Journal of
Medical English Education

JMEE

Journal of Medical English Education

Journal of Medical English Education, the official publication of The Japan Society for Medical English Education, was founded in 2000 to promote international exchange of knowledge in the field of English education for medical purposes. Until June 2006 (Vol. 5 No. 2), the registered title of the Journal was *Medical English - Journal of Medical English Education*; the current title, which was registered in December 2006 (Vol. 6 No. 1), should be used for citation purposes.

第22回 日本医学英語教育学会 学術集会 開催案内

　日本医学英語教育学会は1998年に第1回医学英語教育研究会が開催され，その後，医学英語に関する研究を推進し，医学英語教育の向上を図る目的で学会として発展して参りました。現在では400名以上に及ぶ会員を有しております。

　医学英語教育は卒前・卒後・生涯教育として重要であり，医療の国際化，医師国家試験の英語問題導入や医学英語検定試験など，専門職教育の限られた時間でどのように教育を行うかが課題です。学術集会では例年，医療系の英語教育に係わる教員・研究者・医療関係者が参加し研究・事例を報告します。第22回学術集会は下記により開催します。今回は，東京でも非常にアクセスのよいJR中野駅の目の前の中野サンプラザを会場に選びました。日本医学教育学会の委員会に起源をもつ本会に是非ご参加いただき，医学英語教育について情報を交換していただければと思います。

記

学会名：第22回日本医学英語教育学会学術集会

日　　時：2019年8月3日（土）〜4日（日）

会　　長：五十嵐裕章（河北総合病院）

会　　場：中野サンプラザ（〒164-8512　東京都中野区中野4-1-1）

演題募集：2019年3月15日 正午締切

　　　（国際的交流活動，医療現場と医学英語，USMLE対策，医学英語達成度評価，医学英語教育における新たな取り組み，JASMEEの今とこれから，その他）

＊筆頭演者は本学会の会員に限ります。非会員の方は演題提出前に入会してください。

＊英語・日本語のどちらでも発表できます。学会ホームページよりご登録ください。

＊詳細は学会ホームページをご参照ください。

＊学会ホームページ：https://jasmee.jp/category/events/academic-meetings/

問い合わせ先：日本医学英語教育学会事務局

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The 22nd Academic Meeting of the Japan Society for Medical English Education

The Japan Society for Medical English Education (JASMEE) held its first meeting as a study group in 1998. Since then, the society's main aims have been to promote research in fields related to medical English, and to support and encourage improvements in medical English education. JASMEE now has more than 400 members.

With the globalization of medicine and such recent developments as the introduction of questions in English in Japan's National Medical Practitioners Qualifying Examination, the challenge of how best to make use of the limited time available for medical English education in university curricula is ever more pressing. JASMEE's annual academic meetings seek to address this challenge with a wide variety of presentations, symposia, and workshops given by experts in the field.

Information about the 22nd JASMEE academic meeting is presented below. The meeting in August 2019 will be held at Nakano Sunplaza, just in front of JR Nakano station, which is one of most easily accessible places in Tokyo. We look forward to welcoming JASMEE members and non-members alike to this meeting, where they will be able to share their experiences and expertise with others in the field to the greater benefit of medical English education in Japan and beyond.

Dates: Saturday August 3 and Sunday August 4, 2019

Venue: Nakano Sunplaza

4-1-1Nakano, Nakano-ku, Tokyo 164-8512

President: Hiroaki Igarashi

(Kawakita General Hospital)

Call for papers: Proposals for papers on the following subjects (or similar) should be submitted by March 15, 2019.

・International Exchange Programs

・Medical English in Clinical Settings

・USMLE Preparation

・Evaluation of the Proficiency in Medical English

・New Developments in Medical English Teaching

・JASMEE-Now and in the Future

・Any Other Topics

Submissions will only be accepted from JASMEE members in good standing. To submit a proposal, please access the JASMEE homepage (https://jasmee.jp/category/events/academic-meetings/).

Inquiries should be addressed to the JASMEE Secretariat (c/o Medical View, Attn: Mr. Fujiwara)

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From the editor

Those readers who have been keeping close tabs on the activities of the JMEE editorial committee (not many, I suspect!) will be aware that this year's October issue should, according to previously announced plans, be one devoted to a single specified topic, and they may be wondering what the topic is. I hope it will not come as too much of a disappointment to them, but I have to announce that, after due consideration, we have decided to discontinue the policy of issuing such special issues every other year, at least for the time being. As the journal of a small and fairly specialized academic society, we do not attract an enormous number of submissions, and we felt it was probably not a good idea to continue a policy that in effect puts further restrictions on what those with a mind to contribute can submit. This is not to say that we regret having published two special issues, one in October 2015 devoted to extracurricular activities, and one in October 2017 on the use of information and communication technology in medical English education. Both of these provided a wealth of practical and stimulating ideas that have, I am sure, inspired many of us working in the field of medical English education. However, I hope this is true of every issue we publish and that everyone working in the field will appreciate the opportunity to share their ideas via this journal without feeling they are in any way restricted in their choice of topic.

As for the current issue, along with three original papers, it contains three contributions that failed for one reason or another to make it into the conference proceedings section of last October's issue. And I am very pleased to say that one of the original papers is the first uninvited submission JMEE has received from outside Japan. Let us hope that this is the beginning of a trend.

JASMEE's 22nd annual Academic Meeting will be held this year over the first weekend of August rather than the third weekend of July, as has been customary. Our President this year is Dr Hiroaki Igarashi of Kawakita General Hospital in Tokyo's Suginami Ward. Dr Igarashi was born in neighbouring Nakano Ward, which is where I also happened to live when I first came to Japan more years ago than I care to think about, and as the venue for this year's Academic Meeting he has selected Nakano Sunplaza. This seemed to me, I remember, to be a strikingly modern building when I lived nearby all those years ago. Tokyo has changed a lot since then, and Nakano Sunplaza may no longer stand out quite as much as it did, but it will, I am sure, make an excellent venue for our conference. With an eye to the upcoming Tokyo Olympics in 2020 and the need they will engender for expanded and improved medical services in English, Dr Igarashi has selected *Towards more practical medical English – Tokyo 2020 is coming!* as the theme for this year's Meeting. He has asked me to encourage all JASMEE members to submit presentation proposals for the conference, to which I will add my own encouragement to you all to submit papers to JMEE!

Timothy D. Minton

Editor-in-Chief

Journal of Medical English Education

Using the Internet and social media in pharmacy classrooms to improve patient care in future clinical practice

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Abstract
Modern society relies heavily on the use of the Internet and social media (SM) in daily life, but in pharmacy education in Japan, its utility is still questioned as being appropriate for clinical study or practice. This was revealed by the results of a communication questionnaire which the author developed in a recent study asking pre- and post-clerkship pharmacy students about their usage of the Internet/SM and their perceptions of its usage in the community pharmacy. The results indicated that despite using Internet/SM for personal communication, pharmacy students did not perceive of these as professional means of communication with patients. Their responses to related questions about the means of communication with patients supported traditional face-to-face conversations, body language, and written explanations, but largely disregarded digital means of communication through email, texting, and videoconferencing. Based on these findings, in this paper the author will argue that if professional use of online communication were endorsed in the clinical pharmacy studies, students would understand its necessity as a tool to improve patient care and health outcomes and, thereby, increased access to information and health care through the Internet/SM benefits both pharmacists and patients. Further, it will be argued that the modeling and practice of the Internet/SM-related means of communication in pharmacy classrooms will promote the use of these communication skills to improve patient care in the community pharmacy.

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Keywords Internet, social media, communication, pharmacy education, pharmacy practice,

1. Introduction

The Internet and social media (Internet/SM) play a dominant role in the daily life of students, professionals, and society in general. Students rely on it for social interaction and entertainment, but are often denied access to it during class time.[1] Concerns over the use of the Internet/SM in the classroom have been raised in many academic institutions because it is said to promote student over-reliance and is often used for unnecessary social interaction during class. Conversely however, studies have actually revealed that the Internet/SM can increase attention and stimulate the curiosity to learn more.[2,3] Thus, the inclusion of practical Internet/SM activities in the classroom for active learning can help to develop basic research and communication skills that students will use in their future studies and provide the experience necessary for professional use. While networking opportunities offered through platforms such as email, Social Networking Services (SNS), and even video-conferencing (Skype, webinars) allow pharmacists to expand their professional influence into the medical profession beyond the pharmacy or hospital to communicate with the general public, many hesitate to use it professionally in their practice.[3] A study carried out in the United States in 2014 found that only half of the responding pharmacists used email to communicate with patients, while texting and SNS were rarely used.[4]

The recent movement in Japan towards patient care through 'family pharmacy' (kakaritsuke yakkyoku in Japanese) and home visits (zaitaku) has raised new questions about the use of the Internet/SM with patients. Patients are

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given 24-hour access to the pharmacist through the pharmacist's work mobile phone number in family pharmacy practice, making it essential to be continuously online. An argument presented to the author by many Japanese pharmacists in previous discussions about greater Internet/SM use in the pharmacy and pharmacy education was that the elderly do not have these digital platforms or devices, making it impossible to change the system. An initial report in 2011 stated that "hardly anyone over 50 years of age in Japan accessed the Internet," but in fact the elderly have been increasingly purchasing and relying on the Internet and their devices every year since then.[5, 6] Recent news and health programs in Japan have exposed new digital platforms and technology to connect with patients who have limited mobility and are unable to go to the hospital or pharmacy. Pharmacists in many parts of the world use Smartphones and tablets to send daily reminders to their patients' mobile phones to improve drug adherence, interact through texts to answer inquiries, and build their networks through the Internet/SM, making it an integral part of their practice.[4]

Smartphone apps also allow patient information to flow quickly and directly between patients, doctors, and pharmacists. For example, new mobile phone technology in diabetic care allows the data from a glucometer to be sent directly to pharmacists so that they can check glucose levels and decide if insulin levels need to be adjusted. The FreeStyle Libre, a patch adhered to the arm, can continuously read glucose levels, and these readings are scanned and then linked to a mobile device, omitting the need for finger pricks.[7] These technological advances improve a patient's quality of life through communication between patients and their health caregivers as they work together for better health outcomes.

2. Background

All pre-clerkship pharmacy students at the author's university take a compulsory English communication class in the fourth year of pharmacy study. In this class, they study about communication with patients through evidence-based reports about medicines that are developed from the information found in drug reviews. Case studies are discussed, and the related drugs are studied using the drug reviews found on English websites, such as rxlist.com and drugs.com. Because drug names and dosages are different in Japan, the students also use the government PMDA website ('kusuri no shiori') where they can access information in both English and Japanese. The students are encouraged to use this drug review information when formulating responses that will educate patients and encourage adherence. This communication training requires searching for scientific evidence and

the development of appropriate responses to educate patients under the pharmacist's care.

This class is a challenge for many students for three reasons. First of all, the students are in 'pre-clerkship', meaning they lack the experience of standing face-to-face with a patient in a pharmacy or hospital ward. Secondly, they have not yet developed the mindset of a pharmacist and still tend to rely on 'textbook' answers, without considering other possible scenarios of communicating with patients. This is because their first three years of their pharmacy study is focused on basic science and pharmacology with little connection to the patient as a human being with feelings and ideas. The written responses in the assignments of pre-clerkship students often reflect this lack of understanding, as students struggle to respond as a professional pharmacist.

Thirdly, drug information found on the Internet requires an understanding of the specialized English used in drug reviews. The information is summarized on a 'drug guide' worksheet that will assist them in developing their responses to potential patient questions. The inclusion of researching the Internet for information about specific medications provides experience in reading complex drug review explanations, summarizing them, and understanding the most commonly used vocabulary for professionals and consumers, as well as familiarizing them with relevant online websites in both English and Japanese.

Given this scenario, the author recently conducted a survey with these students regarding communication education in their pre-clerkship pharmacy studies in order to understand student perceptions of professional communication in a community pharmacy.[8, 9] The students completed the same communication questionnaire *before* their pre-clerkship communication training class, *after* the training, and yet again *after* completing the community pharmacy clerkship. The questionnaire inquired about their communication skills, their confidence to communicate with patients beyond initial questioning, and their perceptions of pharmacist communications with patients.

The results of this initial study[8, 9] showed that the students had gained confidence and understood the importance of communication with patients during the training program, but lost their confidence and failed to communicate with patients during the clerkship experience the following year. The students reported that they did not feel a connection between what they had studied in the communication training and what they were permitted to do in the clerkship. Many were discouraged from speaking to patients, and some were not allowed to remain at the counter, only staying at the back of the pharmacy to prepare medicines. To eliminate this

practice during clerkship training, the current curriculum and clerkship guidelines assert that pharmacies must provide students with experience at the counter with patients continuously throughout the clerkship.[10] Time at the counter would provide students with opportunities to practice communicating in various ways with the patients.

The same communication questionnaire contained an additional section of two questions asking students how they communicated with their family and friends and what they perceived to be appropriate methods of communication with patients in a pharmacy. For post-clerkship students, the second question was modified to ask them how they perceived the pharmacists to have communicated with patients during their pharmacy clerkships. (see **Table 1**) The primary objective of this section was to determine if the pre-clerkship training the students received was compatible with the pharmacy practice in their clerkships. A secondary goal was to challenge the students to consider various methods of communication that potentially could be used in the pharmacy. Since awareness of the use of Internet/SM in professional practice can lead to the development of these platforms for communication with patients,[3] student responses to these questions were analyzed separately from the initial study.

3. Methods

The students responded to a Japanese translation of the questionnaire. A 5-point Likert scale regarding the means of communication in Japanese was used, with the following corresponding values: 1= 'never use' 2= 'don't use' 3= 'sometimes use' 4= 'often use' and 5= 'always use'. The data from the student responses were collected and analyzed over three consecutive years using JMP® 14 Academic version.[11]

An exploratory factor analysis on the data from the 2016 to 2017 group of students led to a two-factor loading for each question to identify the preferred and non-preferred means of communicating with friends and family and how respondents thought pharmacists should respond to patients. Paired t-tests and Wilcoxon signed-rank tests determined the significance ($p < 0.05$) of the differences between the mean scores of pre- to post-training and post-clerkship responses. Positive and negatives changes in perception scores from pre to post-clerkship were assessed using McNemar's test of correlated proportions.[12]

Ethics permission was granted from Daiichi University of Pharmacy to collect the data from students with the questionnaire, and students signed consent. The questionnaires were assigned a reference number to protect student identities.

4. Results

A total of 685 questionnaires were collected from fourth and fifth-year pharmacy students from the same university over three years, from 2015 to 2017. Two groups of students were followed throughout their fourth (pre-clerkship) and

Table 1. Post-clerkship Communication Questionnaire,[8] Part 2, Means of Communication

Internet/Social Media Communication Questions for Post-Clerkship Students

Q9	Presently, how do you communicate with your family and friends?
	a. face-to-face conversation
	b. phone (mobile phone, Smartphone)
	c. email
	d. SNS (Line, Facebook, etc.)
	e. videoconferencing (Skype, FaceTime)
	f. letters/memos
	g. body language, gestures, facial expressions
Q10	In the pharmacy, how did the pharmacist communicate with the patients?
	a. face-to-face conversation
	b. phone (mobile phone, Smartphone)
	c. email
	d. SNS (Line, Facebook, etc.)
	e. videoconferencing (Skype, FaceTime)
	f. letters/memos
	g. body language, gestures, facial expressions
	h. labels, written explanations

[8] Reference: Epp DA, 2018.

fifth (post-clerkship) years of study. The ages of the students ranged from the early twenties to the late forties, with the average age being 24 to 25 years old.[9]

4.1 Personal use of the Internet/SM

Given the limited number of questions, two factors were considered sufficient for loading in the exploratory factor analysis using Promax. Eigenvalues were 66% (4.13) for Factor 1 and 34% (2.12) for Factor 2. The two factors in the exploratory factor analysis were designated as 'Preferred Means of Communicating' for questions 8a (face to face conversation), 8b (phone, cell phone, Smartphone), 8d (SNS, Line, SMS, Facebook) and 8g (body language, gestures), and 'Non-preferred Means of Communicating' for questions 8f (letters and memos), 8e (videoconferencing, Skype, FaceTime), and 8c (email), with the suppressed value lowered to 0.29 for inclusion.

