Song, Donggil & Oh, Eunyoung. (2011). Learning styles based on the different cultural background of KFL learners in online learning. *Multimedia-Assisted Language Learning, 14*(3), 133–154.

It is imperative to analyze learning styles based on learners’ cultural backgrounds when designing successful online learning courses. The present study investigated the learning styles preferences of learners who have diverse cultural backgrounds in an online language learning environment. For this purpose, the study employed the Felder and Silverman’s Learning Styles Model and examined sixty five international students who enrolled in a Korean language course at a university’s language education institute in Seoul, Korea. The participants were culturally diverse and represented numerous countries, which were categorized according to six cultural clusters: China, Japan, Middle East, other Asia, America, and Europe. The online language learning course was analyzed using the active/reflective, sensing/intuitive, sequential/global and visual/verbal dimensions of the model. The participants’ learning style preferences were investigated using a questionnaire. A one-way ANOVA was conducted to compare the effect of cultural backgrounds on learning style preferences of each section. In addition, MANOVA and post hoc multiple comparison of means tests (Scheffé test) were conducted. The results demonstrate significant cultural group differences in learning style preferences of learners of Korean language with diverse cultural backgrounds.

I. INTRODUCTION

Ever since the Internet became a big part of people’s everyday lives, online learning has been growing at a phenomenal rate. However, most of current online learning
designers and instructors tend to employ only one pattern or process to fit in diverse situations (Liegle & Janicki, 2006). Since learners have diverse backgrounds, abilities, and preferences, online learning courses that overlook these differences would have difficulty in satisfying learners’ needs effectively (Atman, Inceoğlu, & Aslan, 2009). The traditional methods used in face-to-face environments (e.g. showing videos or presenting slides) and one-size-fits-all approaches might not be appropriate for an online learning situation.

Therefore, it is crucial to provide different learning environments, such as individualized or personalized learning systems or environments (see Reigeluth, 2009), according to the preferences of the learners and their learning styles. Among the diverse personal differences, individual learners’ learning style preferences provide valuable insights into the educational context (Felder & Spurlin, 2005; Sternberg, 1990; Xu, 2011). For example, there is a significant relationship between the learners’ learning styles and the learners’ academic achievement (Cassidy, 2004; Dunn, 1984; Kopcha & Sullivan, 2007; Park, 1997a).

To date, studies have investigated differences in the learning style preferences of learners with cultural backgrounds (e.g. Park, 1997a, 1997b, 2000). However, the learner differences between cultural backgrounds and learning style preferences in online learning environments have not been explicitly examined. Specifically, there is a lack of research on the impact of second language learners’ cultural backgrounds on their online learning style preferences. Although Park (2002) investigated learning style preferences and cultural backgrounds in the second language education field, her study was focused on the achievement level differences in English learning style preferences. Other studies (e.g. Chen, 2009; Wintergerst, DeCapua, & Verna, 2009; Xu, 2011) investigated the learning style preferences of second language learners. However, they did not address the learners’ cultural backgrounds. Thus, this study aims at investigating learning style preferences based on cultural difference of international students who were learning Korean as a Foreign Language (KFL).

II. LITERATURE REVIEW

1. Individual Differences

Individual differences can affect learning and its processes. Educators, including college instructors (De Vita, 2001) and K–12 teachers (Jenks, Lee, & Kanpol, 2001), might find that even well-organized instruction often fails to engage all learners when they have
learners with diverse cultural backgrounds. Culturally diverse learners might approach learning tasks differently and employ a variety of learning strategies and behavior patterns that they have developed over time. This is called learning style preferences (Baldwin & Sabry, 2003).

1) Learning Styles

Learning styles are one of the most significant factors, which could support individualized or personalized instruction that facilitates learners’ learning and improves their performance (Liu, Kuljis, & Lines, 2007). The concept of learning styles refers to the individual differences related to an individual’s preference (Joy & Kolb, 2009) and “preferred or habitual patterns of mental functioning and dealing with new information” (Ehrman & Oxford, 1990). In addition, learning styles are broadly defined as “cognitive, affective, and physiological traits that relatively stable indicators of how learners perceive, interact with and respond to learning environment” (Keefe, 1979, p. 4) or “the characteristic strengths and preferences in the ways that learners take in and process information” (Felder, 1996).

