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Recurrent Education in Higher Education Institutions for Clinical Laboratory Scientists who are Responsible for Ultrasonography examination

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Abstract

In 2018, the Japanese government introduced a policy called "100 years of life", which emphasized the importance of lifelong learning, including reskilling. most of the knowledge obtained from university lectures becomes obsolete within 5 years and is not sufficient for laboratory work and physical exams in hospitals. Many students who work in hospitals perform ultrasound exams, and as medical technologists, they often pursue certification as a "JSUM Registered Medical Sonographer" from the Japan Society of Ultrasonic Medicine. This certification is a popular milestone for medical technologists performing ultrasound exams to advance their careers. At Kobe-Tokiwa University, we have offered continuing education classes for medical technologists who work in hospitals and perform ultrasound exams since 2018. During these classes, we had paper-based interviews for students. In this paper, we present the records of the lectures and the results of our analysis of the interviews. We also discuss the need for continuing education for medical technologists provided by higher educational institutions.

Keywords: recurrent education, re-skilling, ultrasound examination, whole life study, medical technologist

1 Introduction

In recent years, people are living longer lives. The Japanese government has suggested a policy called "100 years of life" to address the importance of lifelong learning and creating a secure social system for all ages[1]. In this paper, we report on a project for medical technologists working in hospitals, particularly in physiological testing. The government has defined "recurrent education" and "reskilling" as key components for career advancement and productivity growth[2]. Kobe-Tokiwa University has many students who will work in medical or educational facilities as specialists, such as healthcare workers. Graduates from the medical technology department often work as medical technologists in hospitals. Some medical technologists in Japan perform ultrasound exams[3]. This paper reports on a continuing education project at Kobe-Tokiwa University specifically for ultrasound exams and considers the needs of such education.

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2 Method and Result

The recurrent education program at Kobe-Tokiwa University was established due to the transfer of an author. The program was scheduled to run from 2018 to 2023, but due to the COVID-19 pandemic, we had to suspend the course for a few months. To develop the recurrent education program, we drew upon the history of the lecture course at Kobe City Medical Center West Hospital, which was a part of community healthcare from 2002 to 2018 under the author's leadership. The program is designed to help former students acquire the necessary techniques and knowledge for ultrasonography examinations. Below, we present the records of the program in Kobe-Tokiwa university as "Table 1".

Table 1: Program of recurrent education class

No. of class	Contents of the class
1	Basic Scanning (Classification of Couinaud) and Evaluation Points
2	Portal hypertension and diffuse disease
3	Liver cirrhosis and premalignant lesions
4	Neoplastic lesions and their evaluation points
5	Liver cystic lesion
6	Fundamentals of Practical Cardiology
7	Acute myocardial infarction and cardiovascular examination
8	Routine work of echocardiography
9	Left ventricular diastolic dysfunction and shortness of breath
10	Diagnosis and concept of ascites and pleural effusion
11	Epithelial exocrine tumor (Invasive pancreatic ductal carcinoma)
12	Epithelial endocrine tumor (p-NET)
13	Epithelial exocrine tumor, cystic tumor (IPMN, SCN, MCN)
14	Pancreatic metastatic tumors and non-epithelial tumors
15	Pancreatic Metastatic Tumor and Groove Pancreatitis, Groove Pancreatic Cancer
16	Diagnosis of mitral valve prolapse and diagnosis of severity of mitral valve regurgitation
17	Basics of heart sound auscultation
18	Basics of electrocardiogram1
19	Basics of electrocardiogram2
20	Basics of electrocardiogram3
21	Biliary lesions, gallbladder disease and obstructive jaundice

We have compiled the profiles of the students who participated in the program, and shown as below "figure 1 to 3". Approximately 35% of the students were informed about the program through our university officials, and 48% of the students had less than three years of experience in ultrasonography examination.

