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Exploring Students' Early and Campus E-Learning Experiences for Academic Success

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학업 성공을 위한 대학생의 입학 전·후 이러닝 경험 탐색

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<ABSTRACT>

The goal of this study was to examine students' early e-learning experiences and campus e-learning experiences of students within a university context. A total of 381 undergraduate students enrolled in a Korean university participated in this study. We found that most of the students had early experiences at the elementary school level with e-learning before entering the university. However, the university students did not show a high level of active experience regarding e-learning on campus. Students frequently took mobile e-learning courses using their smart devices, while the students lacked experience with mobile e-learning courses. The findings indicated necessity of adopting e-learning technology as a cognitive tool for their intellectual challenges.

Key words : E-learning environment, academic achievement, learning management system

I. Introduction

Advancements in e-learning environments at universities around the world continue to improve student academic success (Naveed, Muhammed, Sanober, Qureshi, & Shah, 2017). Technological tools and systems in e-learning environments enhance the quality of learning experiences and outcomes by providing adaptive materials and strategies for the needs and preferences of individual learners (Chang, Kao, Chu, & Chiu, 2009; Means, Toyama, Murphy, & Baki, 2013). E-learning is a web-based ecosystem that integrates technology with teaching and learning practices (Cidral, Oliveira, Di Felice, & Aparicio, 2018). To

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achieve a high rate of student academic success, e-learning in higher education encompasses the use of digital technologies to build educational materials for teaching and learning, to teach learners, and to regulate courses (Fry, 2001). Benefits include sharing notes in class (Grabe, 2005), watching recorded lectures (Odhabi & Nicks-Mccaleb, 2011), and participating in massive open online course (MOOC)-based flipped classrooms (Lee & Lee, 2018). E-learning has expanded rapidly with the popularization and advancement of multimedia and network technologies such as high-speed internet, high-definition quality, and smart devices (Cidral et al., 2017).

Campus e-learning environments advance based on the understanding and needs of students belonging to the digital generation. Driven by recent arguments regarding the digital native (Prensky, 2001; Strømsø & Bråten, 2014), educators in higher education tend to assume that students are already digital natives who fluently use digital technology at an adequate level (Guzmán-Simón, García-Jiménez, & López-Cobo, 2017; Murray & Pérez, 2014). However, research findings show that undergraduate students require additional digital training to enhance their academic experience (Alvermann, 2008; Strømsø & Bråten, 2014). While students' digital literacy facilitates the use of e-learning (Mohammadyari & Singh, 2015), universities have not fully considered the digital competencies of students regarding academic success in university e-learning environments (Parkes, Stein, & Reading, 2015). Therefore, the past and current experiences of students in relation to e-learning may provide a guide to the amount of e-learning experience in the university context that will be required.

Recently, technology-driven learning experiences in higher education have followed the changing educational paradigm from instructor-led to learner-centered learning strategies (Collis, Bruijstens, & van der Veen, 2003; Olelewe & Agomuo, 2016). For example, the high quality of e-learning resources triggers the transformation of traditional classrooms into flipped classrooms or blended learning (Álvarez, Martín, Fernández-Castro, & Urretavizcaya, 2013), thereby enhancing face-to-face instruction through e-learning resources and offering students more intellectually engaging learning experience (Woods, Baker, & Hopper, 2004). The e-learning environment provides learning assistance, allowing students to be more engaged and perform better in their academic courses (Kim & Gupta, 2017; Najmul Islam, 2013).

The present study aimed to investigate the past and current e-learning experiences of students, as well as student perceptions of campus-wide e-learning environments in terms of their performance in a Korean university context.

II. Methodology

1. Participants

The convenience sample in the study was composed of 381 respondents enrolled at a large university located in a large urban area, ranging in age from 18 to 27 years (mean=21.37, SD=2.09); 127 were male, and 254 were female. Ninety-nine students were freshman, 98 were sophomores, 108 were juniors, and 76 were seniors.