Though there are several models of learning style, such as Kolb (1984), McCarthy (1980), or Myers–Briggs (Myers, McCaulley, & Most, 1985), researchers (Atman, Inceoğlu, & Aslan, 2009; Baldwin & Sabry, 2003; Cha, Kim, Park, Yoon, Jung & Lee 2006; De Vita, 2001; Liu, Kuljis, & Lines, 2007) believe that the Felder and Silverman Learning Style Model (Felder & Silverman, 1988) is the most appropriate model for online learning systems. In the Felder and Silverman Learning Style Model, there are four dimensions: perception (sensing/intuitive), input (visual/verbal), processing (active/reflective), and understanding (sequential/global). These dimensions are explained in the following: 1) the processing dimension: people who have an active style like being involved in the outside world and enjoy testing in many ways (e.g. discussing and commenting), while people who have a reflective style like observing, working, and manipulating information; 2) the perception dimension: people who have a sensing style appreciate events, data, and experiments, while people who have an intuitive style relish principles and theories; 3) the input dimension: people who have a visual style take pleasure in drawings, graphs, flow charts, and times tables, while people who have a verbal style like words and sounds; 4) the understanding dimension: people who have a sequential style like procedures, while people who have a global style value seeing the whole picture.

There are several advantages of the Felder–Silverman’s (Felder & Silverman, 1988) theory (Baldwin & Sabry, 2003; Liu, Kuljis, & Lines, 2007). It includes other learning style
models (Kolb, 1984; McCarthy, 1980; Myers, McCaulley Most, 1985) and it covers cognitive strategies in other learning theories. The Felder–Silverman’s theory can assist to implement the adaptability of online learning environments in the light of learning style preferences in learners’ four dimensions (e.g. perception, input, processing, and understanding) of instructional information. The learning style preferences in the Felder–Silverman’s theory were developed in order for learners to obtain specific skills relevant to learning goals and instructional objectives. In addition, learning style profiles from the Felder–Silverman’s theory explain behavioral tendencies rather than being accurate predictors of learning processes (Felder & Spurlin, 2005).

2) Cultural Differences

Learners’ cultural backgrounds affect learning preferences for cognitive processing, relating to others, and particular types of classroom experiences (De Vita, 2001). If the learning process and its effectiveness rely on learning styles, online learning should be designed that make use of the relationship between learning style preferences and individual differences. Otherwise, when international students with diverse backgrounds attempt to quickly adapt to novel learning environments, discrepancies between the education that they have received and the present instructional system could be aggravated (Bentley, Tinney, & Chia, 2005).

Regarding learner differences, Park (1997a, 1997b, 2000, 2001) has revealed statistically significant differences in the learning styles of learners with diverse cultural backgrounds. For example, in her study (Park, 1997b), Korean, Chinese, and Filipino learners revealed a preference for the visual style whereas Anglo students were the least visual. Also, Korean, Chinese, Filipino, and Anglo students indicated a preference for working individually while Vietnamese students prefer working in groups.

Recently, as increasing numbers of international learners take online courses that are designed by educators far from their native countries, international students need more support than local students in online environments (Bentley, Tinney, & Chia, 2005). To sum up, greater variations of learning style preferences exist within diverse cultural groups (De Vita, 2001). However, learning style differences and diverse cultural backgrounds in second language learning courses have not been explicitly examined in online learning research.
2. Second Language Learning

Although most of first language learners can show similar levels of linguistic capacity for the basic communication, second language learners’ performances could be significantly different from one another, even when they are exposed to same amounts and quality of second language learning environments (Gardner, Tremblay, & Masgoret, 1997; Jang & Jiménez, 2011). Several studies have revealed that the learners’ individual differences play an important role in foreign or second language learning (Chen, 2009; Ehrman & Oxford, 1990, 1995). In order to provide effective instruction, second language instructors and instructional designers need to identify and understand their students’ individual differences which include the students’ language learning style (Bentley, Tinney, & Chia, 2005; Carrell, Prince, & Astika, 1996; Ehrman & Oxford, 1995).

Cultural backgrounds (e.g. first language communities and various educational experiences) have significantly influenced learners (Bentley, Tinney, & Chia, 2005; Rubenfeld, Clément, Lussier, Lebrun, & Auger, 2006). Also, cultural backgrounds have a strong impact on second language learning (Chen, 2009). Language learners are forced to encounter unexpected situations for learning their second language and cross-cultural experiences in language learning environments (Abraham, 2008). Thus, online learning environments need to support second language learners with opportunities to reflect on their cultural background and the culture of the language they are learning.

