



Exploring medical educators' readiness and the priority of their educational needs for online teaching

Jihyun Si¹, Hyun-Hee Kong² and Sang-Hwa Lee¹

Departments of ¹Medical Education and ²Parasitology, Dong-A University College of Medicine, Busan, Korea

Purpose: This study investigated medical educators' readiness for online teaching by exploring their perceived ability and importance of online teaching competencies and identified the highest priority of their educational needs.

Methods: In this study, 144 medical education faculty members from a university were invited to participate. The faculty online teaching readiness scale was virtually distributed at the end of the spring semester of 2020 and 38 faculty members responded for 2 weeks. The collected data were analyzed with descriptive statistics, paired t-tests, Borich Needs Assessment, and the Locus for Focus model.

Results: The overall average perceived ability was 2.76, while the overall average perceived importance was 3.36. The course design and the technical competency categories showed the highest and lowest educational needs, respectively. Five competencies were given the highest priority of educational needs.

Conclusion: The results revealed that the medical educators are not ready for online teaching; thus, urgent educational needs for online teaching competencies exist.

Key Words: Online teaching readiness, Faculty development, Needs assessment

Introduction

In the light of the rapidly evolving coronavirus disease 2019 (COVID-19) pandemic, universities worldwide are going online [1]. However, this urgent imperative to move online has raised significant challenges for medical educators who normally deliver their courses in traditional face-to-face mode. Online teaching involves different skill sets from those commonly required in traditional classrooms [2]. Thus, medical educators' readiness for online teaching has

become important.

Online educators' readiness can be defined as their preparedness for online teaching [3,4]. Their preparedness plays a critical role in the process of transition to online learning environments and is described as one of the most influencing factors on students' online learning experience [2]. Martin et al. [4] suggested that online teaching readiness can be examined by instructors' perception of attitude and ability for online teaching competencies. Attitude refers to a person's viewpoint about something and its relevance; thus, instructors' attitude toward online teaching is reflected on their

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Corresponding Author: Jihyun Si (<https://orcid.org/0000-0002-4782-6104>)
Dong-A University College of Medicine, 32 Daesingongwon-ro, Seo-gu, Busan 49201, Korea
Tel: +82.51.240.2617 Fax: +82.51.240.2617 email: jenny0306@dau.ac.kr

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perception of importance [4]. The perception of the ability refers to their perceived capacity to successfully perform online teaching [4].

How online instructors perceive the importance or ability of online teaching competencies varies by contexts. Martin et al. [5] compared American and German online instructors' online teaching readiness and reported that overall American instructors rated the competencies higher both in the perception of importance and ability. This result indicates that the characteristic or experience of the faculty is likely to impact their perception of online teaching. Instructors accustomed to lecturing in a traditional classroom may perceive competencies associated with instructional design, such as planning, organizing, and structuring course components, as more important, or instructors who are new to online learning environments may need to feel comfortable with technology [6].

Assessing faculty readiness based on their perception of the ability and importance of online teaching competencies can also provide important information to identify developmental areas or educational needs for faculty development programs. Online instructors' educational needs can be defined as a discrepancy between their importance and ability levels of the competencies [7]. Training and supporting faculty members are routinely noted as essential for the successful implementation of online education [8]. It is critically important that when faculty members are asked to re-design their course to an online format, they receive appropriate training. However, a study reported that 19% of the online instructors in 2,500 college and universities in the United States have no training programs for online teaching [4,9]. Furthermore, faculty development programs should focus on developing proficiencies in developmental areas of teaching competencies based on online teaching readiness assessment. Many institutions,

however, use a one-size-fits-all approach without systematical assessment about their educational needs [8]. Due to the COVID-19 pandemic, online learning is no longer a choice. A significant need exists for systematically assessing medical educators' online teaching readiness and educational needs as well as training them; however, very few studies have focused on this important issue [3].

Therefore, this study aims to explore medical educators' online teaching readiness and their educational needs. Their online teaching readiness will be explored by faculty members' perception of the importance and ability of online teaching competencies. It also aims to identify the online teaching competencies with the highest priority of educational needs using both Borich Needs Assessment [7] and the Locus for Focus model [10]. The findings from this study will provide important implications for medical educators who assess faculty members' suitability for online teaching and offer faculty development programs. The specific research questions are as follow: (1) What levels of the perceived importance and ability related to online teaching do the medical educators exhibit? (2) What educational needs do medical educators have in terms of online teaching competencies? Which online teaching competencies have the highest educational needs?

