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Evaluation of an E-Learning Distance Education System in the Graduate School of Medical Sciences of Tottori University

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Three years have passed since the introduction of a new e-learning system as part of the graduate study program in the Faculty of Medicine of Tottori University. To improve this system, a survey was conducted among graduate students and faculty members to evaluate it. The subjects of the study were 138 graduate students (in the doctoral programs in Medical Science, 1st- and 2nd-term doctoral programs in Life Science, 1st- and 2nd-term doctoral programs in the Institute of Regenerative Medicine and Biofunction, and Clinical Psychology) as well as 108 faculty of the Graduate School of Medical Sciences of Tottori University. Graduate students reported that the e-learning education system is adequate and that they are satisfied to an above average level. The reasons for dissatisfaction with the system were roughly divided into 3 categories: "contents", "system" and "student reports". This e-learning system is still at an early stage of development, but we are pushing forward to improve this in anticipation of increasing the use of web learning modalities in the future.

Key words: distance education; graduate education; graduate student

In 2009, a new distance education program (the e-learning system) was introduced into the graduate study program of the Faculty of Medicine at Tottori University. A report was published about this by Houri et al. (2009). This program involved the delivery of a CD/DVD course to graduate students in the program. The education course consisted of seven sub-courses, each going beyond individual fields of study. Each sub-course is divided into 1–6 categories (1 category corresponds to a 1-credit class) and each category has 7–8 content units. A graduate student studies 7–8 content units from each selected category, chooses 3 of its 7–8 content units and writes a report about the problem specified in the 3 units. A content teacher evaluates these student reports.

We believe that this type of distance education is useful because it enables us to deal with an increase in graduate students from society. Three years have now passed since the introduction of this e-learning system. Therefore, we decided to revise the contents of the program by surveying postgraduates' feelings and requests as well as teacher's awareness and opinions, aimed at improving our distance education program. To clarify the program's effectiveness, a questionnaire survey was designed and conducted for teaching faculty and graduate students using it. Based on the results of this survey, revisions and upgrades of the program contents were carried out in order to improve the system.

Abbreviations: CD, compact disk; DVD, digital versatile disk; USB, universal serial bus

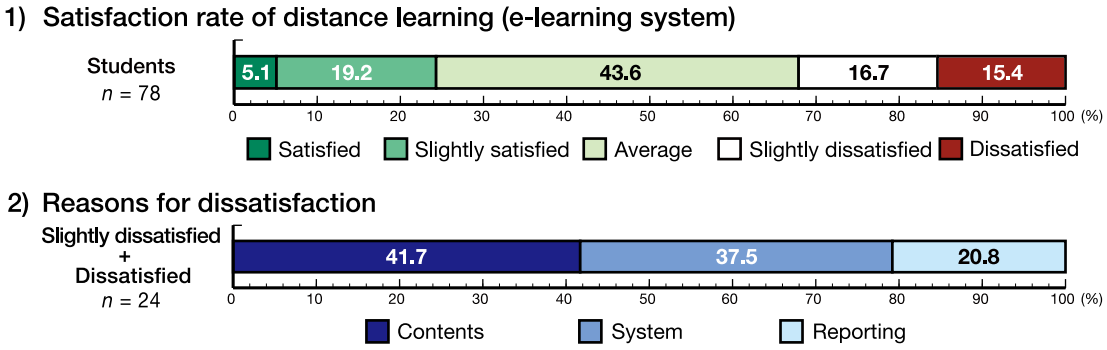

Fig. 1. Satisfaction rate of distance education and reasons for dissatisfaction.

Materials and Methods

The subjects of this study were 138 graduate students (50 from doctoral programs in Medical Science, 33 from 1st- and 2nd-term doctoral programs in Life Science, 51 from 1st- and 2nd-term doctoral programs in the Institute of Regenerative Medicine and Biofunction, and 4 from Clinical Psychology) as well as 108 faculty from the Graduate School of Medical Sciences, Tottori University.

The questionnaire form was distributed to, and collected from, teaching faculty and graduate students in the fields of life science, clinical psychology, and function science of regenerative medicine using the university's campus mail delivery system. Students majoring in medicine were sent the form by the public postal system, because of the large number of these students living off-campus. The forms were sent back unsigned. The collection rate of graduate students was 64.5%, while that of teachers was 81.7%. The questionnaire dealt with the subjects' satisfaction, program contents and problems concerning distance education and the e-learning system.