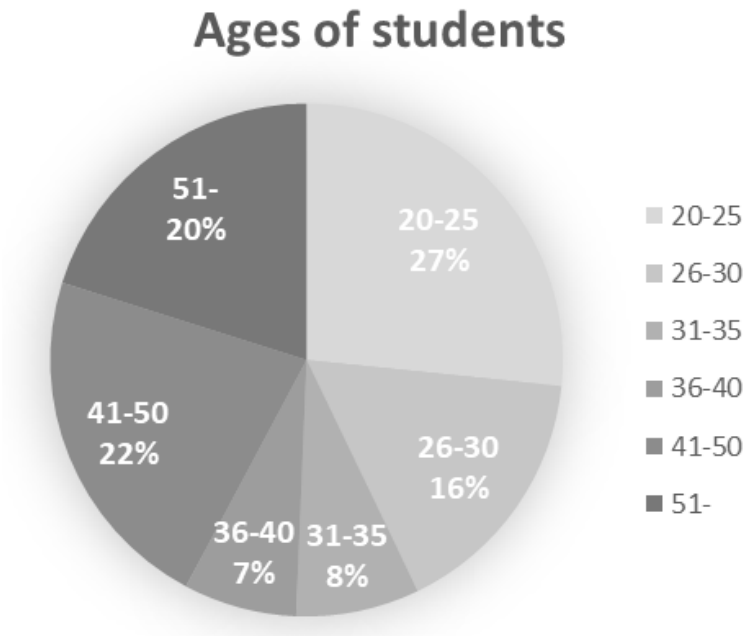

Figure 1: Ages of students

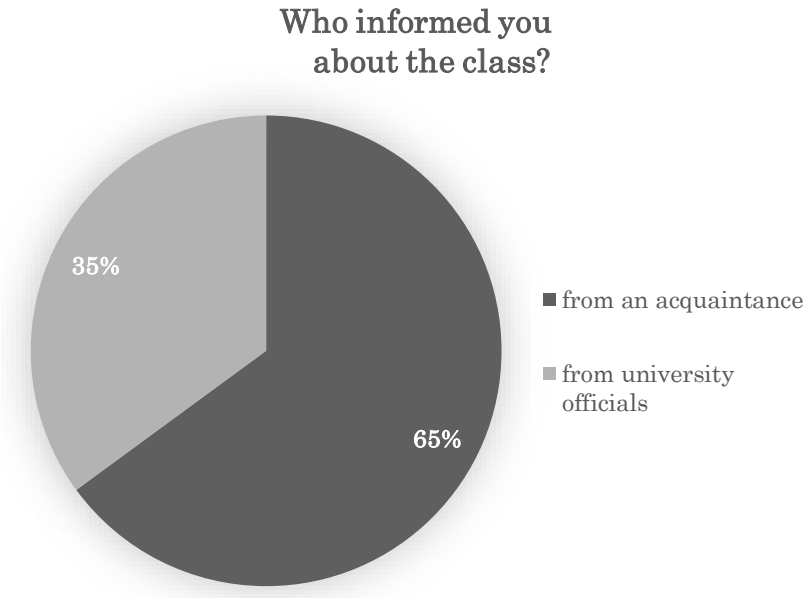

Figure 2: Who informed you about the class

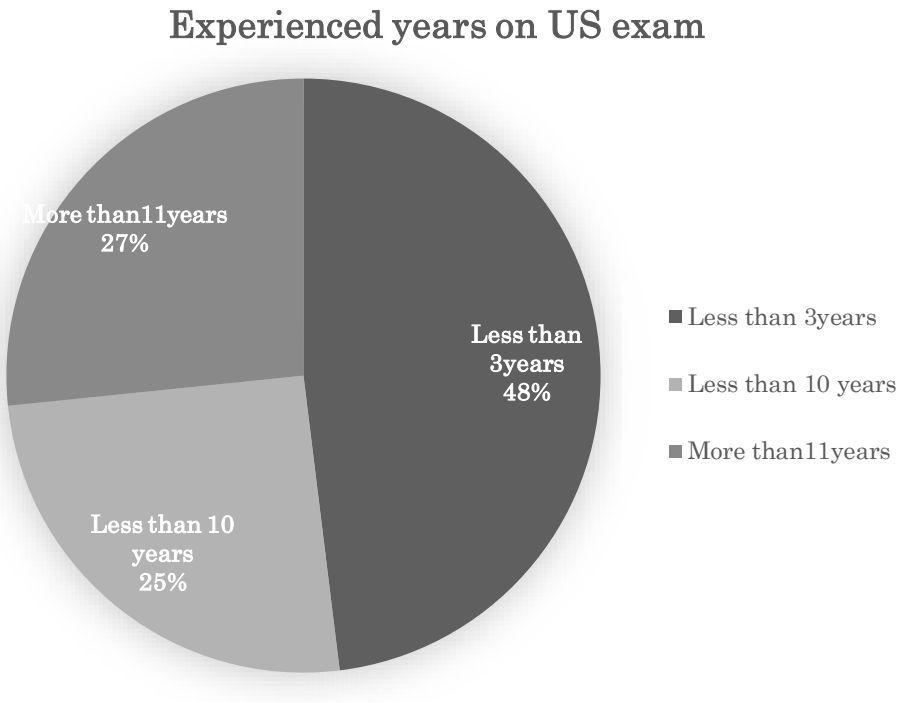

Figure 3: Experienced years on Ultrasonography examination

Throughout the duration of the program, we conducted interviews with the participating students to gather feedback and assess the effectiveness of the course.