In both year groups, students responded similarly to their preferred means of Internet/SM for personal use, mainly using their phones and SNS, but not using email or videoconferencing. (see **Table 2**) Non-digital means of communication through face-to-face conversation and body language maintained high mean scores throughout the study. Letters

or memos were not clarified as digital or handwritten, but they decreased in scores ranging from 'rarely' to 'never' being used by the students.

4.2 Perceived pharmacist use of the Internet/SM

For the question regarding perceived pharmacist use of the Internet/SM, Factor 1 was designated as 'Traditional Means of Communication; and Factor 2 as 'Digital Means of Communication'. Factor 1's 'traditional communication' mean scores were all above 4.0 on the Likert ('often' to 'always' used) and included communication by face-to-face conversation (9a), body language (9g), and written explanation through labels and diagrams (9h). Factor 2's 'digital' means of communication included SNS (9d), email (9c), videoconferencing (9e), phones (9b), and letters and memos (9f) with mean scores of below 4.0. For the sake of comparing these two factors, communication by letters or memos was considered digital, rather than handwritten. (see **Tables 3 and 4**) Comparisons of pre- to post-training responses from fourth-year students, followed by pre-clerkship (the same as post-training data) to post-clerkship responses of fifth-year students, revealed that students perceived the use of traditional means of communication in a pharmacy similarly.

Table 2. Comparison of Means of Communication Pre to Post Clerkship

Question	Factor 1 Preferred means of communicating	Pre-Clerkship Mean (SD)	Post-Clerkship Mean (SD)	p-value
8a	by face-to-face conversation	4.39 (0.80)	4.39 (0.78)	1.00
8b	by cell phone, Smartphone, phone	4.13 (0.76)	4.31 (0.64)	0.16
8d	by SNS (Line/SMS/Facebook)	4.02 (0.98)	3.95 (1.15)	0.74
8g	by body language	3.87 (0.91)	3.84 (0.99)	0.85
	Factor 2 Non-preferred means of communicating			
8f	by letters or memos	2.23 (1.09)	1.81 (1.08)	0.03
8e	by videoconferencing (Skype/FaceTime)	2.35 (1.28)	2.24 (1.39)	0.64
8c	by email	3.02 (1.11)	2.42 (1.31)	0.01

Y4 pre-clerkship Y5 post-clerkship n=62; Wilcoxon Signed Rank p $\leq$ 0.05

Table 3. Comparison of Student Responses Pre to Post Training (Y4)

How Pharmacists Should Communicate with Patients (student perceptions)

Question	Factor 1 Traditional Means of Communication	Pre-training Mean (SD)	Post-Training Mean (SD)	p-value
9h	by written explanation (labels, diagrams)	4.28 (0.68)	4.35 (0.77)	0.42
9g	by body language	4.28 (0.82)	4.29 (0.82)	0.90
9a	by face-to-face conversation	4.69 (0.50)	4.60 (0.61)	0.20
	Factor 2 Digital Means of Communication			
9d	by SNS (Line/SMS/Facebook)	2.78 (0.89)	2.85 (0.97)	0.53
9c	by email	2.93 (0.78)	3.22 (0.86)	0.0038
9e	by videoconferencing (Skype/FaceTime)	3.01 (0.89)	3.20 (0.94)	0.09
9b	by cell phone, Smartphone, phone	3.24 (0.87)	3.55 (0.84)	0.003
9f	by letters or memos	3.33 (0.90)	3.56 (0.82)	0.02

pre-training n=135; post-training n=133; Wilcoxon Signed Rank p $\leq$ 0.05

Pre- to post-training scores of the fourth-year students increased slightly in the mean scores for digital means of communication, with significance shown for communication by email, phone, and letter/memo use. (see **Table 3**) In contrast, the pre- to post-clerkship mean scores of the fifth-year students showed a significant decrease in all perceived use of digital means of communication, equating to a value that pharmacists 'sometimes use' to 'never use' such means of communication in the pharmacy. (see **Table 4**)

The same 135 students were followed over two years from 2016 to 2017, and a contingency analysis of their responses was performed using McNemar's test of those students who completed the first term of the community pharmacy clerkship. (see **Table 5**) Normally, significance is observed on the McNemar's test via a change from negative responses beforehand to positive responses afterward, but in this case, the students did not change their perspectives, but remained steadfastly either in favor of or against a particular means of communication from pre- to post-clerkship training. Digital means of communication either remained negative throughout the clerkship or they were positive pre-clerkship but became negative post-clerkship. The value of traditional means for communicating remained positive throughout the clerkship.

5. Discussion

Student responses to personal means of communication varied slightly over the three years of data collection and analysis, preferring to use their phones and SNS to communicate rather than email or videoconferencing. During the time the students were in the community pharmacy, they had the opportunity to observe face-to-face conversations, body language, and the use of written explanations at the counter. Despite using the Internet/SM in their personal lives, the students' expectations of the use of it in community pharmacy practice did not match the reality of its use during the clerkship. They perceived pharmacist communication with patients within a traditional means of communication that excluded Internet/SM options such as email, SNS, and videoconferencing. This result reflected what the literature had also stated, that most pharmacists and academics use the Internet/SM personally, but not professionally.[1]

In **Table 4**, responses regarding digital means of communication before the clerkship were significantly higher than responses after the clerkship. These post-clerkship responses were based on what the students had observed of pharmacists' communication with patients and could therefore be a result of the students not observing the pharmacists using

Table 4. Comparison of Student Responses Pre to Post Clerkship

How Pharmacists Should Communicate vs. How Pharmacists Communicated

Question	Factor 1 Traditional Means of Communication	Pre-Clerkship Mean (SD)	Post-Clerkship Mean (SD)	p-value
9h	by written explanation (labels, diagrams)	4.39 (0.66)	4.03 (0.99)	0.02
9g	by body language	4.39 (0.84)	4.16 (0.96)	0.17
9a	by face-to-face conversation	4.66 (0.60)	4.81 (0.44)	0.13
	Factor 2 Digital Means of Communication			
9d	by SNS (Line/SMS/Facebook)	3.00 (0.99)	1.52 (0.92)	<.0001*
9c	by email	3.42 (0.80)	1.58 (0.93)	<.0001*
9e	by videoconferencing (Skype/FaceTime)	3.37 (0.91)	1.31 (0.62)	<.0001*
9b	by cell phone, Smartphone, phone	3.61 (0.88)	2.77 (1.32)	<.0001*
9f	by letters or memos	3.60 (0.86)	2.06 (1.13)	<.0001*

Y4 pre-clerkship Y5 post-clerkship n=62; Wilcoxon Signed Rank p$\leq$ 0.05

Table 5. Contingency Analysis of Pre to Post Clerkship Student Responses

Communication between Pharmacist and Patient (Y4 should be compared to Y5 as was observed)

Question	Pharmacists should communicate by:	**P-P	P-N	N-P	N-N	Chi-square	p-value
9a	by face-to-face conversation	62	0	0	0	--	--
9b	by phone, cell phone, Smartphone	9	27	7	19	11.76	0.0006*
9c	by email	3	25	0	34	25.00	<.0001*
9d	by SNS (Line, SMS, Facebook)	2	16	2	42	10.89	0.0010*
9e	by videoconference (Skype, FaceTime)	0	26	1	35	23.15	<.0001*
9f	by letters and memos	5	35	1	21	32.11	<.0001*
9g	by body language	46	12	2	2	7.14	0.0075*
9h	by written explanation (labels, diagrams)	40	18	2	2	12.80	0.0003*

n=62 P=postive response = Likert 4-5; N=negative responses = Likert 1-3; McNemar's test Chi-square p<0.05

**Pre-clerkship to post clerkship postive response to postive response

any digital means to communicate with patients. Students were clearly instructed before their clerkships that cell phones and computer use were not permitted during their time at the pharmacy. Therefore, if emailing or phoning was carried out before or after the students were present in the pharmacy, they may not have been aware of the communication taking place between the pharmacists and patients, either at the counter or away from the counter.

This 'observational learning' method of practical training thus raises concerns about the effectiveness of educating students in the clerkship merely by watching pharmacists rather than practicing communication skills under a preceptor's attention. Since students learn responses from preceptors and instructors, the lack of education on integrating the Internet/SM into pharmacy practice may have created a bias against using it. The stronger reaction against the digital means of communication, as seen in **Table 5**, could also reflect any instruction the students had received to not use their phones or computer at the pharmacy and the lack of modeling by preceptor pharmacists.

Changes in technology and Internet/SM develop quickly and extensively, so the lack of videoconferencing, for example, might stem from the fact that communication through video can now be carried out on SNS platforms, such as Line and Facebook. Opposition to texting and using cell phones at work as a form of communication previously came with the reasoning that they cannot be recorded or tracked, but this no longer applies as these platforms can now be saved and archived on a device or in an online cloud. One example is with electronic medicine memo books ('kusuri no techo' in Japanese) that are being used increasingly at community pharmacies. Since patients often forget to bring in paper memo books or lose them, a QR code reader in a Smartphone app is now available to allow the patient's prescription information to load directly into the phone from the pharmacy online system. The information about the patient's prescriptions is also sent automatically to the national archives. This online system was developed to assist in disaster situations, when personal records may be difficult to retrieve. It has become an essential tool for maintaining prescription and drug information and making it available at anytime.

Through the use of the Internet/SM in their studies, students would learn how to use this system effectively and professionally for communication and research. This process begins with pre-clerkship education, where they should practice the necessary skills before entering the clerkship or the workforce. For example, students could be instructed on professional use of the Internet/SM to enhance pharmacy practice with modern means of communicating with patients

(Smartphone apps and SNS platforms) and learn to develop appropriate networking skills. The opportunity to use the Internet/SM in a low-risk pre-clerkship pharmacy class develops confidence to use the fundamental skills needed for clerkship experience in the following year, when standing face-to-face with patients. Studies have shown that the use of the Internet/SM can improve patient loyalty and increase trust in the pharmacist as a professional.[4] Therefore, pharmacy students should be exposed to its usage and understand the importance of networking and interacting with patients through its usage. Integrating it into formal education does not mean abandoning traditional learning styles, but provides more experiences in a safe environment to ensure success in the new generation of medicine. The Internet/SM offers creative options for modern students' learning styles and the pharmacists' role in communication and patient care.

6. Conclusion

Although students and pharmacists use the Internet/SM in their personal lives, they hesitate to integrate it into professional pharmacy practice. The results of this study indicated that students did not perceive the Internet/SM as indispensable means of communicating with patients in the pharmacy, and neither did communication training positively influence their perception of its use in pharmacy practice. Students should be introduced to Internet/SM options as an effective communication tool during their pharmacy study at university and experience its use in educating and assisting patients for the future. The introduction of effective and professional use of the Internet/SM at schools and in clerkship will help students better understand the issues and expectations regarding its use, meet modern students' learning needs, and promote professionalism for future patient care and pharmacy practice.

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Construction and proposal of an academic word list for medical professionals at different developmental stages

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Abstract

The current paper discusses how a corpus composed of 99 research articles comprising 1,025,574 tokens was used to create a word list for would-be and current medical professionals. To this end, words occurring fewer than 30 times in the corpus or are too simple (lexical items for L2 junior high school students) were first eliminated. Next, words in the corpus that were also present on a vocabulary list for L2 senior high school students, the University Word List (UWL) and, the Academic Word List (AWL) were compiled into word lists targeting high school students, university-level learners, and medical researchers, respectively. Subsequently, words in the corpus that were not found on the three aforementioned lists but appeared at least once in fifty percent of the articles collected for the corpus were compiled into another list for practitioners in general medical fields. Finally, words that occurred in less than fifty percent of articles were compiled to form the word list for medical practitioners in specific fields. The final product is a word list, with 1,266 words, along with figures for the total number of frequency of occurrence, and information on each word's appropriateness for each of the aforementioned five categories of medical professionals. The word list has useful reference points for students, researchers, and teachers in the medical field, especially in terms of what vocabulary items should be prioritized, taught, and learnt for English for Medical Purposes (EMP) courses. Finally, further suggestions for research within this field are also provided.

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1. Introduction

Scholars have agreed that vocabulary acquisition is important as a building foundation for various aspects of language skill and competence. Nation,[1] for instance, described vocabulary acquisition as a crucial component in writing ability since the width and depth of a learner's vocabulary knowledge has a direct effect on the descriptiveness, accuracy and quality of his or her writing. Students themselves also feel that vocabulary acquisition is an important part of learning a language; learners are aware of the importance of vocabulary acquisition, especially when they advance to upper academic levels.[2] However, the degree of importance perceived by students may be different in terms of age or educational attainment. As students move into more specific areas of discipline, they become more conscious of the idea that some words are more important than others.

Stahl's view[2] mentioned above entails that not all words are equally important for learners at different stages of learning and across different specific disciplines. In 2001, Nation found that words could be divided into four specific categories—high frequency words, academic vocabulary, technical vocabulary and low frequency words. The idea that some words occur more frequently than others shows that some of these lexical items deserve more attention than others as well. A study by Matthews and Cheng[3] showed that words can be categorized into high and low frequency bands, and they found that knowledge of high frequency words was a strong predictor of successful L2 listening comprehension. Based on these findings, it is conceivable that L2 practitioners should focus more on the teaching of high frequency words.

Notwithstanding, the consideration of what needs to be

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prioritized in vocabulary teaching is not only determined by the frequency concern. Whether a word needs to be prioritized and mastered is also determined by the purpose and scope of language learning (general English vs. English for specific purposes). In this vein, Hudson[4] discussed in his book how crucial it is to learn academic words; some academic words that are not considered high frequency words on general word lists may turn out to be the words learners need to master in their particular academic disciplines. In addition to academic and general words, there is also a distinction between words L2 learners generally learn and those that are subject- or discipline-specific such as jargon specifically used in the ESP (English for Specific Purposes) arena and essential vocabulary that need to be taught according to a learner's specific needs. To fulfill the specific need of academic writing, researchers have created many versions of academic word lists.

1.1 Previous literature on the development of academic word lists

Many useful academic word lists have been produced during the past decades. The word list created by Campion and Elley[5] is a case in point. Campion and Elley developed a general word list containing most frequently used 3,200 words university students were the most likely to encounter and use in their university studies. Praninkas[6] also compiled a university word list that catered specifically to American university students. The word list was based on a corpus of 272,466 words from ten different textbooks used by university students coming from different academic disciplines. To cater to the needs of international students who were less proficient in English than native speakers, two researchers collected data from international instead of local students in American universities. Lynn[7] created a word list consisting of annotated words found in university students' textbooks of international students whose first language was not English. Ghadessy[8] constructed a list of words that were considered difficult in reading passages by another group of international students.

However, Xue and Nation[9] were the first to formally compile a word list that was made up of words found both on high frequency word lists and on academic word lists for L2 learners. Xue and Nation's University Word List (UWL) consisted of about 800 academic words that were not included in the General Service List (GSL)[10] that catered to learners of English at the beginning level.

