Students' perceptions about the use of digital badges in an online English terminology course: a three-year study

Jun Iwata[1], Shudong Wang[2], and John Clayton[3]

Abstract. In e-learning environments, 'digital badges', often referred to as 'micro-credentials', are expected to function not only as valid indicators of learner's accomplishments but also as useful tools for motivational and reward purposes (Clayton, 2012). In this study, we investigated students' perceptions about the use of digital badges in an online terminology course we had developed (Iwata et al., 2017). We hypothesized that the badges which students earned for the course would not only function as an indicator of their achievement but also help enhance their learner autonomy. Through a three-year survey on students' perceptions of their course of study in this course, we found that a large majority of students (88.3%) were satisfied with their study through this course and that most of the students (69.7%) found the use of badges helpful in confirming their course achievements. The results also showed that two-thirds of them (64.3%) found that earning badges helped motivate them toward further autonomous study. These findings indicate that the use of digital badges can provide students with opportunities to enhance their learner autonomy.

Keywords: digital badges, micro-credentials, students' perceptions, medical English.

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1. Introduction

In today's e-learning environments, more and more learning tools and activities are available for learners. They have more choices for the time, like when they choose to learn and the place where they choose to learn. In these increasingly learner-centered, personalized learning environments, learners are expected to be more responsible for their learning outcomes. This means there is an increasing need for them to collect learning experiences or outcomes that matter to them (Aşık, 2010). Clayton, Iwata, and Saravani (2016) suggested that "a fundamental criterion for the success of self-motivated and self-directed English language learning environments is the ability of learners to make the appropriate connections between their existing skills, knowledge and experience, and expected skill, knowledge and behaviors" (p. 1340). Clayton (2012) and Clayton et al. (2016) also suggested that digital badges or micro-credentials function as valid indicators of accomplishment and they also function as a motivator by demonstrating their learning achievements through the display of endorsed digital badge collections.

In our study, we investigated students' perceptions about the use of digital badges in a 1,000 Basic Medical English Terminology course we had developed by using the badge function of Moodle, one of the most popular learning management systems in our previous study (Iwata et al., 2017). We hypothesized the use of digital badges would firstly help learners confirm their achievements and secondly help them engage with the courses available and participate autonomously in learning activities. Through a three-year study (2016-2018) on students' perceptions of implementation of digital badges in the course, we evaluated the effects of using them in the course.

2. Course details

2.1. Structure

The course we used in this study was a 1,000 Basic Medical English Terminology course on Moodle. This course was developed to help medical students in Japan to review the basic medical terms they learned at school. We applied the use of digital badges to this course by using the badge function of Moodle. The course consists of 13 sections, each of which includes three types of quizzes to check medical terms.

