
59. Frey, A., Yankelov, P. and Faul, A.: "Student Perceptions of Web-Assisted Teaching Strategies," *Journal of Social Work Education* (39:3), 443-457 (2003).