More recently, Coxhead[11] developed the Academic Word List (AWL), which consists of 570 word families that are not in the first 2,000 most frequently occurring words of English

on the GSL but that have reasonable frequency of occurrence in a 3.5-million word corpus of academic texts. The texts selected for her corpus were selected from academic journals covering four main disciplines: arts, commerce, law and natural science. Because her word list provided more text coverage and a more consistent word selection criteria, it has become a more widely cited academic word list across a wide range of domains, especially in English language learning. The same idea of developing a word list for learners in different contexts was put forth by Cobb and Horst[12] albeit for another language, French. The 2004 study sought to find out the percentage of words in a French academic word list that was covered in newspapers, expository writings and medical articles. To this end, the most frequently used word families were entered into an online lexical frequency-profiling program. Then these word families were analyzed according to the aforementioned three genres of written work. Results showed that 85% of the words in newspapers, expository writings and medical articles were covered by the word list they proposed. Both the word lists proposed by Coxhead[11] and Cobb and Horst[12] provide useful reference points for learners who intend to advance their lexical knowledge for various academic purposes.

However, for some words in language learning, their frequency of usage may differ significantly when the difference between productive and receptive vocabulary is taken into account. As such, Paquot[13] developed another academic list that specifically targeted words that were used for production. In the study, she identified and teased out words on the AWL that were not frequently used in production. In addition to that, she used learner corpus data to fine-tune some English for Academic Purposes (EAP) words by providing insights regarding how different word forms (e.g., item vs. itemize) and how homonyms (e.g., fly as a noun vs. fly as a verb) can have different frequencies of occurrence. Based on the aforementioned studies, word lists have been created for both native-speakers of English as well as L2 learners in university, prescribing words that need to be prioritized for general academic proposes and for productive purposes for the aforementioned two groups. In addition to this, there have also been many studies focusing on word lists for a specific discipline.

1.2 Previous literature on the development of discipline-specific word lists

Because of the unique features present in the academic vocabulary used in a specific discipline, many studies have suggested that providing a general academic list does not suffice. Lam[14] investigated words that are the most frequently

used in the academic discipline of Computer Science. It was noted that academic vocabulary in this discipline was semantically different when compared to the same vocabulary used in general texts. This discovery underscores the needs for discipline-specific word lists. Mudraya[15] did something similar but in the discipline of engineering. Mudraya established the Student Engineering English Corpus (SEEC), which contained 2,000,000 running words based on textbooks from 13 different engineering disciplines and produced an academic word list of 1,200 word families. Ward[16] created another engineering word list but the list was constructed specifically for low proficiency students across all engineering disciplines.

In addition to creating word lists for a specific domain, there has also been research done comparing the word lists of two very specific disciplines. Chung and Nation[17] proposed a four-step scale in order to help researchers rate words found in two textbooks, one from the field of applied linguistics, and another from anatomy. It was found that one out of three words in anatomy texts and one for every five words in applied linguistics texts were considered words used commonly in academic texts. Although textbooks from both disciplines contained academic words, the fact that there was a difference in the amount and the proportion of academic words between the two disciplines highlighted the need to create academic word lists used specifically for those working in the medical field.

1.3 Previous literature on the development of word lists in the medical field

During the past decade, some research has been done on the creation and analysis of vocabulary lists catered specifically to medical practitioners. Chen and Ge[18] analyzed the occurrence as well as the distribution of AWL word families in medical research articles. Although findings from the study confirmed that a lot of words used in academic research were also found in medical research articles, it was also concluded that the AWL did not sufficiently represent many of the terms used in medical academic vocabulary.

Chen and Ge's creation and analysis of medical word lists paved the way for another study by Wang, Liang and Ge[19]. Wang et al.[19] created a medical word list called the Medical Academic Word List (MAWL). Wang et al.[19] referred to *ScienceDirect Online* and retrieved 288 medical research articles from 32 subject areas, which resulted in a corpus consisted of a total of 1,093,011 running words. Only root words were considered as all the lexical entries were lemmatized. The word selection criteria were based on the three principles proposed by Coxhead[11] in developing the AWL; therefore, the

data collected were in the form of specialized occurrence, range and frequency. Of the 1,093,011 running words, 31,275 word families and 4,128 pages of texts found in the corpus, 3,345 word families were found to have occurred more than 30 times. After eliminating all the words found in West's GSL, 1,446 word families were left and an even further 650 word families were eliminated because these words did not meet the range criterion. Another 27 word families were eliminated upon consultation with experts, specifically two experienced professors working in the English for Medical Purposes (EMP) field. As such, the final word list consisted of 623 word families, which appeared 133,746 times in total.

In another 2015 study by Yang[20], a word list was created catering specifically to learners working in the nursing profession. 252 English nursing research articles were collected and used for the creation of the Nursing Research Articles Corpus (NRAC), which consisted of 1,006,934 running words. In addition to creating this word list, the paper analyzed the words according to word families and found 676 word families, which was found to account for almost 15% of the coverage in the corpus created in the study.

Extant studies, albeit still limited in number, have established word lists for medical professionals working in medicine and those in nursing. Thus, more research effort targeting medical corpus is still warranted. Furthermore, existing word lists created in the studies reviewed above failed to provide sufficient information needed by learners, such as information on the frequency of occurrence. Moreover, the word lists did not cater to users at different developmental stages. Since medical word lists may be used by learners ranging from high school students preparing for entrance examinations to get into medical programs in universities, all the way to experienced practitioners working in a specific field of medicine, it is important to develop a word list that can meet the demands of target users at different developmental stages.

1.4 Research Gap(s)

As seen in the previous section, previous literature focusing on medical word lists has been quite limited. In addition to contributing another research article in this field, the present study intends to address several research gaps. First of all, by using word lists such as the vocabulary list for L2 senior high school students, the UWL, the AWL as well as information on the range of each word in the corpus, the word list created in the present study composed of five sub-lists, with each sub-list representing a different category targeting learners at different developmental stages, ranging from pre-medical school high school students to experienced

professionals in a specific medical discipline. Furthermore, the word list created in the current study contains not only the list of words but also information about the frequency of occurrence; therefore, users will be able to determine which words are used the most often.

2. Methods

2.1 Corpus Establishment

The present study created a written specialized corpus containing 1,025,574 tokens extracted from 99 medical research articles. The 99 written texts were further divided into 33 subject areas, with each subject area having three articles each represented in the corpus.

2.1.1 Data Collection

All the written medical research articles—all published between the years 2009 and 2019—adopted in the corpus were either downloaded from the website of the *National Central Library* in Taiwan or from *Google Scholar*. Those downloaded from the *National Central Library* in Taiwan consisted of master's theses written by L2 medical professions whereas those from *Google Scholar* were made up of published journal articles written by native speakers in the same field of expertise. Research articles were taken from the aforementioned two sources since both master's theses and published journal articles go through stringent measures of proofreading and revision to ensure quality in terms of language and content. All sample medical research articles included in the corpus were not edited in anyway; therefore, the original length of each article was kept, with the average word count for the articles to be 7,907.53 words, which is close to the number of words (8,000 to 8,500 words) typically set by medical journals. Research articles shorter and longer than 5,049 and 9,998 words were excluded. Also, only research articles written in the internationally conventionalized Introduction-Method-Result-Discussion structure were considered and were made up of articles from the 33 subject areas. The 32 subject areas chosen were based on Wang et al.'s 2008 study[19], which included anesthesiology and pain medicine, cardiology and cardiovascular medicine, clinical neurology, complementary and alternative medicine, critical care and intensive care medicine, dentistry, oral surgery and medicine, dermatology, emergency medicine, endicronology, diabetes and metabolism, forensic medicine, gastroenterology, health informatics, hematology, hepatology, immunology, allergology and rheumatology, infectious diseases, medicine and dentistry, nephrology, obstetrics, gynecology and women's health, oncology, ophthalmology, orthopedics, sports medicine and rehabilitation, otorhinolaryngology and facial

plastic surgery, pathology and medical technology, perinatology, pediatrics and child health, psychiatry and mental health, public health and health policy, pulmonary and respiratory medicine, radiology and imagine, surgery, transplantation, and urology. In contrast, the additional one subject area was in advancements in molecular biology since it has only been recently considered a popular subject area for research as seen in its prevalence in both the website of Taiwan's *National Central Library* and *Google Scholar.*

2.1.2 Data Processing

In the current study, data processing incorporated the standardization of the medical research articles to be stored in the corpus. As such, all the charts, diagrams, bibliographies and some components in texts, which would have been difficult to process by computer analyzing programs, were removed in order to eliminate factors that had the possibility of confounding the final tally of running words. In addition, all words were lemmatized so as to count related words into word families.

2.2 List Development and Word Selection Criteria

The present study used Coxhead's[11] and Wang et al.'s[19] principles in developing the AWL and MAWL, respectively, albeit with a few minor adjustments. In sum, all the words included in the final tally of words on the word list met the criteria for selection as described below:

1. Specialized Occurrence:

All lemmatized lexical items included on the list of the present study could not occur on a 2,000-word vocabulary list for L2 junior high school students—words that are too generic and simple (and hence may be less useful) for the target population of this study. For example, although the word *cancer* was found to be related to the medical field, it had to be eliminated because it was one of the words found in the 2,000-word list for L2 junior high school students. All the words that were not eliminated were then matched against the words appearing on an L2 word list for senior high school students, the UWL and the AWL to determine under which category to put the non-eliminated words.

2. Frequency:

Members of the word family had to occur 30 times or more in the corpus of medical research articles. The benchmark of 30 times was based on Wang et al.'s 2008 study that created word list based on a corpus consisting 1,093,011 words, making it comparable to the present study's corpus that consists of 1,025,574 words. Furthermore, an ophthalmologist from Taipei Veterans Hospital had to verify that all the words

were actual medical terms. For example, the word *BSA* appeared 54 times in the corpus and was verified to be an actual medical term (body surface area) whereas the token *Gunn* appeared 53 times but was eliminated due to it being just a common last name of researchers.

3. Range:

After the above trimming procedure, the range of the words was considered for the words in Category 4 of the word list. Specifically, all words that appeared in at least half

of (49 or more) the 99 articles were labeled as general medical academic words; words that had not been labeled in any of the aforementioned four categories (words meeting the L2 senior high school, UWL, AWL and range requirements) were considered words for specific disciplines within the field of medicine. **Table 1** shows the five categories of the words on the word list created in the current study as well as the description of each category and the corresponding target user.

Table 1. Five categories of the word list created in the present study, the description for each category and the corresponding target user

Category	Description	Target User
Category 1: High School (HS)	Words in the corpus that also appeared on the list of words used by L2 senior high school students	High school students preparing to enter medical school
Category 2: University Word List (UWL)	Words in the corpus that also appeared on the UWL (University Word List)	University students enrolled in medical school
Category 3: Academic Word List (AWL)	Words in the corpus that also appeared on the AWL (Academic Word List)	Researchers doing work in the medical field
Category 4: General (G)	Out of the 1,266 words, those that satisfied the range requirement, appearing at least once in at least 50% (49 out of 99 articles) of all articles in the corpus	Professionals in general medical fields
Category 5: Specific Discipline (SD)	Out of the 1,266 words, those that failed to satisfy any of the aforementioned four categories	Medical professionals working in a specialized/specific discipline

3. Results

The final tally of running words was 1,025,574 tokens, out of which 2,876 words met the criterion for words occurring 30 times or more. After the elimination of some words due to them being on the vocabulary list for L2 junior high school students and eliminated by expert opinion, the result was the final tally of 1,266 words. Out of these 1,266 words, 410, 240 and 329 words were also present on the word list for senior high school students, the UWL and the AWL, respectively.

Moreover, out of the 1,266 words tallied, 124 words appeared at least once in more than fifty percent of all articles collected (words considered for medical professionals in general medical fields) and 782 words did not fall into the aforementioned four categories and was thus labeled as Category 5 words, which were those considered for specific disciplines in the medical field. **Table 2** displays the frequency of occurrence for the first 30 words on the word list created in this study as well as their appropriateness for target users.

Table 2. Medical Academic Word List: Showing Word, frequency of occurrence and word categor(ies).

Number	Word	Frequency	Categories
Top 30 Most Frequently Occurring Words (Categorized into HS, UWL, AWL, General & Specific)			
1	express	2300	HS
2	protease	1883	HS, General
3	analyze	1340	HS, UWL, AWL, General
4	disease	1093	HS, General
5	leukocyte	1092	HS, AWL
6	gene	1085	General
7	trauma	854	HS, AWL, General
8	datum	851	HS, UWL, AWL, General
9	indicate	837	HS, UWL, AWL, General
10	factor	816	HS, UWL, AWL, General
11	associate	760	HS, AWL, General
12	contain	704	HS, General
13	sigma	698	HS
14	endothelial	694	HS
15	inhibit	680	UWL, AWL, General
16	structure	640	HS, UWL
17	prominent	639	HS, AWL, General
18	identify	634	HS, UWL, AWL
19	RLU	613	HS, UWL, AWL
20	T-cell	608	HS, General
21	function	607	HS, AWL, General
22	antibody	603	General
23	induce	600	HS, UWL, AWL, General
24	regard	599	HS, UWL, AWL
25	signal	594	HS, AWL, General
26	determine	586	HS, General
27	preliminary	577	HS, General
28	reagent	569	Specific
29	regress	561	AWL, General
30	recur	560	HS, General

* Legend: (HS): High School, (UWL): University Word List, (AWL): Academic Word List

4. Pedagogical Implications

Creating a medical academic word list can be beneficial to teachers, students as well as textbook writers and curriculum designers. For teachers, the word list can serve as a starting point for the design of EMP courses. By knowing the words that most frequently occur in medical research articles, textbooks, curriculum and syllabus designers can categorize the words and create lessons based on the needs of a specific group of target users. For example, if the target students of a class are high school L2 learners of English, then the prospective teacher may focus on the words found in Category 1 of the word list **(Table 1)**. Furthermore, teachers can use the words to create vocabulary-learning aids such as booklets and flashcards catering to learners in the medical field.

As for learners, the words found on the list in the present study can help learners at different developmental stages. As mentioned before, the word list created in the present study is multi purpose, meaning the target user of the word list is not constrained to only one small group of medical practitioners. As shown in **Table 1**, the word list created in the present study can help learners ranging from those high school students who wish to get ahead by preparing in advance and becoming familiar with medical jargon listed in Category 1 to medical professionals who have had a lot of experience in the medical field but are just trying to venture into a new specific discipline and familiarizing some specialized medical terms as listed in Category 5.

Finally, for those who design courses and textbooks, the word list created in the present study can serve as a stepping-stone in the creation of not only a word list but also a glossary with a short description for each word. This can be especially helpful for L2 learners who may need the additional help in order to learn medical terms more effectively.

5. Limitations and Suggestions

Given that the selection of words for a word list can be a very complex process, researchers could usefully address a number of areas. The following areas require further research.

First, some of the words on the word list created in the present study were abbreviations. Unfortunately, the present study did not spell out the meaning of the abbreviations. As an example, RLU was one of the top 30 most frequently occurring words found in the corpus. However, it would have been more informative had RLU been spelled out as "Relative Light Unit". To help learners, it is suggested that future versions of the list include the abbreviations as well as their fully written counterparts, and their co-occurring (two-word, three-word, four-word) collocational cohorts.

In addition to that, the present study only included 1,266 words. While the elimination process was exhaustive enough, it may have been too strict; thereby the final tally of the number of words was lower than expected. To increase the number of words and to enhance the representativeness of the words included in the corpus, it is suggested that future studies may want to include more texts from published textbooks, which have undergone stringent peer review procedures before publication. Another possible venue for relevant studies is to compile a discipline-specific corpus based on lectures from medical professionals. While spoken and written texts vary differently in terms of essence, register, and style, corpora consisted of texts from different modalities should be considered in the future.

