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Language Learning with Mobiles, Social Media and Gamification in Mongolia: Possibilities and Challenges

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Abstract: In this paper, we present the design and evaluation of the mobile-assisted language learning (MALL) program that was implemented in three schools in Mongolia, and how students perceived the efficacy of such a digital learning solution for improving their English competency. The digital learning solution employed in this research includes mobiles, social media, and gamification to help students learn English through contextualized social learning processes. The students (N=67) completed the perception survey that measured their perceived efficacy of the digital learning solution. In addition, interviews with selected students and teachers were conducted to further investigate their experiences and challenges faced during the intervention. Overall, the findings indicate high levels of student participation throughout the intervention period and their increased interest towards English learning. In conclusion, we discuss both possibilities and challenges of integrating digital learning solutions in the developing world.

Keywords: Gamification, Facebook, mobile-assisted language learning (MALL), digital learning, international development

1. Introduction

Mongolia, a rapidly developing country in Asia has been facing new challenges brought by rapid modernization and urbanization since its political democracy has emerged in the 1990s. The fall of Soviet Union, the extreme climate, and the recent economic crisis have created a unique emergency situation in which people in the rural area have been abandoning the nomadic lifestyle and moving to the capital city. This recent phenomenon has also been heavily influencing Mongolia's public education system. Many nomads head to the capital in search of better schooling for their children (Kingsley, 2017). Due to the insufficient number of public schools which cannot accommodate the rapidly increasing student population in Ulaanbaatar, most students have to share school buildings and can only receive on average 4 hours of education a day.

Concerning the emerging challenges that Mongolian public education has been facing, the main goal of this research program was to investigate how gamification and social media can be incorporated into the design of an effective mobile-assisted language learning (MALL) program in Mongolian public schools, in order to promote effective contextualized learning experiences. This study was implemented in Mongolia to deliver a new model of mobile-assisted language learning to teachers and students. We believed that a packaged model with pre-defined content would not be a sustainable solution in developing countries in the long-term since such solutions often rely on the expertise of external researchers. Beyond the content-delivery model of language learning, this project explored how to motivate and empower learners in the developing world to participate in social learning environments where they can exchange ideas and generate learning content that are meaningful and relevant to them. Our digital learning solution includes the integration of social media and mobiles that are readily available in Mongolia. Further, we explored the use of gamification in the

learning activity design to make learning experiences more learner-centered and participatory. This paper presents the design and evaluation of the MALL program that was implemented in three schools in Mongolia, and how students perceived the efficacy of such the MALL solution for improving their English competency. In conclusion, we discuss both possibilities and challenges of integrating such digital learning solutions in the developing world.

2. Theoretical Background

2.1. Social Media for Learning

Social media, which plays an important role in the life of the youth for both communicative and creative activities, has the potential to situate and support language learning in authentic social contexts (Kukulka-Hulme, Traxler, & Pettit, 2007; Yunus, Salehi, & Chen, 2012). Social media can also support user-generated activities in which students share everyday life situations with meaning-making processes across time and context. Leveraging its communicative nature, social media has been widely used for educational purposes (Gikas & Grant, 2013). Some of the most popular social media platforms include Facebook, LinkedIn, and Edmodo. Facebook has especially been widely used to enhance student interactions in and out of classroom settings (Ghani, 2015), promote students' involvement (Buga, Căpeneafă, Chirasel, & Popa, 2014), and utilize the platform as an institutional tool (Hunter-Brown, 2012).

In Asia, two Singapore-based MALL projects "Move, Idioms!" (Wong, Chin, Tan, & Liu, 2010;) and MyCLOUD (Wong, King, Chai, & Liu, 2016) have genuinely transformed and connected classroom-based participatory learning of language knowledge and skills with learners' day-to-day authentic social media creation. Subsequently, such learner-generated content fostered further peer learning and social interactions through the reply feature. The low-stakes (not graded) social media spaces became a 'brave new world' for the young learners to tinker with their ideas and learn language without the fear of overt academic consequences. According to Wong et al. (2016), 37 students who participated in such a MALL-based Chinese as L2 learning trajectory over a year gradually developed their propensity to proactively and spontaneously create meaning through interacting with their living spaces. This resulted in the retrieval of a greater diversity of the learned vocabulary and the application of the language in 1,043 social media items which they created, particularly the use of significantly more "less frequent words" (which are typically more difficult words) in the informal physical context, as compared to those from the formal or online contexts.

