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Hofstede's cultural dimensions in relation to learning behaviours and learning styles: A critical analysis of studies under different cultural and language learning environments

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Abstract

This review is aimed at exploring the association between the two aspects of Hofstede's model i.e. cultural dimensions with language learning behaviours and learning styles under different cultural contexts and learning environments. Although there are many models of cultural dimensions, Hofstede's model has been selected for this study because of its relatively high popularity. The language learning environments discussed in this study include a vast number of types of learning such as the classroom, online, web-based, self-directed, blended and mobile learning. Further, cultural contexts of single, dual or more than two countries are included here. Available literature on the reviewed topic has been selected using Google Scholar as the main search engine with suitable search terms and periods of searches to ensure the availability of maximum number of research reports. Generally, power distance, individualism/collectivism, uncertainty avoidance, masculinity /femininity and to a lesser extent, orientation, either in the long term or the short term, have been associated with cultural dimensions, learning styles and behaviours. Kolb's (2005) is the most accepted learning styles' categorisation. Differences in cultures of nations have been found to be relevant to the learning behaviours and styles in a number of studies. The relationship of the above four dimensions in the case of single or multiple nations have been described by several authors. The relationship of cultural dimensions with language learning environments like classroom, online, web-based and self-directed have been studied. Most studies were on online learning environments. However, there is lack of studies on learning styles in online environments and their relationship to the cultural dimensions, and hence, there should be more studies on this aspect. Even after reviewing a large number of studies the question remains: Are we ready with a definite answer on what approaches are required to motivate learners to adopt specific learning styles in specific cultural contexts for most beneficial learning outcomes to them?

Keywords: Cultural dimensions; Learning cycles; Language learning environment; Cultural contexts; Learning behaviour.

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1. Introduction

When considering the connection between the two aspects of Hofstede's model i.e. cultural dimensions and learning environment, many types of comparisons arise. Even when western and eastern cultures are compared, the following contexts arise-

1. Learning/ acquiring a native language in own country
2. Learning a non-native language in own country- EFL/ESL or other foreign languages taught by a teacher of the same country/ nationality
3. Learning a non-native language in own country taught by a teacher native to that foreign language
4. Learning of a non-native language in a foreign country by students undergoing higher studies and by immigrants
5. Web-based/online and blended learning

Clearly, the influence of cultural dimensions on the learning environment will be different in each of the above contexts.

The aim of this review is to search for patterns in the relationships Hofstede's cultural dimensions have with learning behaviours and learning styles under different cultural contexts and learning environments.

2. The Scope of this Paper

The following points need to be clarified regarding the scope of this paper.

2.1. Why Hofstede?

Many types of cultural dimensions have been proposed by different authors. Trompenaars (1997) proposed seven dimensions of cultural diversity in business organisations. Inglehart and Baker (2000) and Inglehart and Norris (2003) proposed two world value dimensions. Schwartz (2006) proposed three cultural value dimensions containing seven cultural value orientations. Steenkamp (2001) proposed four national cultural dimensions based on the data obtained by Hofstede and Schwartz. Although termed differently, there are many similarities among cultural dimensions proposed by these authors. The differences in their theories reflect only how they approached culture and in what context they studied the dimensions. Hsu, Woodside, and Marshall (2013) compared these theories. In another comparative study, Nardon and Steers (2009) compared the models of Kluckhohn and Strodtbeck (1961), Hofstede (2011), Hall and Hall (1990), Trompenaars (1997), Schwartz (2006) and Globe Associates (House et al., 2004). Among these, the cultural dimensions of Hofstede are the most researched ones. More papers are likely to be available on the topic of this study if Hofstede's dimensions are used. However, some papers have compared some other models also.

2.2. Hofstede's cultural dimensions

The word culture has many definitions. The definition given by Hofstede (2011) was, "Culture is the collective programming of the mind that distinguishes the members of one group or category of people from others". However, as was pointed out by Signorini, Wiesemes, and Murphy (2009) the leading concept of cultural layers is contradicted by the overlapping nature of an individual's cultural behaviour in different social groups. Instead of a static notion of culture with only one way relationship between social structures and values, it may be more realistic to assume a mutable, dynamic culture with high interactions among all its components. Changes in one cultural dimension

beget changes in other cultural dimensions. The bidirectional relationship questions the applicability of Hofstede's model to contemporary situations, especially as radical political, social, economic and educational reforms have been taking place in many nations after he had collected data from them.

The proposition that culture differentiates groups of people led Hofstede to develop dimensional tools for such differentiation. He pointed out that changing the level of aggregation, say from ethnic groups to nations, also changes the concept of culture. For instance, the culture of American Africans is presumably, in conceptual terms, different from that of the American Indian culture. Cultures related to nations, societies and genders develop from early childhood and are more deeply embedded in the people's minds than say, occupational cultures. The former are not exchangeable while the latter are exchangeable as when a new job is taken up at a new place.