2.2. Learning procedure

Figure 1. Learning procedure

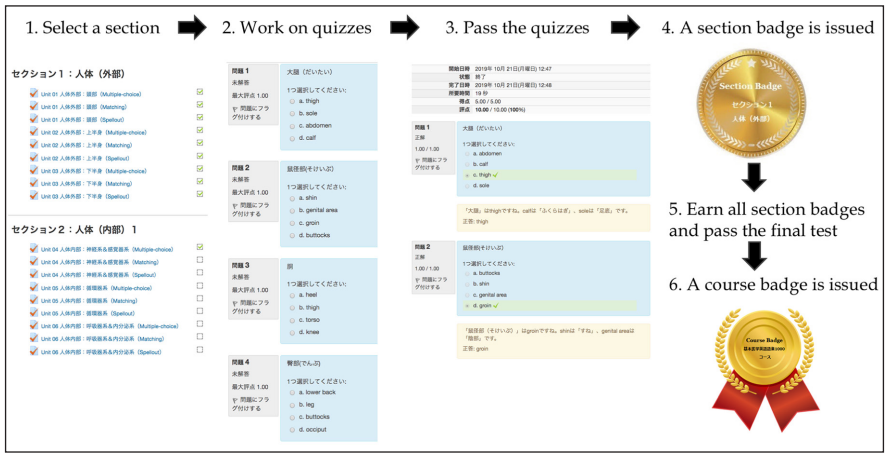


Figure 2. Portfolio

基本医学英語語彙1000 学習コース: Badges

Number of badges available: 14

Image	Name	Description	Criteria	Issued to me
	セクション１：人体（外部）	This badge is issued for successful completion of Section 1.	Users are awarded this badge when they complete the following requirement: • **ALL** of the following activities are completed: o **"Quiz - Unit 01 人体外部：頭部（Multiple-choice）"** o **"Quiz - Unit 01 人体外部：頭部（Matching）"** o **"Quiz - Unit 01 人体外部：頭部（Spellout）"** o **"Quiz - Unit 02 人体外部：上半身（Multiple-choice）"** o **"Quiz - Unit 02 人体外部：上半身（Matching）"** o **"Quiz - Unit 02 人体外部：上半身（Spellout）"** o **"Quiz - Unit 03 人体外部：下半身（Multiple-choice）"** o **"Quiz - Unit 03 人体外部：下半身（Matching）"** o **"Quiz - Unit 03 人体外部：下半身（Spellout）"**	Date: 19/09/16 ✓
	セクション２：人体（内部）１	This badge is issued for successful completion on Section 2.	Users are awarded this badge when they complete the following requirement: • **ALL** of the following activities are completed: o **"Quiz - Unit 04 人体内部：神経系＆感覚器系（Multiple-choice）"** o **"Quiz - Unit 04 人体内部：神経系＆感覚器系（Matching）"** o **"Quiz - Unit 04 人体内部：神経系＆感覚器系（Spellout）"** o **"Quiz - Unit 05 人体内部：循環器系（Multiple-choice）"** o **"Quiz - Unit 05 人体内部：循環器系（Matching）"** o **"Quiz - Unit 05 人体内部：循環器系（Spellout）"** o **"Quiz - Unit 06 人体内部：呼吸器系＆内分泌系（Multiple-choice）"** o **"Quiz - Unit 06 人体内部：呼吸器系＆内分泌系（Matching）"** o **"Quiz - Unit 06 人体内部：呼吸器系＆内分泌系（Spellout）"**	
	セクション３：人体（内部）２	This badge is issued for successful completion of Section 3.	Users are awarded this badge when they complete the following requirement: • **ALL** of the following activities are completed: o **"Quiz - Unit 07 人体内部：消化器系（Multiple-choice）"** o **"Quiz - Unit 07 人体内部：消化器系（Matching）"** o **"Quiz - Unit 07 人体内部：消化器系（Spellout）"** o **"Quiz - Unit 08 人体内部：泌尿器系＆生殖器系（Multiple-choice）"** o **"Quiz - Unit 08 人体内部：泌尿器系＆生殖器系（Matching）"** o **"Quiz - Unit 08 人体内部：泌尿器系＆生殖器系（Spellout）"** o **"Quiz - Unit 09人体内部：筋骨格系（Multiple-choice）"** o **"Quiz - Unit 09 人体内部：筋骨格系（Matching）"**	

A typical learning procedure is shown in Figure 1 above. As explained in a previous paper:

> "[s]tudents first chose a section in the course and then worked on the quizzes in that section. To pass each quiz, they had to meet the criteria we set. When students successfully passed all the quizzes of each section, they were issued a 'section badge'. When students had earned all 13 section badges and had passed the final test, they were issued a 'course badge'" (Iwata et al., 2017, p. 172).

The badges students had earned during their course of study were displayed in their portfolio on Moodle as shown in Figure 2 above, which were expected to function as validated indicators of their achievements.

3. Course evaluation

We carried out a three-year research project to investigate students' perceptions for the course from 2016 to 2018. Each year, we made this course available on our Moodle site as a self-study review course and we encouraged first-year medical students to complete the course at their own pace during a four-month period in the fall semester.

After students had finished the course, we asked them to fill in an online questionnaire on Moodle using a Likert scale (5, strongly agree; 4, agree; 3, neither agree nor disagree; 2, disagree; and 1, strongly disagree) regarding their use of the course. We asked the following six questions based on the perceptual measures (Iwata et al., 2017) to investigate students' perceptions.