The questionnaire data were analyzed for statistical significance by means of the chi-squared test. Differences were considered significant at $P < 0.05$.

Results

For the item "Satisfaction rate of distance education", a large number of graduate students answered, "average" (43.6%; Fig. 1). The reasons for dissatisfaction with the system were roughly divided into 3 categories: "contents", "system" and "student reports".

- Contents: There were many comments about content relevance such as "The contents are too old for graduate lectures (even on subjects from 2 years ago)".
- System: i) The voice on the CD/DVD was hard to understand. ii) There was insufficient explanation given in the PowerPoint notes and voice input. iii) There was 1 case where trouble occurred due to the password necessary to open the CD. iv) The quality of the contents could be improved if an evaluation of each content unit was installed.
- Student reports: There were many comments such as "The work only of examination and summary is meaningless for graduate students", "To write opinions and hypotheses about hard-to-answer questions is effective" and "Reports could be excellent after graduate students read and summarize a number of textbooks and scientific papers" (Fig. 1).

When asked "Are you satisfied with the kind and number of content units?", 65% of graduate students answered "Yes" and 5.2% "No" (Fig. 2). When asked "Do you think the contents were designed in a way that stimulates intellectual curiosity?", 23.8% of teachers answered "Yes" while 31.2% of graduate students answered, "No". There was thus a significant difference ($P = 0.0001$) in opinion between teachers and graduate students (Fig. 2). When asked "Do you think that the contents are old?", about 60% of teachers and graduate students answered, "Yes" or "Yes, a little", and there was no significant difference (Fig. 2).

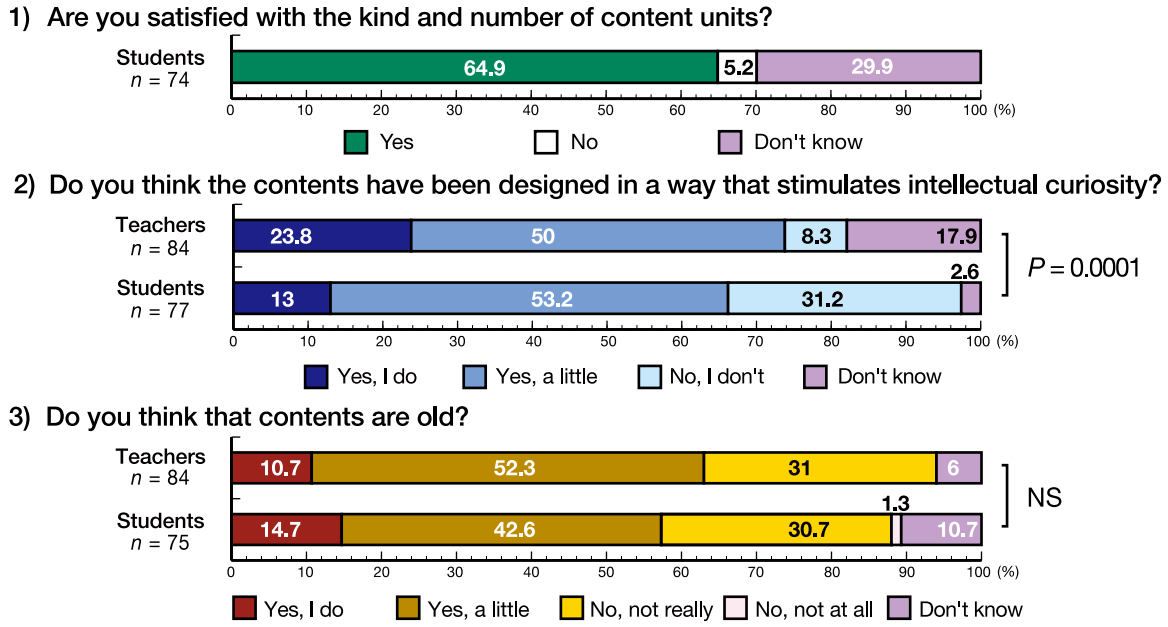

Fig. 2. Subject responses about e-learning contents. NS, not significant.