Besides cultural backgrounds, learning style preferences could be the most important variables influencing performance in a second language learning environment (Oxford, 1989). Researchers have been trying to find out the most influential factor of individual differences and several studies suggested learning styles as one of the most effective elements (Carrell, Prince, & Astika, 1996; Ehrman & Oxford, 1995; Gardner, Tremblay, & Masgoret, 1997). Learning styles are one of the general approaches that second language learners are likely to use (Ehrman & Oxford, 1990, 1995).

In an attempt to find out learners’ preferred learning styles, many inventories of learning styles that have been developed and used are only for native English speakers (Wintergerst, DeCapua, & Verna, 2009). For instance, Reid’s (1987) Perceptual Learning Styles Preference Questionnaire was the first created for English as a second language learners at the university level. However, as an increasingly growing number of people learn various languages as a second language, the researchers’ focus has changed to the diverse language field. It is difficult for international students to learn a second language (e.g. vocabulary, grammar, or reading) in online learning courses that are not designed to consider their learning style preferences (Bentley, Tinney, & Chia, 2005), which will lead
to different degrees of their learning achievement (Xu, 2011). Thus, instructional designers need to consider the online learners’ learning styles in order to facilitate learning processes and online language learning systems should be developed to consider individual learners’ learning styles.

The purpose of this study was to investigate the learning style preferences of KFL students who are culturally diverse and represent an assortment of countries (e.g. China, Japan, Middle East, other Asia, America, and Europe). We generated two sets of research questions. The first question is ‘What are the distribution patterns of learning style preferences of KFL learners with diverse cultural backgrounds?’ That is, we tried to figure out specific learning style preferences of KFL learners who were culturally diverse and represented various countries. The second question is ‘What relationships are there between cultural backgrounds and learning style preferences of second language learners in online learning environments?’ That is, we tried to investigate whether there were any relationships between learning style preferences and cultural backgrounds of the online language learners.

The main hypothesis was that there would be significant differences in learning style preferences among the various cultural groups in online language learning environments due to the learners’ diverse cultural backgrounds. We also set out to explore relative effects that cultural backgrounds have in comparison with other demographic variables such as gender and age, computer skills, and online learning experience.

III. METHOD

This study employed four dimensions of the Felder and Silverman Learning Styles Model. The topic of instruction (i.e. Comparative) in a regular KFL online learning environment was chosen as a course for the study. To measure learning style preferences, two combination scores (i.e. active/reflective, sensing/intuitive, sequential/global, visual/verbal) were respectively selected as the dependent variables using questionnaires. We also operationalized culture as countries. The choice of nations was from the cultural clusters empirically identified by five instructors who have 5 to 7 years of experience teaching KFL at a university’s language education institute. Thus, the six cultural clusters represented these groups: China, Japan, Middle East, other Asia, America, and Europe.
1. Participants

This study was conducted in a Korean language institution within a university in Seoul, Korea. In this study, the sixty five participants enrolled in the institution were students learning Korean as their second or third language. The participants ranged in age from 20 to 29, with a mean age of 24.8 (male: 56% and female: 44%).

| Table 1 | Cultural Clusters of the Participants |
|---------|---------------------------------------|
|         | China   | Japan | Middle East | *Other Asia | **America | Europe | Total |
|---------|---------|-------|-------------|-------------|-----------|--------|-------|
| China   | 9       | 10    | 6           | 13          | 13        | 14     | 65    |

* Other Asia: Asia except Japan, China, and Middle East.
** America: the United States and Canada.

The participants were culturally diverse and represented various countries: China, Japan, Middle East, other Asia, America, and Europe (see Table 1). The experiment was conducted at the end of the semester.

2. Materials

The Felder and Silverman Learning Style Model was adopted in this study, because it is considered the most appropriate model for online learning systems (Atman, Inceoğlu, & Aslan, 2009; Baldwin & Sabry, 2003; Liu, Kuljis, & Lines, 2007). The Index of Learning Style (ILS) (Felder & Soloman, 2009) was converted to the direct preference questionnaire in this research as an appropriate category for designing the learner diagnosis in that each learning style can be classified into several distinctive preferences. The questionnaire has four dimensions: 1) active/reflective (processing); 2) sensory/intuitive (perception); 3) global/sequential (understanding); and 4) visual/verbal (input). Table 2 shows relevant patterns for various sections and dimensions in the Korean language online learning course.

