Understanding the Acceptance of E-learning in a Japanese University English Program Using the Technology Acceptance Model

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Abstract:

In the Japanese university context, student and faculty acceptance of technology is a rather under-researched field. Due to this lack of research and our university's move towards promoting e-learning, this project aimed to examine the reception of the learning management system (LMS), officially known as *Manaba*, currently in place at Ritsumeikan Asia Pacific University. Although the current LMS has only been in place for two years, it was necessary to analyze student and staff perceptions of its utilization in order to improve its implementation in the future. Therefore, to understand student and faculty perceptions of the LMS's use, a quantitative survey was designed and modified from the Technology Acceptance Model (TAM), the most widely used model to classify a user's technological acceptance. The quantitative TAM survey, consisting of 17 questions, was distributed to 446 students and 16 English lecturers based on the categories of perceived self-efficacy, perceived enjoyment/ease of use, perceived usefulness, and behavioral intention of the LMS. The results of the survey indicated students and lecturers leaned favorably toward accepting the new technology in place. We believe these results offer valuable insights for universities seeking to effectively implement an LMS for homework and assessment purposes.

Key terms

Learning Management Systems (LMS), Manaba, e-learning, Computer Assisted Language Learning (CALL), Technology Acceptance Model (TAM), Japanese Tertiary Education, Information and Communication Technologies (ICT)

1. Introduction

In Japan, "25% of ... students (age 16-29) lack basic computer skills" (OECD, 2015, as cited in Cote & Milliner, 2016, p. 127). This statistic has strong implications on Japanese universities currently looking for new and inventive ways to support students through implementing new technologies into their curriculum. Universities need to reflect upon the impact these technologies have on student learning and their acceptance of such systems. The current global trend sweeping higher education institutions necessitates the implementation of e-learning technologies. Particularly in the English as a Foreign Language (EFL) sphere, institutions are moving away from the traditional paper-based activities and examinations towards blended learning which provides opportunities for language learners both in and outside of the classroom. Our university currently utilizes this

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blended learning style where teachers can focus on classroom instruction rather than checking every assignment in class and students can receive instant feedback on their assignments on-line. Often referred to as learning management systems (LMS), these digital platforms aid in supplementing course content to create a learning environment that allows learners more control and autonomy over their own learning through providing online opportunities to study anywhere and at any time (Tselios, Daskalakis, & Papadopoulou, 2011; Nunan & Richards, 2015). Although universities around the world are currently providing these e-learning services within their courses, research reveals a lack of consideration of how learners and teachers perceive and participate in the online learning process, which may eventually create issues in delivering quality courses that effectively implement these technologies in the future (Gamble, 2018; Kohang & Durante, 2003). Furthermore, one of the most essential factors necessary for successful implementation of an LMS is understanding learner acceptance of the use of the current technology in place (Butorac, Nebic, & Nemcanin, 2001; Tselios, Daskalakis, & Papadopoulou, 2011).

Particularly in the Japanese context, the Ministry of Education, Culture, Sports, Science and Technology (MEXT) has prioritized making Japan a contender on the global stage of digitally literate learners. As of April 2010, (MEXT) established the "Conference on the Use of ICT in Primary and Secondary Education" which developed a comprehensive policy, titled "The Vision for information and communication technologies (ICT) in Education." This policy focused on more effective utilization of ICT in the education system for the year 2020 (Murami, 2016). The central aims of this policy were to revitalize the economy and improve Japanese international competitiveness rankings through developing student technology literacies inside and outside the school environment to prepare them for a rapidly digitizing world (MEXT, 2011). Though enacted since 2010, in practice, the goals of this ICT policy are not being realized as many schools and universities have not effectively adopted these practices and remain highly paper dependent (Murami, 2016). Therefore, students entering universities are often at a disadvantage when dealing with university-enforced e-learning systems. A recent study conducted by Cote and Milliner (2016) echoed this finding, which revealed that Japanese students' digital literacy is ranked much lower behind students from other advanced countries. As previously mentioned, the Organization for Economic and Co-operation and Development (2015) found that "25% of Japanese students (age 16-29) lack basic computer skills" (OECD, 2015, as cited in Cote & Milliner, 2016, p. 127). This statistic has massive implications for students entering universities throughout Japan. These universities assume students are capable and functioning users of digital technologies required to succeed in higher education. However, this assumed expectation may negatively impact new students entering a digitally run and organized university academic life (Cote & Milliner, 2016; Gobel & Kano, 2014; Lockley & Promnitz-Hayashi, 2012). Furthermore, Fukuda and Yoshida (2013) concluded that Japanese students lack the motivation to increase their out-of-class language-learning time with their university LMSs and interact with the LMS less than an hour a week. As universities move towards internet-based assessments and testing, this lack of digital literacy and universities' focus on digital learning technologies must be acknowledged and researched.