Hofstede progressed from his original four cultural dimensions to the current six dimensions based on his own studies as well as a few other works. His paper (Hofstede, 2011) provides a detailed description of all the six dimensions. These are briefly discussed here.

1. Power Distance (PD) is associated with the various resolutions to the fundamental plight of human inconsistency.
2. Uncertainty Avoidance (UA) in any society is concerned with the rate of stress resulting from the unknown and foggy future.
3. Integrating individuals into basic groups is known as Individualism versus Collectivism (IC).
4. The emotional distinctions between males and females according to their roles is known as Masculinity versus Femininity (MF).
5. Orienting people according to their efforts into present, past and future is the concern of Short Term Orientation versus Long Term focus (LTO/STO).
6. Indulgence versus Restraint (IR) is associated with the satisfaction of human's appetite as against the self-control.

The abbreviations given are not the ones he used, but made for exclusive use in this review.

The low and high levels of these dimensions were contrasted in six tables. Accordingly, he classified 76 nations for these six dimensions, as summarised in Table 1.

Table 1. Comparison of 76 nations for the six cultural dimensions based on Hofstede (2011).

Cultural Dimension	**High In**	**Low In**
Power distance	Latin, East European, African countries and Asian	Western countries where Germanic and English are spoken
Uncertainty avoidance	Latin countries, Central and East European countries, German and Japan speaking countries	Chinese and Nordic culture, and English speaking countries.
Individualism- Low individualism means high collectivism	Developed and Western countries	Less developed and Eastern countries; Japan is in the middle position
Masculinity- Low masculinity means high femininity	High in Japan, German speaking countries, some Latin countries like Italy and Mexico. Moderately high in spoken English Western countries.	Moderately low in some Asian and Latin countries like Spain, Portugal, France Korea, Thailand, and Chile. Low in the Netherlands and in Nordic countries.
Long term orientation- Low long term orientation means high short term orientation	Countries of East Asia, followed by Central and Eastern Europe. Medium term orientation is found	Australia, Latin American and USA, African, and Muslim countries

Cultural Dimension	High In	Low In
	in North and South European countries of South Asia	
Indulgence-Low indulgence means high restraint	South and North America, Western Europe and parts of Sub-Sahara Africa. Mediterranean Europe has a middle position.	Eastern Europe, Asia and Muslim world.

Although Hofstede discussed the applicability of his dimensions in organisational management research, he applied it to teaching and learning only in his paper of 1986 discussed below.

2.3. Cultural contexts

Hofstede identified nations as the unit of differentiating cultures. Hence, cultural contexts of one, two or more than two countries have been included in this review.

2.4. Language learning environment?

According to the definition given in Edglossary (2013) a learning environment refers to the various physical locations, contexts and cultures in which students learn. The dimensions of learning environments are: operational characteristics, cultural attributes of students, teachers, educators, staff and community, learning styles, pedagogy, modern learning styles like online and blended learning. It may not be possible to find research literature on all these aspects. This review is restricted to multicultural dimensions of language learning environments as this is the space where the maximum effect of cultural dimensions could be expected. In this review, language learning environment refers to environments such as classroom, out of classroom, online, mobile, web-based, computer-aided and blended learning of any one or more language.

3. Method of Literature Search used for this Review

The main engine to collect and locate research studies, investigations and reports related to the topics of this review was the "Google scholar". First using “Any time” as period of choice, the first 10 web pages of Google scholar was searched. As most works in these pages belonged to periods earlier than 2010, another search using customised range of 2010-2017 was done on five web pages of Google Scholar. This search did not yield works published in or after 2013. Hence another search for time range of 2013 to 2017 was done on first five web pages of Google Scholar. It is admitted that searching more web pages in each stage would have resulted in accessing more works. However, the above manner of search was done due to time and target length of article limits. In all, 57 works were available from this search and are reviewed in the following sections.

4. Results and Discussions

4.1. General findings

In an early paper, Hofstede (1986) discussed cultural varieties in teaching and learning contexts where teacher and student belong to two different cultures as in the case of an Asian student attending English classes in the USA.

When the above cultural dimensions are applied to educational contexts, the following dimensions are the differentiating characteristics between high and low status countries (Table 1 above) based on Signorini, Wiesemes, and Murphy (2009) containing some criticisms also:

1. Power distance (PD) - In low power distance (LPD) countries, the relationship between students and teachers is informal and students can argue and question the teacher. There is spontaneous participation of students. The education process is student-centred. Focus on student initiative develops them as independent thinkers. In high power distance (HPD) countries, formal and hierarchical relationship exists between students and teachers. Education is teacher-centred. Teacher, as Guru, creates intellectual paths which students need to follow without questioning. Class communication is initiated and driven by teacher. Thus, in LPD countries, learning occurs due to the learner's prevalence and in HPD countries it heavily depends on the ability of the teacher.
2. Individualism/collectivism (IC) - In individualist countries, students are highly individualistic. Education is meant to learn how to learn. There is no age-specificity for learning. In contrast, in collectivist countries, learning is a one-time process to be acquired in young age. The aim is to make them strenuous members of the society by teaching how to do so. Academic certificates in individualistic countries enhances worth and self-respect due to perception of achievements. In collectivist countries, an academic certificate is a means to improve social status rather than self-respect of the individual. In defining these differences, Hofstede repeatedly mentions the concept of "in groups", but without defining the term. Group dimensions are either collectivist or individualist. On the other hand, the responsibility of an individual to the group is more important. The quality of group may differ between different cultures. Thus both groups can be found in any country. Philanthropic and humanitarian attitudes of some groups in developed countries reflect collectivist culture although the country may be categorised as individualistic by Hofstede. Deficient social security in some collectivist nations denotes that collectivist behaviours are determined more by socio-economic necessity than attachment to any group. Thus, both individual and collectivist interests can occur together and therefore, societies cannot be strictly classified as belonging to only one of the two. A complicated relationship between values and social structures is indicated here. Measurements are made difficult as different collective and individual interests may be expressed by the same individual in different contexts. Applied to higher education, group cultural dimensions need to be visualised as developing, flexible and negotiated.
3. Masculinity/femininity (MF) - In highly masculine countries, there are distinct gender roles. In low masculine/high feminine countries, gender roles may overlap. In high femininity nations, students express shared tenacity and fading level of open contest in classrooms. In highly masculine societies, learners compete highly and manifest themselves in classrooms. In feministic countries, teacher skills are more significant. In masculinistic countries, academic reputation, brilliance and performance are more important. However, ascribing gender differences to classroom behaviours is superficial and even dangerous. Hofstede did not differentiate the ranges of MF to learning settings like pre-school, primary, high school or university education levels. The differences in their classroom cultures are not due to cultural dimensions, but due to age, maturity, curricula and physical and human resources.
4. Uncertainty avoidance/acceptance (UA) - Reactions to perceived threat under uncertain situations might be applied by avoiding or by accepting it. In educational contexts, this dimension is supposedly revealed in many ways. In high uncertainty avoidance/low acceptance countries, students are not supposed to openly disagree with teachers or students. This is perceived as disloyalty. Teachers are experts with all answers. The opposite is true in countries of low avoidance/high acceptance. In this way, students are more comfortable in unstructured learning environment.
5. Long term/short term orientation (LTO/STO) - LTO encourages virtues for future rewards. In STO, the past virtues are glorified and present virtues are preserved with stress on tradition, fulfilment of social obligation and saving "face" in awkward situations. In LTO, the students' academic failure or

success is attributed to their spent efforts. Such students are mathematically talented. Moreover, they can deal with the applied sciences and solve problems easily. In STO, success or failure is purely accidental. Students in these have higher capability in theoretical and abstract science. They are not good in mathematics or solving problems. In LTO, children are rewarded for academic achievements. In STO, children are given gifts for pleasure. Hofstede found a causal relationship between long/short term orientation of nations and cognitive skills of individual children (maths scores). There is a contradiction in saying that students do not have talent for abstract or theoretical science, but have basic mathematical skills. This dimension was added by Hofstede to get rid of alleged western bias in the case of the other four dimensions.

Signorini et al., (2009) cited the works of Mitsis and Foley (2005) and Cambridge (2006) to show that Hofstede's cultural dimensions may be inseparable from each other. This makes independent causal relationship between any dimension and any behaviour superficial. In Hofstede's model, homogenisation of within country variations created national identities of learners such as "Japanese learner" identified in terms of the cultural dimensions attributable to that country. Thus, all Japanese learners conform to either high or low individualism etc. The possibility of some students in a class being very individualistic (quite commonly seen) while others may be collectivist, was not considered in this typology. Gender, age and location were ignored. Equating culture with nation is a debatable point. Categorisation of students into only two broad categories based on ancient leaders of a particular country is erroneous. Confucian tradition may be true for China and other similar countries, but not all Asian countries, for example India, where many different philosophical systems are followed. Similar argument applies to categorising all western students as Socratic students. Not recognising the existence of different cultures in the same nation is a serious drawback of Hofstede's dimension. Hofstede only emphasises on cultural differences, but not commonalities like some elements of the Japanese culture which are similar to the western culture. The possibility of the similar learning behaviour of the Chinese and UK students was highlighted by Hofstede himself. Other contradictions in the application of Hofstede's dimensions in education are: British students (STO) attribute success or failure to luck, but learning environment promotes individual ability (individualistic culture). On the other hand, Chinese learners (LPD) expect their teachers to be experts. But weak uncertainty avoidance means these students do not expect their teachers to be experts. International students have been found to adapt their learning behaviour according to the new educational context of the host country. School-specific behaviour and age factors were not adequately investigated by Hofstede.