Methods

1. Participants and procedure

This study occurred in Dong-A University in Busan in Korea and received the institutional review board approval (2-1040709-AB-N-01-202005-HR-018-04). At the spring semester of 2020, the university decided to conduct online classes due to the COVID-19 pandemic.

The faculty in the medical school delivered all their contents online instead of face-to-face mode. At the end of the semester, an online survey was distributed to 144 faculty members using the university faculty email system. For 2 weeks, 38 faculty members (26.3%) responded to the survey. Detailed information about the participants' characteristics is gender (female, 18; male, 20), department (pre-medical science department, 10; medical science department, 28), faculty rank (professor, 15; associate professor, 10; assistant professor, 13), main delivery method (recorded lecture, 31; recorded lecture plus real-time remote lecture, 4; no class, 3), previous experience with online teaching (yes, 4; no, 34) and experience with faculty development programs about online teaching (yes, 4; no, 34).

2. Instrument

The online survey consisted of two parts: demographic questions and Faculty Readiness to Teach Online (FRTO) items. The demographic questions included six questions about gender, department, faculty rank, main delivery method, previous experience with online teaching, and experience with faculty development programs about online teaching. FRTO developed by Martin et al. [4] was used to assess online teaching readiness in the following four areas: course design, course communication, time management, and technical competencies. These teaching competencies are major issues faced by a faculty new to online teaching [2,11]. The course design involves planning instruction with

course objectives, instructional strategies, as well as activities and assessments that align to course objectives. Course communication involves facilitating discussions, sending regular announcements, and providing timely feedback. Online teaching is more time-consuming than traditional face-to-face teaching and several studies report lack of time as an essential obstacle for faculty members to teach online [8]. Time management competencies address this issue and involve scheduling time for course design or using features of a learning management system to manage time, and so forth. Technical competency is specific to using technology to deliver an online course. It involves how to use the software, learning management system, and tools. FRTO consists of 32 items; the participants were asked twice to rate how important each competency is for online teaching and how successfully one was able to perform the task. The respondents rated each item on a 5 point-Likert scale from 1 (not important or successful at all) to 5 (very important or successful). An online instructor is ready if each mean value derived from four competencies is at least four [3]. While analyzing the instrument's internal consistency, one item from the technical competency was excluded as it had a very low correlation value. Thus, the results of 31 items were ultimately analyzed. Cronbach's α for all the items and the subscales are seen in Table 1. All the results show the values have a reliability coefficient of 0.70 or higher, which is considered acceptable.

Table 1. Cronbach's α for Faculty Readiness to Teach Online

Variable	No. of items	Perceived ability	Perceived importance
Total	31	0.90	0.94
Course design	9	0.81	0.85
Course communication	10	0.82	0.86
Time management	6	0.72	0.78
Technical competencies	6	0.74	0.88

3. Data analysis

IBM SPSS ver. 26.0 (IBM Corp., Armonk, USA) was used to analyze the participants' responses. The internal consistency of the survey items was tested using Cronbach's α . The participants' characteristics and perceptions of the ability as well as the importance of online teaching competencies were analyzed using descriptive statistics. In addition, their educational needs were analyzed using paired t-tests, the Borich Needs Assessment, and the Locus for Focus model, which are

the three typical steps used to analyze educational needs [10]. The paired t-tests were conducted to screen if there were significant differences between the two perceptions. The Borich Needs were assessed to determine the order of priority of the educational needs and calculated by using the Borich Needs formula ($(\sum(RCL-PCL) \times \overline{RCL}/N)$; RCL, each individual's importance score; PCL, each individual's ability score; \overline{RCL} , average score of importance by each competency; and N, total number). The Locus for Focus model represented the priority of educational needs in an x-y plane (Fig. 1). The line parallel to y-axis shows the average score of the importance level while the line parallel to x-axis represents the average score of the discrepancy between the importance and ability level. Thus, the first quadrant, which is higher than the average important level and higher than the average discrepancy, represents the area with the highest priority of the educational needs among the four quadrants. The online teaching competency items, both in the first quadrants of the Locus for Focus model and the top-ranking items of the Borich Needs

