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Motivation, Learning Strategies, and Language Competency in a Technology Facilitated Chinese as a Second Language Classroom

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Abstract

The present study examines the effectiveness of a game-based mobile technology application *Kahoot* on the motivation and language competency of high school student learning Chinese as a foreign language, and the relationship among student motivation, learning strategy use, and language competency in such a technology-facilitated classroom. Data was collected using pre- and post-surveys from a class of 18 students taught by a teacher candidate in a Chinese teaching licensure program at a state university. The results indicate significant student improvements in two areas of Chinese language learning: reading and speaking, though no significant difference was found in the areas of listening and vocabulary or in student motivation. Motivation and learning strategies were found to be positively related to Chinese proficiency, with the exception of cognitive and affective strategies which mainly correlate with Chinese speaking competency. Findings and limitations of the study were discussed and implications for future research were suggested.

Keywords: Chinese as a second language, educational technology, game-based learning, motivation, learning strategies, language competency, secondary education

科技手段对中文二语学习者的学习动机、策略及语言能力的影响

摘要

本研究旨在考察基于游戏的移动科技应用平台 *Kahoot* 对美国高中生学习中文的动机和语言能力的影响，以及在这样一个使用科技手段的课堂教学中学生学习动机、学习策略和语言能力之间的关系。本研究的数据由在某州立大学攻读教师执照的实习教师以问卷调查的形式从所教的 18 名学生中搜集而来。数据分析的结果表明学生在阅读和会话两个方面有显著进步，在听力、词汇和学习动力方面没有显著变化。此外，学习动机和策略与汉语语言能力呈正相关，唯一例外的是认知和情感类的策略只和汉语会话能力相关。本文对上述研究结果、研究的局限性和未来的研究方向做了讨论。

关键词: 汉语第二语言, 教育科技, 基于游戏的学习, 动机, 学习策略, 语言能力, 中学教育

Introduction

With the globalization of world economy, there is an increasing demand for proficiency in foreign languages among U.S. workforce (National Education Association, 2012). While Spanish and French have been the most widely offered second languages in U.S. schools, Chinese as a second language (L2) is getting more attention nowadays. Chinese is the national language of China, one of the world's most populous countries and most dominant economic powers. Forbes magazine (Patton, 2016) predicts that China's contribution to global economy will exceed that of the U.S. in 2018. It is therefore not surprising that many educators and parents in the U.S. increasingly favor the addition of Chinese as L2 to the k-12 curriculum. At the same time, more than 100 Confucius Institutes, funded and staffed by the Chinese government, have been established in the U.S. Besides hosting cultural enrichment and language learning activities, these institutes also provide a consistent supply of volunteer Chinese teachers at no cost to local schools. As a result, the number of U.S. elementary, junior high and senior high schools that offer Chinese L2 programs has doubled from 2013 to 2015, to an unprecedented 550 schools (Shao, 2015).

In spite of its growing popularity, empirical research in the teaching and learning of Chinese L2 has been quite limited, compared to research in the teaching and learning of other L2 such as Spanish or French. With a historically high enrollment in Chinese L2 programs in the U.S. schools, there is an urgent need for more research in this area in order to develop new knowledge about different approaches to the teaching and learning of Chinese L2 and to inform educators of the best practices in Chinese L2 instruction. The purpose of the present study is to examine the motivation, language learning strategies, and L2 competency among students taking Chinese L2 lessons in a technology-facilitated classroom with full integration of game-based learning.

Literature Review

Motivation plays an important role in student engagement and goal attainment in language learning (Henter, 2014). A predominating theory of motivation in L2 learning is Gardner's socio-educational model (Gardner & Lambert, 1959). Formulated based upon research with French L2 learners in Canada, the socio-educational model highly emphasizes the social, contextual and pragmatic reasons for people to engage in L2 learning. An important concept in the socio-educational model is the integrative orientation (vs. instrumental orientation), which refers to the desire to learn L2 for the purpose of having contact with members of the L2 community. This model also includes attitudes to the teacher and the course.

While Gardner and his followers have made revisions to the socio-educational model after it was first proposed (e.g., Gardner, 2011), many researchers believe that it over-emphasizes the community and cultural contexts and a broader perspective of motivation is needed in order to take into consideration of the cognitive processes at an individual level (Dörnyei, 1994). Perhaps the most comprehensive model of motivation in L2 learning is a framework proposed by William and Burden (1997), which covers a wide range of internal and external factors. Specifically, the internal factors in their model include intrinsic interest, perceived value, goal orientation, goal-setting, self-efficacy, anxiety, attributions, and attitudes, whereas the external

factors include significant others, the nature of interactions, the learning environment, and the broader social and cultural contexts.