Furthermore, the current study attempted to obtain comparable tokens among the 33 subject areas (32 from Wang et al.'s study and 1 from molecular biology). However, during the course of collecting research article, it was found that a substantial amount of medical research articles are not only limited to one subject area, probably because of the recent trend of conducting interdisciplinary research. In this regard, using a relative measuring yardstick (e.g., proportion of each subject area) to ensure the representativeness of words for the subject areas at focus is probably a better way than using an absolute measuring yardstick (e.g., absolute number of articles).

Finally, it is suggested that word lists do not just list down words in a specific domain or discipline of study. While the present study improved previous word lists by including frequency of occurrence and the corresponding category of each word, future word lists can make use of the concordance function found in *Sketch Engine* so that learners know not only the meaning of the words but also how to use them. In essence, the aim of future studies should not just be to create a word list, but a glossary containing definitions, explanations and sample sentences that learners can acquire these words in a more holistic fashion.

6. Conclusion

The present study aimed to create a medical academic word list based on research articles. 99 research articles written by both native speakers and L2 learners of English in the 33 subject areas of the medical field were collected and uploaded onto *Sketch Engine.* The total tally of running words following the collection of research articles was 1,025,574 words. Following exhaustive elimination procedures, including exclusion of words based on those occurring fewer than 30 times, those that were deemed too easy due to their presence on a vocabulary word list used by L2 junior high school students, and those eliminated following expert opinion, the final tally of words for the word list in the study was 1,266 words. The words were further divided into five different categories, with each category having a distinct target user within the medical field. The present study was intended to be a preliminary study. Nevertheless, it is hoped that the present study helps teachers, students as well as curriculum designers and textbook authors in the medical field and serves as a stepping-stone towards an easier and a more efficient way of learning medical vocabulary.

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A medical English language course for Japanese radiological technologists

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Abstract

In Japan, there has been an increase in foreign tourists and residents in recent years. In addition, with the upcoming 2020 Olympics, the need for healthcare professionals to communicate with foreign patients has also increased. However, there are no commercially available textbooks written to address the clinical communication needs of Radiological Technologists (RT). Japanese RTs are involved in consultations with patients, treatment planning and carrying out treatment plans. Therefore, they need good communication skills in order to do their jobs effectively. At Kyushu University's Graduate School of Medical Sciences, a vocabulary-based course in English for Radiological Technologists was created using iBooks Author for iPads and taught to eleven master's course RT students. The students (all graduate students with Japanese RT licenses) showed significant gains in vocabulary and pronunciation of medical terms.

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Keywords radiology, medical English, radiology English, English for specific purposes, English for medical purposes, English for radiological technologists

1. Introduction

1.1 Background

In Japan, the number of foreign tourists and residents has been increasing over the last few decades.[1,2] Some of these will require medical treatment but may not be fluent in Japanese. Japanese Radiological Technologists (RTs) are involved in consultations with patients, treatment planning and carrying out treatment plans. Therefore, they need good communication skills in order to do their jobs effectively. However, at the time of writing, none of the major Japanese publishing companies offer any medical English textbooks to address the clinical communication needs of Radiological Technologists. Therefore, the Radiology Department at Kyushu University requested the creation of a textbook and course specific to the needs of RTs. As such, no formal needs assessment was conducted for this project.

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1.2 The Radiological Technologist

There are 50,960 Clinical RTs in Japan, and they are responsible for the majority of radiology work.[3] RTs work with the patient in varying capacities, from taking diagnostic images using equipment such as X-ray, CT and MRI to designing cancer treatment protocols. In the case of cancer treatment, the RTs may assist the Medical Doctor (MD) in designing a treatment protocol or may design it themselves, which is then checked by the MD. The RT also works out the patient positioning, which, again, is checked by an MD. Communication between the patient and the RT varies from simple to complex. Therefore, it is necessary to teach English which encompasses all these situations.

1.3 Radiology Vocabulary

In designing a medical English course for Japanese Radiological Technologists (RT) at Kyushu University School of Medicine, Department of Health Sciences, the starting point is vocabulary. The choice of vocabulary is critical in the teaching of medical English.[4] In *Vocabulary Myths*, Folse points out that communication is hindered when one does not know the word for "a simple noun".[5] RTs will need radiology-specific terminology, but it is unlikely that students stud-

ied this in previous English classes. It is possible that they have studied some basic medical terminology, but in addition to the radiology-specific terminology, this course includes general medical terminology they are likely to use in the radiology setting.

Pronunciation is particularly important because, in a situation where patients may be preoccupied with serious illnesses, miscommunication can have serious consequences. For example, if the staff use the katakana pronunciation 'are-rugi' instead of *allergy*, it is possible that the patient may not understand, yet the staff may believe they are using good English.

1.4 Language Education

Japanese students have traditionally studied English using the Grammar Translation Method, so they have been exposed to the grammar they need.[6] They need to review and practice the grammar using the radiology-specific terminology. The minimal structures necessary include giving instructions ('Please lie face up.'), explaining procedures ('It takes about an hour for the tracer to circulate through your body.'), asking questions ('Do you have your blood sugar report?') and answering questions ('Metal will interfere with the results of the test.'). Other important language includes acknowledging emotions (a patient feeling panic will need additional support) and giving advice ('During the test, you could picture yourself in your favorite place.'). Since many radiology departments are run on tight schedules, it is not likely that RTs will engage in long discussions with patients.

2 Methods

2.1 Radiology Vocabulary Selection

To determine appropriate radiological vocabulary, a source of radiology terminology is needed. The RT licensing exam is a comprehensive source of up-to-date radiology vocabulary as students are tested in all facets of radiological technology. The 67th Medical Radiological Technologist Examination (given in 2016) was accessed on Japan's Ministry of Health, Labour and Welfare (MHLW) website and vocabulary was analyzed for frequency.[7] As this is a public website, all of the national licensing exams can be accessed by anyone (in Japanese). Using the website Gensen Web,[8] the vocabulary was extracted from the exams.

The website lists all the radiological vocabulary words in descending order of frequency. The vocabulary list is in Japanese, which then needed to be translated into English (see **Table 1**). To ensure accuracy, several methods were used: machine translation, dictionaries, and verification with bilingual health care and university professionals.

Table 1. Example of extracted vocabulary list

Japanese	English
X線	X-ray
X線撮影	radiography
X線CT	X-ray CT
エネルギー	energy
放射線	radiation
照射	exposure

Students who study radiological technology in Japan need an extensive radiology-specific vocabulary in Japanese in order to pass the licensing exam. Much of the language regarding the physics behind the treatments and details about the processing and analysis of the results will not be needed when communicating with patients. The minimum information patients need is what will happen to them, why it is necessary, and what the patient needs to do during testing and treatment.

Gensen Web yielded a list of 227 words. Many of them related to solving physics-based problems. The list was narrowed down to a preliminary list of 60 keywords that are likely to be used with patients. This was done in consultation with medical physicists at Kyushu University Hospital, an RT who works at Kyushu University Hospital, and Nuala Hannon of Hannon Oncology Education, Ireland. Some of the words which can be listed under a category other than radiology (e.g., disease names) were eliminated from the radiology-specific list. They were listed under the appropriate categories (e.g., diseases).

There were several words that were not extracted from Gensen, but were deemed to be relevant enough to add to the list. These were *tissue*, *immobilize*, *malignant*, *benign* and *cancer* (Gensen extracted phrases such as *prostate cancer*, but not *cancer* as a single lexical item.)

2.2 Textbook Assessment

Current Medical English textbooks available in Japan were assessed for content.[9-17] As there are currently no medical English textbooks for Japanese RTs, general medical phrase books with a radiology section were used instead.

In addition to radiology-specific vocabulary, the following categories/groups are needed:

Symptoms. For explaining expected sensations during treatment and understanding patients' reported symptoms.

Internal Body Parts. Internal body parts can be given priority over external body parts because, in many cases, patients and staff can point to the external body parts, sometimes to an exact location.

Basic disease names. For managing patients' ability to tol-

erate treatment; for example, handling the effects of arthritis, diabetes, or peripheral vascular disease. For talking to patients about their specific diseases.

Instructions. For giving instructions and explaining procedures and treatments. Simple grammar can usually be used; e.g., "Describe your chest pain", "Please turn your head."

Emotions. For acknowledging the potential emotional turmoil of medical issues such as confusion, worry, fear, relief, even excitement (e.g., the birth of a healthy baby).

Directions and Departments. For directing patients to various facility locations, helping lost visitors and patients, and as a bonus, reviewing giving instructions (the grammar is similar).

Medications. For managing effects of medications which affect testing or treatment, such as diuretics (the patient may need to urinate more frequently), anti-anxiety and pain medications (the patient may be unsteady), and for patients who need sedation for radiological diagnostics and treatment.

Most textbooks include a section on Patient Registration and Payment Information. In most clinical settings, this is handled by the admissions staff or at the front desk of an outpatient setting. Therefore, except for confirming identification and name spellings, this topic can be omitted. However, in making the decision to include or omit any particular unit of language, it is necessary to remember that any omission simply means that it is a lesser priority than the language that is included, not that it is entirely irrelevant.

2.3 E-Textbook

An electronic textbook for a 10-week, 2-credit elective course was created using iBooks Author. This included 2 weeks of testing (pre- and post-tests) and 8 weeks of teaching.

There were 10 iPads available for use in this study; they belonged to the university as purchases by individual professors. In the Wi-Fi enabled classroom that was used, ceiling-mounted, retractable power cords were installed. This made it easy to keep the iPads charged at all times.

The iBooks Author software, which is relatively easy to use for textbook creation, includes features well suited to language learning. It has a variety of programs, called widgets, which help with textbook creation. For example, one widget allows teachers to create a photo gallery. This is a convenient feature as it allows students to view many images in a small space on a page. Teachers can also include audio and videos. The videos in this textbook include videos for dictation and listening, and silent videos for students to write a possible conversation. As Wi-Fi was available, links to relevant websites were included.

One useful feature is an interactive review widget. It functions as a multiple-choice quiz. As with the photos, many questions can be put into a small space on a page. Students can receive immediate feedback on their answers (See **Figure 1**). Students used this to quiz each other.

The Chapters were broken down into the following: *First Encounters, Hospital Departments, Body Parts, Tests, Symptoms, Emotions, Treatment and Co-morbidities. Medications* was not included as a separate chapter due to time constraints. Each chapter included examples of language used by the RT such as questions about the patient's condition, explanations of procedures, instructions for patients, and advice. Also, examples of things patients might say and questions they may ask were included. Activities in each chapter provided opportunities for students to practice together.

At the end of each chapter, a section called 'How It Works in Simple English' was included. Many patients have no medi-
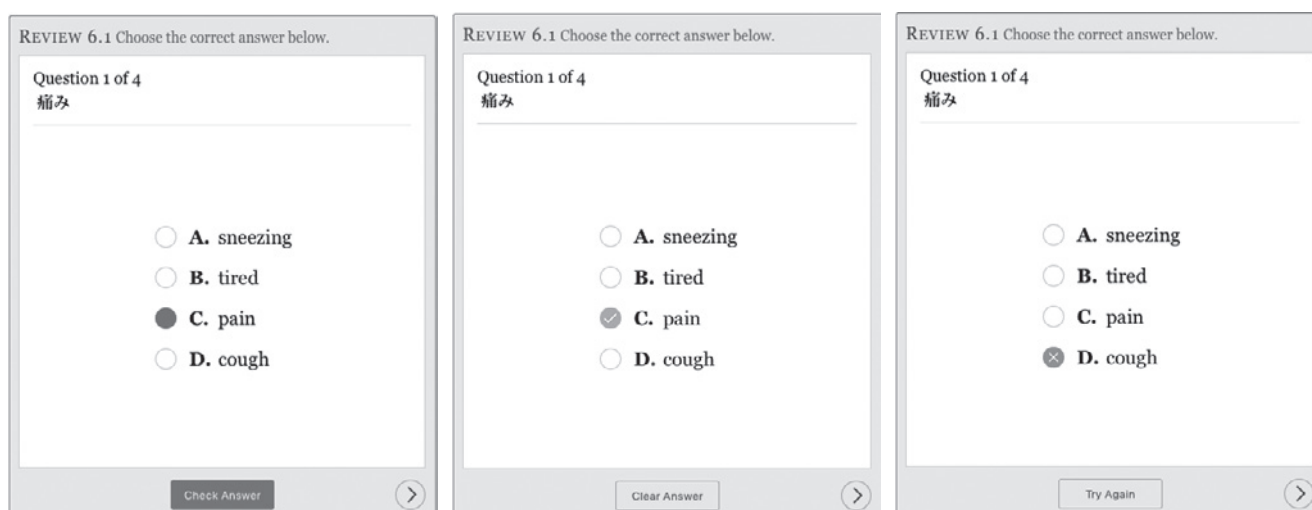

Figure 1. interactive review widget: choose answer, correct answer, incorrect answer

cal training and, particularly in the beginning stages of cancer treatments, the information can be overwhelming. A guide to radiological concepts can help students understand the English as well as explain these concepts to patients. A text-based example follows (See **Figure 2**).

At the end of the book were two glossaries: one for general medical terminology and the other for radiology-specific vocabulary. The radiology-specific glossary included a translation into English and a definition in English for each item. An attempt was made to keep it as simple as possible for the benefit of both students and patients, but the concepts did not always lend themselves to simplicity. A sample entry: Dose distribution　線量分布　The variation of radiation in the human body (For the full list, see https://share.iii. kyushu-u.ac.jp/public/ZTJgAA1I8M-A_mcBj6Bognsbhze9j9i-YrYECg2qEUUuO.)

2.4 Radiological English Course

Eleven master's course RT students, all with Japanese RT licenses, enrolled in the course. A vocabulary pretest of 20 words was administered during week one. The Japanese word was given and the students wrote the word in English.

A pronunciation test was also given. A list of 10 words was chosen based on pronunciation difficulties that Japanese people often have, for example, b-v, l-r, th, and some specific words such as *fatigue* and long words such as *anesthesiology*. Each of these factors was worth one point. The students read the words into recording software on an iPad. The 10 words counted for a total of 25 points.

The course consisted of using the text to study vocabulary and commonly used sentence structures, and questions and answers used by both staff and patients. Students worked together to solve problems, create scenarios and quiz each other.

As students recognize that writing by hand enhances learning,[18, 19] paper homework was given in the form of Free-Form Crossword Puzzles (FFCP). FFCP's help with spelling as words need to fit together. In addition, for Japanese students, it helps reduce the reliance on katakana instead of using dictionaries.

Students were also required to write original conversations for homework. Many students use an example in a textbook and simply change a detail or two. The basic conversation remains the same. A different approach was used here. They were given from one to three vocabulary items and, if necessary, suggestions for possible approaches. The conversations were checked, and editing assistance was given. Students then practiced and shared their conversations with the class.

This allowed for a variety of language for students to listen to. The students could use language based on their clinical experiences. It even allowed for humor; for example, in one case a patient wanted his mother to accompany him during an X-ray, but she said no because he was 38 years old.

The use of humor has been shown to be an effective tool in language learning.[20] One of the positive effects is the lowering of the affective filter. The affective filter relates to variables which affect learning, particularly language learning. Attitudes such as motivation, self-confidence and anxiety affect learning.[21] Judicious use of humor can lower anxiety in the classroom and enhance participation in class activities.[22]

3. Results

After the course, post-tests were administered: a vocabulary test and an audio pronunciation test. The post-tests were the same as the pre-tests. Scores improved in both the Vocabulary and Pronunciation tests.

