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Are there cultural differences in learning style?

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ABSTRACT

This study examines the role that culture plays in the way individuals learn. Experiential learning theory is used to describe the learning process and the Kolb Learning Style Inventory is used to assess differences in how individuals learn. Using the framework for categorizing cultural differences from the Global Leadership and Organizational Effectiveness (GLOBE) study, national cultures are examined by cultural clusters and individual cultural dimensions. The first part of the study assesses the relative influence of culture in comparison to gender, age, level of education and area of specialization of 533 respondents born in and currently residing in 7 nations. We found that a significant portion of the variance in the preference for abstract conceptualization was explained by culture, gender, level of education and area of specialization. The variability in preference for active experimentation over reflective observation was accounted for by age and area of specialization. The impact of culture was only marginally significant. In the second part of the study where we examined the influence of individual culture dimensions in shaping the learning style preferences, we discovered that individuals tend to have a more abstract learning style in countries that are high in in-group collectivism, institutional collectivism, uncertainty avoidance, future orientation and gender egalitarianism. Individuals may have a more reflective learning style in countries that are high in in-group collectivism, uncertainty avoidance and assertiveness.

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1. Introduction

In the “flat” world of the twenty-first century (Friedman, 2006) educators are finding their classrooms filled with students from many cultures. Many observe that these cultural differences among students have a significant impact on the learning process. For example, students from high power distance cultures often seem uncomfortable with professors who want to be called by their first name and Asian students appear quiet and reflective in the extroverted, high participation American classroom. Similarly in organizations, workers from different cultures appear to exhibit different styles of work and problem solving. For instance, it is believed that individuals from high uncertainty avoidance cultures can appear cautious and systematic in their approach to problems while those from low uncertainty avoidance cultures seem more comfortable with risk and trial and error problem solving. Are these perceived cultural influences on the learning/problem solving process empirically verifiable or are these perceptions just cultural stereotypes?

In the study we present in this paper, we address these questions by examining how individuals from different cultures vary in their approaches to learning. Using the framework for categorizing cultural differences from the Global Leadership and Organizational Effectiveness (GLOBE) study (House, Hanges, Javidan, Dorfman, & Gupta, 2004), cultures are examined by

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regional culture clusters and individual cultural dimensions. Experiential learning theory (ELT, Kolb, 1984) is used to describe the learning process and the Kolb Learning Style Inventory (KLSI, Kolb, 2005; Kolb & Kolb, 2005) is used to assess differences in how individuals learn. ELT has been used by many researchers to examine the learning process in cross-cultural adaptation (Van Vianen, De Pater, Kristof-Brown, & Johnson (2004); Yamazaki, 2004; Yamazaki & Kayes, 2004) and the Kolb Learning Inventory has been used in many studies to examine cultural patterns in learning styles, many of which are summarized in Yamazaki's (2005) review published in this journal. Using a general linear model (GLM), we examine differences in learning style of people from countries belonging to different cultural clusters controlling for gender, age, level of education and educational specialization, variables that previous research (Kolb & Kolb, 2005) has shown to have an influence on learning style. In the end, we examine the potential role that various dimensions of culture might be playing in developing various learning style preferences.

2. Characterizing cultural differences

Research on culture spans many disciplines such as Anthropology (Benedict, 1946; Hall, 1976; Kluckhohn, 1962), Psychology (Markus & Kitayama, 1991; Triandis, 1994) and Management (Hofstede, 2001; House et al., 2004). Irrespective of the discipline, the scholars have come to more or less a common ground with respect to defining culture. Culture can be conceptualized as 'shared motives, values, beliefs, identities, and interpretations or meanings of significant events that result from common experiences of members of collectives that are transmitted across generations' (House et al., 2004, p. 15).

This common understanding notwithstanding, the units of analysis chosen by culture researchers vary. The earlier researchers on culture, especially in the field of Anthropology, studied societies or communities. For example, Kluckhohn and Strodtbeck (1961) studied five communities in America discovering differences in their value orientations. There have been studies that focused on countries like Benedict's (1946) research on the Japanese culture. Research in the latter half of the 20th century increasingly focused on country differences in culture, perhaps resulting from the development of nation states that defines boundaries for governing structures, law and social institutions that paved the way for increased cultural homogeneity within nations. Hofstede's (2001) research on differentiating between the cultures of around 40 countries reinforced the use of country names as the surrogates to represent culture. The more recent Global Leadership and Organizational Behavior Effectiveness (GLOBE) study (House et al., 2004) followed suit. There have also been scholars who looked at the historical evolution of different regions of the world and suggested the possibility for cultural clusters that transcend national boundaries. Huntington's (1996) classification of the world cultures into Western, Latin America, African, Islamic, Sinic, Hindu, Orthodox, Buddhist and Japanese is an example. The GLOBE study empirically arrives at ten cultural clusters – Anglo, Latin Europe, Nordic Europe, Germanic Europe, Eastern Europe, Latin America, Sub-Saharan Africa, Middle East, Southern Asia and Confucian Asia – wherein the countries within a cluster are more similar to each other while being significantly different from countries in other clusters.

Culture researchers have endeavored to build in-depth understanding of the customs and practices within certain cultures and also to develop meaningful ways to enable comparison between cultures. This has resulted in a number of cultural typologies based on the salient features identified by the researcher. Some examples include high context and low context cultures (Hall, 1976) based on the amount of dependence on the context used in determining the meaning of messages, low trust and high trust cultures (Fukuyama, 1995) based on the relationship between trust and social structures, independent and interdependent self cultures (Markus & Kitayama, 1991) based on the extent to which definition of self is in relation to the larger society, and shame and guilt cultures (Benedict, 1946) based on whether the standards for behavior are internal or external to the individual. These typologies tend to be dichotomous in nature. Hofstede (2001) introduced the concept of continuous cultural dimensions as the basis for comparison. Dimensions are various categories into which the salient features of the cultures are grouped. Hofstede identified power distance, uncertainty avoidance, individualism-collectivism and masculinity-femininity (later long versus short term orientations) as the major aspects on which cultures differ. The GLOBE study (House et al., 2004) refined Hofstede's work suggesting nine dimensions: in-group collectivism, institutional collectivism, power distance, uncertainty avoidance, future orientation, performance orientation, humane orientation, assertiveness and gender egalitarianism. The proponents of the cultural dimensions approach introduced the practice of calculating scores on each dimension for each culture enabling relative ranking among them. These typologies and dimensions are especially useful in providing explanations when we encounter differences in outcomes that seem to originate from the differences in cultural values and practices. Researchers in variety of fields that range from education to epidemiology have explored the potential impact of cultural variables on outcomes that vary from educational accomplishments to depression.

3. Experiential learning theory and learning style

Experiential learning theory draws on the work of prominent 20th century scholars who gave experience a central role in their theories of human learning and development – notably John Dewey, Kurt Lewin, Jean Piaget, William James, Carl Jung, Paulo Freire, Carl Rogers and others – to develop a holistic model of the experiential learning process and a multi-linear model of adult development (Kolb, 1984). ELT defines learning as "the process whereby knowledge is created through the transformation of experience. Knowledge results from the combination of grasping and transforming experience" (Kolb, 1984: 41). The ELT model portrays two dialectically related modes of grasping experience – concrete experience (CE) and abstract conceptualization (AC) – and two dialectically related modes of transforming experience—reflective observation

(RO) and active experimentation (AE). Experiential learning process is portrayed as an idealized learning cycle or spiral where the learner “touches all the bases” – experiencing, reflecting, thinking, and acting – in a recursive process that is responsive to the learning situation and what is being learned. Immediate or concrete experiences give rise to observations and reflections that are assimilated and distilled into abstract concepts from which new implications for action are drawn. When these implications are actively tested new experiences are created again (See Fig. 1).