There is much evidence that motivation can predict a significant amount of variance in L2 achievement above and beyond a student's language aptitude (e.g., Clément & Kruidenier, 1985). While anxiety is considered a huge barrier to language acquisition with consistent empirical support, an integrative instead of instrumental orientation and a positive attitude towards the foreign language and the culture where it came from can facilitate student engagement and strategy use and positively impact student L2 achievement. Nevertheless, since it is a sophisticated construct with a history of controversial conceptualizations, measuring L2 motivation could be a challenging task. Attempts have been made to explore different ways to measure multiple aspects of motivation for L2 learning (Gardner & MacIntyre, 1993; Henter, 2014). Findings indicate that motivational factors tend to be highly correlated with each other and when combined, can explain student achievement better than any single factor.

Language learning strategies are specific actions taken by the learners to make language learning "easier, faster, more enjoyable, more self-directed, more effective, and more transferable to new situations" (Oxford, 1990, p.8). Oxford classified strategies for language learning into six groups: *memory strategies* for storing and retrieving information, *cognitive strategies* for comprehension and production, *compensation strategies* for overcoming limitations in linguistic knowledge or performance, *social strategies* for cooperative interactions, *affective strategies* to help control motivation and emotions, and *metacognitive strategies* such as planning, organizing, focusing, and monitoring the learning process. Successful L2 learners tend to use language learning strategies more often than their less successful peers (Green & Oxford, 1995; Vandergrift, 2003). A review of previous research also indicates that effective language learners seem to "use a variety of appropriate metacognitive, cognitive, and social-affective strategies for both receptive and productive tasks while less effective students not only use strategies less frequently, but have a small repertoire of strategies and often do not choose appropriate strategies for the tasks" (Chamot & Kupper, 1989, p. 246).

Computer technology and the Internet are playing a more and more important role in L2 teaching and learning. Earlier research in technology-facilitated language learning focuses on web-based audiovisual media, digital annotations, computer-assisted drill practices, and computer-mediated communication (Salaberry, 2001). In recent years, ground breaking technology innovations have enabled affordable high speed Internet, mobile devices such as laptops, tablets and smartphones, and easy uploading and downloading of audio and video materials. Such innovations allow an unlimited variety of approaches to using technology to facilitate learning both individually and collaboratively, in school settings and at home. One of the most effective technology applications in language learning is the use of computer games. Review of existing research indicates that language learners seem to benefit from participation in computer games in many areas of language development such as reading, writing, and conversation skills (Peterson, 2013).

One popular example of a game-based learning platform is *Kahoot* (Wang, 2015). This is a free application that can be installed on any computer device with a web browser. While using *Kahoot*, teachers can create Kahoots to build and customize multiple choice quizzes. When they

launch a Kahoot in the classroom, the multiple choice questions will be shown on the screen in a timed manner. Students are then asked to enter their answers as quickly as possible using any stationary or mobile computer device. For every question answered correctly, students will earn points and view their current scores and rankings real time. Students can play this game either individually or as a team. When a quiz is over, the students or student teams with the highest scores are displayed on the screen. There is some evidence that *Kahoot* seems to have a positive influence on student motivation and participation (e.g., Olatoye, 2015).

In the present study, we examine the motivation, language learning strategies, and competency among students taking Chinese L2 lessons in a technology-facilitated classroom with the implementation of *Kahoot* activity in each lesson. Our research question is two-folded: First, what is the impact of a game-based mobile application on the motivation and competency of learners of Chinese L2? Second, what is the relationship among motivation, language learning strategies, and Chinese competency? We hypothesize that students who used mobile applications for learning Chinese L2 for a whole semester would develop higher motivation and competency and that both motivation and language learning strategies are related to Chinese competency.

Method

Participants

Participants in this study included all 18 students who were taking an optional Chinese as a second language class at a private, all female high school in Midwestern U.S. in spring 2015. Among the 18 participants, 8 were in 9th grade and 10 were in 10th grade. The participants were mostly White and consisted of 15 Caucasians, 2 Asians and 1 Hispanic. The teacher of the Chinese class was student teaching at this high school as a candidate in the Chinese teaching certificate program at a four-year Midwestern university.