Japanese university student and faculty acceptance of technology has only recently begun to garner interest in the ICT and EFL research community (Dizon, 2016; Gamble, 2018; Cote & Milliner, 2016; Fatheli & Okada, 2018). Accordingly, this research project aims to examine Japanese university student and faculty acceptance of technology for language learning through the integration of the Technology Acceptance Model (TAM), the most widely used and well-established framework which is argued by some to be the most "robust, powerful, and parsimonious model for predicting user acceptance [of technology]" (Venkatesh & Davis, 2000, p. 187). Thus, within this context, there is a further need to examine language learner's acceptance of this technology and their intention to continue using technology-enhanced learning methods.

Before this research began, we decided to take paper-based homework activities from the textbook and digitize them onto our university's LMS. Students could practice these grammar homework exercises on the LMS anytime they wanted and as often as they liked. While these exercises were identical to the paper-based activities, the students could receive instant feedback on the assignments they completed. Furthermore, teachers could access the completed tasks and use the data to gain additional insights into student learning behavior and weaknesses. Although at the onset of our research we were excited about the concept of digitizing homework assignments for students, we couldn't assume that students and teachers shared our enthusiasm. Thus, our research goal of measuring student and teacher perceptions of our universities LMS's use required immediate attention. Additionally, most LMS research in Japan has focused solely on teacher's use of the technology as opposed to its use and perceptions from students (Toland, White, Mills, & Bolliger, 2014; Murami, 2016).

2. Literature Review
2.1 Defining the Manaba Learning Management System

Manaba, as an LMS, can be defined as a form of technology used by instructors to build and maintain an EFL course in a blended learning environment (OCED, 2005). The *Manaba* LMS has the main purpose of improving the learning flow for students with instant feedback from homework assignments, administering unit tests, creating a seamless connection between school and home or personal use of the technology, and even reducing the reliance on paper for homework assignments. *Manaba* was created by the Japanese company AsahiNet in 2007 and implemented at the university in which this study took place in the spring of 2017. Previously, another LMS known as Blackboard was utilized primarily for online assessments done in class in the form of unit tests and grade inputting but was replaced when the contract expired. Originally, *Manaba* too was used solely as a test platform, but in 2018 homework exercises were digitized and incorporated as independent learning to be completed outside of class. Since 2018, this has expanded to the Upper-Intermediate English level as well as the Intermediate English course. Students can now get instant feedback when they complete on-line assignments in the form of automatic scoring and repeat the homework as many times as they wish in preparation for exams. *Manaba* is also device-compatible and can be used more conveniently on a smartphone or tablet than its predecessor.

2.2 TAM History and Use

Since its inception in 1989 (Davis, 1989), the TAM framework has been the most widely used model to determine a user's acceptance of a technology. This acceptance of technology is measured through the five variables of (a) *perceived usefulness* (PU), (b) *perceived ease of use* (PEOU), (c) *attitudes toward use* (ATU), (d) *behavioral intention* (BI), and (e) *actual use* (AU). From the five elements, perceived usefulness, perceived ease of use, and attitudes towards use are considered predictors of behavioral intention and eventually the actual use of the system (Toland, et al., 2014). Moreover, other studies have argued that external variables such as *self-efficacy/confidence* and *perceived enjoyment* should also be considered as they are crucial indicators in explaining a user's acceptance and eventual use of the technology (Davis, Bagozzi, & Warshaw, 1992; Venkatesh & Davis, 2000). Essentially, the model is designed to show that an individual will be more willing to use technology if they are accepting of it (Jones, McCarthy, & Halawi, 2010).