Fig. 1. Priority of the Educational Needs from the Locus for Focus Model

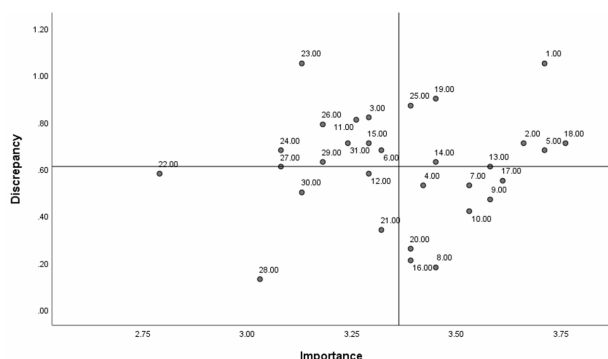


Table 2. The Paired t-Test and Borich Needs Assessment Results of Medical Educators' Perception

Variable	Perceived ability	Perceived importance	Mean difference	t-value	Needs assessment scores	Ranks
Course design						
1. Create an online course orientation (e.g., introduction and getting started).	2.67 ± 0.71	3.71 ± 0.65	1.05 ± 0.99	6.59*	3.91	1
2. Write measurable learning objectives.	2.95 ± 0.66	3.66 ± 0.58	0.71 ± 0.80	5.46*	2.60	8
3. Design learning activities that provide students opportunities for interaction (e.g., discussion forums).	2.47 ± 0.83	3.29 ± 0.80	0.82 ± 0.98	5.12*	2.68	5
4. Organize instructional materials into modules or units.	2.89 ± 0.76	3.42 ± 0.68	0.53 ± 1.01	3.22*	1.80	22
5. Create instructional videos (e.g., lecture video, demonstrations, and video tutorials)	3.03 ± 0.82	3.71 ± 0.69	0.68 ± 0.87	4.83*	2.54	9
6. Use different teaching methods in the online environment (e.g., brainstorming, collaborative activities, discussions, and presentations).	2.63 ± 0.79	3.32 ± 0.66	0.68 ± 0.81	5.21*	2.27	13
7. Create online quizzes and tests.	3.00 ± 0.74	3.53 ± 0.73	0.53 ± 0.83	3.91*	1.86	20
8. Create online assignments	3.26 ± 0.55	3.45 ± 0.56	0.18 ± 0.73	1.56	0.64	30
9. Manage grades online	3.11 ± 0.65	3.58 ± 0.64	0.47 ± 0.80	3.67*	1.70	23
Subtotal	2.89 ± 0.46	3.52 ± 0.45	0.63 ± 0.24	7.03*	2.22 ± 0.84	

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Table 2. (Continued)