Regarding the interchangeable connection between national cultural dimensions of Hofstede and usability of e-learning system, a study by Downey et al., (2005) used 24 participants of an international training improvement workshop. This sample provided required variations in cultural dimensions. Participants from cultures with high uncertainty avoidance expressed the usability of e-learning as the most frustrating. Low power distance participants reported usability of e-learning to be higher than those from high power distance cultures. Although the authors claimed the sample size to be sufficient, such low sample size may not validate the conclusions of their study.

The failure of Western concept of cooperative learning in countries of Confucian heritage like China shows a mismatch with the Confucian collectivist learners should support group works. Forcing western model into a new context of Confucian society without adaptation was attributed as the cause of this mismatch by Phuong-Mai, Terlouw, and Pilot (2005).

In the studies of Fisher et al., (2005) the terms equity (power distance, gender egalitarianism) and collaboration (collectivism) get the meanings of Hofstede's cultural dimensions indicated in parenthesis. These were associated with the perception of primary grade students on teacher proximity (but not influence) indicating more cooperative nature of teacher, authoritative or uncertain but tolerant types (against repressive types) of teachers and interpersonal behaviour of teachers. However,

overall, congruence and teacher proximity had the greatest effect. In this study, the authors surveyed 2178 students of 103 primary classrooms of 5, 6 and 7 grade students in Australia.

Some points emerging from the observations of Yamazaki (2005) are worth discussing here. Hofstede (1997) had argued that the preferred learning style of individuals are influenced by their native culture. This contention has been supported by a number of workers like Katz (1988), Pratt (1991) and Vita (2001).

Although culture and learning approaches were positively related, social, institutional and individual factors limited the extent of this relationship. This finding was reported by Bianca Sulkowski and Deakin (2009) based on a survey of students.

How culture of a country can affect the learning process of students was demonstrated by Kumar and Laakso (2016) on computer programming students of Vietnam. Many learners had finished their high school education in a teacher-centred (high power distance) environment, in which students were shy to show their attitudes to their teachers and used existing solutions to complete their work. High power distance culture may affect students' engagement in studying programming course. However, many students wanted to use strenuous learning settings.

For problem-based learning (PBL) in medical education, low uncertainty avoidance, low power distance, members with some collectivism, femininity and long term orientation were listed as associated cultural dimensions by Ju et al., (2016) in Korea. The Korean students and tutors were found to possess large power distance, collectivism with minor individualism, high uncertainty avoidance masculinity, and short-term orientation as their learning culture. These are exactly the opposite of what was considered desirable for PBL and this was the reason for challenges faced by students and tutors. This mismatch needed to be addressed for improvement of medical learning.

4.2. Cultural dimensions and learning styles

Learning styles by Curry (2000) refers to the individual similarities in attitudes, judgment memory, intellectuality, and across any motivated condition. Learning consists of feeling, reflecting, thinking, and doing, (Kolb & Kolb, 2005). Specialised abilities and preferences developed using these factors are termed learning styles. Kolb's learning model has been widely used to examine the cultural variations in the different learning styles. According to Kolb's model (Kolb & Kolb, 2005), learning occurs when a person employs solid experience, abstract conceptualisation, reflective monitoring and lively experimentation. Depending upon the dominance of any of these four factors, Kolb classified learning styles as diverging, converging, assimilating and accommodating. His learning style model is given in Fig 1 (Kolb, Boyatzis & Mainemelis, 2001).