The online language learning (see Figure 1) for teaching Korean was employed for this study. Learning contents in the online course were composed of 12 units especially for KFL novices. Each unit took from 15 to 25 minutes to complete. Learning units were investigated into eight learning styles (see Table 2). There are 5 main features: Vocabulary (i.e. Words and 2 Practices), Role Play, Grammar (i.e. Notes and 5 Practices), Reading, and Culture. In the Vocabulary section, there are Korean words supported by text and pictures. The Role Play section includes the main aspect of subject supported
with interactive features (see Figure 2). In the Grammar section, just like in the Vocabulary part, there are several sentences supported with pictures (see Figure 3 and 4). The Reading section includes global features, and finally in the Culture section, there are instructional materials about the subject.
Each unit was labeled as visual, verbal, verbal/sensing, visual/sensing, active, global/verbal and global/reflective (see Table 2). For example, the Role Play section was labeled as active of the processing dimension (active/reflective) because learners choose and play a role in the online learning environment (see Figure 2).
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The Grammar–Notes section was labeled as verbal of the input dimension (visual/verbal) because learners can learn this section with the verbal explanations and audio files (see Figure 3). On the other hand, the Grammar–Practice 1 section was labeled as visual of the input dimension (visual/verbal) because students can learn the meaning of the Korean sentences by answering questions based on several pictures (see Figure 4). These labels were determined in parallel to dimension of Felder and Silverman Learning Styles Model.

[Table 2] Sections and Dimensions in the Korean Language Online Learning Course

| Section | Dimension | Value and Label |
|---------|-----------|----------------|
| 1 Words | Input (visual/verbal) | (-) Verbal |
| 2 Vocabulary Practice 1 | Perception (sensing/intuitive) | (+) Sensing |
| 3 Practice 2 | Input (visual/verbal) | (+) Visual |
| 4 Role Play | Processing (active/reflective) | (+) Active |
| 5 Notes | Input (visual/verbal) | (-) Verbal |
| 6 Practice 1 | Perception (sensing/intuitive) | (+) Sensing |
| 7 Practice 2 | Input (visual/verbal) | (+) Visual |
| 8 Grammar Practice 3 | Perception (sensing/intuitive) | (+) Sensing |
| 9 Practice 4 | Input (visual/verbal) | (-) Verbal |
| 10 Practice 5 | Perception (sensing/intuitive) | (+) Sensing |
| 11 Reading | Understanding (sequential/global) | (-) Global |
| 12 Culture | Processing (active/reflective) | (-) Reflective |

Twelve questions performed by learners gave evidence about their learning style preferences. The questionnaire consisted of sets of 12 statements with Likert-type responses (i.e. Strongly disagree, Disagree, Neither agree nor disagree, Agree, and
Strongly agree) on each of the online learning section (e.g. Vocabulary–Words, Role Play, or Grammar–Practice 1).

3. Procedure

The institute contains two computer labs with 80 IBM-compatible computers. The participants visited the lab and took the online KFL course. In the stage of data collection, the questionnaire was administered to the online learners. The study that identified and measured learning style preferences relied on a self-reporting questionnaire. The total subjects (N=65) responded to the survey and 62 responses (i.e. submitting substantially incomplete responses) were used in the analysis. Each of the 12 items was scored on a five-point basis ranging from -2 to 2, that is, Strongly disagree (-2), Disagree (-1), Neither agree nor disagree (0), Agree (1), and Strongly agree (2). In ILS, there are four dimensions and 11 items for each dimension, which is a bipolar scale so there can be two answers for each item. Likewise, in this study, if the Role Play item (see Table 2) scored -1 (i.e. Disagree), the score of the processing dimension (i.e. active/reflective) would get -1.

A one-way between subjects Analysis of variance (ANOVA) was conducted to compare the effect of cultural backgrounds on learning style preferences of each section. In order to analyze the overall learning style preferences, the preference score which is related to the specific learning style was divided by the number of learning style dimensions. For example, the total preference score for visual sections (i.e. Vocabulary–Practice 2, Grammar–Practice 1, 2, 3) was divided by 4 in order to achieve learners’ visual/sensing levels because there are 4 visual dimensions on the online learning course. The group means were broken down into three ranges: moderate learning style preferences (0.66 or less), mild learning style preferences (0.67 to 1.32), and strong learning style preferences (1.33 and above). In addition, participants self-reported their countries, age, gender, and computer skills. Multivariate analysis of variance (MANOVA), univariate F tests, and post hoc multiple comparisons of means tests (Scheffé test) were performed.