Variable	Perceived ability	Perceived importance	Mean difference	t-value	Needs assessment scores	Ranks
Course communication						
10. Send announcements/email reminders to course participants.	3.11 ± 0.76	3.53 ± 0.65	0.42 ± 0.91	2.82*	1.49	26
11. Create and moderate discussion forum.	2.45 ± 0.95	3.26 ± 0.64	0.81 ± 1.01	4.98*	2.66	7
12. Use email to communicate with the learners.	2.71 ± 0.93	3.29 ± 0.87	0.58 ± 1.11	3.23*	1.91	19
13. Respond to student questions promptly (e.g., 24 to 48 hours)	2.97 ± 0.92	3.58 ± 0.68	0.61 ± 1.08	3.46*	2.17	15
14. Provide feedback on assignments (e.g., 7 days from submission).	2.82 ± 0.80	3.45 ± 0.69	0.63 ± 0.85	4.57*	2.18	14
15. Use synchronous web-conferencing tools (e.g., Webex, Blackboard Collaborate, and Skype).	2.58 ± 1.00	3.29 ± 0.57	0.71 ± 1.01	4.33*	2.34	11
16. Communicate expectations about student behavior (e.g., netiquette).	3.18 ± 0.61	3.39 ± 0.76	0.21 ± 0.66	1.95	0.71	29
17. Communicate compliance regarding academic integrity policies.	3.05 ± 0.70	3.61 ± 0.82	0.55 ± 0.86	3.96*	2.00	18
18. Apply copyright law and fair use guidelines when using copyrighted materials.	3.05 ± 0.70	3.76 ± 0.71	0.71 ± 0.96	4.58*	2.67	6
19. Apply accessibility policies to accommodate student needs.	2.55 ± 0.86	3.45 ± 0.65	0.90 ± 1.03	5.33*	3.09	3
Subtotal	2.85 ± 0.51	3.46 ± 0.47	0.61 ± 0.20	6.72*	2.12 ± 0.67	
Time management						
20. Schedules time to design the course prior to delivery (e.g., a semester before delivery).	3.13 ± 0.78	3.39 ± 0.72	0.26 ± 0.64	2.52*	0.89	28
21. Schedule weekly hours to facilitate the online course.	2.97 ± 0.89	3.32 ± 0.74	0.34 ± 0.85	2.49*	1.14	27
22. Use features in learning management system in order to manage time (e.g., online grading, rubrics, SpeedGrader, and calendar).	2.21 ± 0.96	2.79 ± 0.84	0.58 ± 0.86	4.16*	1.62	24
23. Use facilitation strategies to manage time spent on course (e.g., discussion board moderators, collective feedback, and grading scales).	2.08 ± 0.78	3.13 ± 0.62	1.05 ± 1.04	6.25*	3.30	2
24. Spend weekly hours to grade assignments.	2.39 ± 0.92	3.08 ± 0.75	0.68 ± 0.81	5.21*	2.11	16
25. Allocate time to learn about new strategies or tools.	2.53 ± 0.69	3.39 ± 0.72	0.87 ± 0.91	5.91*	2.94	4
Subtotal	2.56 ± 0.54	3.18 ± 0.51	0.63 ± 0.30	7.27*	2.00 ± 0.97	
Technical competency						
26. Navigate within the course in the learning management system (e.g., Moodle, Canvas, blackboard, etc.).	2.39 ± 0.89	3.18 ± 0.73	0.79 ± 0.96	5.05*	2.51	10
27. Use course roster in the learning management system to set up teams/groups.	2.47 ± 0.89	3.08 ± 0.78	0.61 ± 0.97	3.83*	1.86	20
28. Use online collaborative tools (e.g., Google Drive and Dropbox).	3.16 ± 1.05	3.03 ± 0.71	-0.13 ± 1.21	-0.67	-0.40	31
29. Create and edit videos (e.g., iMovie and Movie Maker).	2.55 ± 0.89	3.18 ± 0.61	0.63 ± 1.13	3.46*	2.01	17
30. Share open educational resources (e.g., learning websites, Web resources, games, and simulation).	2.63 ± 0.88	3.13 ± 0.67	0.50 ± 0.89	3.45*	1.57	25
31. Access online help desk/resources for assistance.	2.53 ± 0.86	3.24 ± 0.75	0.71 ± 0.987	4.45*	2.30	12
Subtotal	2.62 ± 0.60	3.14 ± 0.56	0.56 ± 0.23	4.52*	1.64 ± 1.06	
Total	2.76 ± 0.40	3.36 ± 0.42	0.60 ± 0.23	8.08*	1.98 ± 0.89	

Data are presented as mean ± standard deviation.

*p < 0.05.

Assessment, represent the highest priority of the educational needs. The statistical significance level used in this study was 0.05.

Results

1. Medical educators' perception of the ability and importance of online teaching competencies

The analyses of medical educators' perception are seen in Table 2. The overall average perceived ability was 2.76, while the overall average perceived importance was 3.36. All the scores were below four; thus, the educators are not deemed to be ready for online teaching. For the perceived ability, the course design category showed the highest and the time management showed the lowest scores. For each item, the "created online assignment" item showed the highest and the "use facilitation strategies to manage time spent on course" item showed the lowest scores. For the perceived importance, the course design category showed the highest and the technical competencies showed the lowest scores. For each item, the "apply copyright law and fair use guidelines when using copyrighted materials" item showed the highest and the "use features in learning management system in order to manage time" item showed the lowest scores.

2. Medical educators' educational needs

The educational needs assessment results are seen in Table 2. First, the overall mean difference between ratings of ability and importance is 0.60, which is statistically significant. All the subcategories also revealed significant mean differences. All the items, excluding three, exhibited significant differences as well.