2. Procedure

The data were collected as part of a larger study on the quality of undergraduate educational experiences at the university, particularly the e-learning experiences of students. The survey was conducted through a self-administered online

<Table 1> Summary of student's early experiences with e-learning

Early e-learning experience	n	%	Gender 1=male 2=female	Academic achievement (GPA)	Digital application in university
Attending e-learning at home					
10 years or younger	104	28.4			
11-13 years (elementary school)	127	34.7			
14-16 years (middle school)	96	26.2	-.18***	-.26***	-.13*
17-19 years (high school)	31	8.5			
After entering the university	8	2.2			
Adopting e-learning at school					
10 years or younger	74	20.1			
11-13 years (elementary school)	140	38.0			
14-16 years (middle school)	79	21.5	-.08	-.17**	-.04
17-19 years (high school)	47	12.8			
After entering the university	28	7.6			
Watching lecture videos					
10 years or younger	43	11.7			
11-13 years (elementary school)	74	20.2			
14-16 years (middle school)	139	37.9	-.16**	-.17**	-.13*
17-19 years (high school)	103	28.1			
After entering the university	8	2.1			

Note. *** p<.001, ** p<.01, * p<.05

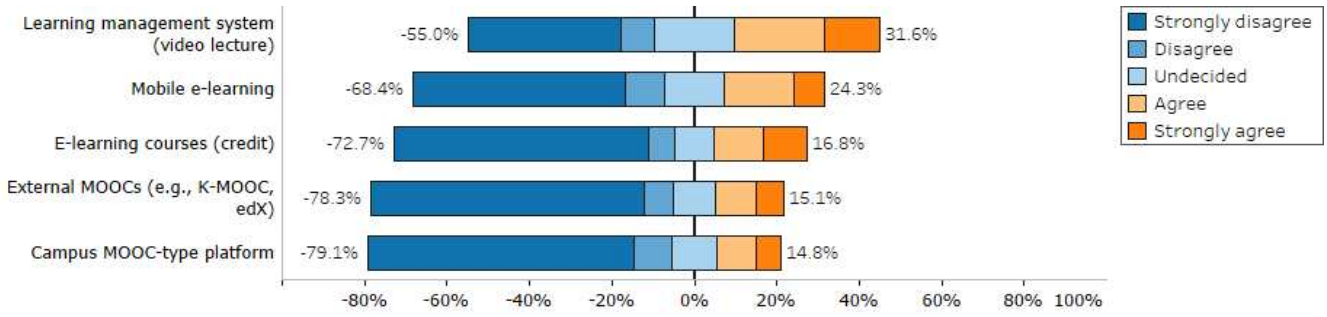
questionnaire using SurveyMonkey.com. The students were sent an email in which they were asked to click on an attached internet address that linked to the target survey.

3. Instruments and Data Analysis

In addition to questions regarding demographic information such as gender, age, grade, academic discipline, and grade point average (GPA), the survey included several questions to measure the students' perceptions of e-learning environments on campus and early e-learning experiences. The level of student experience with campus e-learning environments was measured using items developed to collect such data, including e-learning systems with on-campus and off-campus components, the level of information and communication technology required for the major, learning ways to use e-learning resources and systems, and previous experience with e-learning prior to university. To analyze the collected data, descriptive statistics were used to calculate the mean, standard deviation, correlations, independent t-test results, and ANOVA using IBM SPSS 23 software.