It is not necessary that each person starts his/her learning cycle in the same mode, say for example, concrete experience, and goes through all other modes in a uniform manner. Because of our hereditary equipment, our particular life experiences, and the demands of our present environment, we develop a preferred way of choosing among the four learning modes. Those who rely on concrete experience for grasping are open to new experiences, depend on people contact for gathering information, are intuitive and make feeling based judgments (Barmeyer, 2004; Kolb & Kolb, 2005). Those who rely on abstract conceptualization are logical and analytical in their approach to a learning situation and seek theories and generalizations (Auyeung & Sands, 1996). A person may transform the experience either through reflective observation or active experimentation. Those who prefer reflective observation watch and observe all sides of an issue in order to understand its meaning and take time to act. Those who prefer active experimentation like to try things out, are more willing to take risks and are practical and application oriented (Barmeyer, 2004; Kolb & Kolb, 2005).

The concept of learning style refers to the individual differences in approaches to learning based on an individual's preference for using a combination from these dialectic modes. The four basic learning style types are Diverging, Assimilating, Converging and Accommodating. Diverging learners prefer to make more use of concrete experience and reflective observation, Assimilating types prefer to learn through reflective observation and abstract conceptualization, Converging types rely on abstract conceptualization and active experimentation and Accommodating types use active experimentation and concrete experience.

The Kolb Learning Style Inventory (KLSI, Kolb, 2005) is an instrument ‘designed to measure the degree to which individuals display different learning styles’. It contains 12 items that ask the respondents to rank four sentence endings that correspond to the four learning modes—CE, RO, AC and AE. Because of this forced choice format, the cumulative ranks reflect the relative preferences among the dialectic modes. The combination score AC–CE (i.e., cumulative rank for CE subtracted from the cumulative rank for AC) represents the preference for abstract conceptualization over concrete experience and AE–RO (i.e., cumulative rank for RO subtracted from the cumulative rank for AE) the preference for active experimentation over reflective observation. The combination scores may range from –36 to +36. A higher AC–CE score implies a relatively greater inclination for abstractness (AC) and lesser inclination for concreteness (CE), whereas a lower AC–CE implies the opposite. Similarly, a higher AE–RO score would mean preference for action (AE) over reflection (RO) and a lower score the reverse. One's learning style type can be determined by taking both combination scores together and comparing them with the cut-off values from the normative group.

ELT emphasizes that learning style is not a psychological trait but a dynamic state resulting from synergistic transactions between the person and the environment. The stability and endurance of these dynamic states depend not only on the genetic qualities or characteristics of human beings but also on the demands of the environment they are in. The way we process each emerging event determines our choices and decisions, which in turn determine the future events we live through (Kolb, 1984: 63–64). The environment in which this process of self-creation takes place is shaped by the pervasive influence of culture.

4. The relationship between culture and learning style

In *The Geography of Thought* the cognitive, cultural psychologist Richard Nisbett describes how his work with a Chinese student challenged and changed his lifelong universalistic view of human cognition—the view widely shared by cognitive

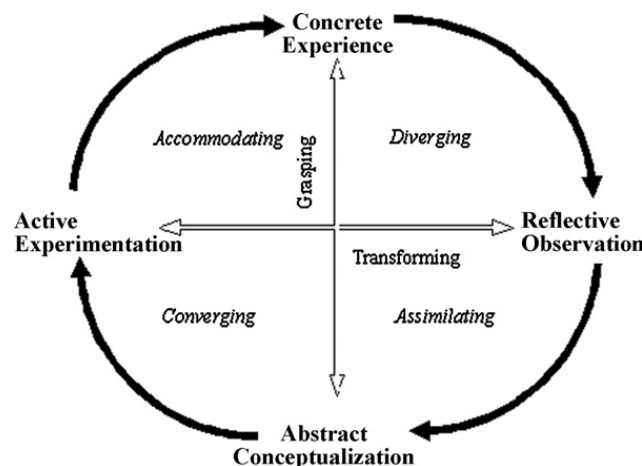


Fig. 1. Experiential learning cycle.

scientists that all human groups perceive and reason in the same way. The student argued that Chinese believed in constant change, the importance of context and relationships between things while Westerners “live in a simpler more deterministic world; they focus on salient objects or people instead of the larger picture; and they think they can control events because they know the rules that govern the behavior of objects” (Nisbett, 2003, p. xiii). His conversations led to a program of research studying these differences between East Asian and American ways of perceiving and thinking based on a model that views cognitive processes as embedded in a nested, culturally determined set of factors—epistemology, metaphysics, attention, social structure, economy and ecology—arguing that “indoctrination into distinctive habits of thought from birth could result in very large *cultural* differences in habits of thought” (p. xiv). Other culture researchers support this view. Triandis says, “within a culture as people interact, some of their ways of thinking, feeling and behaving are transmitted to each other and become automatic ways of reacting to specific situations” (1994, p. 4). Culture acts as a strong socialization agent (Barmeyer, 2004; Hayes & Allinson, 1988) that influences information processing and cognition (Earley & Ang, 2003). Thus there is reason to believe that the differences in cultural socialization tend to influence learning preferences and produce different learning styles (Reynolds, 1997; Wilson, 1971 as cited by Kerr, 2004).

4.1. Review of the past studies

A few researchers have attempted to find empirical evidence for learning style variations based on cultural backgrounds. A number of comparative studies using KLSI found significant differences in the learning style preferences among the samples from different countries. Yamazaki's (2005) meta-analysis provides a summary of some of these studies. He compiled Yamazaki's and Kayes' (2005) study on Japanese and American managers, Fridland's (2002) study of Chinese and American teachers, Barmeyer's (2004) study of students from France, Quebec and Germany, Auyeung's and Sand's (1996) study of accounting students from Australia and Hong Kong, and Hoppe's (1990) study of managers from 19 countries. Fig. 2 is a graphic representation of the mean scores on AC-CE and AE-RO of the samples from these studies. The cut-off point for AC-CE was 4.3 and for AE-RO 5.9 following the KLSI 2.0 norms that were used in the reported studies.

These studies provide valuable empirical evidence that initiates exploration into culture's impact on ways of learning. However, before associating certain countries or cultures with specific learning styles, it is advisable to take a careful look at the study designs and findings from these studies.