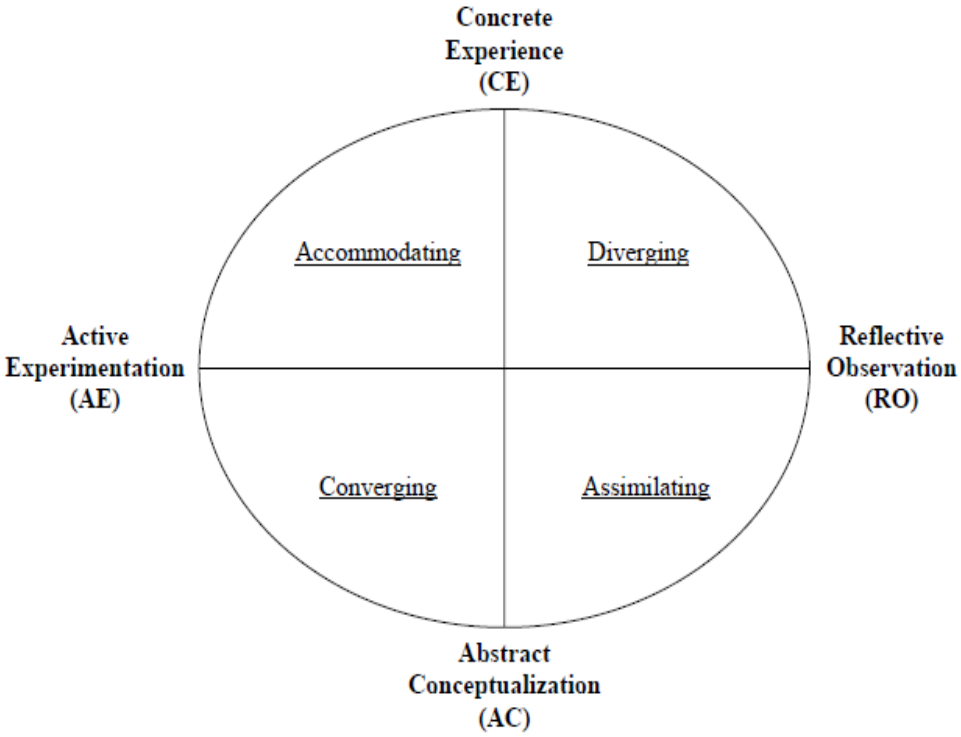

Figure 1. The Kolb's learning styles model (Kolb, Boyatzis, & Mainemelis, 2001)

Studies by Hoppe (1990) and Auyeung and Sands (1996) focused on Hofstede's cultural typologies to establish the relationship between the learning styles and culture. A conceptual relationship between uncertainty avoidance and Kolb's learning abilities was noted by Hoppe (1990). In high uncertainty avoidance cultures, individuals have fear or anxiety when they face uncouth risks, events or conflicts. They watch and obtain sufficient information and knowledge to reduce risks and uncertainties. In Kolb's model, learners using reflective abilities watch carefully and reflect upon their observations and experience. They take time to act as they need to collect information on earlier experiences. They are anxious to avoid errors and failures. Thus, uncertainty avoidance and reflective learning have similarities. In low uncertainty avoidance, individuals are prepared to take risks. Achievements motivate them. This related well with Kolb's active learning style. These learners aim at maximising achievements rather than avoiding risks. Independent and interdependent selves are associated with individualism/collectivism dimensions of Hofstede. Interdependent self can be related to Kolb's concrete experience and reflective observation. Independent self can be associated with abstract conceptualisation and active experimentation. In his work, Yamazaki (2005) did not give high importance to Hofstede's cultural dimensions when compared to other models.

The experiential learning theory describes the learning process. The Kolb Learning Style Inventory can be used to assess differences between the learning styles of individuals. From a study on participants from seven nations, Joy and Kolb (2009) did not obtain evidence of the relationship of cultural dimensions with the learning styles. In contrast, the effect of the individual cultural differences in their learning style differences was significant. Although the authors used GLOBE model, some of the dimensions were the same as Hofstede's. Thus, more abstract learning style was noted in the case of individuals from countries high in collectivism, uncertainty avoidance, long term orientation and gender egalitarianism. More reflective learning style was observed in the case of individuals from countries high in collectivism, uncertainty avoidance, but with high level of assertiveness.

A total of 623 undergraduate business students from three countries - US, Korea and India-were surveyed (Jaju et al., 2002) to evaluate whether there were any differences in the learning styles based on Hofstede's cultural dimensions and Kolb's learning styles. American students liked speculative observation and solid experience. On the other hand, Indian students favoured active experiment and theoretical conceptualization. Students from Korea preferred reflective observation and abstract conceptualization. These results were explained in terms of differences in Hofstede's cultural dimensions of respective nations.

In a research comparing accounting students of Japanese and Australian universities, Sugahara and Boland (2010) noted that the differences in Kolb learning styles of doing/watching (AE-RO) between the two groups was significantly associated with individualism of Hofstede. Australians exhibited more individualistic behaviour than Japanese as per Hofstede's categorisation of countries.

There is positive influence of individualism on active experimentation and abstract conceptualisation learning styles. Masculinity had a positive effect on the preference for abstract conceptualisation and reflective observation learning styles. Power distance, long term orientation and uncertainty avoidance did not have any effect. These findings were reported by Holtbrügge and Mohr (2010) comparing 939 university students of Germany, UK, USA, Russia, Ireland, Spain, Netherlands, Poland, China and UAE.

In the case of dental education, Chuenjitwongsa et al., (2016) noted that most western students were using assimilating learning styles, which was more effective in student-centred contexts. In the case of eastern students, accommodating learning styles with teacher-centred learning was practised. The authors supported the former to be better.

The results of Manikuttyet al., (2007) showed that the learning approaches of Entwistle and co-workers categorised as deep, surface apathetic and strategic were related to power distance, individualism/collectivism, uncertainty avoidance, long/short time orientation and masculinity/femininity dimensions of Hofstede. Based on a review of works, the authors proposed that power distance had a negative relationship with deep and positive relationship with surface type learning. Collectivism had a negative relationship with deep and positive relationship with both surface and strategic learning. Uncertainty avoidance was positively related to strategic and negatively related to surface and positively to moderately positively related to deep learning. Short term orientation was positively related to surface and strategic learning and negatively related to deep learning. Masculinity/femininity was positively related with deep and strategic learning. These hypotheses need to be validated. Entwistle's learning types were more suitable to distinguish cultural differences compared to Kolb's learning styles used for individual learning styles. Experiential learning, which is the basis of Kolb, may not hold true in higher education contexts.

