

First-Year Nursing Students' Knowledge of Metacognitive Strategies in the COVID-19 Learning Context

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Abstract

2020年度は、COVID-19の影響を受け、日本の多くの大学が授業形態を大きく変えざるをえなくなり、ほとんどの学生はオンラインでの授業を自宅から受けることとなった。本研究では、2020年度入学の姫路大学の看護学生を対象として、彼らがどのようなメタ認知方略を知っているのかについて調査した。メタ認知方略の知識に関する質問23項目に対して、4段階のリッカート式の質問すべてに回答した98人は、メタ認知方略を示すほとんどの項目に対して、「同意する」「強く同意する」という肯定的な回答をした。コロナ禍の影響を強く受けた本研究の調査対象者に関しては、学修の自己評価・振り返り・計画ができる自律した学習者として育てていく必要があり、今後も学生のメタ認知方略の知識に関する経年変化を調査していく予定である。

Keywords : university, metacognitive strategy, first year students, nursing, COVID-19

I. Introduction

1.1 Present situation

Universities around the world have canceled in-person instructive lectures, shifting instead to remote teaching and learning in order to contain the spread of COVID-19. Most universities in Japan closed their campuses and began providing online classes for their students in March 2020. Since then, teachers' policies and teaching itself have drastically changed in both positive and negative ways. Whether they like it or not, teachers have found themselves teaching through methods involving the use of video conference systems, chat platforms, or YouTube videos. While this has helped enhance their ICT skills, it may not be as effective as face-to-face learning in terms of increasing students' learning motivation. Furthermore, due to the demands of the online-only platform, teachers have little time to plan or reflect on their teaching. Despite the disadvantages, they need to contemplate how to encourage their students and help them perform as well as in regular situations. In order to do this, students' motivation and behavior should first be considered.

1.2 Determining the causes of human behavior

Investigation into the causes of human behavior have been conducted in the fields of motivational psychology.

The literature on motivational psychology reveals that the expectancy-value framework (Atkinson & Raynor, 1974) is popular among researchers. Expectancy-value theories are based on the belief that humans are innately active learners with inborn curiosity, an urge to know their environment, and a desire to meet challenges. This framework originated with Atkinson and Raynor's classic theory of achievement motivation, which comprises four key factors: an individual's expectation of success in a given task, the value he/she attaches to such success, his/her need for achievement, and his/her fear of failure. The theory proposes that achievement-oriented behavior equals hope for success minus fear of failure plus various extrinsic influences (Atkinson & Raynor, 1974; Snow & Jackson, 1994).

Stated simply, expectancy-value theories are concerned with questions of what directs and shapes people's inherent motivations rather than with the motivations themselves (Dörnyei, 2001).

In the field of education, the most important factors appear to be: (a) processing past experience, (b) judging one's own abilities and competence, and (c) attempting to maintain self-esteem. The first factor is based on attribution theory (Weiner, 1979), the second on self-efficacy theory (Bandura, 1993), and the third on self-worth theory (Covington, 1992). Based on these theories, some cognitive theorists developed the notion of motivational

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style (Williams & Burden, 1997) and found that self-efficacy processes are some of the most important influences on the formation of expectations.

Metacognitive strategies are derived from self-efficacy processes and work by allowing learners to control their own learning. According to Oxford, Lavine, and Crookall (1989), these strategies comprise evaluation, self-monitoring, and planning. Some metacognitive theorists insist that self-regulation can be established by selecting appropriate strategies, testing one's comprehension and state of knowledge, correcting deficiencies, and recognizing the utility of cognitive strategies (Paris & Newman, 1990; O'Malley, Chamot, Stewner-Manzares, Kupper, & Russo, 1985; Oxford & Shearin, 1994). Bandura (1993) states that individuals who firmly believe in their ability to self-regulate provide the required staying power during the learning process. As learners' belief in their ability to effectively regulate their motivation and learning activities increases, so does their confidence in their ability to effectively master academic achievement. A high level of perceived academic efficacy seems to promote intellectual achievement not only directly but also by raising academic aspirations (Schunk & Zimmerman, 2007). Although there are various definitions of metacognition, most researchers agree that two processes are involved: the "knowledge of cognition" and the "regulation of cognition" (Sannomiya, 2008; Hacker & Graesser, 2009).