Procedures

Prior to the implementation of our study, the Chinese language teacher candidate was trained in the use of *Kahoot*. In our study, *Kahoot* was used daily during each of the 45-minute class sessions in the Chinese classroom. The Chinese language teacher would develop a Kahoot in advance and launch it in the classroom 15 minutes prior to the end of the class. After a brief review of the contents that have been covered, the game would begin with questions shown on the screen one after another. Students would compete to answer the questions using their mobile device, usually their cell phone. When the quiz was over, names of the five top players would be displayed on the screen. The teacher would congratulate them and give them a small gift. The whole class would then throw a little celebration to conclude the lesson.

All participants completed a pre-survey in class at the beginning of the semester and a post-survey at the end of the semester. The Chinese language teacher administered the surveys after explaining the procedures and provided clarifications when students had questions about specific survey items. Survey forms were distributed in class and students were asked to take it home and bring it back in a week.

Measures

Identical pre and post surveys were used in this study for data collection. The survey consists of a demographic section with questions about the student's grade level, age, gender, ethnicity, primary language at home, level of Chinese study, and amount of time spent on Chinese learning. There are three Likert-type scales in the pre- and post-survey: Motivation for Chinese Language Learning, language learning strategies, and Chinese competency.

Motivation for Chinese Language Learning. This scale is adapted from a measure of student beliefs about Chinese learning developed by Lan (2014). We use seventeen statements from the affective subscale and ask students to respond according to a 5-point Likert-type scale (1 = "strongly disagree", 5 = "strongly agree"). Sample questions are "I find great pleasure in learning Chinese" and "Chinese will make me more competitive in the job market".

Language Learning Strategies. This is a short version of Oxford's (1990) Strategy Inventory for Language Learning (SILL) scale. The original scale consists of 50 items grouped into six categories, each as a subscale representing a specific type of language learning strategies. Ardasheva and Tretter (2013) developed a shorter 28-item version of SILL based on results of factor analyses and input from a panel of experts. The short version maintains the structure of six categories but has fewer items in each category. Students rate the frequency of them applying the learning strategy described in each item using a five-point Likert type scale, where 1 = "never or almost never true of me" and 5 = "always or almost always true of me". The majority of the six subscales of the short version shows satisfactory reliability: *memory* (7 items, $\alpha = .77$), *cognitive* (5 items, $\alpha = .63$), *compensation* (5 items, $\alpha = .63$), *metacognitive* (4 items, $\alpha = .72$), *affective* (3 items, $\alpha = .71$), and *social* (4 items, $\alpha = .75$).

Chinese Competency. This scale was adapted from a self-efficacy for foreign language learning instrument developed by the National Foreign Language Resource Center (2000). It consists of 20 questions, 5 on each of the following four areas: reading, listening, speaking, and vocabulary. On a scale that ranges from 0 (not sure at all) to 100 (completely sure), students would rate how sure they are completing a specific Chinese learning task such as figuring out the main topic/gist or retelling in English what they read when reading a text in Chinese.

Results

Results were based on 17 of the original 18 students, after the removal of data from one careless student who entered 0s in a random way when responding to the language competency scales. Mean substitution was used for a few missing values on individual items.

Paired *t*-tests were conducted to examine whether there were significant differences in student motivation and competency for Chinese as a second language. As indicated in Table 1, there was no significant difference in motivation, $t(16) = .476, p = .64$. Among the four areas of Chinese competency, we found significant differences in reading, $t(16) = 2.63, p < .05$, and in speaking, $t(16) = 3.633, p < .01$. There was no significant difference in student competency for Chinese listening, $t(16) = 1.427, p = .173$, or Chinese vocabulary, $t(16) = .364, p = .721$.

Table 1

Means and Standard Deviations of Student Motivation and Chinese Competency Before and After *Kahoot* Intervention

Variables	Pre-intervention		Post-intervention	
	Mean	SD	Mean	SD
Motivation	3.94	.59	3.90	.64
Competency-Reading	59.88*	18.17	69.18*	12.94
Competency-Listening	51.76	19.05	57.41	18.40
Competency-Speaking	50.71*	17.73	61.29*	15.64
Competency-Vocabulary	69.41	13.26	70.24	12.90

Note. * $p < .05$.