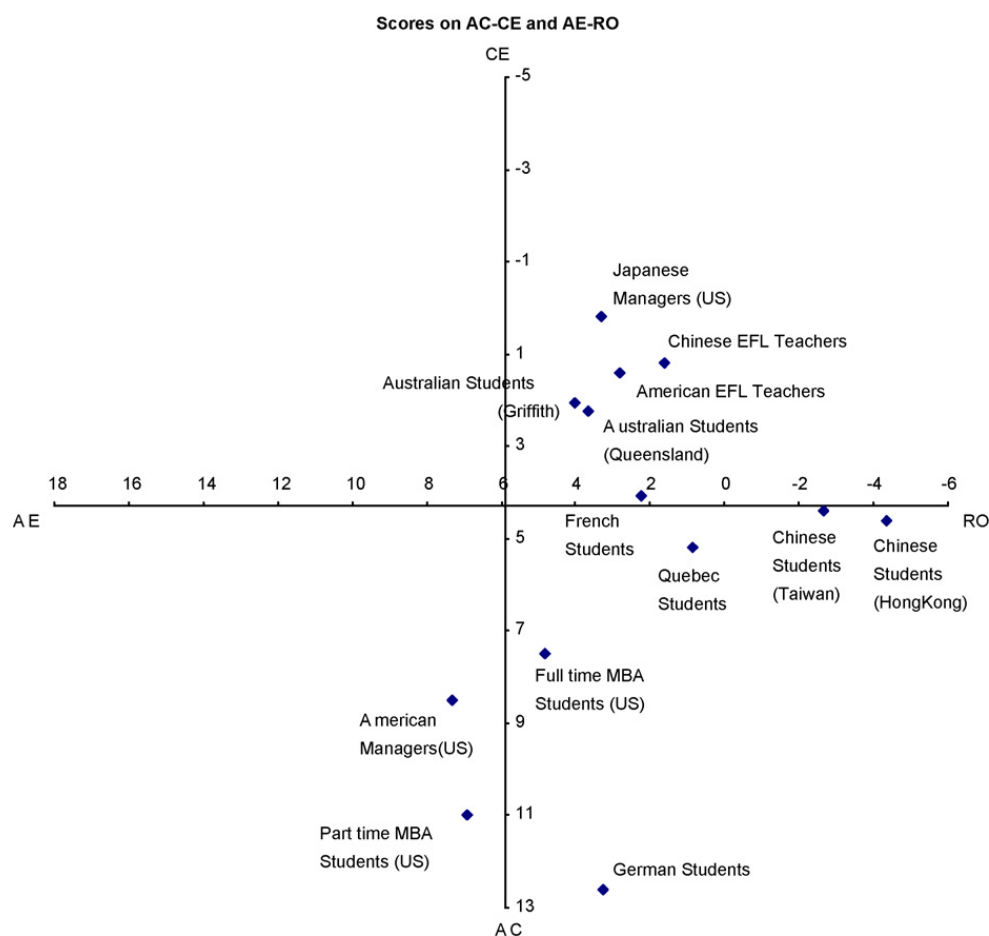


Fig. 2. Mean AC-CE and AE-RO scores.

4.1.1. Significance and size of the impact of culture

The studies by Yamazaki and Kayes (2005) and Auyeung and Sands (1996) found significant differences on both AC-CE and AE-RO scales among the country samples that they tested. Some of the other studies found that the significance levels or the effect sizes were small. The significance level of the difference between the American and Chinese teachers in Fridland's (2002) study was only marginal. Barmeyer (2004) discovered that French, Quebec and German students did not show any significant difference in reflective observation. Kerr (2004) found that though the practicing accountants from Mexico and USA were significantly different in their preference for abstraction over concreteness, the effect size was less than moderate. Many studies did not delve into effect sizes. This makes one wonder how strong the impact of culture on learning styles is.

4.1.2. Effect of culture compared to that of other demographic variables

Previous research with the normative samples of Kolb Learning Style Inventory shows that gender, age, level of education and area of specialization of the respondent have a bearing on learning styles (Kolb & Kolb, 2005). The relative impact of these variables may vary. Fridland (2002), for example, suspects that academic specialization might have more influence on learning than culture. This would help explain results by Zuolkernan, Allert, and Qadah (2006) who found no difference in learning styles of Middle Eastern and American computer programming students. In the studies that Yamazaki (2005) reviewed, these variables were not included in the analysis. The samples usually had the respondents from the same profession, level of education and the age group. Gender is found to be mixed. In some studies, the academic background of the respondents is the same and in others it is not taken into consideration. The general method of analysis used in the culture-learning style studies is a Chi-square test on the learning style types or a one-way ANOVA on the learning modes or the combination scores. While these are useful methods in assessing the significant 'between groups' differences on account of culture, they do not take into consideration the influence of other variables that may have an effect of learning styles. It may be necessary to adopt a sampling strategy and method of analysis that allows for inclusion of other demographic variables in the model if we were to assess the relative impact of culture.

4.1.3. Dimensions of culture that impact learning style

In these studies, culture is operationalized as the country from where the sample is or the nationality of the subjects. The learning style differences among these subjects are explained in terms of one or other cultural dimension on which their countries are different. Auyeung and Sands (1996) attribute the preference for concrete and reflective modes among the accounting students in Taiwan and Hong Kong to the collectivistic nature of those countries while the preference of the Australian students for active and concrete modes is attributed to the individualistic nature of Australia. Hoppe (1990) suggests that reflection is related to uncertainty avoidance. Though the link to the cultural dimension gives additional insights, using only a single dimension may be a very simplistic explanation for how culture could be influential in shaping learning preferences.

Yamazaki (2005) in his meta-analysis elicited multiple ways of understanding the cultural differences between countries by synthesizing the culture typologies from the fields of Anthropology, Cross-Cultural Management and Cross-Cultural Psychology. The dimensions that he describes include high and low context cultures (Hall, 1976), shame and guilt cultures (Benedict, 1946), Uncertainty Avoidance (Hofstede, 1997), O-type and M-type organization (Hayashi, 1999), independent and interdependent self (Markus & Kitayama, 1991), and field dependent and field independent cultures (Witkin, 1976). He explains how the practices and behaviors associated with each cultural type might be instrumental in encouraging certain learning preferences. This definitely is a praiseworthy approach as it helps to delineate the impact of the multiple aspects of culture on learning styles.

All studies except Hoppe's (1990) had been comparisons between samples from only 2–3 countries. This limits the generalizability of the findings. However, including more countries or cultural groups in studies will pose the challenge of meaningfully differentiating between them on multiple dimensions/typologies in order to discover the ways in which they might be affecting learning styles. We have to be mindful that most of the countries cannot be placed at the extremes on these typologies or dimensions and devise ways for recognizing the relative differences between them.

4.2. Hypotheses

In the light of the above observations, we felt that in order to conclusively say whether culture has an impact on learning styles and which dimensions of culture play a part in shaping them, we needed to conduct a study with samples from more countries that are empirically proven to be different from each other on multiple dimensions of culture and when taken together will systematically represent a large part of the cultural heterogeneity of the world. Therefore, we decided to conduct a study with samples from countries representing each cultural cluster discovered in the GLOBE study.

In the first part of our study, we set out to determine if culture had a significant effect on learning style and also to explore the relative effect that culture has in comparison with other demographic variables such as gender, age, level of education and area of specialization. As the previous studies had indicated that culture might have an impact on the two modes that determine learning style, i.e., AC-CE and AE-RO, we started with the following hypotheses.

H1. Members of different cultures will significantly differ in their preference for abstract conceptualization over concrete experience (AC-CE) in order to grasp an experience while learning.

H2. Members of different cultures will significantly differ in their preference for active experimentation over reflective observation (AE-RO) in order to transform an experience while learning.

However, since no previous study had compared the effect of culture with that of other demographic variables such as gender, age, level of education and area of specialization, we could not have any a priori hypothesis and decided to take an exploratory approach.

Our focus in the second part of the study was to delineate the dimensions of culture that impacted learning styles. We chose to use the dimensions evolved from the GLOBE study for this purpose not only because they describe different aspects of the culture, but also because GLOBE study had provided an empirically validated classification to capture the relative differences between the cultures on these dimensions without dichotomizing them. We examined how in-group collectivism, institutional collectivism, uncertainty avoidance, future orientation, performance orientation, assertiveness, power distance, gender egalitarianism and humane orientation might have influenced the shaping of learning styles in each culture. The following were the hypotheses we had.

4.2.1. *Collectivism*

Collectivism perhaps is the most widely used dimension to differentiate between cultures, to the extent that both scholars and laymen often think of it as the only way to explain cultural differences. A number of scholars agree that collectivism is not as simple and straightforward as it is portrayed and have made attempts to fine-tune the concept. House et al. (2004) found out in the GLOBE study that collectivism can be differentiated into in-group collectivism and institutional collectivism.