IV. RESULTS

There was a significant effect of cultural backgrounds on the active/reflective learning style of Role Play ($F(5,56) = 3.36, p < .05$) and Culture ($F(5,56) = 8.96, p < .001$). In addition, there was a significant effect of cultural backgrounds on the sensing/intuitive
learning style of Vocabulary–Practice 1 ($F(5,56) = 3.29, p < .05$), the visual/verbal learning style of Grammar–Practice 1 ($F(5,56) = 8.79, p < .001$), and the sequential/global learning style of Culture ($F(5,56) = 8.96, p < .001$). However, there was not a significant effect of cultural backgrounds on learning styles of Vocabulary–Words, Vocabulary–Practice 2, Grammar (except Practice 1), and Reading.

| Table 3 | Learning Style Preference Means and Standard Deviations by Cultural Background |
|---------|-----------------------------------------------------------------------------|
|         | Processing                  | Perception                  | Understanding                | Input                        |
|         | Active(+) · Reflective(-)   | Sensing(+) · Intuitive(-)   | Sequential(+) · Global(-)   | Visual(+) · Verbal(-)        |
|         | M     | SD   | M     | SD   | M     | SD   | M     | SD   |
| China (8) | -.86  | .83  | 1.03  | .63  | -1.19 | .70  | -.11  | .21  |
| Japan (10) | -1.4  | 1.07 | .48   | .67  | -.60  | .70  | .33   | .40  |
| Middle East (5) | 1.25 | .96  | .30   | .12  | .88   | .63  | .40   | .41  |
| Other Asia (12) | -.77 | 1.10 | .95   | .73  | -1.10 | .92  | .11   | .33  |
| America (13) | .85   | .90  | .65   | .96  | -.92  | .61  | .05   | .70  |
| Europe (14) | -.21  | .70  | .81   | .34  | -.54  | .99  | .01   | .38  |
| Total (62) | -.29  | 1.23 | .75   | .69  | -.74  | .92  | .10   | .46  |

Figure 5 shows the resulting bar chart of learning style preferences (error bars: 95% confidence intervals). The bar chart displays the mean and the confidence interval of those means. Table 3 shows the results of overall learning style means and standard deviations by cultural backgrounds. Learners with the cultural backgrounds of America ($M = .85, SD = .90$) and Middle East ($M = 1.25, SD = .96$) were the active learning style, whereas the other cultural cluster groups exhibited higher tendency to the reflective style. The result indicates that all groups were overwhelmingly the sensing learning style as opposed to the intuitive style. Only the Middle Eastern learners ($M = .88, SD = .63$) preferred the sequential learning style and the Chinese participants ($M = -.11, SD = .21$) showed the verbal learning style. In terms of the breakdown of each style (i.e. moderate: 0 to ±0.66, mild: ±0.67 to ±1.32, and strong: ±1.33 to ±2), 50% of the population exhibited a mild preferences and 42% exhibited moderate tendencies. On the other hand, 8% showed strong learning style preferences.
There was a significant cultural group difference in the learning style preferences of KFL students with diverse cultural backgrounds. The results of a MANOVA revealed that learning style preferences were significantly affected by cultural backgrounds (Wilks’ lambda=.331, $F(20,177)=3.50$, $p<.001$). However, there was no significant difference between cultural backgrounds and other variables, such as age (Wilks’ lambda=.313, $F(64,167)=.90$, $p>.05$), gender (Wilks’ lambda=.945, $F(4,57)=.83$, $p>.05$), and computer skill (Wilks’ lambda=.891, $F(8,112)=.83$, $p>.05$). The results showed strong associations between cultural backgrounds and learning style preferences.