- Q1: Was the badge-based assessment system comprehensible? (Comprehensibility)
- Q2: Was the badge system helpful in checking your achievements? (Checking achievements)
- Q3: How do you think this course helped you improve your medical English vocabulary? (Usefulness)
- Q4: Are you satisfied with your medical English study through this course? (Satisfaction)

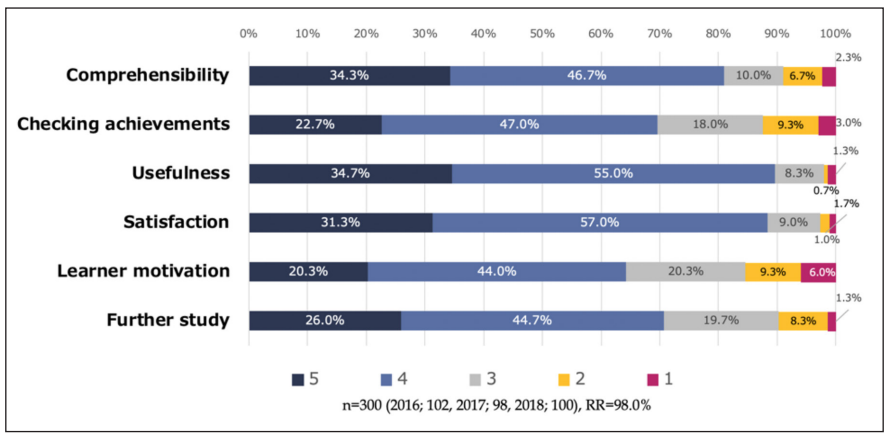
- Q5: Did the badges influence your learning motivation? (Learner motivation)

- Q6: Would you like to study English with online self-study courses like this course? (Further study)

4. Results

Three hundred students (RR=98.0%) answered the questions and the results of the six questions (Figure 3).

Figure 3. First results of the Likert scale questions about students' perceptions



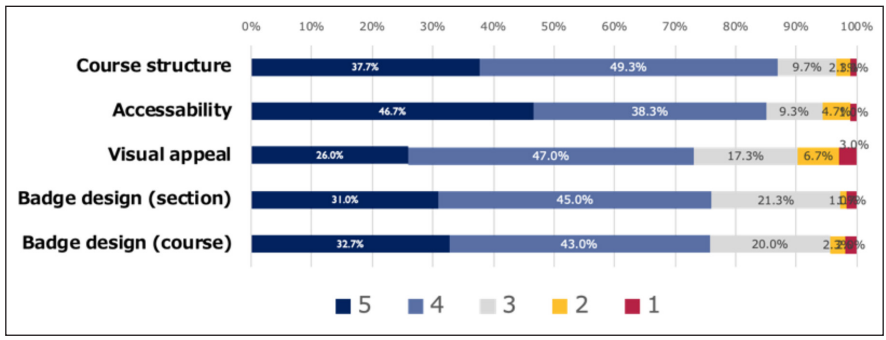
We regarded five (strongly agree) and four (agree) as positive results. The first two questions investigated whether the badge-based assessment was comprehensive and how digital badges helped confirm achievements. Eighty-one percent of the students found the badge-based assessment system comprehensible and 69.7% of them found the system helpful in checking their achievements. The next two questions investigated students' self-engagement: usefulness and satisfaction. A large majority of students (89.7%, 88.3% respectively) gave us positive responses to these criteria.

The last two questions investigated students' autonomy and their willingness to study further. About two-thirds of students (64.3%) found that earning badges helped motivate them toward further autonomous study. However, a third of them (35.7%) seemed unsure about the effect. Also, while about 70.7% of the students

said that they would like to study English with online self-study courses like this course, about 30% of them said they were not willing to do so.

We also asked another series of questions about the structure and design of the course using a Likert scale. The results show that a majority of students seemed to find the course structure and design of badges satisfactory though there remained room for improvement in visual appeal and the design of badges (see Figure 4).

Figure 4. Second results of the Likert scale questions about students' perceptions



5. Discussion

The initial findings from the survey on students' perceptions about the course seemed to indicate the use of badges functions well as an indicator (Clayton, 2012). As a whole, most of the students found the badge-based assessment was helpful in checking achievements. The data also has shown that the use of badges seemed to help students' engagement in the course. A large majority of the students found the course useful and they seemed satisfied with the course. As for the function of the use of badges as a motivational tool, two-thirds of the students found that earning badges helped motivate them with their study. However, there seems to be room for improvement because a third of them responded that the badges were not yet a motivating factor for them.

6. Conclusions

An investigation through three-year survey results on students' perceptions of the use of digital badges in a medical terminology course suggests that this digital

badge system allows learners to create a holistic view of their achievements through a pictorial display of earned badges. The results also suggest that while there seems to be room for improvement, the digital reward system shows potential to help learners study autonomously.

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