The average Vocabulary score was 6.9 out of 20 with a Standard Deviation of 3.1 in the Pre-test, and 15.8 with a Standard Deviation of 3.3 in the Post-test (n=11). A paired t-test was done on the vocabulary scores. There was a significant difference (p<0.0001) between the pre-tests and post-tests.

The average Pronunciation score was 13.5 out of 25 with a Standard Deviation of 3.3 in the Pre-test, and 22.4 with a Standard Deviation of 1.4 in the Post-test (n=11). A paired t-test was also done on the pronunciation scores. Again, there was a significant difference (p<0.0001) between the pre-tests and post-tests.

The vocabulary results can be grouped according to lexical

How It Works in Simple English

Basic atom activity: Atoms are a basic unit of matter with 3 main parts: electrons, protons and neutrons. Electrons can move within the atom and move out of the atoms. When this happens, the charge (+, positive or -, negative) changes and they gain or give off different kinds of energy. (This is highly simplified. For this English course, and for your patients, this should be enough.)
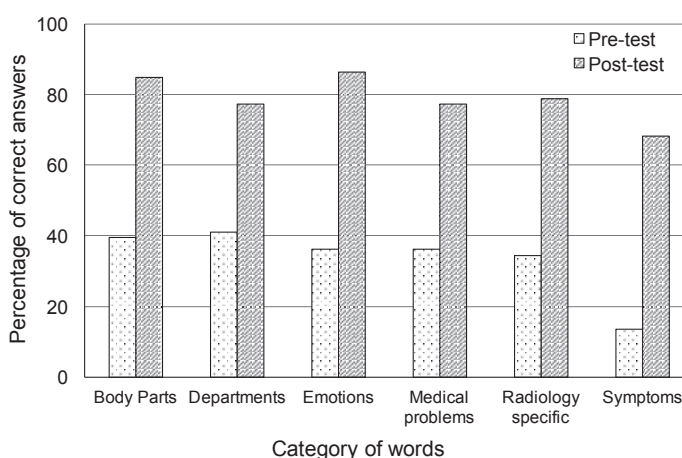
Figure 2. 'How It Works in Simple English': Atoms

Figure 3. Lexical Category

category: body parts, departments, emotions, medical problems, radiology specific, symptoms. The students made gains in all lexical areas. The greatest gains were the 'symptoms' vocabulary words (**Figure 3**).

4. Discussion

The fact that the greatest gains were the 'symptoms' is significant because sometimes treatment may need to be adjusted according to the patient's condition (e.g., the patient cannot stay still because of muscle cramps) or response to the treatment (ex., burning at the treatment site). In other cases, treatment may not need to be adjusted, but the patient may need assurance that the response is normal; for example, fatigue due to radiation therapy. Staff (RT or other) can suggest ways to cope with common symptoms. Otherwise, patients may stop treatment if they feel that the treatment is harmful, not working, or simply too uncomfortable.

5. Conclusion

This study was an attempt to create a textbook which would suit the needs of RTs. By using a textbook tailored for RTs, the students were able to improve their vocabulary. They also practiced radiology-specific vocabulary in the context of radiology-based conversation, sometimes based on their own experiences. Allowing students to write their own conversations rather than memorizing textbook conversations gave the students a degree of control over their language learning.

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Setting up for success: A workshop for Japanese medical students in preparation for overseas clinical electives

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Abstract

In order to prepare medical students for their overseas clinical elective, we developed a clinical English workshop that focuses on both the clinical interview and the oral case presentation. The two-day workshop, which was administered to a total of 37 fourth- and fifth-year Japanese medical students, was divided into four phases: an (1) interactive lecture, (2) role-play, (3) clinical interview with Standardized Patients (SP's), and (4) clinical case presentation. During day one of the workshop, the lecture, taught by a U.S. physician, introduced students to questions and phrases used during clinical history-taking, along with common patient responses. It also emphasized the principles of the oral case presentation, which is a key part of undergraduate medical education. The students then practiced the clinical interview with their fellow classmates via role-play. On the second day of the workshop, the students had an opportunity to conduct two separate clinical interviews with English-speaking SP's. Based on the interview, the students were then tasked with presenting the clinical case to a U.S. board-certified physician, who gave direct and immediate feedback to the students. This was meant to simulate the students' clinical environment, where they would have to present their patient's clinical history in an orderly fashion to their supervising attending in English. We propose that such an immersion workshop would be a valuable introductory course in clinical English, which would be immensely beneficial for all Japanese medical students going overseas for clinical training.

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Keywords study abroad, clinical English workshop, clinical interview, oral case presentation

1. Introduction

At Showa University, there has been a steady increase in the number of medical students who pursue clinical training overseas. (See **Figure 1**). With the exception of certain institutions, medical education in Japan is conducted almost entirely in Japanese, leading to challenges in communication for many students when engaging in clinical training outside of Japan. This is especially difficult for Japanese medical students in countries such as the United States, where medical students are given greater responsibility in patient care and are expected to clinically evaluate patients and present those patients to supervising physicians and residents. This is in contrast to the typical Japanese medical student, who typi-
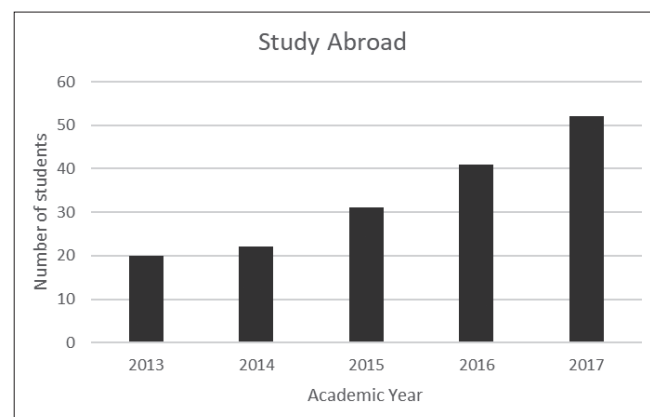
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Figure 1. Number of Showa University medical students engaging in some form of study abroad program

cally observes in the hospital, rather than engaging in hands-on learning.[1] Indeed, when Showa University medical students were asked the reasons for their concerns regarding overseas clinical training, one of the most commonly cited reasons was their lack of comfort in carrying out the clinical training in an English-speaking environment.

In an effort to relieve some of this anxiety and provide preparation prior to the students' overseas clinical studies, we developed a 2-day workshop on clinical English that aimed to mimic an English-speaking environment. This was achieved by utilizing the services of native English-speaking Standardized Patients (SP), in addition to a native English-speaking U.S. board-certified physician. This workshop was made part of the prerequisite training for students engaging in a clinical rotation overseas. We implemented this workshop in January 2017 and repeated it in November 2017. The formats of both sessions were nearly identical, with the exception of a more formalized evaluation system for the latter session.

2. Workshop

The target audience for our Clinical English Workshop were students in their 4th and 5th years of medical school who were scheduled to travel overseas for their clinical training. The timeframe for each students' rotations varied, but most were scheduled to go overseas within a few weeks to a few months following the completion of the workshop. All students were scheduled to spend 4 weeks for their study abroad clinical experience. The training institutions all used English as their lingua franca, and were located in seven different countries spanning four different continents (see **Table 1**). A total of 37 medical students participated in the two workshops (18 students in January 2017, and 19 students in November 2017).

The workshop was set up to allow students to practice the forms of communication required to function in the clinical setting: (1) Communication between doctor and patient and (2) communication between doctors and other healthcare

professionals, including other doctors, nurses, etc.

During the first day of the workshop, an interactive lecture was delivered by a native English-speaking physician, instructing students on how to conduct a clinical interview, with a focus on the phrases used to elicit clinical information from patients, including common English medical terminology (See **Figure 2**). Common patient responses to these questions were also taught. In the session, it was also discussed how to generate a differential diagnosis, based on the patient's symptoms and clinical history, with an explanation on how the differential diagnosis would affect a physician's line of questioning. This is a skill that students had previously been introduced in their native tongue (Japanese), but during our workshop, there was a greater focus on English medical phrases and terminology.

Immediately following the lecture, students practiced these interview skills with one another. Initially, as a form of demonstration, a model roleplay session was conducted with one student demonstrating the clinical interview with a native English-speaking staff member (See **Figure 3**). The students were then split into groups of two to conduct the role-play with one another, with close supervision by a U.S. licensed physician.

As part of the interactive lecture, students also learned the principles of delivering an oral clinical case presentation. This is essential for communication amongst health care professional, such as a supervising resident or attending physician. This training included the skills needed to develop a cogent summary of the patient's clinical information, which is typically part of the patient's assessment.

On day two, the students had an opportunity to practice history-taking with standardized patients in a simulated clinical setting (See **Figure 4**). The SP's were foreigners living in Japan, primarily from the North America and Europe. These SP's were previously trained and supervised under Professor Ruri Ashida at Jikei University, who had presented her prior work using native English-speaking SP's.[2] There was a total of 4 SP's, each of whom had a different clinical

Table 1. Overseas institutions where workshop participants were planning to engage in clinical training

Institution Name	City, Country	Continent
Children's National Medical Center	Washington D.C., U.S.A.	North America
St. Bernardine Medical Center	San Bernardino, CA, U.S.A.	North America
University of Hawaii	Honolulu, HI, U.S.A.	North America
The Queens Medical Center	Honolulu, HI, U.S.A.	North America
Taipei Medical University	Taipei, Taiwan	Asia
St. Vincent's Hospital	Melbourne, Australia	Australia
Medical University of Vienna	Vienna, Austria	Europe
Aragon Health Sciences Institute	Zaragoza, Spain	Europe
Agaplesion Ev. Bathildiskrankenhaus bad pyrmont	Bad Pyrmont, Germany	Europe

presentation with commonly seen symptoms (fatigue, short-ness of breath, abdominal pain, and chest pain). Each student conducted a clinical interview with two SP's, with each inter-view allotted a time limit of 13 minutes.

Following this clinical encounter, the students were given a few minutes to organize their thoughts. Students used this time to write down relevant clinical information to use for the next phase of their workshop, which was the oral case presentation (See **Figure 5**).

Each student had to choose one patient to give an oral pre-sentation to one of our authors (K.S.), who is an English native-speaking U.S. licensed physician. After each presenta-tion, each student received two minutes of immediate feed-back.

3. Evaluation of Students

The students were evaluated by SP's on a five-point scale in the areas of (1) spoken English (conversation skills, pro-nunciation, and English grammar); (2) relevance and order

of questions; and (3) bedside manner. See the sample student evaluation form **Figure 6**.

The student's oral case presentation was evaluated by the supervising physician, with this evaluation form becoming more formalized for the 2nd session, conducted in November 2017. Comments by the evaluator, including specific areas for improvement, were also noted on this evaluation form. A sample of this evaluation form can be seen **Figure 7**.

4. Evaluation of the workshop

The workshop was well-received by students. Based on the immediate post-workshop questionnaire, 100% of students believed that the workshop was helpful. In addition, all stu-dents found the workshop to be motivating for improving their clinical skills in English. All participants also recom-mended that the workshop be repeated the following year.

5. Discussion

All medical students at Showa University undergo an Eng-

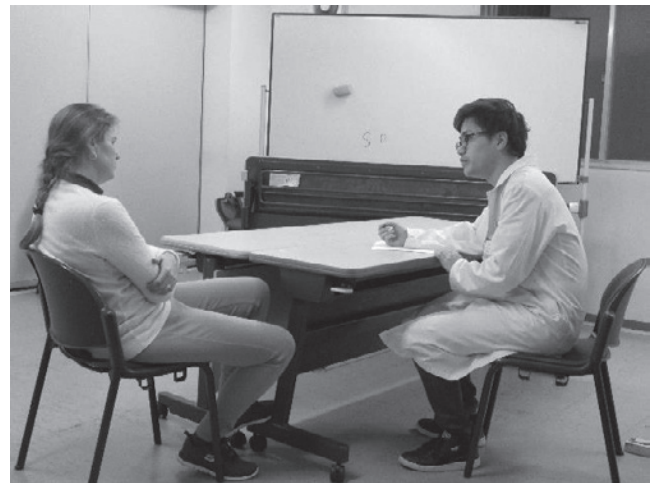
Figure 2. Day 1 - Interactive lecture delivered to students

Figure 4. Day 2 – Interview conducted with native English-speaking SP

Figure 3. Day 1 – Role Play amongst students, conducted in pairs

Figure 5. Day 2 – Oral case presentation

lish communication course during their first year of medical school, but the medical English phrases used are very basic. Furthermore, limited clinical English education is administered between this early period and their clinical years (4th and 5th year). Therefore, a structured review of the phrases and terminology was required, which was the intent of the first day's interactive lecture.

We believe the main strength of this workshop is the ability to mimic the clinical setting that students would encounter in their overseas training. This was through the use of native English speakers of English amongst the SP's and the proctoring physician. In clinical settings, students are often expected to perform the initial patient evaluation, which includes obtaining a clinical history. This information is then often relayed to the supervising physician in the form of an oral presentation. Unique to our workshop was the opportunity for students to practice their clinical case presentation with a native English-speaking physician, who is a clinically active U.S. board-certified surgeon with experience in educating Japanese medical students and physicians. Students were able to receive immediate and constructive feedback on their presentation skills. Furthermore, in order to closely mimic the realistic time constraints of the clinical setting, each student was allowed up to 5 minutes in order to deliver their oral case presentation, which was to include their developed assessment and management plans.

Developing oral case presentation skills is a hallmark of undergraduate medical education, especially in the United States, and being able to conduct this in a second language can be particularly challenging for the young Japanese medi-

cal student. With more practice, we believe students could improve this skillset in a very efficient manner. Although each student was allocated one opportunity during the workshop, we noted that for a few students who had the opportunity to practice their oral presentation more than once, there was a noticeable improvement in their presentation during the second session. Those students demonstrated improvement in maintaining an appropriate order of the clinical history, as well as marked improvement in providing a clinical summary in the 'Assessment' section. Immediate feedback was key for this improvement.

One of the challenges that many students had was keeping the clinical information in the appropriate order. The order of the clinical history is anticipated by many physicians and is standardized. The initial information is the chief complaint, followed by the history of present illness, review of systems, past medical history, past surgical history, medications used by the patient, allergies, social history, and family history. Generally, physicians anticipate hearing the patient history in this format, and greatly deviating from this can be distracting for most listeners.

For future workshops, we hope to make concrete improvements to the evaluation system. For example, the above evaluation system by SP's included a parameter on grammar. During the United States Medical Licensing Exam (Step 2 Clinical Skills), the evaluation is performed primarily according to how difficult it is to understand the examinees' spoken English.[3] Perfect grammar isn't always necessary for adequate comprehension. We therefore believe that the level of difficulty of understanding the students' spoken English is

Figure 6. Student Evaluation Form

Figure 7. Patient Presentation Feedback Form

the most important parameter, and for future workshops, we plan to modify our SP evaluation sheet accordingly.

We are in the process of analyzing feedback from students that was submitted at the completion of their overseas clinical training to assess the utility of our workshop. Through feedback that has already been collected, we intend to make some modifications to the program, including the addition of a more robust physical examination component and a mini-workshop on understanding medical documentation, which is often rife with acronyms and abbreviations.

6. Summary

We believe that a workshop that closely simulates what is encountered in English-speaking environments, through the use of native English-speaking SP's and proctoring physicians, can be immensely helpful for students preparing to go overseas for clinical training. Having the students practice an oral case presentation with an experienced native English-speaking clinician is the unique strength of our workshop. The students found the workshop to be useful and increased their motivation. Since our workshop was so well-received, we hope to continue this workshop annually with continual improvement in each iteration.