When asked "Do you think that students write good reports at graduate level after understanding the contents thoroughly?", the ratio of teachers who replied "Yes, I do" and "Yes, a little" was 1.8 times greater than that of students (Fig. 3). There was a significant difference (P = 0.0002) in opinion between teachers and students.

The reasons why teachers didn't think that graduate students write good reports at graduate level can be classified into 3 areas (Fig. 3).

i) Their motivation and zeal are insufficient ("Students' originality cannot be felt at all" and "Although the quality and quantity of their written reports are not high enough, graduate students think these are good enough to present").

ii) Students don't study enough ("There is no description of subjects examined by students themselves" and "Little consideration was based on the scientific literature").

iii) The Copy and Paste problem: When asked " Do you think it is appropriate to study 7–8 content units and submit 3 reports for each credit?", about 60% of teachers and students answered, "It's just right" (Fig. 3). The ratio of students who answered "That's too much" was more than twice that of the teachers. A significant difference (P = 0.0109) was observed here in opinions between teachers and students.

The teachers took 8 days on average to prepare each unit. The graduate students studied 1 content unit in 0.8 h, and wrote a report in 1.6 days (Table 1).

Discussion

Three years have passed since the introduction of e-learning by CD/DVD into the graduate study program of the Faculty of Medicine in Tottori University. The questionnaire survey described here was conducted to learn about the effectiveness of this distance education program. The opinions of teachers and graduate students were analyzed, and the contents were revised accordingly.

For the item "Satisfaction with distance education and the e-learning system", 67.9% of graduates indicated that they were not dissatisfied. The ratio of students satisfied with the type and number of contents was 64.9%. Graduate students and teachers agree that it is appropriate to study 7–8 content units and submit 3 reports for each credit. Thus, graduate students seemed to think that this distance education system is adequate and are satisfied to a

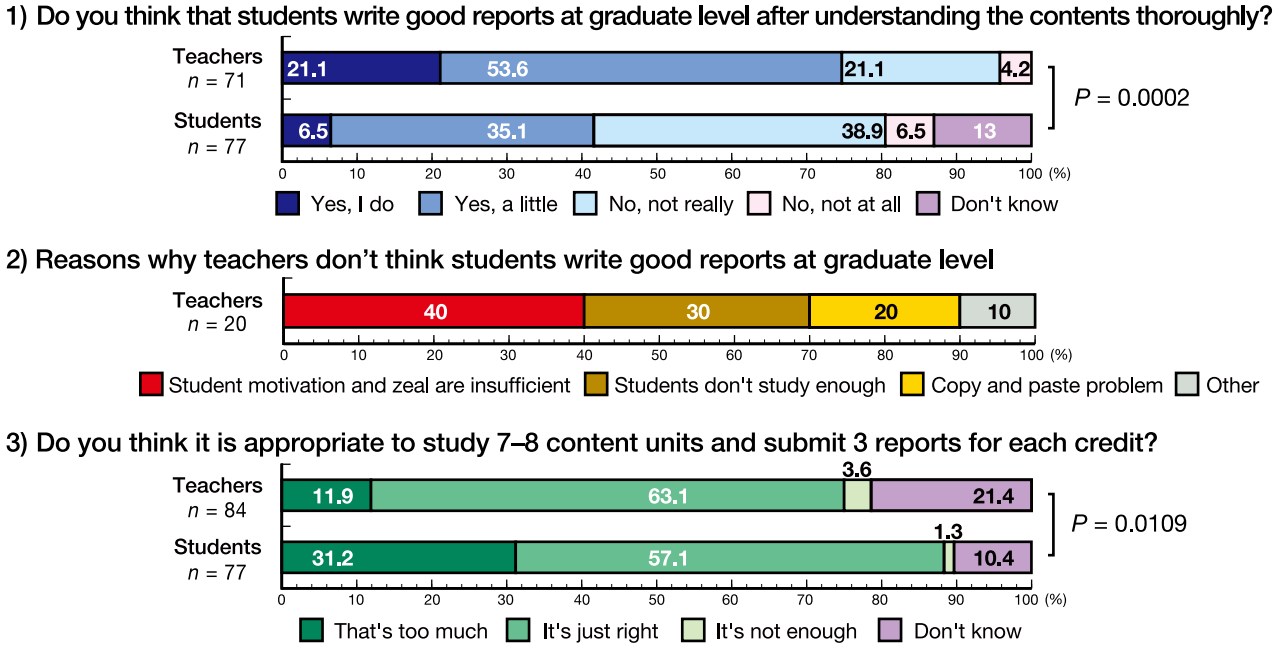

Fig. 3. Subject responses about e-learning student reports.

degree above average. However, 32.1% of graduates were dissatisfied.