Follow-up univariate F tests were performed to investigate the main effect of cultural backgrounds on learning styles. The F test results showed that there were statistically significant cultural group differences in the active/reflective ($F(5,56)=10.23$, $p<.001$) and the sequential/global ($F(5,56)=4.66$, $p<.05$), on the other hand, there were non-significant treatment effects on the sensing/intuitive ($F(5,56)=1.25$, $p>.05$) and the visual/verbal ($F(5,56)=1.35$, $p>.05$).
To investigate cultural group differences in learning style preferences, post hoc multiple comparisons of means tests were performed. The tests revealed that: American students (.85) and Middle Eastern students (1.25) showed statistically significant preference for the active learning style than Chinese students (-.86), Japanese students (-1.4), and other Asian students (-.77) (Scheffé test, \( p < .05 \)). Middle Eastern students (.88) showed statistically significant preference for the sequential style than American students (-.92), Chinese students (-1.19), and other Asian students (-1.10) (Scheffé test, \( p < .05 \)). On the other hand, there were no statistically significant differences in the sensing/intuitive and the visual/verbal learning style preferences (Scheffé test, \( p > .05 \)).

V. DISCUSSIONS

Several studies have focused on cultural aspects of learning style preferences (Bell, 1994; Ryan, 1992) and have identified cultural differences in the learning style preferences of various backgrounds (Dunn & Griggs, 1990; Park, 1997a, 1997b, 2000; Reid, 1987). However, research on second language learning styles related to cultural differences in online learning environment has not been explicitly investigated. This study examined learning style preferences based on cultural differences of international KFL students. There was a significant cultural group difference in learning style preferences of KFL learners with diverse cultural backgrounds. As learners’ differences might explain the rate and the degree of success of language learners (Wintergerst, DeCapua, & Verna, 2009), different cultural backgrounds and learning style preferences could account for their different level of performance.

The results show that there is a significant effect of cultural backgrounds on the dimensions of the active/reflective learning style in the Role Play and Culture section. Also, there is a significant effect of cultural backgrounds on the dimensions of the sensing/intuitive learning style in the Vocabulary–Practice 1 section, the visual/verbal learning style in the Grammar–Practice 1 section, and the sequential/global learning style in the Culture section. Although the Grammar section includes 6 items (i.e. Notes and 5 Practices) of the survey, only 1 item (i.e. Practice 1) shows the statistically significant relationship between cultural backgrounds and learning style preferences. The result of each survey item revealed that cultural backgrounds might affect all four dimensions of learning styles.

As the overall MANOVA result indicated, there was a significant cultural group
difference in the learning style preferences of multicultural KFL students. The findings in this study are consistent with previous research (Joy & Kolb, 2009), as indicated that culture has an impact on the learning style preference that is comparable to that of some of the demographic variables. One of the most influential factors in learner differences could be the learning style related to cultural backgrounds. For instance, as revealed in this study, in terms of the input (visual/verbal) style, second language learners tend to exhibit a marked preference for the visual style of information perception (De Vita, 2001). Based upon the findings of this study, instructional designers are encouraged to use more sensing (for all cultural groups) and visual (except the group of China) materials to offer appropriate instruction for KFL learners (Reid, 1995; Xu, 2011). Many variables of individual differences directly influence language learning success (Ehrman & Oxford, 1995). In this sense, in order to design a successful online language learning system, the learning styles of culturally diverse learners needs further exploration.

Learning styles might be fixed and it is not easy to be changed as people cannot easily change their personality, habit, or cognitive style (Xu, 2011). Thus, providing individualized instruction (Brown, Cristea, Stewart, & Brailsford, 2005) considering their learning styles could be one solution for current online learning system. Instructional designers need to understand that considering learners’ cultural background could complement the current online learning design requirements. Add to that, language instructors should take the differences of learning style into account in the process of teaching online as well as face-to-face instruction. They should teach in a balanced way according to the learning style of learners with diverse cultural background.

Recently, it is easy to find our classrooms filled with students from various culture (Joy & Kolb, 2009), the online learning market becomes increasingly global, and it is much easier for many international learners to enroll in online learning courses. This means that online learning designers and instructors should try to use appropriate instructional strategies considering learners’ different learning styles. To be specific, second language instructors will need to know the learning style difference in relation to learners’ optimal and practical use in online language learning. In the multicultural online learning community, there are considerable cases for possibilities of failed communication across cultures between learners and online learning systems as well as among learners. Managing this problem, firstly, “requires a well-conceived pedagogy and careful selection of technologies to match purpose” (Levy, 2009). Add to that, adaptive technologies could be employed for the effective instruction (Sun, Ousmanou, & Williams, 2004).