The average educational need for online teaching competencies calculated by the Borich Needs Assessment formula was 1.98; items 1, 23, and 19 had the highest educational need. Among the subcategories, course design showed the highest educational need, while the technical competency had the lowest educational need. The result of visualizing priorities using the Locus for Focus model is shown in Fig. 1. The first quadrant represented the highest priority and in total, eight competencies were included in the first quadrant. The five competencies (items 1, 2, 18, 19, and 25), which were both in the eight top priority items in the Borich Needs Assessment and the first quadrant of the Locus for Focus model, were the highest priority items in educational needs. The last six items, which were derived from either Borich Needs Assessments (items 3, 11, and 23) or the Locus for Focus model (items 5, 13, and 14), were the second-highest priority items for the educational needs.

Discussion

The purpose of this study was mainly twofold. The first was to assess the online teaching readiness of medical educators and the second was to identify the highest priority of their educational needs. The results reveal that they are not ready for online teaching in terms of their attitude and ability for online teaching, which is similar to that of studies reporting that faculty members with little to no online teaching experience have lower perceptions of their ability in online teaching than those with more than 5 years of online teaching experience [4]. This result indicated that online teaching was literally thrust upon medical educators without any proper preparation and there is an urgent training need for online teaching competences.

The results of this study have several important implications. First, the medical educators had very low scores in terms of their ability of online teaching, which may be due to their tendency of carrying traditional educational practices into the online environment. Having little prior experience in online teaching, online educators tend to transfer traditional approaches to online classrooms, which have been proven ineffective in online education settings [2]. Online instructors are critical to building capacity and quality for online education. Thus, first, a pre-assessment of faculty online teaching readiness and then, training them properly should be a mandatory step before they develop and implement online courses. Second, they are not ready in terms of their attitude as well. In the study of Martin et al. [5], the German faculty showed lower perceived importance (mean=3.82) than the American faculty (mean=4.29) and the authors argued that it could be due to the barriers concerning online teaching. In the German faculty, most of them teach in traditional face-to-face settings and the institution is reluctant to innovate new teaching methods. This explanation could be applied to the result of this study. The low importance score may indicate that medical educators feel uneasy about the value of online teaching and learning practices. Their positive attitude toward online course delivery, however, have strong impacts on the success of online education [11]. Thus, the faculty development program should include online educators' roles as well as their underlying assumptions and value instead of just focusing on technological components, such as how to use learning management systems or Zoom.

Third, faculty development programs need to be developed as multiple levels, not just one trial. The highest priority items for educational needs in this study are “create an online course orientation,” “write

measurable learning objectives,” “apply copyright law and fair use guidelines when using copyrighted materials,” and “apply accessibility policies to accommodate student needs.” The second highest priority items are “designing learning activities,” “create and modulate discussion forum,” “provide feedback and respond to students promptly,” and “use facilitation strategies to manage time.” When looking at these results, faculty training programs need to first focus on initial analyses about students, course objectives, and available resources. They should, then, broaden instructional practices including designing course activities as well as interaction and facilitation components. In addition, considering the very low ability scores, early support for new online instructors should focus on the simple implementation of their early course attempt.

Four, the result points out the necessity for training time management competency. One of the highest priority items for educational needs is “allocate time to learn about new strategies or tools.” Such abrupt online transfer might add heavier workload on their already heavy schedule with clinical, research, and organizational duties. Online teaching provides flexibility to instructors' schedule, but organizing, structuring, and facilitating learning processes online is time-consuming for novice online instructors [11]. Clear procedures and shared routines for recurring situations help them efficiently allocate instructional time, engaging time, and learning time [11]; faculty training programs should address this issue.

This study has some limitations. The sample size was small and drawn from one university. Although the medical education contexts in Korea are not much different among the universities in term of online teaching and learning, cautions should be taken with generalizing the findings. Despite this limitation, this study stands to contribute initial understanding about

online teaching readiness of medical educators and their educational needs. Further research with a large sample from various universities is necessary to gain more insight about this important issue.

ORCID:

Jihyun Si: <https://orcid.org/0000-0002-4782-6104>;

Hyun-Hee Kong: <https://orcid.org/0000-0003-1075-0051>;

Sang-Hwa Lee: <https://orcid.org/0000-0003-4792-1248>

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