2.2. Games and Gamification for Learning

Another line of studies seeks to infuse game or gamification elements into MALL designs. For game-based learning, beyond behaviorist mobile games that drill learners in (e.g., recognizing words), there were mobile games rooted in the notion of mobile Computer-Supported Collaborative Learning (mCSCL) in which either individual Spanish syllables (Zurita & Nussbaum, 2004) or Chinese character components (Wong, Boticki, Sun, & Looi, 2011) were assigned to individual gamers' mobile applications; and the gamers need to negotiate with their peers that get hold of the other syllables or components to form teams that will constitute legitimate Spanish words or Chinese characters. Meanwhile, Holden and Sykes (2012) developed "Mentira", an augmented reality game that requires learners to converse with fictional characters in Spanish concerning a murder case. The conversations are a portion of partly-fictional, geographically situated narrative. Each choice of where to go, what to say, or what to do can trigger an event or gives the player an item to carry on with the game. A similar location-based English learning game, HELLO, was reported in Liu and Chu (2010), which requires college students to carry out learning tasks that utilize the target language in the campus.

Regarding gamification, Nicholson (2012) suggests that, so far, the use of game elements focuses mainly on external motivation with reward-based systems. The BLAP gamification refers to the acronym of the four commonly used reward-based elements: Badges, Levels and Leaderboards, Achievements, and Points. Nicholson cautions against the excessive use of BLAP gamification

elements, especially when the essential goal is to change human behaviors and attitudes in the long term. Our review of the existing literature indicates that gamification-based learning research in Asian context is still at the early stage and that only a few research studies have been conducted (e.g., Boticki, Baksa, Seow, & Looi, 2015; Liu & Chu, 2010; Su & Cheng, 2015;). For instance, Boticki et al. (2015) examined how gamified learning experiences unfolded across multiple locations over a one-year period and unpacked how primary school students in Singapore participated in the gamified mobile learning platform across formal and informal settings.

3. Methods

3.1. Research Context and Participants

The main goal of this research program was to deliver a participatory model of mobile-assisted language learning (MALL) to improve English teaching methods and learning experience in public schools in Mongolia. Our intention was to go beyond didactic and decontextualized language learning experience through the mobile gamification-based learning solution. The main research intervention took place from October 2016 to January 2017 with three teachers (two 10th grade and one 6th grade) and their students (N=67). The three selected schools cover both the Ulaanbaatar city-center area and the Ger district, and both the lower secondary and upper secondary grades. Two teachers were teaching 10th-grade students (Schools 67 and 87), and one was teaching 6th-grade students (School 2). Each teacher selected one class on a random basis to be the experiment group and another class of the same grade as the control group. Students in School 65 (n=28) studied English for 4-5 hours per week whereas those in School 87 (n=17) and School 2 (n=22) studied English for 3 hours per week.

We used a BYOD (Bring Your Own Device) approach where students used their own cell phones to complete the learning activities. This decision was made based on the baseline survey results, where we found that most high school students own smartphones or a feature phone, and have access to mobile devices at home. For a small number of students who did not own a smartphone, the teachers provided a smartphone or encouraged sharing of the device among the students. To support the Internet connection in and out of school, we provided the students and teachers in each class with cellular data cards that allowed Internet access for 24 hours.