To clearly understand each variable's intended meaning on the survey, it is essential to define the terms. According to Lee (2006), *perceived self-efficacy/confidence* (PES/C) refers to an individual's judgment of their own ability to perform tasks using the system, or in the case of this study specifically, complete homework and tests using *Manaba* (Lee as cited in Fageeh, 2015). The next variable of *perceived ease of use/enjoyment* (PEOU/E) is described by Davis (1989) as a variable which determines "the degree to which a person believed that using a particular system would be free of physical and mental effort" (p. 320). PEOU and the concept of enjoyment (E) are sometimes used synonymously, as in the case of Fageeh's (2015) study. Therefore, we combined the two factors to represent one variable. Davis (1989) explains *perceived usefulness* (PU) as "the degree to which a person believes that using a particular system would enhance his/her job performance" (p. 320). The final variable, *behavioral intent* (BI), determines a user's intention to use an e-learning system which has been shown to have a positive relationship in user's overall acceptance of an LMS (Lee, 2006). Although a user's BI is often informed by their PU and PEOU/E, for the case of the current study, the BI to use the technology was already predetermined by the teacher—homework assignments and unit tests. Therefore, our study focused more on the external variables and the interaction between PU and PEOU/E. These interactions can be more clearly seen in the figure below which visualizes Davis' (1989) framework.
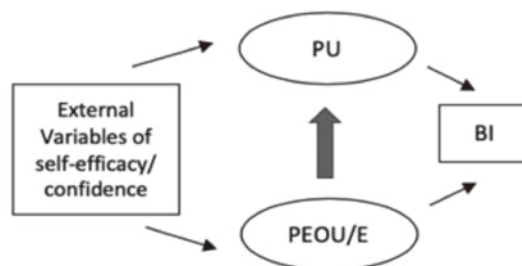

Figure 1: Research Framework Modified TAM Model from Davis (1989)

2.3 TAM Studies in Japan

Since the 2017 enactment of the "The Vision for information and communication technologies (ICT) in Education" act by MEXT, universities throughout Japan have been integrating LMSs. However, as previously identified, students are not properly trained to use these types of systems in their secondary education and, therefore, are thrust into university life with minimal e-learning literacy skills (Cote & Milliner, 2016). While many studies have been conducted using the TAM model in the past, very few have focused on the EFL sector, especially Japan (Gamble, 2017; Dizon, 2016; Fathali & Okada, 2018). The few studies utilized similar methodologies including the administration of a quantitative TAM survey based on familiar TAM variables. Gamble (2017) administered a TAM survey to 35 Japanese university students and found students showed a positive acceptance to the LMS Google sites. Results from Dizon's (2017) study of 80 Japanese university students also found that students received internet-based tests (summative—midterm and final) positively. Although slightly different to other recent TAM studies in Japan, Fathali and Okada (2018) integrated the self-determination theory (SDT) and its connection to 162 Japanese university students' acceptance of out-of-class language learning (OCLL). They found a positive correlative relationship between perceived self-efficacy and perceived usefulness. These studies informed the methods and survey constructs implemented in the current study; however, this study utilizes a much larger sample size (over 400). This includes the perceptions from language teachers as well, a side not yet analyzed in conjunction with students in Japanese TAM studies; therefore, the results of this project add to the current gap identified in current TAM research. To address this gap, this study has two main research questions:

1. What are the correlational relationships between the TAM variables: *perceived self-efficacy/ confidence* (PSE/C), *perceived ease of use/enjoyment* (PEOU/E), *perceived usefulness* (PU) and *behavioral intention* (BI)?
2. How is the current implementation of the Manaba LMS being received by Japanese students and faculty?