Both teachers and graduate students indicated that the contents are too old for graduate lectures (even content units on subjects of 2 years ago). To address this, teachers were requested to revise and upgrade their contents.

As for dissatisfaction with the system, an old microphone for recording voices, no specification of the USB hub of the main current at the time, and a teacher unaccustomed to putting voice to PowerPoint are thought to be responsible. Attempts were made to resolve the password problems by putting a password to each folder with 7–8 content units, instead of to each content unit. A quick support system is necessary for graduate students to maintain their motivation and to enhance their learning. This kind of support system involves preparation and presentation of a well-maintained learning environment (Tanaka et al., 2007). For this, it is necessary to evaluate each content unit. However, issues such as how evaluation results should be given to teachers and how teachers should evaluate themselves based on survey results are problems that need to be addressed in the future. Graduate students' opinions about written reports were taken into account. When the program's contents were revised, teachers were requested to improve their content units so that the level of the contents is higher than that of lectures for undergraduate students. Moreover, it was felt that the topics for student reports should not be easily available on the Internet. The reports should require the inclusion of graduate students' own ideas.

On the other hand, 73.8% of teachers felt that the contents were written in a way that stimulated intellectual curiosity. However, the number of students who answered, "No, I don't (think so)", was 3.8 times more than that of teachers, showing that a significant difference is present between teachers and students. It is regrettable that graduate students didn't understand that it took 8 days for teachers to devise each content unit on average. However, there must obviously be some differences among content units, some being good and others less good.

Recently, techniques and ideas for writing student reports have greatly changed, with the development and general use of the computing environment. The problem of students plagiarizing documents from the Internet ("Copy and Paste") also exists. In 1 recent opinion poll (Fujimoto et al., 2009), more than 65% of students did not feel guilty

Table 1. Time for teachers to create contents and for students to study these

Subject		Mean ± SE	*n*
Time required for teachers to create 1 content unit	(d)	7.98 ± 1.29	80
Time students spent watching CD or DVD to study 1 content unit	(h)	0.80 ± 0.14	70
Time required for students to write 1 report	(d)	1.58 ± 0.26	72

CD, compact disk; DVD, digital versatile disk.

about using "Copy and Paste" for writing student reports. In a related result, 12.4% did not feel guilty about cheating in examinations. Despite this misbehavior, "Copy and Paste" is felt by students to be far less serious than cheating in examinations.

There were many teachers who feel that students write good reports at graduate level after understanding the contents thoroughly. This indicates that student reports may seem to reach the level that teachers expect. However, these seemingly respectable reports might be a result of "Copy and Paste". Because their reports may have been made via "Copy and Paste", the students themselves might not consider them good reports. Given the amount of time (1.6 days) that it took for graduate students to write their reports, and considering that the students themselves don't think their reports are good, there are strong reasons to believe that their reports contain unreferenced quotations from the Internet and even "Copy and Paste" writing.

Research using an online report submitting system has shown that students easily plagiarize parts of reports written by other students (Ueta and Tominaga, 2010). To determine whether a given report was written by students themselves, the degree of similarity of reports should be ascertained, and reports evaluated by an examination to see if materials learned are included in student reports. However, a great deal of time is necessary to carry out this task accurately and impartially. Although a report evaluation support system is available, no teacher at Tottori University has been reported to use this.

Collectively, although examination problems requiring knowledge to solve might be necessary, harder-to-answer problems that require individual students' hypotheses and opinions may be much better.

This questionnaire survey on e-learning was conducted for the first time. Based on results from the survey, we carried out revisions and upgrades of the contents in order to improve the system and our distance education program. We are still at an early stage in the development of our e-learning system, but are pushing ourselves forward to improve this in anticipation of increasing use of web learning modalities in future.

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