4.3. Comparison of national cultural contexts

Eastern students from China and India preferred group works and in the group work appeared face-saving and modest personalities. US students were confident, assertive and independent with a contest perception showing dominance in the process of group interaction. These results are associated with femininity and collectivism parts of Eastern cultures whereas the masculinity and individualism are characteristics of Western cultures as per Hofstede's country classifications. However, these cultural differences did not affect free interactions among the students of different cultures. According to the students, US instruction style was more learner-centred, process-oriented focussing on interaction and participation. On the other hand, the Eastern style lecture-centred teaching emphasized on exams. The progression of instruction was more implicit and less structured in the US as it started from samples to general rules. In Eastern system, instruction sequence was highly controlled and more explicit as it

progressed from general rules to examples. The unstructured case based method resulted in difficulty to adapt to the more interactive learning style. This was attributed to the absence of organized content and rigidly controlled instruction. These observations were in line with the observations of Hofstede (1984) that members in countries of Eastern Asia resorted to have low certainty avoidance and were insecure with open ideas and situations. Heavy reliance on instructors and textbooks by Eastern students were indicative of the high power distance in their cultures. These findings were reported by Liu et al., (2010) from one-to-one interviews with seven Eastern students and focus group interviews with 12 Eastern students. The limited sample size and use of only interview method may be insufficient to make generalisations based on the findings.

When an individual perceives a threat to his/her self-respect, face saving strategies are adopted. Thus the concept of face arises. Threat perception occurs in situations of high level of uncertainty and face-saving strategies become uncertainty avoidance strategies. However, Hwang et al., (2003) noted individualism to be associated with gaining face. However, collectivism and fear of losing face were not associated. High level of relationship between loss of face and students asking questions in the class was also noted in Hong Kong and Singapore. In the USA, asking questions had a positive effect of face gain on students. Asking questions outside class had positive effect and asking questions inside class had negative effect on grades of US students. The opposite was true for Hong Kong students. There was no effect on students from Singapore.

In a study by Zhu et al., (2010) using both survey and interview on the perceptions of Chinese (high PD) and Flemish (low PD) college teachers, no difference was noted between the two cultures regarding teaching and learning, contrary to conceptual contentions and findings in general. This variation was attributed to changes in cultural dimensions due to modernisation and globalisation. In the Chinese cohort, teachers combine authoritative and friendly relationship with students, thus narrowing power distance between teachers and students. This was termed “hierarchical friendship” by the authors. Competition among students was promoted in Chinese more than in Flemish context. Highly competitive educational environments lead to a teacher-centred education in China.

Using cross-cultural communication experiences between South African professors and Sudanese students, Cronjé (2011) showed that power distance and uncertainty avoidance amplified each other, together resulting in individualism moving towards collectivism. Cross cultural accommodation did not indicate the need for moving into another culture. When cultures meet, reduction of communicative uncertainty, construction of shared meaning and appropriate use of technology were important.

According to a multimethod study by Chen et al., (2010) differences in individualism/collectivism, power distance, and uncertainty avoidance between provider (teacher) and recipient (learner) reduced the likelihood of successful knowledge transfer in a structured knowledge transfer process. On the other hand, if there is peer-to-peer help, close relationships and proactive learning, the difficulties of knowledge transfer may be reduced. Although the work was related to knowledge transfer from a US based on-shore technical support centre to an offshore support centre in China, the conclusions may be applicable to an academic learning environment as well. However, the generalisability of a single organisation-single country study needs to be evaluated.

In a study on the Chinese students in the UK, Germany, France, Belgium, Spain and Netherlands, Cao et al., (2016) obtained responses from 463 Chinese students in an online survey. The obtained results were interpreted in terms of country scores for cultural dimensions estimated by Hofstede. Comparing the results of participants in the three countries (China, United Kingdom and France), it is found that the score of 20 went for China whereas the other two countries under comparison appeared to be close to each other with respect to individualism scores and so were 71 for UK and 89 for

France. Therefore, students of China origin and living in France and UK are expected to face stressful life as a result of the culture shock due to the individualism cultural differences between their own country and the countries they are living in. The score 30 related to "uncertainty avoidance" are for Chinese whereas for “masculinity" the scores are 66. For the students of United Kingdom, these are 35 and 66 respectively and thus both countries are close to each other. The scores of France are very different at 86 for the item uncertainty avoidance and 43 for the item "masculinity". This difference may explain the higher stress experienced by Chinese students in France than in the UK. In the case of power distance, China with a score of 80 is closer to France with score of 68 than to UK with a low score of 35.