3. Study Design

The survey research data-collecting phase of the study involved distributing a quantitative questionnaire to 224 intermediate and 222 upper-intermediate Japanese university students as well as 17 teachers involved in the instruction of those courses. The survey was administered to students and teachers through *Google Forms*. Students took the survey during class time and were monitored by their instructor to ensure they did not take the survey twice. Teachers, on the other hand, were emailed the survey and completed it at their leisure. The 17 question items identified student and teacher opinions on the current LMS system use at our university based on the sub-factors of PSE/C (3), PEOU/E (8), PU (4), and BU (2). These items were marked using a 1-5 Likert scale. As many Likert scale style TAM studies have been conducted before, the survey items were adapted and modified concepts from other research (Dizon, 2016; Fageeh, 2015). To ensure the survey items were accurate in Japanese, we employed a back-translation method, meaning the survey was

translated from English to Japanese and then back from Japanese into English again. The two versions were then compared to ensure that the originally desired meaning remained the same.

The questionnaire was designed as a cross-sectional survey where data was collected from the selected group of participants at one particular time, which was effective for providing a snapshot of the current attitudes and opinions of teachers and students on the current implementation of *Manaba* at the university (Gay et al., 2012, kindle version p. 184). The results were then coded and categorized to inform this project's second research question: identifying current attitudes of students and teachers on the implementation of the e-learning system in place at our university. Like many other studies which focused on the interaction of the variables within TAM, our research questions involved analyzing these interactions, additional external factors, and finally the identification and subsequent analysis of the overall student and faculty perceptions of *Manaba's* current implementation. Our findings, then, provide a general explanation of the user's opinions which are directly connected to their behavior and use of the technology (Fathali & Okada, 2018). Based on suggestions and implications identified from previous research, the factors included on our survey contained both aspects of the original elements of Davis' TAM model (1989) as well as essential external factors blended together—largely adapted and modified from two previous TAM studies (Dizon, 2016; Fageeh, 2015).

3.1 Internal Consistency Results of the Survey Tool

When conducting Likert scale survey research, it is necessary to determine if a survey tool has internal consistency. This type of analysis measures if items on the survey are like one another in content. If items on the survey have the ability to have more than two options for scoring (in the case of this study, students have 5 options), then Cronbach's alpha can be used to determine internal consistency of the items (Gay, Mills, & Airsian, 2012, kindle version p. 176). According to George and Mallery (2003), the rule of thumb for determining high internal consistency for social science research studies is "_ > .9 – Excellent, _ > .8 – Good, _ > .7 – Acceptable, _ > .6 – Questionable, _ > .5 – Poor, and _ < .5 – Unacceptable" (George and Mallery as cited in Gliem, J. & Gliem, R., 2003, p. 87). As our survey borrows components from various previously conducted TAM surveys, we needed to analyze the internal consistency of our individual constructs. Table 1 breaks down the internal consistency results for the 17-question item survey divided into sub-category constructs of PSE/C (3), PEOU/E (8), PU (4), and BU (2). Within each construct there was a Cronbach *alpha* of α .80 or higher, which indicates that the specific constructs have a good reliability. This finding further shows that the question items utilized in our survey have a high internal consistency meaning that the items on the scales are closely related.

Table 1

Internal Consistency Results (Cronbach α) for individual cluster sets
PSE/C, PEOU/E, PU, and BI

Construct	Number of items	Cronbach's α
Perceived Self-Efficacy/Confidence	3	.80
Perceived Ease of Use/Enjoyment	8	.90
Perceived Usefulness	4	.82
Behavioral Intention	2	.84

4. Analysis of Data

The data received from the results were analyzed using SPSS version 25. The survey was coded as: strongly disagree (1), disagree (2), neutral (3), agree (4), and strongly agree (5). The data received in this research was from Likert items based on interval variables with a numerical format 1-5 opinion scoring metric. The data revealed the current picture of student and teacher perceptions towards the current use of *Manaba* at the university. The SPSS statistical analysis program calculated the frequency distribution, mean, and standard deviation of the survey items in the descriptive analysis. Additionally, as often seen in TAM survey research, identifying the Cronbach alpha and conducting a Pearson correlation coefficient analysis confirms the internal consistency and reliability of the survey tool itself (Fathali & Okada, 2018; Dizon, 2016).