In-group collectivism is 'The degree to which individuals express pride, loyalty and cohesiveness in their organizations or families' (House et al., 2004, p. 12). In-group collectivism is similar to the concept of collectivism as it is generally understood. In collectivistic societies, the group is the basic unit of social perception. There are roles, duties and obligations attached to the group membership. It is important to maintain harmony and save face of the group members. The choice of action and communication depend heavily on the context (Hall, 1976). While communicating, they pay attention to the non-verbals to grasp the full meaning of what is being communicated. The pace of life is slow allowing for reflection (Hofstede, 1997; House et al., 2004; Triandis, 1994). To be an acceptable member of such a culture one needs to constantly pay attention to the experiences and develop intuition and reflection. In a less collectivistic and more individualistic culture, the individual is the recognized social unit. These cultures believe in the individual's intellectual and affective autonomy (Schwartz, 1999). Freedom, pursuit of individual pleasure, individual initiative and achievement are accepted values. Cognition and communication are context independent. Verbal articulation is essential to communicate, silence is embarrassing. They are objective and use explicit logic, proofs and linear argument. They have a positive attitude to trying out new things (Hofstede, 1997; House et al., 2004; Triandis, 1994). Being a member in individualistic culture may guide a person towards abstract conceptualization and active experimentation.

H3. The higher the in-group collectivism in a culture is, the more will be the reliance of its members on concrete experience over abstract conceptualization in order to grasp an experience while learning.

H4. The higher the in-group collectivism in a culture is, the more will be the reliance of its members on reflective observation over active experimentation in order to transform an experience while learning.

Institutional collectivism is 'the degree to which organizational and societal institutional practices encourage and reward collective distribution of resources and collective action' (House et al., 2004, p. 12). Institutional collectivism is 'part of a cultural syndrome that is future and performance oriented' and that tries to achieve them through collective efforts that are not assertive or dominating. It seems to originate more from a sense of justice, equality, collective action and camaraderie, the basis of which is rationality rather than feeling of kinship. The members of the societies that are high on institutional collectivism may have a preference for abstract conceptualization.

H5. The higher the institutional collectivism in a culture is, the more will be the reliance of its members on abstract conceptualization over concrete experience in order to grasp an experience while learning.

4.2.2. *Uncertainty avoidance*

Uncertainty avoidance refers to 'the extent to which the members of an organization or a society strive to avoid uncertainty by relying on established social norms, rituals, and bureaucratic practices' (House et al., 2004, p. 11). Uncertainty avoiding societies resort to creating laws and rules and/or following rituals and religion in order to reduce ambiguity and unpredictability. In the laws they create, they aim to see clarity, structure and purity. In scientific pursuits, they favor deduction, formulating general principles first to apply them to specific situations (Hofstede, 2001). There is a tendency to consider what is different as dangerous. Breaking rules is not tolerated (House et al., 2004). They are more resistant to change. There is fear of failure and preference for tasks with sure outcomes, clear guidelines and less risk. Children are actively protected from experiencing unknown situations. In education, both teachers and students are more comfortable with the structured learning situations with clear objectives and timetables. They like learning situations with one correct answer and reward accuracy (Hofstede, 2001). The methods by which such societies deal with uncertainty may predispose

its members to resort to abstract conceptualization and reflection and refrain from exposing themselves to new experiences and experiments while learning. Hoppe (1990) and Yamazaki (2005) have found evidence for a positive relation between uncertainty avoidance and reflective observation. Members of the less uncertainty avoiding societies are more comfortable with ambiguity, chaos, novelty and convenience. They take every day as it comes. In scientific logic they favor induction, taking note of the empirical facts first to reach general principles. They view what is different as curious. They are more tolerant of breaking rules, less resistant to change and innovation, and willing to take risks. They believe in one's ability to influence one's life and others. Children are encouraged to experience novel situations. In education, they prefer open ended learning situations where there is room for sense of empiricism, relativity and original and unconventional ideas. The members of such societies may find it easier to learn from concrete experiences and active experimentation.

H6. The higher the uncertainty avoidance in a culture is, the more will be the reliance of its members on abstract conceptualization over concrete experience in order to grasp an experience while learning.

H7. The higher the uncertainty avoidance in a culture is, the more will be the reliance of its members on reflective observation over active experimentation in order to transform an experience while learning.

4.2.3. Future orientation

Future orientation implies 'the degree to which individuals in organizations or societies engage in future oriented behaviors such as planning, investing in the future, and delaying individual or collective gratification' (House et al., 2004, p. 12). Future orientated societies engage in planning. This requires the cognitive ability to see 'the world beyond its present physical state'. These societies are cautious in initiating new tasks. They want to ensure that there are strong and positive links between the current tasks and the desired future state (House et al., 2004). Thus abstract conceptualization is a necessary condition to envisage the future (Trommsdorff, 1983). Future orientation requires being flexible (Tendem, 1987), open to taking risks and persistent. Leaders of such societies expect their members to be more innovative and tolerant of change (House et al., 2004). Future orientation thus fosters abstract conceptualization and active experimentation. Less future oriented societies are able to engage more in the present and enjoy the moment. They may show incapacity or unwillingness to plan to accomplish goals in the future. While planning, the thrust is to ensure that they are compatible with the customs and traditions. Only past experience can legitimate innovation and experience (House et al., 2004). This attitude towards the future may develop in members of such societies, habits of absorbing the experiences and reflecting on them in order to have guidelines for the future.

H8. The higher the future orientation in a culture is, the more will be the reliance of its members on abstract conceptualization over concrete experience in order to grasp an experience while learning.

H9. The higher the future orientation in a culture is, the more will be the reliance of its members on active experimentation over reflective observation in order to transform an experience while learning.

4.2.4. Performance orientation

Performance orientation is 'the degree to which an organization or society encourages and rewards group members for performance improvement and excellence' (House et al., 2004, p. 13). Highly performance oriented societies are found to value self-reliance, independence and achievement. The achievement orientation in them may make them focus on future, take initiatives and are persistent in the pursuit of goals (Fyans et al., 1983). They have a 'can-do' attitude and a sense of urgency. The emphasis is more on results than people. What one does matters more than what one is (House et al., 2004). The individuals and groups that produce results and accomplish assignments are appreciated (Parsons & Shils, 1951; Trompenaars & Hampden-Turner, 1998). Thus the societal attitude is one that favors action. The societies that are less performance oriented focus on maintenance of tradition, family, affiliation and social ties than on individual achievement. They value one's role and position in society. In communication, they prefer subtlety and pay attention to context (House et al., 2004). Such an attitude may favor concrete experience. Such an attitude may favor less action and demand more reflection from the members of those societies.

H10. The higher the performance orientation in a culture is, the more will be the reliance of its members on active experimentation over reflective observation in order to transform an experience while learning.

4.2.5. Assertiveness

Assertiveness implies 'the degree to which individuals in organizations or societies are assertive, confrontational and aggressive in social relationships' (House et al., 2004, p. 12). Highly assertive societies appreciate assertive, dominant and tough behaviors from all of its members. They are direct in communication. They believe that anyone can be successful through hard work, take initiatives and are competitive in nature (House et al., 2004). They may have a 'doing' orientation (Kluckhohn & Strodtbeck, 1961). Assertive behavior indicates pragmatism (Rakos, 1991) and adaptiveness. The accepted behavior in assertive societies is one that is oriented towards action and taking charge. Societies that are low on assertiveness consider assertiveness unacceptable and endorse modesty and tenderness. They cherish people and relationships and are cooperative. They value

self-possessed conduct. In communication, they are indirect (House et al., 2004). They have a more 'being' orientation than 'doing' (Kluckhohn & Strodtbeck, 1961). In learning, they may be more attuned towards using reflection than action.