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Study-abroad program for first-year students at Japanese comprehensive medical university

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Abstract

Japanese students have become increasingly interested in studying abroad, but incorporating this education component into the existing curriculum can be difficult for specialized universities, such as medical-related schools. This paper describes a four-week study abroad program that our university developed with a United States university for 1st-year students in the schools of medicine, dentistry, pharmacy, and nursing and rehabilitation sciences. This program focuses on: (1) global communication, (2) international culture exposure, and (3) comparison of healthcare systems. Activities include ESL classes in the morning, culture-related activities/sightseeing, and medical-related tours/activities (such as visits to local medical settings and medical-related lectures). Students spend half of the time with a host family for an enhanced immersion experience. Since 2006, nearly 300 students have participated in this program. Feedback from students indicates that the main reasons for participating in this program were to improve English skills, for self-development/growth, and to learn about foreign culture. Main worries were language skill, homestay, and living abroad in general. We discuss challenges and insights in running this program for the past 11 years, and future plans to examine how this program contributes to the development of our students in their respective fields.

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Keywords study abroad, comprehensive medical university, ESL, health care system

1. Introduction

Japanese university students have shown a growing interest toward study abroad, with reasons such as desiring intercultural experiences, improving English language skills and gaining a more global perspective.[1] Many Japanese medical schools have experienced a similar trend in their students, who want to develop their English clinical communication skills in areas such as patient interactions and case presentations.[2] To address these issues, the International Exchange Center at Showa University, a comprehensive medical university with four schools (medicine, dentistry, pharmacy and nursing and rehabilitation sciences), established the "Health-care in USA Program" and has sent first-year students to Portland, Oregon, for approximately four weeks since 2006. This program is open to all students, regardless of English ability. Instead, during the selection process, faculty interviewers focus on students' motivations for applying and screen for any health conditions (such as severe allergies) that may prevent them from participating in the program, especially the homestay component. As **Figure 1** shows, approximately 23-25 students participate each year, with a total number of 298 students.

In this report, we describe the goals and activities of our 2017 program and examine students' reasons for participating and main worries. We end by discussing challenges and insights in running this program for the past 11 years, and future plans to examine how this program contributes to the development of our students.

2. Methods

2.1. Description of the Healthcare in USA Program

This study-abroad program is organized through the International Special Programs at Portland State University (PSU), an urban college located in the heart of the city. Portland offers a wide variety of activities, is affordable and safe, and

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has a well-developed public transportation system. We also contract with a non-profit homestay organization to provide host families for our students. During the 2017 program (which was similar to previous years), students first spent 15 days home staying with a local family and 9 days in the PSU dormitories. This arrangement provides our students the chance to experience different living styles in America.

2.2. Description of Program's Goals and Corresponding Activities

This program has been designed with 3 goals in mind: Global Communication, International Culture Exposure and Comparison of Health-Care Systems. Every activity is designed to cover one or more of these goals. **Table 1** displays the activities from the 2017 program, separated by
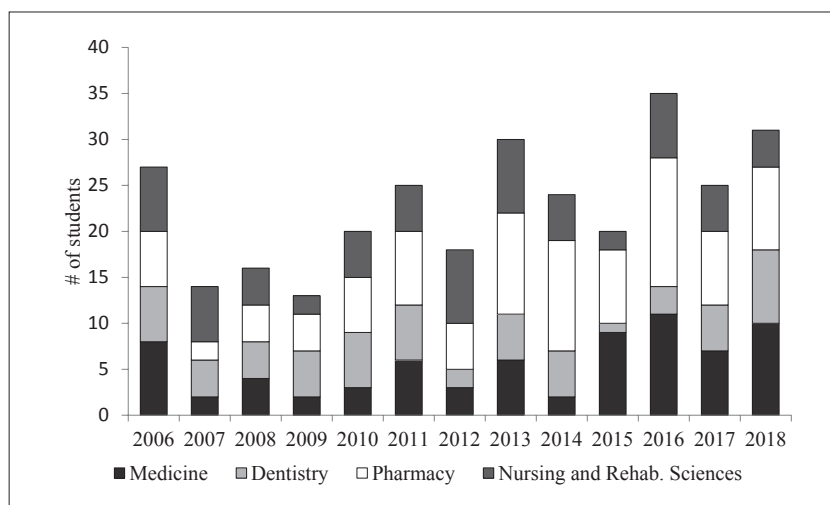

Figure 1. Number of students who participated in "Healthcare in USA Program" since 2006

Table 1. List of each activity from 2017 program, separated by the program goal it covered and number of total hours

Program Goals					
Global Communication		Compar. of Health-Care Systems		International Culture Exposure	
Activity	Hours	Activity	Hours	Activity	Hours
Homestay*	81	PeaceHealth SW Washington Hospital	2	Homestay*	81
ESL Class	32	OHSU Hospital	2	Deschutes River Rafting Trip	10.75
Oral Presentation	3	Metro West Ambulance	2	Columbia Gorge + Outlet Shopping	8
OHSU Student Panel Discussion	1.5	Medical Teams International	2	Clark County Fair	4
		Lecture: "Overview of US Health System"	1.5	Blanchet House Homeless Center	3
		Lecture: "Healthcare Leadership Concepts"	1.5	Timber Soccer Game	2.25
		OHSU Simulation Education Center	1.5	Pearl District	2
		Dental Clinic Visit	1.5	PSU Rec Center	2
		OHSU Student Panel Discussion	1.5		
		OHSU Simulation & Surgical Training Center	1		
		Drugstore Visit	1		
Total	**117.5**	**Total**	**17.5**	**Total**	**113**

ESL: English as a Second Language

OHSU: Oregon Health and Science University

PSU: Portland State University

*Homestay hours are estimated based on 3 hours per weekday and 12 hours per weekend days.

their corresponding goal.

The main activities related to global communication are homestay and ESL classes. Local host families offer our students the best chance to practice and improve their English. Especially, we encourage students to communicate with the host families during dinner time and on the weekends. The students also take ESL classes almost every morning. Class size is kept small and instructors have a Master's degree in Teaching English as a Second Language (TESL) or equivalent experience in TESL, and have experience teaching Japanese students and special program groups. The instructors use many in-class activities to encourage active learning, such as interviewing strangers, role-play, and on the last class, group oral presentations in English. The topics can be related to anything the students experienced in the U.S., often taking the form of comparing some aspect of Japan vs. America.

Regarding international culture exposure, the homestay experience is again a major component. Hosts are often a mix of traditional and non-traditional families, such as single-parent families and same-sex couples. Our host families are also ethnically diverse, with minority families, mixed-race families, and immigrant families. However, all host families speak English at home. Therefore, students can gain a full appreciation of the different people who live in America. Students often become temporary family members and attend activities with the rest of the family, such as going to church, celebrating birthdays, and even attending family reunions.

Students in our program also experience "American culture" related to Portland and the Pacific Northwest through activities that are unique to the area. Recent activities include attending a local county fair, river rafting, seeing a professional soccer game, and volunteering at a shelter to provide free meals to the homeless.

The final goal of this program is to teach students about similarities and differences of health-care systems. We work with another university in Portland, Oregon Health and Science University (OHSU). OHSU has state-of-the-art simulation and training centers that students can explore and try. Students also visit local hospitals, an organization that provides emergency medical care both locally and internationally, and an ambulance company to learn about emergency health care service in America. As our students come from different schools, this program includes small group trips for students from each school, such as a visit to a local dental clinic for the dental students or a visit to drug store for the pharmacy students. We also organize lectures by various medical experts as well as the chance for our students to meet and discuss with current students at OHSU to discuss the medical education system in the U.S. vs. Japan. Because

the English during these visits and lectures can be difficult for our first-year students, translators with medical backgrounds are hired to accompany students during these activities.

3. Results

3.1. Reasons for Participating

To understand why students participate in this program, we asked the 2017 students to complete a non-anonymous questionnaire in Japanese and rate several possible reasons for their participation before they left for America. **Figure 2** shows the percentage of students who chose the highest rating (5) for each reason. The main reasons were to improve their English, experience a different culture where they can make friends, and gain a more global perspective. Our students' sentiments are consistent with past research indicating that students often have a variety of reason for studying abroad, ranging from practical (improving foreign language skill) to transformational (global perspective, experiencing new cultures).[3,4]

3.2. *Students' Worries about the Program*

We also asked students about their worries, and **figure 3** shows their ratings. English ability (or lack thereof) and homestay were the two biggest worries. Past research has also found that these two concerns are often mentioned by Japanese students who study abroad.[4,5] Our center has tried to address these worries by inviting students who participated the previous year to come to orientation and talk directly to students about their experiences. As a lesson during orientation, we also stress to them the importance of "speaking your mind" in America – even to say that you don't understand something – and go through various scenarios and strategies for dealing with them in order to avoid communication problems with their host families and others.

4. Discussion

4.1. *Challenges and Insights*

In the course of providing this program for the past 12 years, the International Exchange Center at Showa University has had to address several challenges. Two of the biggest challenges have been the homestay experience and safety.

Some common homestay issues in the past have been little chance for students to communicate with their host families (most often because they didn't eat dinner together); food issues, such as the same food or the host family asking the student to pay for their food; student's allergies not being completely communicated to the host family, or surprise extra guests staying with the host family when our student

was also there.

We have tried to address these issues in several ways. First, we organize a "homestay" orientation meeting with the students. During this orientation, students clearly learn the host family's responsibilities and their own responsibilities. For example, host families are responsible for providing 3 meals per day, paying for meals if they dine out together, and spending time together during dinner and weekends to communicate with their students, while students are responsible for being flexible and open-minded to new experiences and to engage with their host family whenever possible. Host families also receive similar orientation materials from the homestay organization so that everyone has the same information. Second, to ensure that all important allergy and health information is passed along to the homestay organiza-

tion, we require that all students complete a medical interview at our university's health center. The medical doctor confirms that the allergy information written in the student's homestay application is correct, and also checks the student's mental/psychological status before traveling abroad. Third, we send two faculty chaperones with our students during the first few days of the homestay, when many of these problems often occur. If any concerns arise, the chaperones can quickly learn about it and talk with the homestay organization directly. Finally, after every program our center holds a meeting with staff from PSU International Special Programs and the homestay organization to discuss any new host family issues and how to address them for next year's program.

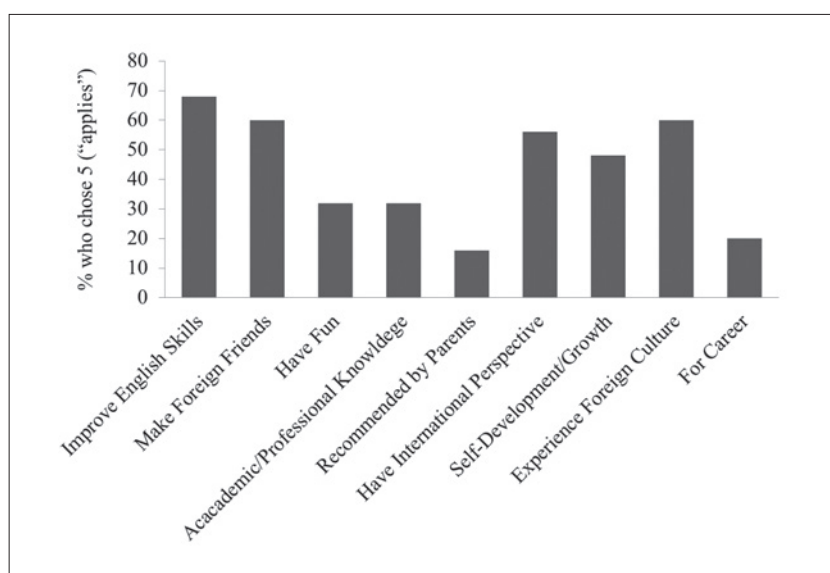Another, more recent issue we've had to address is safety

Figure 2. Percentage of students who selected highest score (5 "applies") for each reason about why they participated in 2017 program (n = 25)
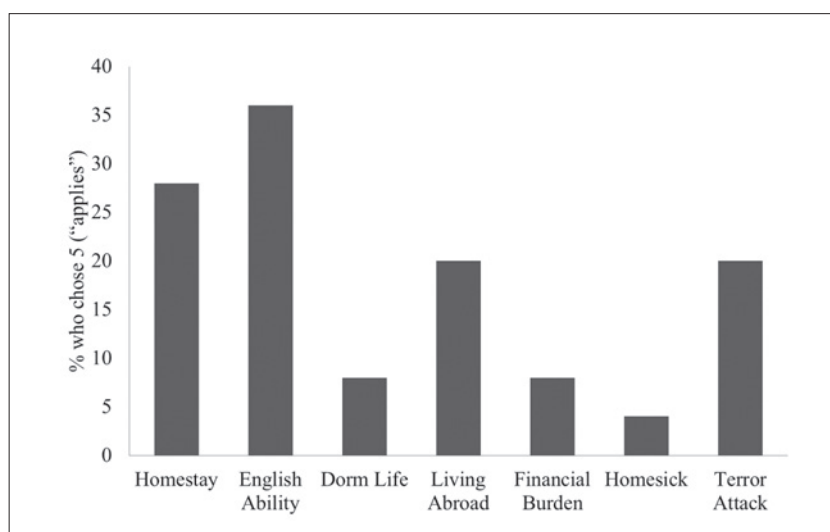

Figure 3. Percentage of students who selected highest score (5 "applies") for each worry about the 2017 program (n = 25)

while traveling abroad. To teach our students more about safety and risk avoidance, during one orientation meeting officials from a crisis management company and insurance company give a lecture about personal safety and travel health insurance. Our faculty chaperones also regularly attend crisis-management seminars to become better informed about this topic.

4.2. Future Research

Starting this year, our center plans to start research projects to address several questions about this program. For example, we intend to examine whether students' stated reasons and worries change after they participate in the program. We also plan to study possible social-cognitive effects of this program, such as increased levels of grit (perseverance of effort combined with the passion for a particular long-term goal or end state)[6] and self-efficacy (feelings of self-worth and autonomy)[7] after participating in this program. Both of these psychological constructs have been shown to be related to positive life outcomes, especially related to work and career, so we intend to demonstrate real-world benefits of this study-abroad program for our students. Finally, our center plans to track these students into the future and see if there are any long-term effects of this program on students' behavior, such as improved English skills, study abroad participation later in their academic career or even future career choices.

5. Conclusion

It is our intent that this summary of Showa University's "Healthcare in USA Program" may provide some ideas for those in the academic field who wish to create their own study abroad program or modify a current program. In particular, we aim that readers may learn from our challenges so that they may avoid those problems in their own programs.

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ESP的視点による英語医学論文抄録Reading授業の実践報告

Applying an ESP approach to teaching the reading of medical research article

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Abstract

Reading medical research articles is an essential skill for medical students. However, novice learners find reading such texts to be a challenge because of technical terms and non-technical set phrases, or hint expressions, which are conventionally used by the discourse community. Understanding genre-specific rhetorical features of research papers has been shown to increase the ability to read and write effectively, but studies on the effectiveness of teaching such features as part of a Medical English reading course are lacking. To investigate whether a research article abstract reading course incorporating explicit instructions on rhetorical moves would enhance the students' reading skills, a study was conducted at a medical college in Japan. The study examined 99 fourth-year undergraduate medical students' understanding of rhetorical structures in abstracts before and after a two-day course. The students read abstracts with explicit explanation on moves and hint expressions. The learners also performed corpus-based analyses of abstracts as a take-home assignment. Pre- and post-course quizzes showed that 47（48.0％）and 87（87.9％）of the 99 students, respectively, were able to identify the correct order of the moves. In the post-course questionnaire, many students noted that the course was effective in deepening their understanding of rhetorical structure, but students also reported difficulties with lexical items and the use of personal computers. Taken together, the results show that the course raised the students' awareness of genre-specific features of medical research article abstracts. Additional instruction on vocabulary and computer skills may improve the effectiveness of the course.