3.2. Intervention Design & Implementation

Figure 1 visualizes the interweaved relationships among the three main components in the digital learning solution proposed in this research project. The idea central to this design framework is to create a participatory language-learning environment where students with mobile phones can learn English through contextualized social learning processes. Mobiles and social media (i.e., Facebook), hence, play critical roles to make this design work in and out of class. The baseline study conducted revealed that 97% of the students used Facebook, which confirmed that Facebook is the most commonly used social media channel in Mongolia. Leveraging the existing media practices among the Mongolian youth, the research team decided to create Facebook groups as the main online learning platform. This social media became a central learning place supporting a diverse range of teaching and learning activities.

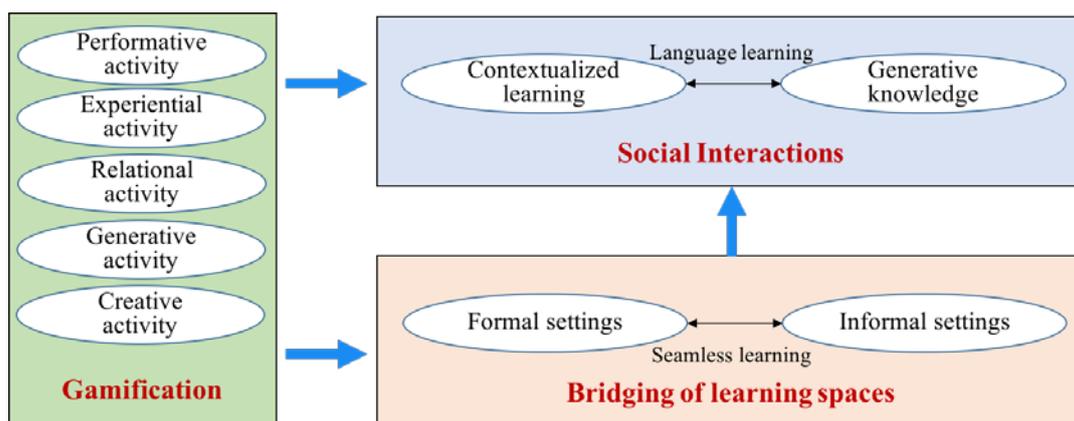


Figure 1. Design Framework for Participatory English Learning

To connect both in and out of the classroom using social media and mobiles, we designed a variety of gamified activities to be implemented in each class. The gamification mechanism includes both top-down and bottom-up participation mechanisms. We define “top-down mechanism” as reward-based gamification strategies including leaderboard, badges, and level systems, while “bottom-up mechanism” means gamification strategies that promote users’ intrinsic motivation. We emphasized both the quality and the quantity of the students’ participation by proving and announcing the Gamification Scores in the Facebook group page. Since Facebook does not offer proper features for a point-reward system, we had to manually calculate the points for each student participation. At the end of the semester, three students who accumulated the highest gamification scores were awarded prizes.

To guide the overall process of designing learning activities, the research team created the Gamification Design Matrix, which functioned as a useful mechanism for both design and evaluation. The Gamification Design Matrix maps the dimension of participatory learning with the various levels of gamified activity design. Firstly, the participatory learning dimension includes the five core principles essential for English language learning derived from the socio-cultural learning perspectives: a) authentic learning, b) communication & collaboration, c) linking learning within and beyond classroom, and d) multiple language skills. Furthermore, the other dimension of the design matrix includes the various gamified activities. With the differing levels of structures (e.g., well-defined vs. ill-defined), the types of activity design range from a performative activity (simple & well-defined problems) to a creative activity (high-level ill-defined problems): a) performative activity, b) experiential activity, c) relational activity, d) generative activity, and e) creative activity. Some representative learning activities on Facebook that were designed based on the Gamification Design Matrix are as below:

- *Video making activity*, which required students to divide into groups of 2 or 3, make their own video and post it on the Facebook group, has received the most number of positive feedback from the students (see Figure 2).
- *Using everyday tools for learning*. The teacher took the photos of everyday stuff that student used for class, and posted the photo with a task, which incorporated the grammar learned in class, such as the questions “Who is this?” and “What are these?”. Type of activity: authentic learning, generative activity (see Figure 3).