H11. The higher the assertiveness orientation in a culture is, the more will be the reliance of its members on active experimentation over reflective observation in order to transform an experience while learning.

4.2.6. Power distance

It is 'the degree to which members of an organization or society expect and agree that power should be stratified and concentrated at higher levels of an organization or government' (House et al., 2004, p. 12). Societies that are high on power distance tend to value social hierarchies. They don't give the individual the freedom to do whatever they want or make own decisions. It is important for them to do what is socially correct and proper. However, the hierarchical systems of such societies assign roles to ensure socially responsible behavior (Schwartz, 1999). There are reciprocal obligations between those who occupy high and low positions in the hierarchy (House et al., 2004). A certain level of thoughtfulness and reflection is required from the members of such societies for them to understand their roles and behave suitably. In such societies, the education system places a value on the wisdom and authority of the teacher. The students are expected to obey the teacher and take in the lessons offered (Hofstede, 2001). The social norms combined with the education system appear to promote reflection rather than active experimentation. In the societies that are low on power distance, the social relationships are not hierarchically arranged. An individual is respected and appreciated for what he or she can offer (House et al., 2004). The education system is student centered where the students are encouraged to question and experiment. The members of such societies may not hesitate to engage in active experimentation (Hofstede, 2001).

H12. The higher the power distance in a culture is, the more will be the reliance of its members on reflective observation over active experimentation in order to transform an experience while learning.

4.2.7. Gender egalitarianism

Gender egalitarianism is 'the degree to which an organization or society minimizes gender role differences while promoting gender equality' (House et al., 2004, p. 12). In cultures that are more gender egalitarian, gender stereotypes and gender roles may be less pervasive, making the lived experiences of both men and women more homogeneous. Women may be as educated and employed in same occupations as men. In such cultures, there might be heightened notions about human equality and justice. It is likely that the sense making is more dependent on such abstract concepts than through relating to the heterogeneous experiences of self and others.

H13. The higher the gender egalitarianism in a culture is, the more will be the reliance of its members on abstract conceptualization over concrete experience in order to grasp an experience while learning.

4.2.8. Humane orientation

Humane orientation refers to 'the degree to which individuals in organizations or societies encourage and reward individuals for being fair, altruistic, friendly, generous, caring, and kind to others' (House et al., 2004, p. 13). In more humane oriented societies, others (family, friends, community and strangers) are very important. The members of the society are responsible for ensuring the well-being of others. They provide the social support for each other (House et al., 2004). They value being forgiving, loving, cheerful and helpful (Bigoness & Blakely, 1996). They are motivated by altruism, benevolence, kindness and generosity (Triandis, 1994). The need for belongingness is high. The members of such societies are likely to develop the faculties for intuition and reflection and may make judgments based on feelings than logic. In less humane oriented societies, the members are not expected to look out for others. People are expected to solve their problems by themselves. There might be state structures to offer social and economic security (House et al., 2004). Therefore, the members can focus on self-enhancement (Schwartz, 1992) by promoting self-interest and self-gratification. They might feel freer to experiment with own lives. Since affiliation is neither a need nor a motivating factor, they might be more objective in their judgments and rely on logic and reason.

H14. The higher the humane orientation in a culture is, the more will be the reliance of its members on concrete experience over abstract conceptualization in order to grasp an experience while learning.

H15. The higher the humane orientation in a culture is, the more will be the reliance of its members on reflective observation over active experimentation in order to transform an experience while learning.

5. Method

5.1. Operationalization of the constructs

5.1.1. Learning style

To measure learning style preference using the KLSI, the two combination scores AC-CE and AE-RO that indicate the preference for abstractness (AC) over concreteness (CE) and the preference for action (AE) over reflection (RO) respectively

Table 1
GLOBE Society clusters.

Anglo	Latin Europe	Nordic Europe	Germanic Europe	Eastern Europe
Australia Canada England Ireland New Zealand South Africa (White sample) United States	France Israel Italy Portugal Spain Switzerland (French speaking)	Denmark Finland Sweden	Austria Germany Switzerland The Netherlands	Albania Georgia Greece Hungary Poland Slovenia
Latin America	Sub-Saharan Africa	Middle East	Southern Asia	Confucian Asia
Argentina Bolivia Brazil Chile Colombia Costa Rica Ecuador El Salvador Guatemala Mexico Venezuela	Namibia Nigeria South Africa (Black Sample) Zambia Zimbabwe	Egypt Kuwait Morocco Qatar Turkey	India Indonesia Iran Malaysia Philippines Thailand	China Hong Kong Japan Singapore South Korea Taiwan

were selected as the dependent variables. The forced choice format of the KLSI induces negative correlation among the primary mode scores (CE, RO, AC & AE) and thus makes them ipsative. However, the combination scores are non-ipsative (Kolb & Kolb, 2005).

5.1.2. Culture

As is the practice in many studies, we also operationalized culture as 'countries'. However, since we wanted to ensure that the countries we considered were significantly different from each other culturally and together represented a large portion of the cultural heterogeneity of the world, our choice of nations was from the 'culture clusters' empirically arrived at in the GLOBE study (House et al., 2004). GLOBE study was a decade long research program that started in 1994 involving 170 scholars from 62 societies in order to conceptualize, operationalize, test and validate societal and organizational level dimensions of culture and explore its relationship with leadership effectiveness. As part of the study, the GLOBE researchers gathered ratings on a 7-point Likert scale from a sample of 17370 middle managers from 951 organizations in 62 societies (mean $n = 251$, range 27–1790, n more than 75 for 90% of the societies) on the societal practices. The factor analysis of these items generated 9 dimensions of culture: in-group collectivism, institutional collectivism, power distance, uncertainty avoidance, future orientation, performance orientation, humane orientation, assertiveness and gender egalitarianism. After arriving at the mean scores for each society on each cultural dimension, they went on to group the societies into clusters based on the relative similarities and dissimilarities in the societal level scores. The ten culture clusters thus emerged were Anglo, Latin Europe, Nordic Europe, Germanic Europe, Eastern Europe, Latin America, Sub-Saharan Africa, Middle East, Southern Asia and Confucian Asia (Table 1). The empirical validity of this grouping was statistically tested through discriminant analysis. Thus, we can take the societal clusters as a 'coherent and convenient' statistical summary of the 'intercultural similarity and intercultural differences' (House et al., 2004, p. 179). For our study, we planned to choose one country each from every cluster.

5.1.3. Cultural dimensions

In our study, we made use of the cultural dimensions from the GLOBE study. We employed a new concept 'culture bands' to meaningfully represent the difference between countries on the dimensions of culture. Culture bands also are a product of the GLOBE study resulting from the Test Banding technique. This procedure groups the mean scores for the countries into bands in such a way that the scores within a band are considered as being not significantly different. Band 1 indicates highest range of scores on any dimension and the subsequent bands indicate lower range scores (House et al., 2004).

5.1.4. Demographic variables

The demographic variables included in this study – gender, age, level of education and educational specialization – were operationalized as categorical variables—five categories for age (19–24, 25–34, 35–44, 45–54, 55 and above) and three categories for level of education (secondary school, bachelor's degree, master's degree/PhD). Educational specialization was divided into four categories – Humanities and Social Sciences, Social Professional, Basic Sciences and Mathematics and

Applied Science Professional – following Biglan's (1973) classification of 36 academic specialties at the University of Illinois and Kolb's (1984) analysis of the Carnegie Commission study of the American Universities and Colleges (1969).