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Keywords English for specific purposes, undergraduate medical students, research article abstracts, moves, classroom, questionnaire

1. はじめに

　医学英語教育のグローバルスタンダードに対応するための医学英語教育ガイドラインでは，医師が地域医療の発展に貢献するために必要な英語運用能力の1つに，専門分野の文献を読むことが挙げられる。「英語論文のabstractを読んで理解できる」こと，ならびに「医学英語論文の基本的な構造を理解できる」ことは，医学研究を行うための要件とされる。[1]論文のabstract（以下，「抄録」）を読むには，難解

な専門分野の用語の意味に加えて，専門分野の用語をつなぐ単語やフレーズの意味も習得する必要がある。医学生は，比較的高い英語運用能力を有すると考えられているが，[2,3]英語学習に充てられる時間が限られているため，将来，論文の抄録を読む際に応用することができるような発展的な学習方法を採用することが望ましいと考えられる。[4]医療現場に貢献するというニーズを満たす人材を育てるには，ESP（English for Specific Purposes: 専門分野別英語）[5]の枠組みが適していると考えられる。ESPは，医学英語教育（English for Medical Purposes; EMP）の上位概念であり，社会のニーズに応える英語力を有する人材を育てることが可能とされる。[5]EMP教育も含めて，近年，ESPは国内外の大学英語教育現場に導入されるようになってきている。[2,6-11]本稿では，大阪医科大学医学部4年生の学生約90名を対象に，ESPの考え方を明示的に伝えて英語医学論文の抄録を読む授業を行い，抄録の論理構成に対する理解を深めるうえで役立つかどうかを調査した結果を報告する。

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　本稿は，第21回日本医学英語教育学会学術集会（2018年7月28・29日，日本歯科大学生命歯学部）における口頭発表を一部改編したものである。

2. 研究の背景

　ESPでは，共通の目標を持つ人々が，共通の目的に応じて会話や文書などのコミュニケーションを行うことを重視する。[12]共通の目的を持つ人々のコミュニケーションは，効率よく問題解決を図るためにパターン化され進化してきた。[13]学術論文や口頭発表のように，パターン化された書き言葉や話し言葉あるいはその双方の組合せ，すなわちコミュニケーション上のイベントを「ジャンル」と称する。[14]学術論文のようなジャンルテクストにおいて，パターン化された構成要素のまとまりは「ムーブ」とよばれる。[13]ジャンル分析を提唱したSwalesによると，ムーブは，書き言葉あるいは話し言葉による談話において，一貫したコミュニケーション上の機能を担う談話あるいは修辞の単位と定義される。[15]Swalesは，ムーブ分析により，学術論文の緒言部には，(1)研究領域を定義して重要性を示し，(2)その研究領域においてまだ解明されていないこと，すなわち研究の隙間(niche)に触れて，(3)当該研究の内容を紹介する，というムーブが存在することを示した。[14]加えて，ムーブの中には，その目的に合うように配置されたより小さな構成単位である「ステップ」がある。[14,16,17]学術論文緒言部のMove 2でのステップの例として，次のような例文がSwalesにより示された。[14]

"However, it is not clear whether the use of ... can be modified to reduce…"

　この文の読み手は，書き手が問題を提起しようとしていることを理解する。この例のように，書き手が意図的に使用して，読み手の注意を促し，言語的な手がかりを授ける表現は，「ヒント表現」と定義される。[18]先行研究では，ムーブは，文脈"context"から推察したり，言語的な手がかり"linguistic clue"を参照したりすることで明らかになると説かれ，[19]また，書き手が読み手を意識し，目的を持って配置するメタ談話"metadiscourse"は，文脈に特有なものであることが判明している。[20]これらの考え方は「ヒント表現」を含む一連のESPの枠組みに依拠すると考えられる。ヒント表現を意識すると，ムーブを特定しやすくなり，学術論文を読むのが早くなるといわれている。[18]また，論文のどこにどのような目的で使用されるかを明示的に教えることには意味があるとされる。[21]

　ムーブ分析は，学術論文の抄録に応用され，抄録は，「目的」，「方法」，「結果」，「結論」というムーブ・パターンから逸脱すると要旨が伝わりにくくなることが明らかにされている。[22]近年，医学誌の抄録はBackground, Methods, Results, Conclusionなどに構造化される傾向がみられる。[23]特に，ランダム化試験報告の抄録に含まれるべき項目については，CONSORT(Consolidated Standards of Reporting Trials: 臨床試験報告に関する統合基準)声明においてさらに詳細なパ

ターンが推奨されている。[24]ムーブ・パターンを内容に対応させることが提案されていることを踏まえると，[25,26]ムーブを特定し，ヒント表現を理解することは執筆の上でも役立つと考えられる。

　ムーブ分析から得られた知見は，学術論文などの専門分野のライティングに援用されている。[27,28]ライティング授業では，主に大学院生を対象に，各自の研究分野の学術論文を集めたコーパスを構築し，コンコーダンス・ツールを使用して言語的特徴を検討する方法や，[29]授業実践[9-11]が報告されている。しかし，学部生を対象とするリーディング授業への応用については，筆者が知る限りあまり報告されていない。

　そこで，先の研究において筆者は，医学部第2学年，第3学年の学生を対象に，医学論文抄録の論理展開におけるムーブを検討する授業を行い，英語で専門文書を読むことの負担が軽減するかどうかについて検討した。[30]その研究では，1回あたり60分の授業を4〜5回，2日に分けて行った。まず，ESPの考え方を主にパワーポイントによる投影資料を用いて伝え，イギリスのBBCやインドのAll Indiaによるウェブサイトの英文健康関連記事と the New England Journal of Medicine(NEJM)誌に掲載された論文のタイトルページにおける外観や読み手について考えてもらった。次に，日本語の医学論文を用いて論文全体の構成を確認し，その上で，NEJM誌の症例報告論文の要旨におけるムーブを検討してもらった。授業の省察を促すために，質問紙調査を，英語論文執筆の負荷について量的に検討した先行研究を参考にして行った。[31]その結果，授業終了時に，英語で教科書を読むことの難しさについて，統計学的に有意な低下が認められたものの効果量は低かった。そのことを踏まえて本稿では，医学部第4学年の学生を対象に，ESPの考え方について手作りの資料を配付して説明した後に，研究論文と症例報告論文の抄録におけるムーブとヒント表現を書き込み式の資料を用いて検討してもらい，明示的に解説する授業を実践し，授業終了時に，英語で学術論文を読むことの難しさが軽減するかどうかを検討した結果を報告する。

3. 授業実践の概要

　医学部第4学年の学生99名を対象に医学英語Reading授業を実施した。授業を行った年度における同学年の学生のTOEFL-ITPのスコアは，480.69±52.63(平均と標準偏差)であった。

　医学部における英語学習は，第1学年では「国際言語文化1(英語)」という，第2学年以降での医学英語への準備となるクラスが通年で毎週2回行われ，第2学年〜第4学年では「医学英語」という0.5単位の授業が必須科目として行われる(表1)。本稿で対象となる第4学年の医学英語授業は，前年度に第3学年の授業が行われて以来，約半年ぶりであった。[30]第4学年全体を1クラスあたり31〜34名の3クラスに分けて，各クラスに対してSpeaking, Listening, Read-

ingの授業が各々2回ずつ順番に行われた。Readingについては，1回目として1日に1コマあたり60分の授業を2コマ連続で行い，翌週あるいは翌々週に2回目の授業を2コマ連続で行った。授業には，1名が2日目に欠席した以外，全員が参加した。

4. 授業の目標

　本授業は，ESPの枠組みに従い，医学英語論文抄録に特有なルールとパターンを理解して，知りたい情報を速やかに入手できるようになるための訓練を行うことを目標とした。シラバスには，医学英語の一般目標としては，「3年次までに学習した内容を踏まえ，専門的な内容の論文や臨床会話の教材を用いて，医学・医療に関する情報収集，情報発信，対人コミュニケーションを英語で実践できるようになること」，また，行動目標としては，「医学英語論文に特有の論理展開を理解し，素早く正確に必要な情報を把握すること」が掲げられている。2回のReading授業は，シラバス上の目標を念頭に，将来応用可能なストラテジーや勉強方法を伝えることを中心に行った。

5. 授業の進行

　1日目と2日目の授業，ならびに持ち帰り課題の内容を**表2**に示した。

　1日目の授業では，ESPの考え方について説明し，抄録でのムーブを示して，ヒント表現を例示した**(図1)**。また，1日目，2日目の授業でのリーディング素材としては，それぞれ，NEJM誌に掲載された研究論文，症例報告論文の抄録を用いた。[32,33,40] NEJM誌は，最高峰の臨床医学誌とされ，ウェブサイトに論文の内容を要約した動画やポッドキャストなどのマルチメディアも充実している。[41] 広範な読者に読まれており，専門分野における「国際コミュニケーションのために用いられているときの英語」[42] の例と考えられた。また，医学誌の規範として確立されたスタイルを有しており，[43] 医学英語授業の教材として用いられている。[2] 研究論文，症例報告論文ともに英文抄録と抄録に用いられた語彙の説明が見開きになるように配置した資料（教材）を準備した。また，抄録を1文ずつに分けて，ヒント表現の例に下線を施したものを掲載した表を準備して，最初の2,3文におけるムーブ，段落における文番号，ヒント表現，動詞の時制を抽出して例示し，続きを授業中に発言して埋めてもらった。授業での言語使用については，学生にとってよりよい方法を模索した。[44] 英語と日本語を用いたが，授業の進行に伴い日本語の使用が増大した。学生からの発言は，リーディング素材に即したものであれば英語，その他については日本語で行われた。1日目と2日目に使用した資料の例を**図2，3**に示した。

　研究論文の抄録では，特有の論理展開に加えて医学研究の記述についても学生にとって不慣れな場合が多い。文章理解には，文脈に即した図を併用することが効果的であると説かれて久しい。[45] 例えば，ランダム化比較試験の報告論文の場合，CONSORT[46] にみられるようなフローチャートは研究過程を理解する上で役立つとされる。[35] また，専門分野の内容の論点に学生の注意を向けるために，ジャンルテクストから抜粋したものを用いた穴埋め問題を用意することは有効であることが示されている。[47] そこで，抄録に書かれた研究の内容を穴埋め形式で図示した資料を準備した**(図2)**。空欄は，授業中に学生からの発言をもとに全員で確認した。

　持ち帰り課題では，学生に検索エンジンPubMedを用いて興味のある分野の論文の抄録を約10報集めてもらった。[37] 学生にとっては昨年度に続いて2度目の課題であり，また

表1　医学部英語カリキュラム体系

学年	科目名	科目特性（単位）
第4学年	医学英語	必須科目（0.5）
第3学年	医学英語	必須科目（0.5）
第2学年	医学英語	必須科目（0.5）
第1学年	国際言語文化1（英語）	必須科目（4）

表2　授業計画

実施時期	内容
1日目	授業開始前のQuizと質問紙調査[31]
	導入（昨年度の復習，ESPの考え方，コーパスツールの説明等）
	医学研究論文の抄録について[32,33]
	（1）書かれた目的（Purpose），読み手（Audience），情報（Information），使用言語の特徴（Language）について検討し（PAIL），特徴を観察して応用するための方法を学習する。[34]
	（2）ムーブとヒント表現を学習する。[14–19,22]
	（3）抄録に書かれた研究について図示して，文脈を活用した読み方を学習する。[35,36]
	医学論文検索エンジン　PubMed[37] とコンコーダンス・ツール　AntConc[38] の使い方を学習する。
持ち帰り課題	PubMedに掲載された医学論文の抄録についてAntConcを用いて英語表現の特徴を調査する（Corpus Discovery）。[9,39]
	Corpus Discoveryでの調査内容を，論文の論理構成（仮説，方法，結果，考察）にまとめてレポートとして提出する。
2日目	各自が行ったCorpus Discovery について，発表する。発表者による発表を評価する。
	症例報告論文の抄録について[40]
	（1）PAILを検討する。
	（2）ムーブとヒント表現を学習する。
	授業終了後のQuizと質問紙調査[31]

例えば，文頭の ``In conclusion,…'' は，「ヒント表現」の一つです。

``In conclusion'' を「ライフサイエンス辞書　（https://lsd-project.jp/cgi-bin/lsdproj/ejlookup04.pl）」で調べて，コーパス検索結果を見ると，以下に示すようにさまざまな分野の論文に使用されています。

```
In conclusion, 20 of 28 (71%) SCHs harbored mutations in       変異
In conclusion, a combination of regular exercise, health       運動
In conclusion, a favorable cardiovascular risk profile a
In conclusion, a global HPV6 phylogenetic analysis revea       心臓血管系
In conclusion, a mouse model of C. glabrata IAC mimics d
In conclusion, a nuclear IMP-3-HNRNPM complex is importa
In conclusion, a potential membrane-associated AmpR dime
In conclusion, a sensitive assay for exposure to tri-o-c
In conclusion, a series of bioanalytical assays should b
In conclusion, AA and C prepubertal youth both demonstra
In conclusion, AAV capsids can be engineered to substant
In conclusion, ABF1 and ABF3 abundance is affected by AB
In conclusion, activation of the UPR sustains angiogenes
In conclusion, acute hypoxic vasodilation is an adaptive
In conclusion, Ad/VNA-Stx treatment is effective in prot
In conclusion, administration of human PRP attenuates br
In conclusion, adolescents show behavioral and electroph
In conclusion, although some Bsg KO spermatogonia can un
In conclusion, although the pVD2-Asian 1 vaccine was imm
In conclusion, although there are overlapping features,
In conclusion, amino acid dysregulation results in aberr
```

次の文は，文頭に，In conclusion, …（結論として…）と書いてあり，研究のまとめを述べていることがわかります。

In conclusion, VSBV-1, a zoonotic bornavirus from a variegated squirrel, **was associated with** three fatal CNS infections in humans.

(Hoffmann, 2015)

図1　1日目の資料例（ESPの考え方：ヒント表現[18]）

Summarizing the Trial ☺「医学論文の抄録を読もう」p. 7—9 ☺

Trials: A randomized, (　　　　　), (　　　　　) trial

Population: Children and (　　　) 8 to (　) years of age with (　　　　)

A total of (　　　) patients were randomized to receive:

| Amitriptyline | (　　　　) | Placebo |

Ratio:　　(　　)　:　(　　　)　:　　1

The primary efficacy analysis included (　　　) patients

| Amitriptyline | (　　　　) | Placebo |

Number of patients included in the primary efficacy analysis:
132　　　　　　(　　　)　　　　　(　　　)

Primary outcome:

A relative (　　　　　) of (　)% or more in the number of (　　　) days

The (　　　) baseline period　< Comparison >　The last (　　) days of a 24-week trial

Secondary outcome:

- (　　　　)-related disability
- (　　　) days
- Number of (　　)(　　　　)
- Treatment-emergent serious (　　　　) events

Results:

- No between-group (　　　　　) in the primary outcome

| (　)% of patients | (　)% of patients | (　)% of patients |

Amitriptyline　　　　(　　　　)　　　　Placebo

- The incidence of serious adverse events was:

Amitriptyline or (　　　　) > (　　　　　).