4.1 Descriptive Analysis Results

Table 2 displays the descriptive statistics for all seventeen survey items for the multi-item scale student survey. Table 3 shows the descriptive statistics for the teacher survey which included eleven items. The information retrieved from the descriptive statistics from both surveys addresses the second research question regarding student and teacher attitudes towards *Manaba*'s current use at our university. Additionally, 30 survey results were removed from the Table 2 student TAM survey in the initial descriptive statistical analysis as they contained survey questions that were unanswered. Table 2 summarizes the mean and SD for survey questions related to the TAM constructs for students.

Table 2

The Descriptive Statistics for the student TAM survey separated by sub-categories (N = 416)

TAM survey construct sub-categories	M	SD	Construct M	Construct SD
Perceived Self-Efficacy/Confidence				
1. I have confidence in taking online tests on manaba.	3.17	1.11		
2. I do not feel anxiety taking tests on manaba (both).	3.41	1.21		
Upper-intermediate (unit tests – 6 in total)	3.58	1.12	3.39	1.06
Intermediate (mid-terms and finals – 2 in total)	3.31	1.26		
3. I have confidence in doing homework on manaba.	3.46	1.07		
Perceived Ease of Use/ Enjoyment				
4. I enjoy using PCs in English classes.	3.84	1.06		
5. I enjoy taking tests on manaba.	3.31	1.14		
6. It was easy (for me) to take tests on manaba.	3.12	1.17		
7. I enjoyed doing homework on manaba more than on paper.	3.36	1.23	3.44	1.16
8. It was easy (for me) to do homework/assignments on manaba.	3.33	1.18		
9. Manabaʹs interface for taking tests was user-friendly.	3.45	1.15		
10. It was easy (for me) to learn how to take tests on manaba.	3.61	1.08		
11. Taking tests on manaba is easier than paper-based ones.	3.45	1.30		
Perceived Usefulness				
12. Manaba is a useful way to evaluate language competence.	3.16	1.07		
13. Manaba is a useful tool for the language practice.	3.45	1.13	3.44	1.13
14. I prefer taking online tests rather than paper-based ones.	3.39	1.30		
15. Doing homework on manaba helped (me) prepare for the tests.	3.67	1.05		
Behavioral Intention (future use)				
16. I would like to take more courses that assign online tests in the future.	3.37	1.07	3.25	1.17
17. If it is possible, I would like to take all tests online.	3.11	1.29		

Table 2 displays the results from the student survey as administered through *Google Forms*. The results displayed in Table 1 are divided into their intended clusters for the readersʹ benefit; however, on the actual survey, only the questions were displayed to students. The three survey items with the highest mean are number 4, the enjoyment of using PCs in an English Classroom (M=3.84), number 10, ease of learning how to take tests on *Manaba* (M=3.61) and number 15, the feeling of usefulness doing homework on *Manaba* to prepare for tests (M= 3.67). These survey items also directly pertain to the TAM constructs of *ease of use/enjoyment* and *perceived usefulness*.

Additionally, the results presented in Table 2 show the average mean and standard deviation for each TAM construct. The first variable, PSE/C, has a mean of 3.39, which indicates that students have moderate views considering their own abilities using *Manaba* for homework and test taking. Although not substantial, the results do show students indicate a positive trend in their confidence

levels. When looking at PEO/E and PU, students show a favorable attitude (*M*=3.44). The final construct, BI, has the lowest mean on our survey, which may require further research and rewording of the questions. As *Manaba's* intended use and applications are explained to students at the outset of the semester (mainly for HW and testing purposes), this could have impacted their responses as they are not given a choice in intended use of the LMS. Overall, however, the results in Table 2 show that students have moderately positive views on their self-reported PSE/C, PEOU/E, PU, and BI towards *Manaba* as an LMS, and as a result, addresses this research project's second research question.