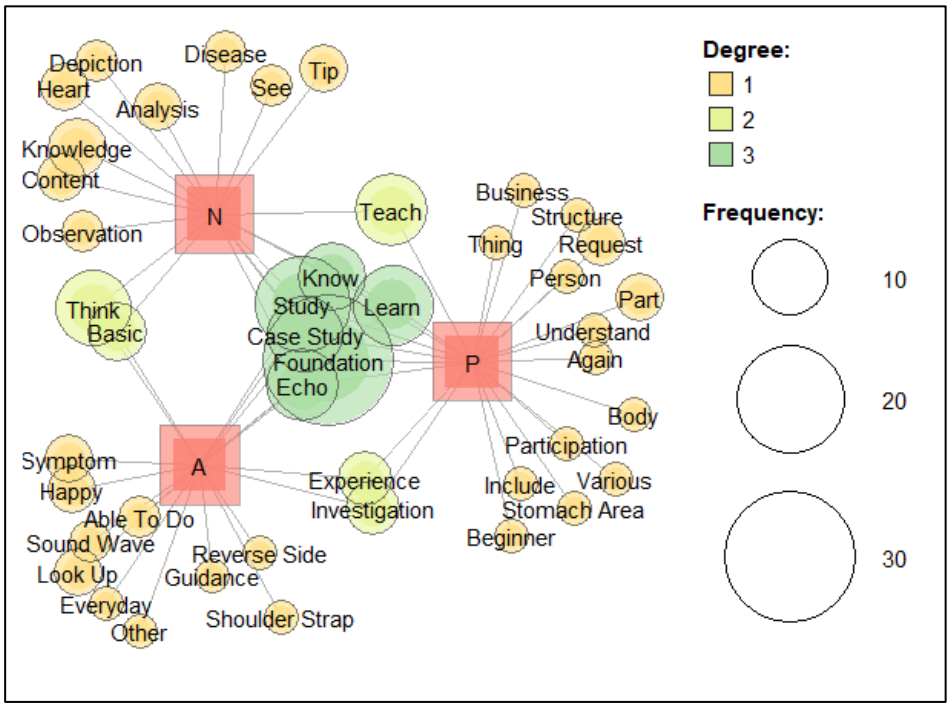

Figure 4: Question1

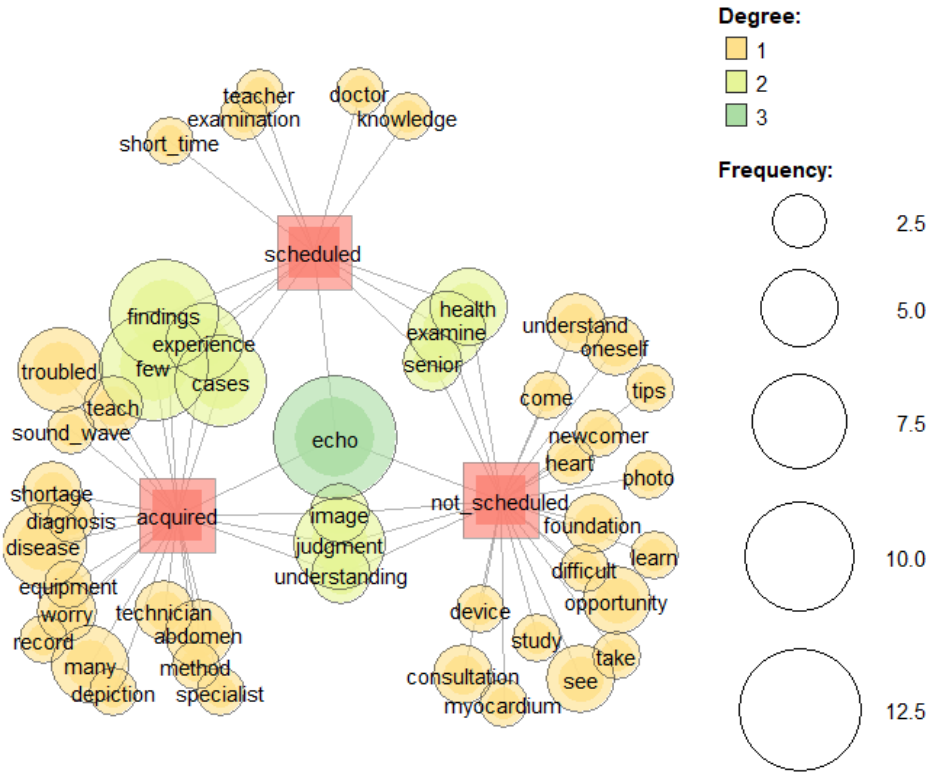

Figure 5: Question2

We analyzed the interviews using the software "KH coder 3"[4]–[6]. A total of 156 students participated in the interviews, with 93 responders for "Question 1: What are your expectations for this study session?", 66 for "Question 2: What issues are you facing in your hospital?", 132 for "Question 3: What was your reason for participating in the program?", and 53 for "Question 4: What are your requests for the program?". For the question regarding qualification status, we received responses from 108 students, with 34 licensed (labeled A in Fig.), 30 planning to take an exam (labeled P in Fig.), and 44 having no plans (labeled N in Fig.) to take an exam.

We analyzed and create network diagrams with the responses of students who answered both questions for each set of questions. Therefore, we analyzed responses from 69 students for Questi on 1, from a