Table 2

Correlation Coefficients among Motivation, Learning Strategies, and Chinese Competency

	1	2	3	4	5	6	7	8	9	10	11
1. Motivation	1										
2. Memory	.32	1									
3. Cognitive	.14	.52*	1								
4. Compensation	.39	.81**	.45	1							
5. Metacognitive	.59*	.47	.15	.36	1						
6. Affective	.12	.61**	.55*	.59*	.23	1					
7. Social	.56*	.37	.51*	.48	.42	.40	1				
8. Reading	.76**	.49*	.41	.54*	.68**	.38	.66**	1			
9. Listening	.72**	.51*	.38	.59*	.64**	.40	.67**	.83**	1		
10. Speaking	.72**	.60*	.50*	.75**	.69**	.48*	.65**	.84**	.90**	1	
11. Vocabulary	.67**	.52*	.18	.61**	.67**	.06	.50*	.72**	.77**	.78**	1

Note. Scales 2-7 are the six learning strategies subscales. Scales 8-11 are the four Chinese competency subscales. * $p < .05$. ** $p < .01$.

As indicated in Table 2, motivation for learning Chinese is significantly related to all four aspects of Chinese competency with moderate to high correlation coefficients: reading ($r = .76$), listening ($r = .72$), speaking ($r = .72$), and vocabulary ($r = .67$). Motivation is significantly related to two of the six learning strategies with moderate correlation coefficients: metacognitive ($r = .59$) and social ($r = .56$). Four of the six learning strategies are significantly related to all four aspects of Chinese competency while the remaining two are significantly related to one of the four aspects. Specifically, correlation coefficients range from .64 - .69 for the use of metacognitive strategies, .50 - .67 for the use of social strategies, .54 - .75 for the use of compensation strategies, and .49 - .60 for the use of memory strategies. The use of cognitive strategies and the use of affective strategies are only significantly related to Chinese speaking competency, $r = .50$ and .48 respectively. The four aspects of Chinese competency are correlated highly or moderately with each other, with coefficients ranging from .50 to .90.

Discussion

Overall, the present study provides evidence for the effectiveness of game-based learning environment in the teaching of L2 Chinese to high school students. Students in our study demonstrated significant improvement in two of the four areas of Chinese language skills: reading and speaking. They also improved in the area of listening by about a third of the standard

deviation though the pre-post difference did not reach statistical significance. In contrast, they showed no improvement in the area of vocabulary.

Regarding our research question about the role of motivation and learning strategy use in the acquisition of language competency in a technology-facilitated classroom, the present study indicates that both motivation and strategy use play important roles in the development of Chinese L2 competency. Students who are highly motivated and use learning strategies more often also tend to have high levels of Chinese competency in reading, listening, speaking, and vocabulary. Relatively speaking, cognitive and affective strategies seem to have a smaller impact on language competency, especially on the acquisition of vocabulary, than the other strategies.

A plausible explanation of findings above is that the acquisition of Chinese vocabulary can be very challenging to English-speaking learners and the process may differ greatly from the process of acquiring Chinese reading, listening and speaking skills. This would particularly be true when the teacher provides *Pinyin* for Chinese texts when presenting reading, listening and speaking tasks but does not do so when focusing on recognition of Chinese characters (*i.e.*, vocabulary) which have no direct correspondence to any alphabetic system that languages like English represent and the *Pinyin* system mimics. Visible progress in Chinese vocabulary acquisition may require not only a different set of learning strategies but also a much higher level of commitment and persistence than other Chinese language learning tasks require, which could frustrate teenage learners, even some of the more motivated ones.

Our study also indicates that motivation may only have a small influence on how frequently a Chinese L2 learner uses language learning strategies. Students who are more motivated for learning Chinese L2 tend to use compensation and social strategies more often than those who are less motivated. Research shows that language learning strategy use is task-specific and successful learners tend to use only those strategies that they judge as appropriate and effective for the task to be completed. This may explain why we fail to find significant relationships between motivation and the use of memory, cognitive, metacognitive, or affective strategies, if the tasks used in *Kahoot* practice require the use of compensation and social strategies more than the use of other strategies. Another possible explanation is that students in our study showed strong motivation throughout the course and the restricted range of motivation may result in reduced correlation.

Of course, our study has some limitations and cautions should be taken when attempting to generalize our findings to other settings of L2 instruction. First, the target L2 in our study is Chinese and the student population is teenage girls from an all-female private high school. Thus, our findings may not apply directly to the teaching and learning of other L2 such as Spanish or French, or to other student populations. Second, the sample size is relatively small in our study, which reduces the power of our statistical analysis. Findings may differ if more students were recruited. For example, some of the pre-post differences and correlation coefficients would likely turn out statistically significant with a larger sample size. Third, *Kahoot* is used in every lesson as a core component of instruction in our study. Findings may not be generalized to Chinese L2 classrooms where teachers integrate technology in a different way or to a lesser degree. Future studies on student motivation, learning strategies, and competency in second language education

may consider a larger sample size, a different L2, a different student population, or a different approach to integrate technology.

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