Table 3

The Descriptive Statistics for the teacher TAM survey separated by sub-categories (N = 17)

TAM Survey sub-categories	M	SD
1. I feel confident assigning Manaba online exercises.	4.24	.56
2. I feel confident using Manaba based tests for testing students.	3.82	.64
3. I feel confident using e-learning environments for homework.	4.0	1.00
Perceived ease of use/enjoyment		
4. I enjoy using computers as an assignment distribution tool.	4.18	.88
5. I enjoy using e-learning for homework purposes.	4.24	.90
6. I enjoy using Manaba for making exercises and or tests.	2.94	.75
Perceived usefulness		
7. I believe an e-learning environment is useful for assisting in the assessment of language ability.	4.35	.70
8. I believe e-learning environments are useful as a platform for students to do language exercises on.	4.41	.62
9. I believe online activities are useful for providing students with homework.	4.41	.62
Experience using the LMS		
10. I have experience making exercises and or tests in Manaba.	2.65	1.54
11. I would be interested in learning how to make e-learning based activities.	4.06	.90

Table 3 displays the descriptive analysis of the teacher survey. The three survey items with the highest mean are item 7, confidence when using e-learning for assessments (M= 4.35), item 8, feeling that e-learning is useful for language exercises (M= 4.41) and item 9, the belief that online activities are useful for homework (M= 4.41). All these questions fall under TAM construct of *perceived usefulness.*

To answer our first research question, what were the correlations among the TAM variables, further analysis was needed to determine the interaction between the administered TAM constructs seen in Table 4. In order to measure the correlation between the four aforementioned constructs, research suggested to analyze the data using a Pearson Correlation Coefficient Analysis (statistics.laerd.com, 2016). With regards to having an adequate sample size for conducting this type of analysis, Comfrey and Lee (1992) suggested that the adequacy of a sample size should be based on 50 – very poor; 100 – poor; 200 – fair; 300 – good; 500 – very good; 1000 or more – excellent (Comfrey & Lee as cited in Osborne & Costello, 2004, p. 1). Therefore, for the sake of this analysis, the sample of 416 is sufficient to perform the correlation coefficient analysis for the student TAM survey results.

Table 4

The Pearson Correlation Matrix of clustered survey categories (N=440)

	PSE/C	PEOU/E	PU	BI
PSE/C	1			
PEOU/E	.77**	1		
PU	.64**	.82**	1	
BI	.55**	.67**	.73*	1

Note ** *p* < 0.01

* *p* < 0.05

Table 4 shows Pearson correlation coefficients between the surveyed TAM variables of PSE/C, PEOU/E, PU, and BI. If a construct has an r value between 0.68 and 1.0, it is considered to have a high correlation (Taylor, 1990). Identifying the correlation among the variables answers the first part of our research question. According to the results, a reasonable correlation can be seen among PU and BI (r=.73) meaning PU is a potential predictor of a user's BI. This finding aligns with previous TAM survey research (Dizon, 2016; Gamble, 2017; Lee, 2003; Vankatesh & Davis, 2000). Interestingly, the strongest correlation can be seen between PEOU/E and PU (r=.82). This discovery was echoed by Lee et al. (2003), where PEOU/E is shown to be a stronger indicator of PU. According to the research, PU has a strong effect on a user's acceptance of technology and eventual use (Lee et al., 203). Additionally, the additional external factor that our survey included, PSE/C, has a strong correlation to PEOU/E (r=.77) which means that a user's confidence in their own ability to use *Manaba* is highly connected to their perceived enjoyment or ease of using it. Therefore, according to our results, our survey variable constructs align with the most current research conducted on TAM.

5. Discussion

5.1 Overview of Main Findings

Based on the results obtained from the student surveys, the data suggests students identify positive attitudes towards using the *Manaba* LMS for the completion of homework assignments and assessments, which answers our second research question. The results also indicated students perceived e-learning via online homework as useful and showed they also felt online assignments helped prepare them for future tests (as seen in response to question 15 on the student survey). Student survey results revealed that a majority of participants prefer taking courses which offer online content and digital assessments. Overall, the TAM survey results are corroborated by previously identified TAM studies conducted in Japan, thus indicating that our research adds to the gap in current Japanese TAM studies (Dizon, 2016; Gamble, 2018; Cote & Milliner, 2016; Fatheli & Okada, 2018).