different set of students for Question 2, from another set of students for Question 3, and from another set of students for Question 4. We found that the node "Foundation" appeared in all three questions (1, 3, and 4), and that it was connected to the nodes showing the qualification status of the students. The results are shown in "Fig. 4 to 7".

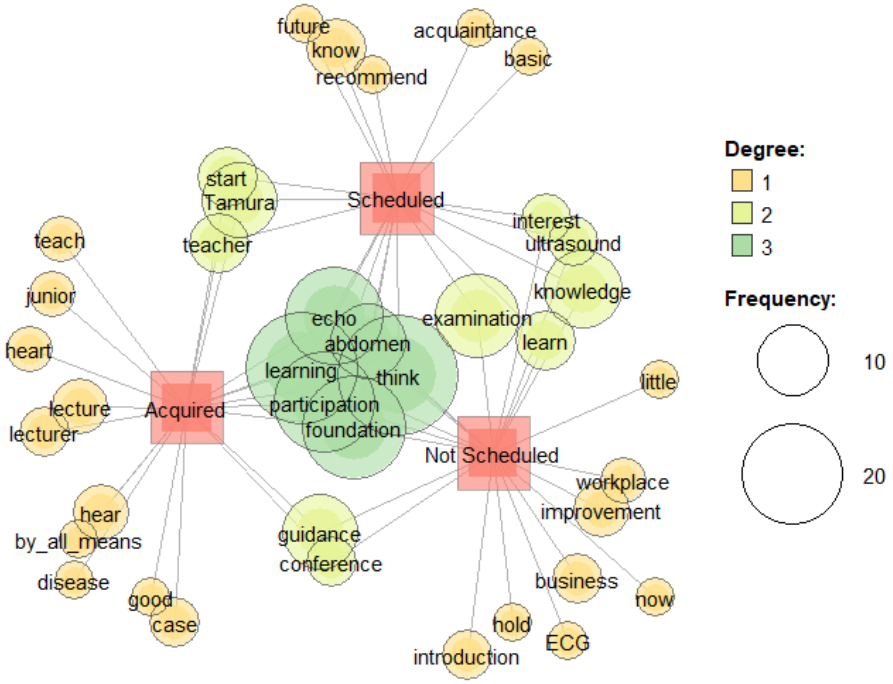

Figure 6: Question3

3 Discussion

In this paper, we presented the results of our recurrent education project at Kobe-Tokiwa University focused on ultrasound examination, and we discussed the needs identified through this project. Our project had 30 students who were interested in obtaining certification in ultrasound examination and they were required to submit 20 case reports to obtain the certification. However, the quality of ultrasonography training heavily relies on the training establishment, and smaller hospitals with fewer cases can make it difficult for students to gain experience.