5.2. Sample

The publisher of the Kolb Learning Style Inventory (KLSI), Hay Group Transforming Learning gave us access to the learning style database it maintained of the KLSI online users from different countries. This database included the following details for each user—gender, age group, level of education, area of specialization, country of birth and country of residence. We included in the study only those were currently living in the countries where they were born. We did this to minimize inclusion of individuals with cross-cultural living experience that could have shaped their learning styles differently.

We followed a combination of stratified and quota sampling. We decided to select one country from each cluster that had the highest number of cases as long as there was a minimum of 30 cases approximately. There weren't countries that could meet this criterion from 3 clusters (Nordic Europe, Sub-Saharan Africa and Middle East). From the other clusters, the countries with the maximum number of cases were chosen. In case of USA and India that had very large numbers of cases, we took out a random sample of 96 and 86 cases respectively. This was done for the purpose of reducing the effect of inequality of variances, which increases with hugely unbalanced sample sizes, on the statistical tests. The final sample included 533 cases from the USA, Italy, Germany, Poland, Brazil, India and Singapore (Refer to Table 1 to see the clusters they belong to). The sample size from each country ranged from 28 to 116 with a mean of 76 (only 2 countries with $n < 65$). All in the sample were at least 19 years of age and none was a student. There were 311 were males, 222 females; 33 had secondary school education, 251 a bachelor's degree and 249 a masters/PhD; and 43 were from Humanities and Social Science background, 74 from Natural Sciences and Mathematics, 153 with Professional degrees in Social Sciences and 263 with professional degrees in Applied Sciences.

5.3. Method of analysis

The objective of the first part of the analysis was to assess the extent to which culture, gender, age group, level of education and area of specialization explained the variance in the learning style preferences. Since the independent variables

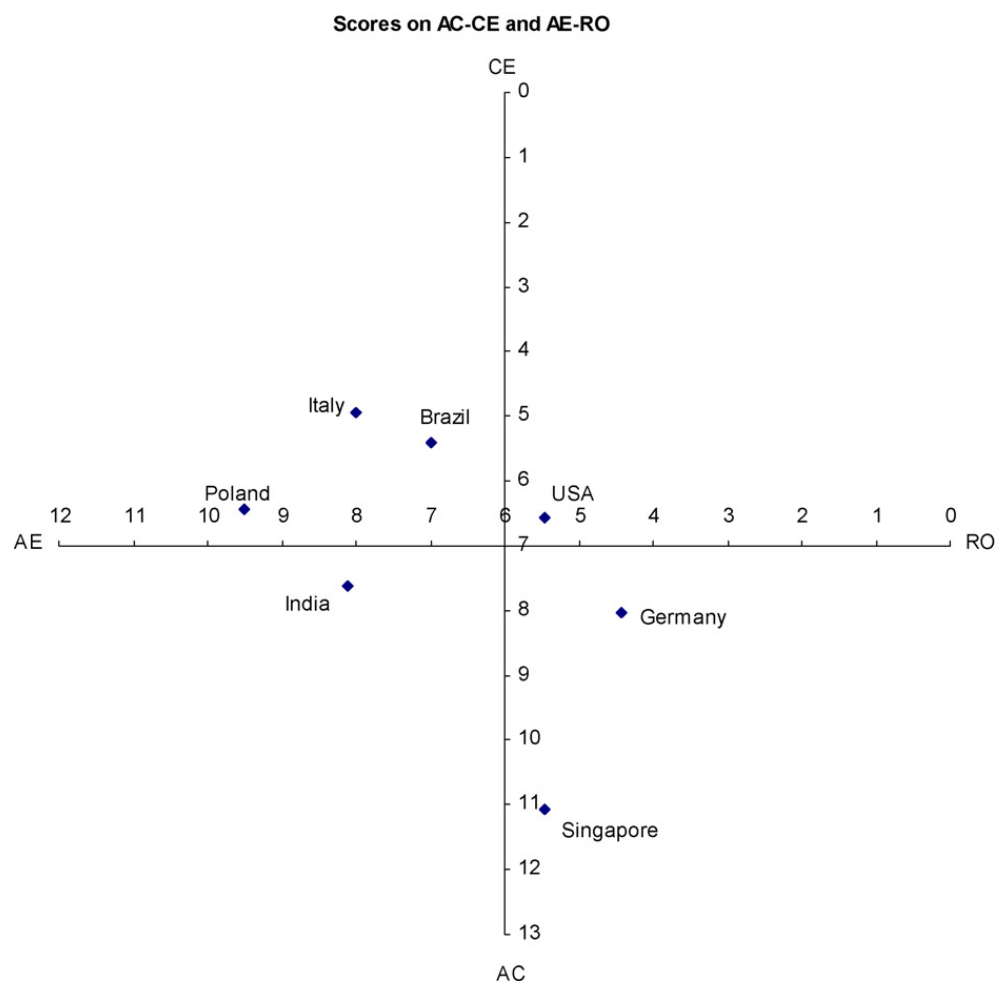


Fig. 3. Mean AC-CE and AE-RO scores for the countries chosen from the clusters.

were of categorical nature, we used General Linear Model with fixed factors to depict the relationship between them and the dependent learning style variables. This is similar to a regression with categorical predictor variables or an n -way ANOVA. The analysis was performed using the PROC GLM procedure in SAS. PROC GLM has the capability to handle unbalanced groups with the appropriate type of hypotheses testing and sums of squares. The output produced by this procedure presents not only the significance of the overall model but also the significance of the effect of each independent variable. The partitioned sum of squares is a good indicator of the amount of variation in the dependent variable due to each independent variable after correcting for all other terms in the model.

In the second part of analysis, we examined if there was a significant difference in the learning style preferences based on the degree of each cultural dimension. We grouped the countries into bands for each cultural dimension and performed ANOVAs and t -tests to find out if the means within the bands differed significantly from those from other bands.

6. Results

6.1. Part 1 – Impact of culture and other demographic variables on learning style

Fig. 3 gives the graphic representation of the mean AC-CE and AE-RO scores for the countries chosen from each cluster.

6.1.1. Abstract conceptualization versus concrete experience

The preference for abstract conceptualization over concrete experience was denoted by the combination score AC-CE. The overall model for assessing the impact of culture, gender, age, level of education and specialization on AC-CE was significant (F value = 3.98, $P < 0.0001$, Table 2). The factors that were the significant sources of variance were culture (F value = 2.93, $P = 0.008$), gender (F value = 2.93, $P = 0.008$), education level (F value = 5.63, $P = 0.004$), and area of specialization (F value = 6.82, $P = 0.0002$). Thus the hypothesis H1 is supported.

We calculated the effect sizes of each factor for the sample (η^2 , partial η^2) as well the population (ω^2). As revealed by ω^2 values, culture explains 2% of the variance in AC-CE of the entire population, gender 1%, level of education 2% and specialization 3%. According to Cohen's (1988) guidelines, these effects are considered small. However, we can conclude that the relative impact of culture is comparable to that of level of education, is lower than that of area of specialization, but higher than that of gender.

6.1.2. Active experimentation versus reflective observation

The combination score AE-RO is an indicator of the preference for active experimentation over reflective observation in learning situations. The overall model that tested the impact of culture, gender, age, level of education and specialization was significant (F value = 2.21, $P = 0.004$) AE-RO (Table 3). The sources of significant effect were age (F value = 3.2, $P = 0.01$) and area of specialization (F value = 2.71, $P = 0.04$). The culture had an F value of 1.97 and a P value .07 and thus had only a marginal significance in explaining the variance. Therefore, our hypothesis H2 is only marginally supported.