Further analysis of the student TAM survey results uncovered that one of the greatest advantages to digitizing assignments is the instant feedback on homework assessments which research has shown may have a positive impact on their autonomy. Students in this study identified that doing homework on *Manaba* helped prepare them for their unit tests (M=3.67). It was seen that students often went back to practice homework exercises again before a unit test which has implications on their autonomous learning. Fathali and Okada (2018) concur with this suggestion as their study identified that Japanese learners' perceived autonomy was directly related to their use of the LMS outside of the classroom for language learning practice. The connection between technology acceptance and learner autonomy is further echoed by Middleton and Spanias (1999) where they argue that e-learning assessments allow students to have more control over their practice and receive immediate reinforcement which can aid in improving intrinsic motivation and confidence in learning the material. From the TAM student survey results and previously identified research findings, students' perception of an LMSs' usefulness has a direct connection to their behavioral intent and autonomous use of the system outside of the classroom. Therefore, it can be concluded that the TAM constructs of PU and PEOU/E have positive implications towards improving student confidence and autonomy in the context of effective LMS implementation.

When compared to the results from the teacher survey, we found that educators have a higher mean when it comes to the confidence and perceived usefulness pertaining to the exercises and assessments as shown in Table 3. One of the possible reasons for this is that teachers understand the potential of having such a large amount of data available to them regarding student assignment completion level, language ability, and instant student feedback. These benefits may not be immediately apparent to the students, but they are more likely in the minds of the educators who are administering these homework activities and assessments. This finding aligns with previously identified research where teachers show a much higher degree of perceived usefulness of LMSs (Fageeh, 2015; Roever, 2001). Additionally, as can be seen on question 11 from the teacher survey, teachers expressed an interest in learning more about how to use *Manaba* to create assessments. However, as our teacher survey contained an open-ended space for additional comments, we

discovered that teachers lamented that they lacked professional training in using *Manaba* and expressed a deep interest in mandatory faculty development. Previous research specifically on teacher's perceptions of *Manaba*'s implementation in Japanese universities revealed similar findings (Toland, et al., 2014). Therefore, although teachers find LMSs useful, it can be argued that in order for an LMS to be properly implemented in an EFL university setting, proper training is required and requested by English teachers.

5. 2 Additional Considerations

Deeper analysis into the TAM findings unearthed additional findings that may serve as items of consideration or suggestions for future curriculum development. For example, the intermediate English course uses high stakes tests in the form of a midterm and final exam while the upper intermediate English course uses a unit by unit exam given approximately every two weeks. The students in the intermediate English course reported a higher level of anxiety during the test taking than those in the upper intermediate English course. This may be due to the high stakes test environment; thus, it should be considered as whether or not this added anxiety is a help or hindrance when it comes to student's use and acceptance of *Manaba*. It could be argued, however, that students with higher anxiety levels are therefore more likely to study independently for longer periods of time and take the tests more seriously. On the other hand, added anxiety is a hindrance because of the affective filter hypothesis (Krashen, 1987). Therefore, according to the research and findings from the TAM surveys, it can be concluded that more exposure to the LMS has positive impacts on students' PSE/C when it comes to assessments and test taking.

5.3 Limitations

As this project combined the TAM survey results of students in two different English level groups, it is necessary to understand the implications of this type of quantitative analysis. Although the level of English capability might vary between the two groups, both classes were using books produced by Macmillan, the Global Series. The Global Pre-intermediate book, used in the Intermediate course and Global Intermediate book, used in the Upper Intermediate course, were identical in content layout and format. Likewise, the worksheets provided identical instructions and question type that were later converted into on-line homework activities. Thus, the authors of this paper agree the results are equally valid across the two courses surveyed because the student's acceptance of e-learning and the *Manaba* LMS were the main subject of inquiry as opposed to their English capabilities.

Student interviews were not a possibility in this iteration of our TAM research. Time was a limited resource and such an endeavor needed detailed preparations. It is believed that a large number of interviews would need to be conducted as talking to a handful of students may not yield information representative of the whole. This means additional staff would have to have been recruited into the project. It was felt that carrying out such interviews appropriately would require multiple native Japanese speakers who are also intimately aware of our project design and research

goals in order to draw out additional insights accurately. The interviewing of students would add the benefit of personal testimony and give researchers the ability to ask follow-up questions. It is advisable that future research includes an interview phase and that preparations be made early on.