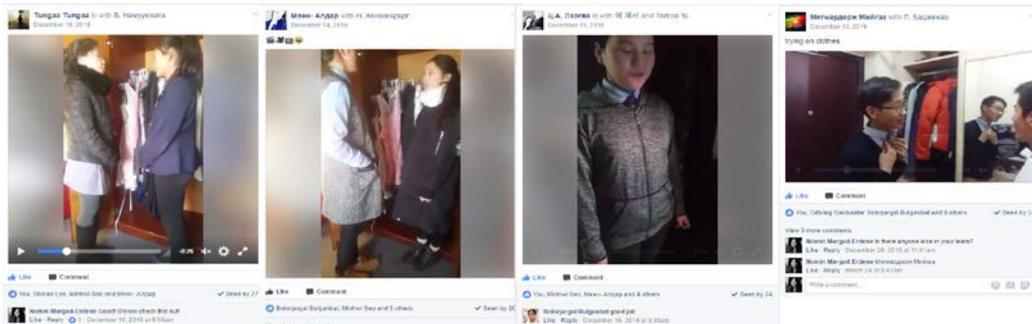


Figure 2. Video Making and Role-playing Activity on Facebook

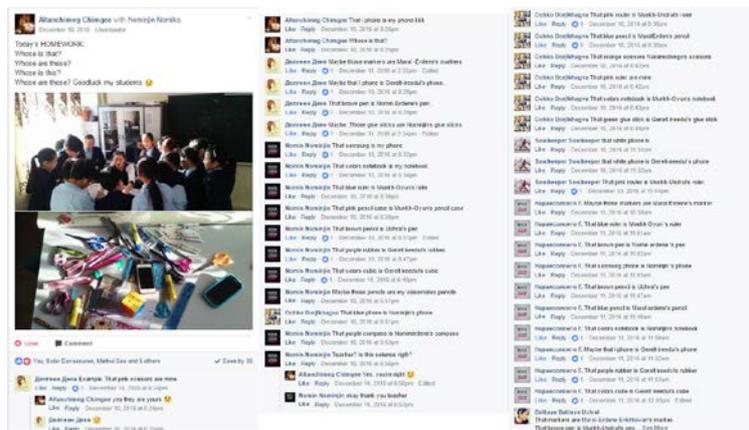


Figure 3. Using Everyday Stuff to Learning English Vocabulary and Grammar on Facebook

3.3. Data Collection and Analysis

As shown in Table 1, we developed a pre-test survey to measure the students' perceptions of digital learning experiences. The instrument includes three themes: (a) motivation for learning English; (b) learning via a mobile device; and (c) learning via various ICT tools. In the post-test survey, we added additional items to measure the students' level of satisfaction with the learning activities on Facebook. For data analysis, we used SPSS to test any statistically significant differences between the pre-test and the post-test survey responses across the three classes.

Table 1: Student perception survey.

Factor	Sample Items
Motivation for learning English (14)	<ul style="list-style-type: none"> I believe I will receive a good grade in English class. If I can, I want to get better grades in English class than the other students.
Learning via a mobile device (4)	<ul style="list-style-type: none"> I like to make sentences or write paragraphs in English with a mobile phone. I can change and improve my English sentences or paragraphs with a mobile phone.
Learning via various ICT tools (7)	<ul style="list-style-type: none"> With the use of technology, I can take initiative to search for English learning content online. I would like to do English homework on the computer and mobile phone.

Satisfaction with learning activities on Facebook (17)	<ul style="list-style-type: none"> • Facebook provides and shares a wide variety of resources and learning materials. • The use of Facebook helps student group work (collaboration).
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After the completion of the intervention, we conducted focus group interviews with selected students from each student to further investigate students’ perceptions, attitudes, and overall experiences about their digital learning experiences that integrated mobiles, social media, and gamification. The interview was semi-structured and conducted at the school site for about one hour. Three teachers who implemented the intervention were also interviewed individually to examine their overall experiences and challenges faced during the implementation. The data was audio-recorded and transcribed for analysis. We identified common themes emerged according to the interview protocol.