On examining the effect sizes of the factors for the population (ω^2) we can see that age explains 2% of the variance and the specialization 1%. Though these effects are small, they can be considered higher than the effect that culture has.

Table 2
Overall model and fit statistics for AC-CE.

Source	df	Sum of Squares	Mean Square	F Value	P Value
Model	16	7606.71	475.42	3.98	<0.0001
Error	516	61582.83	119.35		
Corrected Total	532	69189.53			

Table 3

Overall model and fit statistics for AE-RO.

Source	df	Sum of Squares	Mean Square	F Value	P Value
Model	16	3979.25	248.7	2.21	0.0044
Error	516	58069.66	112.54		
Corrected Total	532	62048.9			
	R-Square	Coeff Var	Root MSE	Mean AE-RO	
	0.0641	168.99	10.6	6.28	

Source	df	Type III Sum of Squares	Mean Square	F Value	P Value	η^2	Partial η^2	ω^2
Culture	6	1333.01	222.17	1.97	0.0676	0.02	0.02	0.01
Gender	1	6.01	6.01	0.05	0.8173	0.00	0.00	0.00
Age	4	1439.31	359.83	3.2	0.0131	0.02	0.02	0.02
Education	2	263.96	131.98	1.17	0.3103	0.00	0.00	0.00
Specialization	3	915.14	305.05	2.71	0.0445	0.01	0.01	0.01

Table 4

In-group collectivism: ANOVA results.

	n	AC-CE		AE-RO	
		Mean	S.D	Mean	S.D
Band 1: India, Singapore, Poland	210	9.04	9.97	7.08	9.9
Band 2: Brazil, Italy	111	5.23	11.81	7.39	11.16
Band 3: Germany, US	212	7.37	12.32	4.9	11.35
	df	Sum of squares	F value	Sum of squares	F value
Between groups	2	1073.99	4.178	674.02	2.910
Within groups	530	68115.55	P value	61374.89	P value
Total	532	69189.54	0.016	62048.90	0.055

6.2. Part 2 – Dimensions of culture that impact learning style

6.2.1. Collectivism

We found that the preference for abstract conceptualization over concrete experience (AC-CE) was influenced by both dimensions of collectivism—in-group collectivism (F value 4.18, P value 0.016, [Table 4](#)) and institutional collectivism (F value 5.62, P value 0.004, [Table 5](#)). The mean AC-CE scores for countries in different bands of institutional collectivism supports the hypothesis [H5](#) that higher the institutional collectivism the more will be the reliance on abstract conceptualization ([Table 4](#)). However, the hypothesized relationship of in-group collectivism with AC-CE ([H3](#)) that the higher the in-group collectivism the higher the preference for concrete experience (i.e., lower AC-CE scores) holds true only partially. On examining the mean

Table 5

Institutional collectivism: ANOVA results.

	n	AC-CE		AE-RO	
		Mean	S.D	Mean	S.D
Band 1: Singapore	96	11.07	10.74	5.45	10.22
Band 2: India, Poland, US	210	6.99	10.35	7.09	10.58
Band 3: Brazil, Italy, Germany	227	6.66	11.4	5.88	11.23
	df	Sum of squares	F value	Sum of squares	F value
Between groups	2	1437.21	5.621	241.34	1.035
Within groups	530	67752.33	P value	61807.57	P value
Total	532	69189.54	0.004	62048.90	0.356

Table 6

Uncertainty avoidance: ANOVA results.

	n	AC-CE		AE-RO	
		Mean	S.D	Mean	S.D
Band 1: Germany, Singapore	212	9.41	11.94	4.89	10.72
Band 2: India, US	182	7.07	10.49	6.72	10.8
Band 3: Brazil, Italy, Poland	139	5.47	11.36	7.81	10.74
	df	Sum of squares	F value	Sum of squares	F value
Between groups	2	1377.56	5.383	770.55	3.332
Within groups	530	67811.97	P value	61278.35	P value
Total	532	69189.53	0.005	62048.90	0.036

AC-CE scores we can see that up to a certain level of increase in in-group collectivism, the preference for abstract conceptualization decreases and concrete experience increases (the band 2 countries that are higher on in-group collectivism than band 3 countries have a lower mean AC-CE score) and after that the preference for abstract conceptualization increases again (the band 1 countries that are highest in in-group collectivism have higher mean AC-CE scores than band 2 countries). This result is not surprising nonetheless. Some studies of the past have produced evidence to associate collectivism with abstract conceptualization (e.g., [Auyeung & Sands, 1996](#)) whereas some others found that collectivism may be related to concrete experience (e.g., [Yamazaki and Kayes, 2005](#)). The cultures that are the highest on in-group collectivism are driven by ideals such as kinship and harmony, and the members of such cultures may be more concerned with the upkeep of these abstract ideals than understanding their own lived experiences which predisposes them to a preference for abstract conceptualization. On the other hand, the cultures that are the lowest on in-group collectivism also are guided by another set of ideals—that of individuality and equality, which might be conditioning their members in favor of abstract conceptualization. The members of cultures that fall in between may be relying on concrete experiences as well to learn since they are not overburdened with ideals.

We found that the preference for active experimentation over reflective observation was only marginally influenced by in-group collectivism (F value 2.91, P value 0.055, [Table 4](#)). A glance over the mean AE-RO scores shows that cultures high on in-group collectivism prefer active experimentation, contrary to our hypothesis [H4](#). In order to understand this, we may need to take into account the fact that the social roles, duties and obligations are predefined in such cultures. The members may not have to reflect on them for sense making since they are prescriptive in nature. On the contrary, what may be expected of them is to keep fulfilling the duties and obligations. This may bring an action orientation, though it may not be very experimental.

6.2.2. Uncertainty avoidance

The countries at different levels of uncertainty avoidance were significantly different in the mean AC-CE scores (F value 5.38, P value 0.005, [Table 5](#)) as well as the mean AE-RO scores (F value 3.33, P value 0.036). The mean AC-CE scores for countries in each band reveal that the cultures high on uncertainty avoidance displayed greater preference for abstract conceptualization than concrete experience as predicted by hypothesis [H6](#). Also, the increase in uncertainty avoidance is associated with increasing preference for reflective observation than active experimentation as is evident from the mean AE-RO scores, thus supporting the hypothesis [H7](#) ([Table 6](#)).

Table 7

Future orientation: ANOVA results.

	n	AC-CE		AE-RO	
		Mean	S.D	Mean	S.D
Band 1: Singapore	96	11.07	10.74	5.45	10.22
Band 2: Germany, US, Brazil, India	366	7.07	11.41	6.05	10.87
Band 3: Italy	43	4.93	12.59	8	12.36
Band 4: Poland	28	6.43	9.53	9.5	8.81
	df	Sum of squares	F value	Sum of squares	F value
Between groups	3	1606.11	4.191	503.95	1.444
Within groups	529	67583.43	P value	61544.95	P value
Total	532	69189.54	0.006	62048.90	0.229

Table 8

Performance orientation: ANOVA results.

	n	AE-RO	
		Mean	S.D
Band 1: Singapore, US	192	5.46	10.92
Band 2: Germany, Brazil, India, Poland	298	6.56	10.47
Band 3: Italy	43	8	12.36
	df	Sum of squares	F value
Between groups	2	279.71	1.200
Within groups	530	61769.20	P value
Total	532	62048.90	0.302

Table 9Assertiveness: *t*-test results.

	n	AE-RO	
		Mean	S.D
Band 1: Germany, Singapore, US, Brazil	376	5.42	10.91
Band 2: Italy, Poland, India	157	8.33	10.29
	df	t value	P value
	531	-2.86	0.004

6.2.3. Future orientation

Difference in future orientation seemed to have an impact only on AC-CE (*F* value 4.19, *P* value 0.006, Table 7). In general, as the future orientation increased, preference for abstract conceptualization increased, thereby validating the hypothesis H8. Since it did not show any significant effect on AE-RO, hypothesis H9 was rejected.