Although Chinese learners may face decisive culture hit in this dimension in UK, the decentralized status and relative similarity between various social classes resulting from low power distance may make it easy to Chinese learners dealing with daily activities. These cultural dissimilarities between the three countries may bring a possible illustration to Chinese learners’ geater difficulties in performing daily activities in France than they face in the UK.

The students' cultures belonging to collectivist and high power distance life style behave in a different manner in comparison to students who adopted the cultures of individualism or low power distance. Fearing to shed their face, Chinese students, while they are living and involved in the society of the United Kingdom or France and because of the expectation that they will commit any socially inappropriate behavior, they try to avoid being too social with the community, and then they like to keep to themselves as much as possible.. This style of life by Chines currently living in France and UK will affect the behaviour of most of the other Chinese students coming to live in these two aforementioned countries. Hence, there will be absence of enough knowledge of communal cultural norms and traditions and then will lack in the confidence to speak sufficiently in English.

In their study using 30 samples each of Sri Lankan, Pakistani and Mauritius faculties to evaluate the effect of culture on online learning, Jayatilleke and Gunawardena (2016) observed high power distance, collectivism and femininity affecting only Sri Lankan and Pakistani learners. There was no such effect on Mauritians. The authors proposed that cultural dimensions may only be applicable to more conventional cultures like those in Sri Lanka and Pakistan. They may not be applicable in defining cultural characteristics of countries like Mauritius, where diverse, multi-ethnic, multicultural and multilingual cultures exist. The authors used self-reflection questionnaire survey, forum discussions and online journal entries as the methods for this work. The small sample size was attributed as a reason for non-generalisability of these findings. However, even Hofstede found it difficult to precisely categorise some countries showing middle values for the indices of cultural dimensions, which might be one reason.

From their cross-institutional comparison of 1275 students (757 international from 52 countries), Rienties and Tempelaar (2013) noted that Hofstede’s cultural dimensions significantly predicted academic adjustment and social adjustment. Power distance was negatively correlated. Both masculinity/femininity and uncertainty avoidance were positively associated with academic adjustment of non-western students, which, in turn, was related with their academic success.

Negative perception was noticed among students from individualist background regarding computer-supported collaborative learning, but achieved better learning outcomes. Women working in culturally similar dyad with individualist students expressed a negative perception of collaborative learning. On the other hand, in the case of men or women working with collectivist students there was less negative (or positive) perception. These findings were reported by Popov et al., (2014) based on a study of 56 Dutch and 64 international undergraduate and post-graduates students.

In their work, Mittelmeier et al., (2016) used learning analytics on 3000 undergraduate learners at first year in business and economics at Maastricht University in the academic year 2013/2014. All students were studying in a problem-based learning (PBL) curriculum, emphasising self-directed learning with teachers acting as facilitators and not as lecturers. As per Hofstede, PBL is more suitable for cultural dimensions of feminine values, low power distance, and low levels of uncertainty avoidance. This is the characteristic of Dutch society also. On the other hand, a substantial proportion of international learners at Maastricht University belong to cultures with opposite characteristics. The authors found that dimension of culture scores, when separated from disposition variables, explained more than 7% of the differences in capability levels. Masculinity, power distance and long-term orientation were the main predictors. Cultural dimensions explained higher than 4% of the difference in learning dispositions in both learning enjoyment and boredom. Masculinity, long-term orientation and power distance were the main predictors here, too. If only such a small percentage of variation in mastery levels are predicted by cultural dimensions, it is not logical to give importance to these dimensions in studies involving learning styles, tools or dispositions.

4.4. Language learning environment: E-learning/web-based/computer-based/mobile/distance learning

The need for adaptation of instruction styles as per the level of uncertainty avoidance was revealed through interviews of students and instructors and classroom observations of a CISCO instructor-led, web-based global e-learning programme done by Selinger (2004). In the findings of Arenas-Gaitán, Ramírez-Correa, and Rondán-Cataluña (2011) although Spanish and Chilean students were culturally dissimilar, their acceptance of web-based learning platforms matched technology acceptance model.

The differences observed between US and South Korean university students regarding acceptance of web2.0 tools for learning was attributed to differences in power distance, individualism/collectivism and uncertainty avoidance in the work of Yoo and Huang (2011). However, small sample sizes could limit the generalisability of the findings.

Multicultural nature of education and training environments are growing rapidly, especially in online learning. Instructors and instructional designers need to develop skills to deliver culturally sensitive and culturally adaptive instructional content. This is especially important in the case of those involved in online learning. In their work, Parrish and Linder-VanBerschot (2010) examined the cultural dimensional differences that are most likely to impact instructional situations. However, in their assessment of how cultural dimensions manifests in learning situations, they used only power distance, uncertainty avoidance, individualism/collectivism, nurture and challenge (perhaps meaning masculinity/femininity) of Hofstede's (1997) model. They also used the models of Nisbet (2003), Lewis (2006) and Hall (1983).