4. Results

4.1. Perception Survey

Four areas of the students’ perceptions were measured and analyzed: (a) motivation for learning English, (b) learning via a mobile device, (c) learning via various ICT tools, and (d) satisfaction with learning activities on Facebook. Since the survey was conducted with items that are specific to the research intervention, we did not include the control groups for comparison. Instead, we compared the student scores in the pre-survey and post-survey for three factors measured in both surveys. Table 2 presents the descriptive statistics for each factor. Motivation for learning English, learning via a mobile device, and learning via various ICT tools were analyzed using the corresponding samples t test. Satisfaction with the learning activities on Facebook was analyzed by a sample t-test because only post-test was conducted. Since there were noticeable increases in all three factors between the pre-survey and the post-survey, t-test was conducted to compare statistical differences between the two survey responses. As seen in Table 2, the results indicated that the differences between the pre-survey and post-survey were statistically significant in the three factors: motivation for learning English ($t=19.00, p<.01$); mobile learning ($t=14.58, p<.01$); and learning via ICT ($t=23.52, p<.01$). Table 3 presents the descriptive statistics and t-test results for each class. All the measures were statistically significant between the pre-survey and post-survey, except the “Learning via various ICT tools in School 2.

Table 2: Descriptive statistics and t-test results (all three classes, N=67).

	Pre-survey		Post-survey		t	p
	Mean	SD	Mean	SD		
Motivation for learning English	1.81	.52	4.11	.47	19.00*	.00
Learning via a mobile device	1.94	.64	4.20	.63	14.58*	.00
Learning via various ICT tools	2.07	.38	3.90	.40	23.52*	.00
Satisfaction with learning activities on Facebook	-	-	4.17	.53		

* $p < .01$

Table 3: Descriptive statistics and t-test results (separated by class).

	Pre-survey		Post-survey		t	p
	Mean	SD	Mean	SD		

Motivation for learning English	School 2	1.53	.44	4.31	.38	14.96*	.00
	School 65	1.83	.52	4.04	.53	11.68*	.00
	School 87	2.08	.47	4.01	.40	9.16*	.00
Learning via a mobile device	School 2	1.95	.60	4.23	.64	8.62*	.00
	School 65	2.02	.68	4.07	.66	8.33*	.00
	School 87	1.82	.63	4.35	.57	8.30*	.00
Learning via various ICT tools	School 2	2.03	.31	3.87	.35	16.30	.00
	School 65	2.05	.38	3.85	.37	18.37*	.00
	School 87	2.18	.47	4.02	.50	8.27*	.00
Satisfaction with the learning activities on Facebook	School 2	-	-	4.19	.54		
	School 65	-	-	4.09	.53		
	School 87	-	-	4.27	.53		

* $p < .05$

4.2. Interview Findings

Through the constant comparison method, we identified three main themes (localization, teaching and learning outcomes, and sustainable adoption) and several sub-themes for each respective factor, as summarized in Table 4. It should be noted that we synthesized the key findings from analyzing both the teacher interviews and the student interviews for a more holistic understanding, by corroborating the interpretations from the two different interview sources. The most frequently mentioned factor for localizing digital learning innovations in Mongolia was the limited Internet infrastructure in public schools. The limited Internet infrastructure affected both the teachers' and students' level of motivation for adopting mobile-devices and social media for teaching and learning activities. This issue became even more prominent after the intervention. Even though the students were given with the mobile data card to help complete the learning activities on Facebook, the limited Internet connection often prevented them from active participation. During the post-intervention interview, the teachers reported some changes in their own teaching styles and expressed enthusiasm for self-improvement. Activities and homework on Facebook mostly involved group work that required collaboration among the students. It appears that such social learning experience influenced the students' perceptions towards learning and impacted their interests and engagement in the learning process:

- *"I liked making videos with friend. It was difficult but we really enjoyed it. We spend hours to make 30 second video."* (Student from School 65)