Takahashi tried to define and use metacognitive strategies (2003, 2011, 2017, 2018) by creating a questionnaire focusing on language learners over the years. Based on Yoshino et al.'s questionnaire (2008), Takahashi and Yamaguchi (2020, p.50) considered different aspects of university students and created a new questionnaire referring to the others available at that moment (Takahashi, 2018; Yoshino et al., 2008). The responses to the newly created questionnaire revealed four categories in the process of learning metacognitive strategies: "effectiveness of strategy use," "knowing about oneself," "human mentality," and "problem-solving ability" (Takahashi & Yamaguchi, 2020, p.50).

The present study intended to clarify the state of metacognitive knowledge among 2020 freshman nursing students at Himeji University. The authors planned to develop a remote nursing program that included courses on the English language, cross-cultural issues, and global health. The program was based on their reported knowledge and use of metacognitive strategies, which are believed to work as pivots in learning processes. For

example, freshman students in 2020 were not able to attend face-to-face classes due to the COVID-19 pandemic. In such circumstances, students are expected to be more independent and autonomous because they might not receive the same level of support from teachers, other staff members, and their peers as during face-to-face learning. To learn how to design programs that encourage such strategies, the research question of this study is as follows:

With what knowledge of metacognitive strategies are 2020 academic-year freshman nursing students equipped?

II. Method

2.1 Participants

In this study, 101 first-year nursing students from the university aged 18–19 years were surveyed and 99 responded. The university ranking is below average among all private universities in Japan (T ranged from 45 to 50; Kawai-juku Knet, 2019). All participants in this study were nursing majors at the university's School of Nursing. The researchers were teachers at the university, in charge of courses on language, cross-cultural planning and administration, and global health. At the time of data collection, all students were taking weekly 90-minute classes online. As noted, due to fears of the spread of COVID-19 and the creation of a disease cluster, the university decided to conduct all nursing classes remotely, except those involving practicum and certain experiments. A request to complete the questionnaire was sent to the participants at the beginning of the academic year.

2.2 Instrumentation

Data were collected at the beginning of the 2020 academic year. The above-mentioned questionnaire (based on Yoshino et al., 2008; Takahashi, 2011; Takahashi et al., 2017; Takahashi et al., 2018; Takahashi & Yamaguchi, 2020) was used, and participants were asked about their knowledge and beliefs regarding metacognition. This study focused on the aspect of knowing, one of the two processes of the metacognitive strategy use, because knowing oneself was thought to be the first step in controlling the learning and managing ones' mental processes.

In total, 23 items were chosen based on the results of previous studies (Takahashi, 2003; Takahashi, Sugimura, & Kazahaya, 2017; Takahashi & Yamaguchi, 2019). The participants rated each item based on a Likert-type scale from 1 (strongly disagree) to 4 (strongly agree). An opt-out response was prepared for each item. The questionnaire was

linked to the university chat-platform.

2.3 Ethical considerations

The survey was approved by the ethics committee of the participants' university (No.2019-N15). An explanation of the survey was sent to all participants beforehand. It described the survey and the participants' rights. Furthermore, it was confirmed that the survey posed no risks and caused no discomfort to the participants. There are no entities, relationships, or other circumstances that present real or potential conflicts of interest that require disclosure in relation to the present study.

III. Results

Of the 101 students surveyed, 98 responded to the online questionnaire. There were no missing values. Table 1 shows the 23 survey items and their descriptive data. Table 2 presents the mode and median for each item in the questionnaire.

In order to indicate the central tendencies and the most frequently obtained scores in the data, the medians and modes were confirmed. The results show that most students responded positively to the majority of the items. Only one item, "I focus on the discussion rather than on taking notes," was the negatively rated because 91 (92.9%) out of all students responded "strongly disagree" or "disagree" to the statement.