A study using multiple methods was conducted by Wang (2007) to evaluate the effect of power distance to be considered for designing online courses for culturally diverse students. The power distance affected learners' seeking help from their instructors. The American group was very comfortable to approach their instructors for help. The Korean group was more hesitant in doing so. The large classroom size of the Chinese students limited their opportunities to interact with their instructors and they expressed a low level of comfort when approaching the instructors. The Chinese group completed their individual and group works more easily. The American group was slightly less comfortable and the Korean group was the least comfortable in completing the assignments. It is likely that the cultural perceptions of the Koreans on communication using computer-mediated might have affected their responses because many Korean participants commented that classmates or online peers can be 'strangers'. As to the high level comfort of the Chinese, it is worth noting that the majority of

such Chinese learners worked in self-constructed group and were therefore joyful about asking their peers for help. Based on the survey responses of 66 teachers and 40 learners on the online environment, Tapanes et al., (2009) noted that the cultural dimensions of the students are significantly related to some of their attitudes of the virtual classroom culture. In contrast to their individualist peers, Collectivist students perceived that their individualist teachers were not often aware of the differences in culture in online classrooms. They also felt that learning was not relevant to their cultural contexts. Individualist students were satisfied in this aspect. No influence of language was noticed in participation patterns of individualist/collectivist dimension learners. Hofstede's Cultural Dimensions predicted the behaviours of students in group work. Students belonging to cultures with high uncertainty avoidance scores seek clarifications or ask questions. Better comfort of free expression may prompt similar behaviour from highly individualistic students. More feminine cultures simplify negotiation, guiding students to participate a lot for the sake of reaching a common solution. This general trend of online behaviour among international students in UK was reported by Mittelmeier et al., (2015). The authors adapted an analytics study of an activity, which replicated experiences in group learning. In a lab environment, small groups of 58 learners at a UK business school were set to work with a Harvard Business School case study. They used an online chat to communicate with all members of their group. Subjective norm and behavioural intention of students were moderated by power distance, individualism/collectivism, and masculinity/femininity and uncertainty avoidance in the finings reported by Tarhini, Hone, Liu, and Tarhini (2017). The authors surveyed 569 undergraduate and postgraduate students who were using e-learning tools in Lebanon for this study.

Using the results of a survey of 423 students, Anakwe et al., (1999) showed that motives and communication patterns of individualistic students were synchronised with online learning as a communication method or medium of instruction; whereas collectivists' stimuli and patterns of communication do not accept any form of cooperative instruction or communication as in online learning.

Knowledge-sharing in multicultural and cross-cultural virtual classes, and national cultural values of students affected explicit and implicit knowledge sharing by students. Using both surveys and interviews, it was concluded that collectivism directly impacted knowledge sharing. Other cultural values (power distance, uncertainty avoidance, and Confucian dynamism) interacted among themselves in the case of motivations for knowledge sharing. The effect of concerns regarding face were complex (Zhang et al., 2014).

Hofstede's cultural dimensions could not explain the differences between the Chinese and Swedish university students in their attitudes towards mobile assisted language learning (Viberg & Grönlund, 2013).

5. Conclusions

This review considered the applicability of Hofstede's cultural dimensions on the learning behaviours and learning styles in different cultural and learning contexts.

Generally, power distance, individualism/collectivism, uncertainty avoidance and masculinity/femininity almost definitely explain variations in learning behaviours and styles in most cultural and learning contexts. In some findings, association of long term orientations with learning behaviours in different cultural contexts are also observed.

In many studies, the sample sizes were small and therefore, the applicability of their conclusions was limited. Mixed approaches using both quantitative surveys and interviews or reflective journals

were used in most studies. This approach seems to be most desirable. However, a sufficient care in data analysis and interpretation to exclude alternative explanations seems to be required in some cases.

Overall, Hofstede's cultural dimensions seem to account for many variations in cultures in acquiring behaviours and styles, but not with the exclusion of other models of cultural dimensions.

Further research is required to answer the basic question: Are we ready with a definite answer on what approaches are required to motivate learners to adopt specific learning styles in specific cultural contexts for most beneficial learning outcomes to them?

6. Recommendations

The relationship of cultural dimensions with language learning environments like classroom, online, web-based and self-directed in the specific environment of Saudi Arabia may be the subject matter of future studies to give a lucid picture of the microcosmic forces at work. Saudi Arabia today has many multi-ethnic, multilingual, and multicultural classrooms at all levels of education. The process of learning in these against Hofstede's model can be a new area of research. Such studies will add to the scant literature on culture and learning behaviours, especially on Saudi soil.

7. Limitations

Original scope of an exhaustive treatment covering all aspects of the association between the two aspects of Hofstede i.e., cultural dimensions and learning behaviours under different cultural and learning contexts had to be reduced to deal with only certain aspects to the exclusion of certain others. This was partly due to non-availability of research reports on excluded aspects and partly due to the fear that this review will become too elaborate and too diversified. Focusing only on one or two aspects seemed to be a more reasonable approach for the sake of this review.

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