From the interviews we conducted with the students, we found that many of them were hoping to get more opportunities to study clinical cases, particularly those who were already licensed. Additionally, several students mentioned the lack of basic classes for beginners in ultrasound examination. Interestingly, 35% of the students were invited to the classes by university officials, which highlights the importance of recurrent education as a means to fill the gaps in training opportunities provided by establishments.

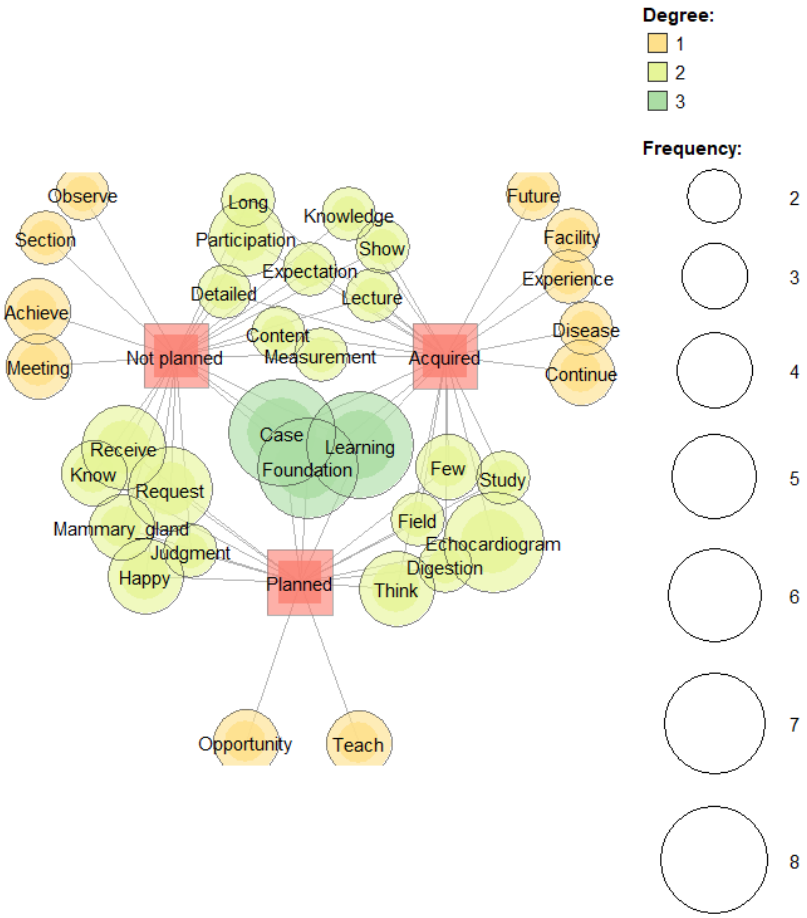

Figure 7: Question 4

Based on our findings, we suggest that recurrent study classes for reskilling should be established to teach the foundations as basics of ultrasound examination and to provide a standardized approach to training clinical professionals.

Acknowledgment

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References

[1] MHLW, "About the 2019 value of healthy life expectancy (Japanese)," *Ministry of Health, Labour and Welfare*, 2021. [Online]. Available: https://www.mhlw.go.jp/stf/newpage_22740.html. [Accessed: 15-Apr-2022].

[2] MHLW, "Human Resource Development Revolution Basic Concept (Japanese)," 2018. [Online]. Available: https://www.mhlw.go.jp/stf/seisakunitsuite/bunya/0000207430.html. [Accessed: 15-Apr-2022].

[3] "Japanese Society of Ultrasonics in Medicine Certified Sonographer System Rules (Japanese)," *Japanese Society of Ultrasonics*, 2023. [Online]. Available: https://www.mhlw.go.jp/stf/seisakunitsuite/bunya/0000207430.html. [Accessed: 15-Apr-2022].

[4] K. Higuchi, "Quantitative Analysis of Textual Data : Differentiaiton and Coordination of Two Approches," *Sociol. Theory Methods*, vol. 19, no. 1, pp. 101–115, 2004.

[5] K. Higuchi, "A Two-Step Approach to Quantitative Content Analysis: KH Coder Tutorial using Anne of Green Gables (Part I)," *Ritsumeikan Soc. Sci. Rev.*, 2016.

[6] K. Higuchi, "A Two-Step Approach to Quantitative Content Analysis: KH Coder Tutorial using Anne of Green Gables (Part II)," *Ritsumeikan Soc. Sci. Rev.*, vol. 53, no. 1, pp. 137–147, 2017.