IV. Discussion

4.1 Answers to the research questions

The negative response to the item "I focus on the discussion rather than taking notes" is indicative of students' lack of knowledge about how to hold a discussion. Although discussions should be prioritized over taking notes, students' lack of participation in discussions due to poor knowledge of techniques used to expand the discussion about a topic could cause them to hesitate.

Four categories in the process of knowing and using metacognitive strategies (Takahashi & Yamaguchi, 2019) could be used to analyze the responses in the present study. As shown in Table 1, students responded most positively to survey items 19, 20, and 21 because they choose "3. Agree" or "4. Strongly agree" to the following statements: "I answer easier questions first on timed tests," "When I want to understand a technical term fully, I explore all the concepts with which it is associated," and "When preparing

for an interview I try to anticipate the questions and answers I will be asked." Based on Takahashi and Yamaguchi's findings, these three items might be categorized under "effectiveness of strategy use." Further studies are necessary to document and analyze changes in the target students' use of metacognitive strategies during the course of their university life.

4.2 Implications for future teaching

One concrete teaching implication is that teachers should enrich the learning environment to encourage students to use their metacognitive strategies. Environment, in this context, includes the teacher, the lesson, and the surroundings. As Williams and Burden (1999) concluded in their study, teachers and administrators must understand how learners make sense of external influences as they shape their internal attributes. Teachers should provide their students with a better curriculum and a learning environment that is more conducive to improving their learning.

What happens in classrooms after COVID-19 will depend largely on what teachers and administrators do during this pandemic: they must prepare environments that encourage students to nurture their self-efficacy and the ability to construct their own learning in the most optimal way. Because "learning never takes place in a vacuum" (Williams & Burden, 1997, p. 188), teachers and administrators must look more carefully into the factors perceived by learners to be important and help them set their individual goals. In order to improve the curriculum and make it adequate to meet shifting demands, teachers need to understand what their students want and need. To that end, needs analyses that include students' opinions should be conducted.

Table 1. Understanding and Using Metacognitive Strategies (n = 98)

Item	Strongly disagree	Disagree	Agree	Strongly agree
1. I know my strengths and weaknesses in learning.	0 (0)	6 (6.1)	72 (73.5)	20 (20.4)
2. I know and understand the elements that are important for effective learning.	1 (1.0)	36 (36.7)	59 (60.2)	2 (2.0)
3. I know how much I can memorize.	0 (0)	13 (13.3)	66 (67.3)	19 (19.4)
4. I know how much I can understand.	0 (0)	17 (17.3)	66 (67.3)	15 (15.3)
5. I ascribe my failure to bad luck. (Inverted item)	19 (19.4)	61 (62.2)	18 (18.4)	0 (0)
6. I tend to accept somebody's offer when he/she knows my weakness.	3 (3.1)	24 (24.5)	59 (60.2)	12 (12.2)
7. I tend to build up to increasingly demanding material and tasks gradually.	3 (3.1)	24 (14.3)	64 (65.3)	17 (17.3)
8. At the moment, I feel I have many advantages.	0 (0)	9 (9.2)	60 (61.2)	29 (29.6)
9. I have difficulty conveying my intentions effectively when typing on a computer. (Inverted item)	12 (12.2)	37 (37.8)	35 (35.7)	14 (14.3)
10. I have difficulty conveying my intentions effectively in written form compared to in spoken form.	1 (1.0)	8 (8.2)	51 (52.0)	38 (38.8)
11. I carelessly dial wrong numbers. (Inverted item)	6 (6.1)	31 (31.6)	46 (46.9)	15 (15.3)
12. I tend not to forget new information if I learn it in the context of multiple familiar topics.	0 (0)	8 (8.2)	62 (63.3)	28 (28.6)
13. I can concentrate on the cooking program on TV if I know I can find the recipe on the Internet.	5 (5.1)	33 (33.7)	46 (46.9)	14 (14.3)
14. I feel that too many cooks in a group discussion make the dish dull.	4 (4.1)	17 (17.3)	53 (54.1)	24 (24.5)
15. When I take breaks during sports, I achieve more effective performance.	3 (3.1)	8 (8.2)	42 (42.9)	45 (45.9)
16. I prefer researching new information by reading books rather than by browsing the Internet.	2 (2.0)	20 (20.4)	56 (57.1)	20 (20.4)