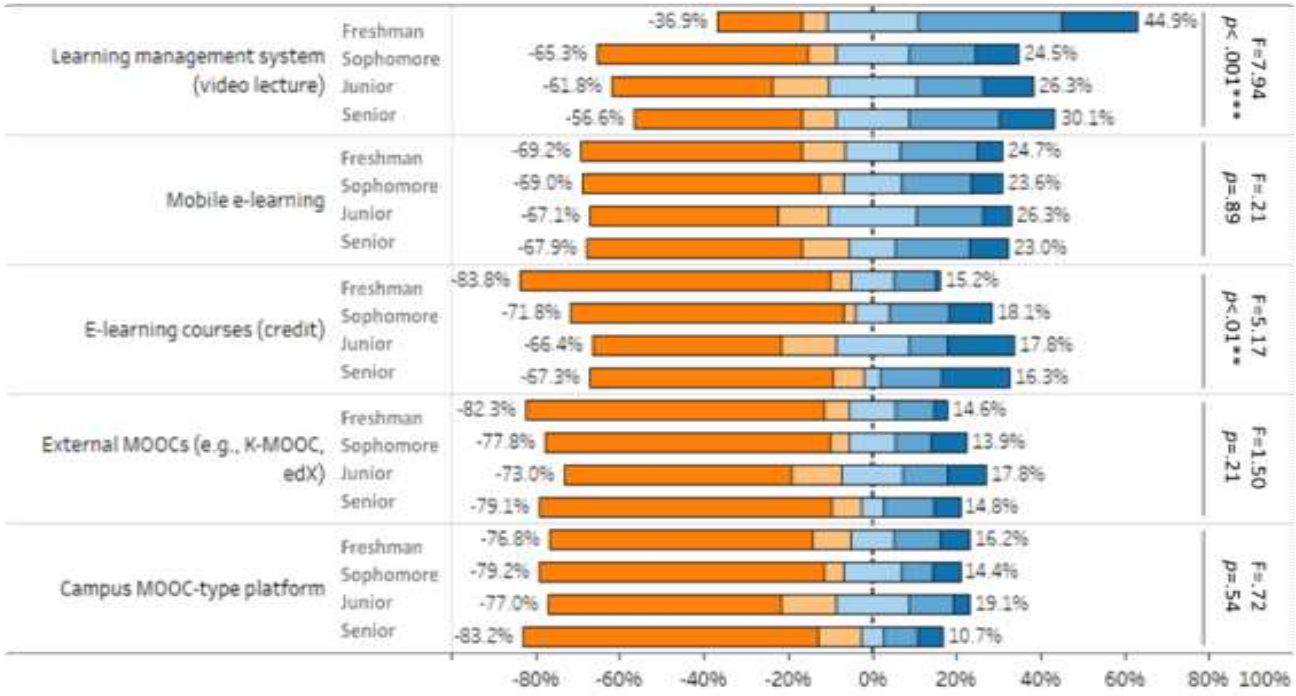
III. Results

A student's early experience of e-learning before entering university were examined in terms of personally engaging in e-learning environments, adopting e-learning in school, and studying using lecture videos <Table 1>. In total, 63.1% of the students (n=381) had personal e-learning experiences beginning in elementary school; 26.2% and 8.5% of the students had personal e-learning experiences that began in middle school and high school, respectively. The age at the onset of personal e-learning experience was significantly associated with gender (r=-.18,

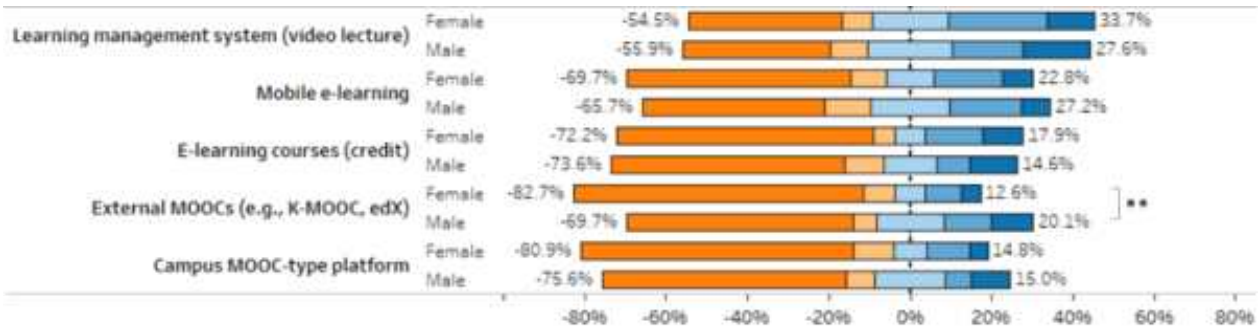


[Figure 1] Diverging stacked bar charts for student experience using campus and external e-learning systems

p<.001), academic achievement (r=-.26, p<.001), and applying digital tools in university (r=-.13, p<.05). A total of 58.1% of the students (n=381) had e-learning experiences in school beginning in elementary school; 21.5% and 12.8% of the students had e-learning experiences in school beginning in middle school and high school, respectively. The age at the onset of e-learning in school was significantly associated with academic learning in university (r=-.17, p<.01). Of the students studied (n=381), 31.9% had experience watching lecture videos beginning in elementary school in Korea, and 37.9% and 28.1% of the students had experience watching lecture videos beginning in middle school and high school, respectively. The age at the onset of experience with watching lecture videos was significantly associated with gender (r=-.16, p<.01), academic learning in university (r=-.17, p<.01), and digital application in university (r=-.13, p<.05). We examined the university students' early experiences with e-learning-related activities rather than their experiences with e-learning in university. When students had an early experience with e-learning components and activities, this predicted their likelihood of engaging in academic learning and the application of digital tools for their academic work in university. To explore student experiences with e-learning while in university, we asked the students to confirm their level of experience using a series of statements on a Likert scale (see Figure 1). Robbins and Heiberger (2011) suggested that a diverging stacked bar chart is useful as an improved method of conveying all the information available in Figure 1, while standard stacked bar charts are difficult to read and can make it difficult to identify the majority in the chart. The length of the bar to the right of zero shows the percentage of students who are highly experienced, while the length to the left of zero shows those who have had little experience with the e-learning item in university. According to the chart, we can see that the students' lack of experience in university was high. In total, 31.6% of the students frequently used campus lecture-videos in standard learning management systems on campus, whereas 55.0% of the students lacked experience using lecture videos as e-learning activities. Additionally, 24.3% of the students frequently took mobile e-learning courses using their smart devices (e.g., smartphones or tablets), while 68.4% of the students lacked experience with mobile e-learning courses. The data show that 16.8% of the students frequently took credit-based e-learning courses, while 72.7% of the students lacked experience with taking credit-based e-learning courses. It was also shown that 15.1% of the students frequently took external MOOCs, such as K-MOOC, edX, or Coursera, while 78.3% of the students lacked experience with taking