It was also interesting that the use of social media affected students' attitudes of doing their homework and made them more aware of the contents learned. Since most students were active Facebook users, their routine of checking instant notifications naturally increased the level of participation in the gamified learning activities:

- *"In the past, we used to procrastinate our homework until the last moment. From this semester, we waited for homework to be posted on Facebook."* (Student from School 87)

Most students reported that they improved their English skills, especially in the areas of vocabulary, grammar, and writing. Some students indicated that the activities on Facebook helped them better understand the lessons given in the classrooms because interactive communication extends the classroom's learning environments:

- *"Facebook activities increased my vocabulary. Because when I do my homework on Facebook and there are words I don't know, I can ask for help."* (Student from School 2)

- “Facebook helps us to understand English topics better and to express better ideas because [Facebook] is like a continuing class.” (Student from School 87)

Some students also mentioned that the authentic photos of real-life context uploaded on Facebook helped them make better linkages to the English lesson, instead of learning only through the textbook materials:

- “When we see the photos for vocabulary learning on Facebook, it is much easier to memorize because they are authentic. From textbooks, you cannot get such good visualization.” (Student from School 65)

Table 4: Main themes and sub-themes of interviews findings.

Main themes	Sub-themes
Critical factors for localization	<ul style="list-style-type: none"> • Internet infrastructure • Curriculum and teaching materials • Teacher professional development
Teaching and learning outcomes	<ul style="list-style-type: none"> • Changes in teaching styles • Changes in student’s perception on learning • Improvement in English proficiency
Sustainable adoption	<ul style="list-style-type: none"> • Technical infrastructure • Teacher facilitation • Government and school support

5. Implications & Conclusion

This research emphasizes the criticality of culturally relevant and learner-centered approaches when addressing digital learning innovations in Mongolia. In this project, we re-designed various kinds of materials and contents for teaching and learning activities to make them relevant to the local context and to the students’ needs. The situation analysis conducted during the baseline study (e.g., learner survey, expert interviews, and examination of the school curricula) greatly enhanced the research team’s understanding of the challenges that the Mongolian public school system had been facing, especially in the area of English education. In addition, our decision to utilize mobiles and social media (i.e., Facebook) was intentionally made to maximize the potential of localizing our digital learning solution. Our belief was that the adoption rate by the teachers and the students would increase when the solution leverages the existing technology and media practices, since user acceptance would likely to be low and slow if we introduce new solutions. Concerning the quality and equity, our digital learning solution aimed to go beyond didactic and decontextualized language learning by utilizing the mobile gamification-based learning solution.

Regarding the sustainability issue, this study demonstrates that the potential of adopting and sustaining digital learning innovations in Mongolian public schools can be enhanced (a) when the solution leverages the existing resources and cultural practices; and (b) when continuous efforts are made for building local teachers’ pedagogical knowledge and skills. As mentioned earlier, the digital learning solution in this research program was designed to utilize the material and cultural resources that are already readily available in Mongolian school contexts. With the use of mobile devices, employing the BYOD approach, and using Facebook where our participants were already active users, we were able to minimize technical set-up issues that digital learning initiatives in developing countries might often face. We were able to confirm that social media like Facebook hold great possibilities to be participatory learning spaces in developing countries when appropriate pedagogical design is accompanied.

To address the equity issue in education, we intentionally selected two schools located in the Ger district. We were able to achieve high levels of student participation throughout the intervention period, and to increase their overall interest towards English learning, as confirmed by the survey results. The interview with students and teachers further revealed several issues at multiple layers that need to be considered for localizing and sustaining such digital learning solutions in the developing

world like Mongolia. As Ertmer (1999) argues, we believe that the first-order barriers such as technical infrastructure and devices issues may be resolved gradually over time. Second-order barriers such as beliefs and culture are more challenging and complex issues that future research and policy actions need to address. This research demonstrated that the new model of MALL with meaningful gamification strategies could be beneficial to both teachers and students who want to improve their English knowledge and skills.

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