Item	Strongly disagree	Disagree	Agree	Strongly agree
17. While studying, I purposely arrange items randomly to increase the difficulty level.	6 (6.1)	31 (31.6)	47 (48.0)	14 (14.3)
18. When I encounter an unfamiliar problem, I refer to a similar problem in my memory and apply the same solution to the new problem.	0 (0)	13 (13.3)	58 (59.2)	27 (27.6)
19. I answer easier questions first on timed tests.	0 (0)	3 (3.1)	40 (40.8)	55 (56.1)
20. When I want to understand a technical term fully, I explore all the concepts it is associated with.	0 (0)	0 (0)	47 (48.0)	51 (52.0)
21. When preparing for an interview, I try to anticipate the questions and answers I will be asked and the answers I will give.	2 (2.0)	3 (3.1)	38 (38.8)	55 (56.1)
22. Before I go to a place, I confirm the location on a map even if I remember where it is.	2 (2.0)	6 (6.1)	54 (55.1)	36 (36.7)
23. I focus on the discussion rather than on taking notes.	27 (27.6)	64 (65.3)	7 (7.1)	0 (0)

Notes. The participants were to choose one answer from a Likert scale (1 = strongly disagree to 4 = strongly agree). There was also an "opt out" option, but none of the participants opted out of any of the questions. Items were translated by Takahashi from Yoshino et al (2008).

Table 2. Descriptive analysis of the 23 Items of the Knowledge Process of Metacognitive Strategy Use (n = 98)

Item	Median	Mode	Mini	Max
1. I know my strengths and weaknesses in learning.	3	3	2	4
2. I know and understand the elements that are important for effective learning.	3	3	1	4
3. I know how much I can memorize.	3	3	2	4
4. I know how much I can understand.	3	3	2	4
5. I ascribe my failure to bad luck. (Inverted item)	2	2	1	3
6. I tend to accept somebody's offer when he/she knows my weakness.	3	3	1	4
7. I tend to build up to increasingly demanding material and tasks gradually.	3	3	1	4
8. At the moment, I feel I have many advantages.	3	3	2	4
9. I have difficulty conveying my intentions effectively when typing on a computer. (Inverted item)	2.5	2	1	4
10. I have difficulty conveying my intentions effectively in written form compared to in spoken form.	3	3	1	4
11. I carelessly dial wrong numbers. (Inverted item)	3	3	1	4
12. I tend not to forget new information if I learn it in the context of multiple familiar topics.	3	3	2	4
13. I can concentrate on the cooking program on TV if I know I can find the recipe on the Internet.	3	3	1	4
14. I feel that too many cooks in a group discussion make the dish dull.	3	3	1	4
15. When I take breaks during sports, I achieve more effective performance.	3	4	1	4
16. I prefer researching new information by reading books rather than by browsing the Internet.	3	3	1	4
17. While studying, I purposely arrange items randomly to increase the difficulty level.	3	3	1	4
18. When I encounter an unfamiliar problem, I refer to a similar problem in my memory and apply the same solution to the new problem.	3	3	2	4
19. I answer easier questions first on timed tests.	4	4	2	4
20. When I want to understand a technical term fully, I explore all the concepts it is associated with.	4	4	3	4
21. When preparing for an interview, I try to anticipate the questions and answers I will be asked and the answers I will give.	4	4	1	4
22. Before I go to a place, I confirm the location on a map even if I remember where it is.	3	3	1	4
23. I focus on the discussion rather than on taking notes.	2	2	1	3

Notes. The participants were to choose one answer from a Likert scale (1 = strongly disagree to 4 = strongly agree). There was also an “opt out” option, but none of the participants opted out of any of the questions.

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