[Figure 2] Diverging stacked bar charts for the student use of campus and external e-learning systems according to class level



[Figure 3] Diverging stacked bar charts for the student use of campus and external e-learning according to gender

external MOOCs. Additionally, 14.8% of the students frequently used campus e-learning platforms for MOOC-type courses for both credit and noncredit courses, while 79.1% of the students lacked experience using campus platforms for MOOC-type courses. When we added the grade dimension of the students to the analysis in Figure 2, we found that freshman students had a greater preference for watching video lectures in learning management systems than did the other class levels (p<.001). Junior and senior students preferred taking e-learning courses for credit (p<.01). However, statistically significant differences were not observed among mobile e-learning, external MOOCs, and campus platforms for MOOC-type courses.

For the five e-learning experiences, there was a significant difference across the gender dimension for taking external MOOCs (p<.01) for the mean comparisons between male and female students. This finding indicated that male and female students have different adoption levels of

external e-learning resources, such as MOOCs. However, previous research has not shown significant gender differences for the use of e-learning (Cuadrado-García, Ruiz-Molina, & Montoro-Pons, 2010) or for learning and achievement in MOOCs (Martinez-Lopez, Yot, Tuovila, & Perera-Rodríguez, 2017). Furthermore, female students showed a higher level of satisfaction with e-learning (González-Gómez, Guardiolaab, Rodríguezc, & Alonsod, 2012). Thus, this result may reflect an accessibility issue with external MOOC platforms.

IV. Conclusion

The aim of this study was to examine student's early and current student e-learning experiences within the context of a university e-learning environment. In the study, we found that university students had personal experience adopting e-learning beginning as early as elementary schools such as using digital textbooks and technology-integrated activities in the classroom and home (Joo & Kwon, 2019; Park & Eom, 2017; Park & Ryu, 2019). After enrolling in a university, students often lacked experience with engagement in e-learning environments, including mobile e-learning, e-learning courses, and external and internal MOOCs on campus. That is, few students actively experienced e-learning environments on campus, contrary to our expectations. The data suggest that even students who are above the freshman level used e-learning environments at a low level even though the e-learning system is a fundamental system on campus. In particular, the findings showed that only a small number of students adopted internal and external MOOC platforms to access e-learning content and function. These results suggest that the advancement of e-learning environments is somewhat separate from their active adoption by students on campus, even though students are familiar with e-learning from a young age before entering university. Notably, freshmen showed a stronger preference for studying with lecture videos in learning management systems than students at other university levels. These results suggest that freshmen may have difficulty following lectures while taking notes or may be reviewing the coursework for a midterm or final exam. In addition, there were gender differences in the adoption of external MOOCs. Male students show a significant preference for using external MOOCs relative to female students.

From the perspective of the connection between effective teaching and learning and e-learning environments on campus, it is surprising that the results show lower student involvement in the adoption of e-learning environments for courses. Although students already have experience integrating e-learning for various purposes from an early age, they did not appear to take advantage of opportunities to engage in e-learning environments frequently or in various ways. One possible explanation for this discrepancy is generational differences in the digital age. Although the students of today are exposed to media for a considerable amount of time in their daily lives, their understanding of the technology may be much shallower than that of previous generations (Oh & Reeves, 2014). The variety of technologies with which these students are engaged and their abilities concerning those technologies are limited. Therefore, it is crucial to help students adopt e-learning technology as a cognitive tool (Jonassen & Reeves, 1996), and the younger generation must be guided to use e-learning technology to further pursue intellectual challenges. A related explanation can be provided for the preference of freshmen for

lecture videos in learning management systems. Younger students were more likely to use e-learning resources when clear instructions were provided, such as assignments and exams given by instructors in video-style lectures.

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