Second language learners’ cultural backgrounds might affect their behaviors, activities,
and even goals and desires (Jang & Jiménez, 2011). Thus, second language learning systems have to be adapted to learners’ learning styles and have to find out appropriate instructional designing approaches. This is because that traditional methods of online instructions, which overlook learner differences (e.g. a one-size-fits-all approach), seem to be ineffective with learners who have diverse and different cultural backgrounds with different learning style preferences (Carrell, Prince, & Astika, 1996; De Vita, 2001). One way is to give learners control over elements of instruction, which may lead to improvements in achievement (Kopcha & Sullivan, 2007).

As the number of online learning courses has been increasingly growing, considering instructional aims and cultural expectations could provide important implications for educators. Thus, future research is needed to investigate the effectiveness of providing online learning courses related to learners’ learning styles, add to the difference of learning style preferences as examined in this study. In addition, future research needs to attempt to enhance learning performance by addressing several factors regarding cultural backgrounds, such as specific strategy choices (Cohen, 2003; Nisbet, Tindall, & Arroyo, 2005), online interactions (Sabry & Baldwin, 2003), learner controls (Liegle & Janicki, 2006), adaptive learning systems (Cha, Kim, Park, Yoon, Jung & Lee 2006; Liu, Kuljis, & Lines, 2007), and grade levels (Chen, 2009) as well as different learning style preferences. Learners inevitably have different learning styles and preferences are related to learner behaviors on user interface of online learning environments (Cha, Kim, Park, Yoon, Jung & Lee 2006). Thus, further research on user interface that can adapt to each individual’s specific preferences is needed to implement intelligent learning environments (Karger & Quan, 2004).

The main goal of this empirical study was to reveal if there was a significant difference of learning style preferences in online second language learners with diverse cultural backgrounds. The results revealed that learners have different learning style preferences related to their cultural backgrounds. The results obtained indicate insightful data with regard to learners’ learning style preferences in online learning environments. In order to offer effective online learning systems for multicultural learners, it is significant that instructional designers design a detecting system for finding learners’ learning style preferences and an adjusting system for accommodating the diverse learning styles of learners. Thereafter, online learning systems could meet the learning needs of the learners with various opportunities for effective learning. In addition, learners should be instructed how to use their learning styles to learn their second language in order to be involved more effectively in their own learning. Many online learning courses still adopt
one–fits–for–all approaches when the course is designed, developed, and delivered. Even though these courses are sufficient for educational purposes and reflect perspectives of instructional design, those might overlook each individual learner’s learning style preferences. We need to continue to reflect on second language online learning systems and assess learning style preferences based on cultural backgrounds, which can remain highly relevant for language learning.

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APPENDIX

1. Learning Style Questionnaire

1. Please indicate your gender.
   : Male ___ / Female ___
2. What is your age?
   : ______
3. Where have you lived (city and country)?
   : ____________________ / ____________________
4. What’s your cultural background?
   : China __ / Japan __ / Middle East __ / Other Asia __ / America __ / Europe __
5. Have you taken online course(s)?
   : Yes ___ / No ___
6. Please indicate your computer skill.
   : Good ___ / Not good but not bad ___ / Not good ___
7. Please indicate your preference.

| I like the instructional style of the learning phase | Strongly disagree | Disagree | Neither agree nor disagree, | Agree | Strongly agree |
|-----------------------------------------------------|-------------------|----------|-----------------------------|-------|---------------|
| 1         Vocabulary/words                           |                   |          |                             |       |               |
| 2         Vocabulary/practice1                      |                   |          |                             |       |               |
| 3         Vocabulary/practice2                      |                   |          |                             |       |               |
| 4         Role play                                  |                   |          |                             |       |               |
| 5         Grammar/notes                              |                   |          |                             |       |               |
| 6         Grammar/practice1                         |                   |          |                             |       |               |
| 7         Grammar/practice2                         |                   |          |                             |       |               |
| 8         Grammar/practice3                         |                   |          |                             |       |               |
| 9         Grammar/practice4                         |                   |          |                             |       |               |
| 10        Grammar/practice5                        |                   |          |                             |       |               |
| 11        Reading                                   |                   |          |                             |       |               |
| 12        Culture                                   |                   |          |                             |       |               |
Key words: learning styles, cultural background, online language learning, Korean as a foreign language
Applicable levels: adult education

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