Finally, it should be made known that this study does not address the impact moving from paper-based assignments to digital ones has had on a student's overall grade. While it can be argued that instant feedback and continual access to materials is considered a positive force, this study does not feature data collection related to student grades. To acquire data that would accurately determine a change in the grades of the students would be a research paper entirely of its own. Furthermore, such research would require a control group who would then be denied access to what the researches of this paper and instructors at the university deem beneficial. This could create issues of unfairness as one group's grades might be negatively impacted long-term and thus could be considered by some as unethical. Prior to this kind of study, a risk-benefit analysis should be considered.

5.4 Conclusion and Implications

In summary, this research revealed students identified that the homework assignments are beneficial for preparing for tests (M = 3.67), that they prefer taking digital assessments (M= 3.39), and that a majority of students felt it was easy for them to learn to take the online examinations (M=3.61). They also felt Manaba is useful for learning language (M= 3.45) and lean towards taking classes that are computer aided (M= 3.37). Research also concluded teachers showed high degree of confidence in using the LMS for the purposes of administering assignments (M= 4.41) and examinations (M= 4.35). The results of this research have led the authors of this article to believe that in fact the implementation of digital assessments and online homework should be continued as students and teachers have demonstrated acceptance of the new technology.

Additionally, there was also a strong indication that instructors have a desire to create digital content for the curriculum (M= 4.06). This shows educators are willing to adapt to new technologies as well. Therefore, the research conducted at this university could affect the confidence of lectures and staff when it comes to creating computer-based activities and exercises for student use. With the knowledge that students in Japan are ready to accept a blended learning environment, instructors may be more willing to create digital content they otherwise were unsure about implementing. This could also open the door to further faculty development opportunities in the area of LMS based education as educators may feel encouraged by the results presented in this research.

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APPENDIX: A Survey Administered through Google Forms to Students with Japanese and English Translations

Perceived self-efficacy/confidence -

1. マナバを使ってオンラインでテストを受けることには自信がある。 I have confidence in taking online tests on manaba.

2. マナバのようなeラーニング環境でテストを受けることに不安は感じない。I do not feel anxiety taking tests on an e-learning system such as manaba.

3. マナバを使って宿題の練習問題をすることには自信がある。I have confidence in doing homework on manaba.

Perceived Enjoyment/Ease of Use

4. 英語の授業でパソコンを使うのは楽しい。I enjoy using PCs in English classes.

5. マナバを使ってテストを受けるのは楽しい。I enjoy taking tests on manaba.

6. マナバでテストを受けるのは簡単だった。It was easy (for me) to take tests on manaba.

7. マナバを使って宿題の練習問題をするのは楽しい。（紙の宿題よりも）I enjoyed doing homework on manaba more than on paper.

8. マナバで宿題をするのは簡単だった。It was easier (for me) to do homework/assignments on manaba.

9. テストを受けるためのウェブサイト（マナバ）はわかりやすかった。The website for taking the tests such as manaba was user-friendly.

10. マナバ上でのテストの受け方を学ぶのは簡単だった。It was easy (for me) to learn how to take tests on manaba.

11. 紙のテストよりもマナバ上でテストを受ける方が簡単だと思う。I think taking tests on manaba is easier than paper-based ones.

Perceived Usefulness

12. マナバは、言語能力を評価するのに役立つと思う。I think manaba is a useful way to evaluate language competence.

13. マナバは、言語の練習問題をするのに便利なツールだと思う。I think manaba is a useful tool for the language practice.

14. 紙よりオンラインでテストを受ける方が好きだ。I prefer taking online tests rather than paper-based ones.

15. マナバ上で宿題の練習問題に取り組んだことは、テストに備えるのに役立った。Doing homework exercises on manaba helped (me) prepare for the tests.

Behavioral Intention

16. 今後、インターネット上でのテストを行う授業をもっと取ろうと思う。I would like to take more courses that assign online tests in the future.

17. 可能ならば、全てのテストをインターネット上で受けたい。If it is possible, I would like to take all tests online.