図2　1日目の資料例（抄録の内容に基づいた穴埋め）[33]

| Summary	ムーブ	文番号	ヒント表現	動詞の時制
Between 2011 and 2013, **three breeders of** variegated squirrels (Sciurus variegatoides) **had** encephalitis with similar clinical signs **and died** 2 to 4 months after onset of the clinical symptoms.	症例の転帰	1	three breeders of... had...and died...	Past
With the use of a metagenomic approach that incorporated next-generation sequencing and real-time reverse-transcriptase quantitative polymerase chain reaction (RT-qPCR), **the presence of** a previously unknown bornavirus was detected in a contact squirrel and in brain samples **from the three patients**.	原因の調査	2	With the use of... the presence of...**was detected** from the three patients	Past

図3　2日目の資料例[40]
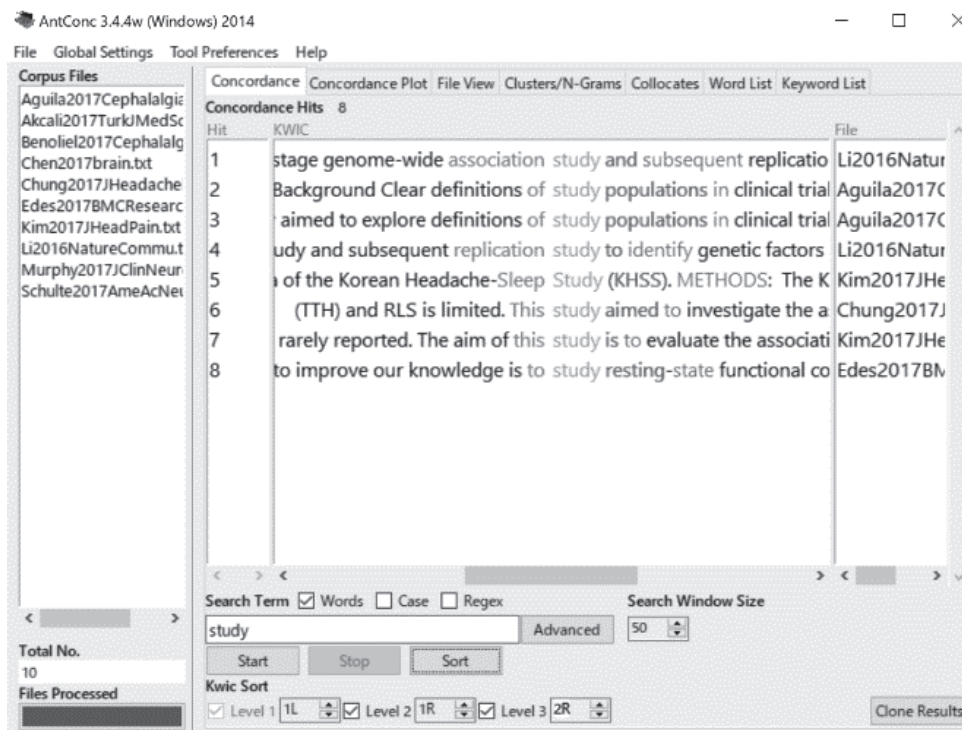
図4　コンコーダンス・ツール（AntConc[38]）を用いた検索例

英語授業を受けるのは4年生が最後の年となるため，本年度は検索エンジンPubMedの用い方を学習し実践してもらうことも課題の目的とした。抄録の数は，医学論文の本文10報をコーパス化してムーブを検討し，対照コーパス10報と比較検討した先行研究に倣い，10報とした。[50] 学生には，集めた抄録を英文データベースとしてコンコーダンス・ツールAntConc[38] と組み合わせてデータ駆動型学習（Data-Driven Learning; DDL）を行ってもらった。[9-11,39,48,49] DDLでは，学習者が，語彙や文法項目に注目して検索し，結果を観察して自らパターンやルールを発見して学ぶ。[48,49] コンコーダンス・ツールを用いて，studyという語の使用に注目して検索した例を**図4**に示した。[38] これらの例からは，対象となる研究をthis studyと簡潔に表現していること，

studyが名詞としてだけでなく，study population のように形容詞としても使用されていることがわかる。検討した結果は，論文の論理構成の形式でまとめて提出してもらった。なお，ESPの考え方や，検索エンジン，コンコーダンス・ツール[38] の使い方については，資料（冊子）を作成して用いた。

　持ち帰り課題については，2日目に発表してもらった。発表者には登壇してもらい，クラス全体に対して行ってもらった。発表の際には，聞き手に関心を持ってもらい，聞いてもらうことが重要となる。[51] 発表者には，各自の報告書に貼付したコンコーダンス・ツールによる検索結果を投影して，全員が発表内容を共有できるように説明してもらった。発表の際の言語は特に指定しなかったが，大半の発

Evaluation Sheet: 4th Year ADVANCED Corpus Discovery

Your Name_____

Presenter's Name	Interesting	Organized	Language	Body language	Comments
	A・B・C	A・B・C	A・B・C	A・B・C	
	A・B・C	A・B・C	A・B・C	A・B・C	
	A・B・C	A・B・C	A・B・C	A・B・C	
	A・B・C	A・B・C	A・B・C	A・B・C	
	A・B・C	A・B・C	A・B・C	A・B・C	
	A・B・C	A・B・C	A・B・C	A・B・C	
	A・B・C	A・B・C	A・B・C	A・B・C	
	A・B・C	A・B・C	A・B・C	A・B・C	

図5　評価シート（学生による発表者への評価の記入）

表者が日本語で行った。発表者以外の全員には，能動的に聞いて発表内容を共有するために，発表内容の面白さや発表時の言語使用などについて評価シート**（図5）**を用いて評価してもらった。[8] 評価シートには，約半数の学生が英語で，残りの半数程度が日本語で記入していた。

　限られた授業時間の中では，学生が積極的に授業に関わり，各自の考えを述べ，質問することで学習を深めることが不可欠となる。しかしながら，授業中に発言することは，学生にとってハードルの高い作業である。米国の大学でも"Academic Discussion Strategies"として学生向けのウェブサイトに掲示しており，容易ではないことが推察される。[52] 米国の事例を参考に，2日間の授業では，自発的な授業への参加を促す目的で，「発言チケット」**（図6）**を発行し，発言ごとに学生に手渡しで配布した。発言チケットは，記名の上，授業終了時に提出してもらい，加点の対象とした。

6. 授業の省察

　授業での発言回数は，学生1人あたり2.7±2.1回（平均と標準偏差）であった。発言がみられなかった3名を除いて全員が発言を行った。発言の大半は，抄録におけるムーブとヒント表現を検討したり，研究の内容を図示した資料の穴埋めを実施したりした際の回答として行われた。ヒント表現については，捉え方によって正解は1つではないことを伝えており，的確性に多少欠ける回答であっても積極的に授業に参加することに意義があることを強調したため，語彙あるいはフレーズ程度の短い回答が多かった。

　授業開始前と授業終了時に，各々異なる初見の抄録を並び替えるQuizを行った。Quizには，99名の学生のうち，授業開始前には47名（48.0％），授業終了時には87名（87.9％）が正解した。正解を1点，不正解を0点とした場合，対応のあるt検定を用いて，フリーソフトR（Version 3.4.0）で検

Comment Ticket

This ticket certifies your contribution to the class☺

Class_____ Name _____

図6　発言チケット

討すると，授業終了時に，授業開始時と比較して，有意水準5％で統計学的に有意な差が認められ（p<0.01），効果量はd=0.953と高かった。[53]

　また，授業開始前と授業終了時に，英語学術論文を読むことへの負担について，次の3つの項目で質問紙調査を行った。[31]
1）英語で学術論文を読むことの「難しさ」
2）英語で学術論文を読んだときの内容の理解についての「不満」
3）英語で学術論文を読むことへの「不安」

　各項目について1）「とても難しい」，2）「とても不満」，3）「とても不安」を7，1）「とても簡単」，2）「とても満足」，3）「不安はない」を1とする7件法で，1〜7点の点数を記入してもらった。授業開始前と授業終了時にすべての項目に記入が認められた68名の回答を対象に，基本統計量を算出した。授業前と授業後の平均値の差に対して対応のあるt検定を行い，効果量を求めた。検定を繰り返すことからボンフェローニ補正を行った。[54,55] 検討には，フリーソフトRを用いた。その結果，1）難しさ（p<0.01,d=0.547），2）不満（p<0.01,d=0.443），3）不安（p<0.01,d=0.457）のすべてにおいて有意な差が認められたが，効果量はいずれも中等度であった**（表3）**。

　授業開始前の質問紙調査は，英語で医学論文を読むことの負担について，1）難しさ，2）不満，3）不安のいずれも

高かった**(表3)**。この調査は，前年度の授業後約半年を経て行われたことになる。[30] その半年間に学生はさまざまな学習と経験を積んだと推察され，すべての要因を考慮することは難しいが，前年度の授業で医学論文抄録を取り扱ったことが，医学論文を読むことの負担を持続的に軽減させることにつながらなかったと考えるのが妥当と思われた。授業終了時の質問紙調査では，医学論文を読むことの負担についての各項目において，授業前と比較して，統計学的に有意な低下が認められ，効果量は中等度であった。本稿での授業時には，前年度の授業時と比べて，学生の英語以外の学習の進捗やクラス編成など多くの相違点があるものの，前年度の授業を踏まえて，医学論文抄録におけるムーブとヒント表現を文単位で検討したことで，抄録での言語使用の特徴について多少の気付きを得ることができたのではないかと考えられた。学生にとって，今回得られた気付きが持続的なものであるかどうかは，現在のところ明らかではない。今後，質問紙を用いた追跡調査を行うことが望ましいと考えられる。

授業終了時の質問紙調査では，授業でできたこと，および難しかったことについて，自由記述の回答欄を設けた。できたことについては60名，難しかったことについては55名からの回答が得られた。得られた回答における高頻度語を，コーパス・ツール CasualConc を用いて検討したところ，できたことについては，「理解」，「ムーブ」，「論文」，難しかったことについては，「単語」，「専門」，「用語」などが上位に認められた**(表4)**。[56]

表3　英語で学術論文を読むことへの負担についての質問紙調査（N = 68）

	授業前[†]	授業後[†]	効果量
難しさ	5.35 ± 1.34	4.59 ± 1.46[*]	0.547
不満	4.93 ± 1.32	4.29 ± 1.53[*]	0.443
不安	5.16 ± 1.48	4.49 ± 1.48[*]	0.457

[†]平均と標準偏差
[*]対応のあるt検定を用いてボンフェローニ補正を行った。有意水準5%で有意差が認められた。

できたことについての回答のうち，「理解」を含む回答例を**表5**に，難しかったことについて「単語」を含む回答例を**表6**に挙げた。

学生の回答を質的に検討してみると，「論文に対する抵抗が少なくなった(ID: 096)」，「ムーブやヒント表現を知って，抄録が読みやすくなった(ID: 037)」，「どこに結果がかいてあるか分かった(ID: 025)」などの意見が多く，ムーブとヒント表現に注目して内容をつかむ練習をすることに意味があると考えられた。一方，「宿題のパソコン作業が難しかった(ID: 027)」，「AntConcの使い方が難しかったです(ID: 054)」という意見がみられた。PubMedにアクセスして各自の興味のある分野の論文10報を探し，それらの論文をダウンロードしてコーパスを構築するという過程は，いずれも，容易ではなかったことが想像される。授業で各自がパソコンを用いてコンコーダンス・ツールを使用するような演習を取り入れるなどの工夫をするべきであった。

7. おわりに

本稿では，医学部4年生を対象とした医学英語リーディング授業について報告した。ESPの考え方のなかでも，ジャンル分析の1つであり，医学論文に応用されているムーブ分析の手法を取り入れ，ムーブとヒント表現に注目して英語医学論文の抄録を読む授業を行った。[19,22] 抄録に書かれた研究の内容について，授業中に，穴埋め形式で図示する資料を用いて検討した。また，医学論文の抄録をPubMedにアクセスして集め，それらを英文データベースとして，コンコーダンス・ツールAntConcを用いて検索し，言語的な気付きを得るアクティビティを持ち帰り課題とした。

授業では，ほぼすべての学生に発言が認められた。自由記述の意見には「発言するのが難しかったです…(ID: 012)」というコメントもみられたが，授業への参加を促し，将来，初めて読む抄録に遭遇しても，ヒント表現を手がかりに，内容理解に特化して読めるようになってもらうことが重要と考えられた。[13]

表4　自由記述の回答における高頻度語[††]

できたこと			むずかしかったこと		
Words	素頻度	割合	Words	素頻度	割合
論文	14	2.46%	単語	13	2.59%
理解	12	2.11%	専門	9	1.80%
ムーブ	8	1.41%	用語	7	1.40%
抄録	7	1.23%	アントコンク	4	0.80%
文章	3	0.53%	把握	3	0.60%
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構成	2	0.35%	AntConc	5	1.00%
流れ	2	0.35%	使い方	2	0.40%
発言	2	0.35%	意識	2	0.40%

表4のレジェンド
[††]コーパス・ツール（CasualConc）を用いた対数尤度比検定による検討による上位語[56]

授業開始前と授業終了時のQuizで初見の抄録を並び替えてもらったところ，授業終了時には授業開始前と比較して明らかに改善が認められた。授業での学習は，医学論文抄録の論理構成への理解を深める上で役立つ可能性が示唆された。しかし，質問紙調査による量的検討では，いずれの項目においても効果量が0.45〜0.55と中等度であり，大きな差が認められたと考えるのは早計であると思われる。また，授業での難しかったこととして，単語や専門用語に加えて，「コンコーダンス・ツール」や「授業」という回答があった。学生にとって，難易度の高い授業であった可能性は否定できない。一方で，できたこととして「発言」という回答があり，授業で発言することは多少の達成感を伴う活動であることが示唆される。また，一部の学生からは，前年度に引き続いて，医学論文の抄録をムーブとヒント表現に注目して読むことで，ようやくムーブの検討をする意味が理解できたという口頭での意見があり，学生にとって，ムーブは必ずしも平易な概念ではなく，それ自体が学習項目の1つと捉えられていたことが示唆された。

これらを踏まえて，今後の授業では，医学論文抄録のムーブとヒント表現に注目するための周辺的なことがらを支援することが必要と考えられた。例えば，語彙学習を併用したり，パソコンの操作を授業中に全員で行ったりすることが望ましいであろう。個々の学生がジャンル文書における慣習的な書き方に対する気付きを得られるように促し，通読の負担を軽減できるような学習の仕方を，さらに検討したいと思われた。

表5　できたことについて「理解」を含む回答例

ID	回答
012	ムーブを理解したことで、抄録の内容を理解する速度がかなりupしたと思います。
013	3年次よりは構造が理解できるようになった。
017	各章における重要なフレーズについて理解することができた。
036	抄録の流れを理解すること。
044	将来、英語で論文を書くことの必要性を理解すること。
046	英文を理解すること。
047	論文の抄録の構成について理解できた。
071	ムーブを理解すること。
093	文の内容を理解すること。
094	ムーブの理解。
097	ムーブを理解できた。

表6　難しかったことについて「単語」を含む回答例

ID	回答
008	単語がむずかしい。
009	単語です。
010	単語が難しかった。
024	医学の単語がdifficultである。
028	出てくる単語。
032	単語。
036	単語が難解でした。
049	単語が難しい。
051	文の構造は英語論文の決まったパターンがあるので読みやすいが、専門的な単語が難しい。
053	使用されている単語の難易度が高い。
064	単語とか熟語とか。
081	医学的な単語力をもっと身に付けていかないと思いました。
092	単語。

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