6.2.4. Performance orientation

As the ANOVA results in Table 8 show, difference in performance orientation did not bring out any significant difference in AE-RO, therefore we rejected hypothesis H10.

Table 10Power distance: *t*-test results.

	n	AE-RO	
		Mean	S.D
Band 1: India, Brazil, Germany, Italy	313	6.49	10.85
Band 2: US, Singapore, Poland	220	5.97	10.74
	df	t value	P value
	531	0.55	0.585

Table 11Gender egalitarianism: *t*-test results.

	n	AC-CE	
		Mean	S.D
Band 1: Singapore, Poland	124	10.02	10.62
Band 2: Germany, US, Brazil, Italy, India	409	6.84	11.54
	df	t value	P value
	531	2.74	0.006

Table 12

Humane orientation: ANOVA results.

	n	AC-CE		AE-RO	
		Mean	S.D	Mean	S.D
Band 2: India	86	7.63	8.81	8.12	9.67
Band 3: US, Brazil	164	6.09	11.62	6.1	11.14
Band 4: Germany, Singapore, Italy, Poland	283	8.43	11.91	5.82	10.93
	df	Sum of squares	F value	Sum of squares	F value
Between groups	2	570.27	2.202	355.02	1.525
Within groups	530	68619.26	P value	61693.88	P value
Total	532	69189.54	0.112	62048.90	0.219

6.2.5. Assertiveness

While the difference in assertiveness did have an impact (t value 2.86, P value 0.004, Table 9), the relation was exactly opposite to what had been hypothesized in H11. We found that cultures that were more assertive were relatively high on reflection than the less assertive ones. It makes us believe that though assertiveness often manifests through action, it is not reckless, but deliberate in nature. The person has to take the onus for his/her action. This demands the individual to be aware of own thoughts, feelings and rationale for taking a stand. Thus reflection has to precede action, though action will follow sooner than later. We would like to point out that our samples were from only two bands that were the highest on this dimension. We cannot quite claim that the direction of the relationship will remain the same when samples from other bands are included in the study.

6.2.6. Power distance

Contrary to the common belief and our hypothesis H12, we did not find any difference in the preference for action or reflection (AE-RO) based on the degree of power distance within cultures (Table 10).

6.2.7. Gender egalitarianism

We found that the more gender egalitarian cultures had greater preference for abstract conceptualization as predicted by hypothesis H13 (t value 2.74, P value 0.006, Table 11). However, we feel that in order to have a full understanding of the directionality of this relationship, it may be necessary to replicate the study with samples from lower scoring bands as well.

6.2.8. Humane orientation

We did not find any evidence for differences in learning style modes AC-CE or AE-RO based on variations in the level of humane orientation and hence rejected hypotheses H14 and H15 (Table 12).

7. Conclusion, limitations and directions for future research

7.1. Conclusion

From the above results, it is evident that culture has an impact on the learning style scales that is comparable to that of some of the demographic variables. Culture has a significant effect in deciding a person's preference for abstract conceptualization versus concrete experience. The significance of its effect on the preference between active experimentation and reflective observation is marginal.

On comparing the effect of culture and that of the demographic variables, the area of specialization seems to have a slightly larger effect on determining a person's liking for abstraction or concreteness than culture does. This may be because of the fact that educational specialties are particularly focused on the development of and socialization into the ways of learning needed to meet the performance demands of the discipline. In case of culture, the socialization with respect to learning may be more indirect. Level of education seems to have as much of effect as culture and gender slightly less. In case of developing a preference for active experimentation or reflective observation age and area of specialization had more impact than culture. Age appears to have the greatest impact in inculcating the habit of reflection than any other variable. If we take the marginal significance level of culture as acceptable, it has equal effect as level of education on developing a preference for active experimentation or reflective observation. Overall, we can see that it is culture and variables related to education, i.e., level of education and area of specialization that have the largest impact on learning styles.

This finding is of particular importance to the fields of education as well as management. Educators need to be aware that conditioning by certain cultures may complement the learning style requirements of certain areas of specialization where as it might be clashing with some other specializations. Also, in the first years of higher education, say before graduation, where discipline specific conditioning is yet to take root, the culture-based differences may be even more pronounced. Therefore,

higher educators in each area of specialization may have to ensure that the learning situations they design have elements that the students from different cultures can comprehend. In management, multicultural teams became prevalent with globalization. Now with the new challenges facing organizations such as sustainability, that require paradigm shift in understanding and resolving the problem, these teams are becoming much more multidisciplinary as well. In order for these multicultural multidisciplinary teams to engage with each other effectively, they may have to understand each other's sense making and problem solving approaches and how their cultures and areas of specialization might have predisposed them to certain approaches. Our findings from the analysis of the dimensions of culture that impact learning style differences may prove useful for these managers—the individuals tend to have a more abstract learning style in countries that are high in in-group collectivism, institutional collectivism, uncertainty avoidance, future orientation and gender egalitarianism and the individuals may have a more reflective learning style in countries that are high in in-group collectivism, uncertainty avoidance and assertiveness.

7.2. Limitations

The study could be improved by larger sample sizes within countries and better representation of clusters particularly the Nordic Europe, Sub-Saharan Africa and Middle East clusters. The online data collection method used may be biased by being a less than full representation of the population. Judging from that fact that the individuals in this sample had filled in a fee-based online instrument in English, we can assume that all of them had basic English proficiency, were computer literate and had the means to pay for the instrument either in their individual capacity or by being part of organizations. This biased homogeneity induced by the sampling technique may increase the chances for not detecting a culture-based difference when it actually exists. Thus, the chance for a Type II error is higher. However, following Hofstede (2001), it should be noted that a sample that is more representative of the population than this might reveal a stronger impact of culture. Another potential limitation of this study is that the individual level demographic variables as well as the other cultural dimensions were not controlled for in assessing the impact of each cultural dimension. Since these variables belong to two different levels of analysis, in order to control for them while avoiding cross-level fallacy (Rousseau, 1985), we would have had to employ a multilevel modeling technique. As our sample size was not sufficient for such modeling, we chose the next best alternative for analysis—ANOVA and *t*-test. Also, not included in this study are some other factors that are known to shape and influence learning styles such as personality types and the current work context (Kolb, 1984; Kolb & Kolb, 2005).

7.3. Directions for future research

This is the first study to examine the influence of culture on learning style that controls for some of the other factors known to influence an individual's approach to learning. Results of the study indicate that culture as measured by the GLOBE country clusters and by representative countries from each cluster does indeed significantly influence learning style, particularly the extent to which individuals rely on concrete experiences versus abstract concepts in the way they learn. However, the exact nature of the influence of cultural dimensions, especially the relative effect of each dimension and the potential interactions among the dimensions, needs further empirical validation. In order to do this, we feel that a multilevel regression model that can accommodate multiple levels of analysis may be a more appropriate analytical method. It will have the capability to assess the impact of the country or cluster level dimensions and their interactions on individual level outcomes while taking into account the individual level demographic variables. It would eliminate the problem of cross-level fallacy (Hox, 1995). However, one would require much larger samples from a number of countries in order to do parameter estimations for such models since they would include many more predictor variables that too at different levels of analysis. This poses practical challenges in data collection and must await future study.

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