Evaluation of the effect of using online database to enhance students' learning of occupational therapy theories in occupational therapy education

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Abstract

Background: Learning about occupational therapy theories is crucial to occupational therapy education, and an online database is developed to facilitate students' learning of occupational therapy theories in this study. **Aim:** This study was conducted to evaluate the effect of this database on users' experiences. **Methods:** A mixed-method approach, including surveys and focus groups, was used. First- and third-year students who had studied occupational therapy theory at a university participated in this study. **Results:** One-hundred-and-twenty students completed the surveys, and 11 students participated in the focus groups. The students demonstrated a significant increase in the number of theories they named and their perceived understanding of theories after the semester. They rated the content, utility and satisfaction with the database in facilitating their understanding/learning of theories as moderate-good. Based on qualitative data, it appeared that the database provided specific information about occupational therapy theories and facilitated students' learning and level of interest in learning about them. However, the first-year students who accessed the database showed a significantly decreased level of interest in learning about theories, but such the decrease was not found in the third-year students. **Conclusion:** The study findings suggest that the use of an online database may enhance students' learning about occupational therapy theories in educational settings.

Keywords

Occupational therapy education, theory, model, frame of reference, database

Introduction

As occupational therapy (OT) is a science-based profession (Mosey, 1989), the application of theory to clinical practice is an important ability for occupational therapists to make scientifically-informed decisions and plan occupation-focused interventions (Boniface, 2011; Dirette, 2015). Theory is defined as a set of interrelated concepts used to describe, explain and predict phenomena (American Occupational Therapy Association, 2012). The theoretical knowledge related to OT, from a generic perspective, encompasses frames of reference (FORs), conceptual frameworks or models, and practice models which have been used in clinical practice.

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Throughout this study, we have used the term 'theory' as an umbrella term to refer to all types of theoretical knowledge related to OT.

Learning about OT theories helps students become competent occupational therapists (Dirette, 2015) and is a compulsory component of the curricula of most universities offering programmes in the field globally. For example, in Ashby and Chandler's exploratory study of 65 Western academic programmes (2010), they found that all of them incorporated occupation-focused theories into their curricula. Some commonly used models included the Model of Human Occupation (98.5%) and the Canadian Model of Occupational Performance and Engagement (98.5%). To teach students about theoretical knowledge and its application, lecture-based education has been found as the most common method (Ashby & Chandler, 2010). Lecture-based education, however, is criticised as a relatively passive learning method (Steen-Utheim & Foldnes, 2018), especially for teaching theoretical knowledge, which is abstract. The passivity of lecture-based education may adversely affect students' willingness to learn and their ability to retain information (Young et al., 2009). This highlights a need to adopt contemporary pedagogies to facilitate students' learning of OT theories.

In recent years, several new methods, such as the use of flipped classroom, have been added to healthcare-related professional education as supplements to conventional teaching methods (Steen-Utheim & Foldnes, 2018). The flipped classroom is a hybrid approach, combining self-directed online learning and face-to-face classroom activities. Using this approach, students engage with content by themselves before class, allowing more in-class time for interactive, active learning (DeLozier & Rhodes, 2017). A meta-analysis conducted by Chen et al. (2018) revealed that students who were taught using the flipped classroom approach earned higher examination scores and course grades. The students' improved performance on exams and in terms of course outcomes is thought to be resulted from their active engagement in pre-class learning, which promotes increased knowledge application, student-initiated discussions and meaningful classroom interactions (O'Flaherty & Phillips, 2015). The flipped classroom approach has been applied widely in teaching practical OT skills, and it has been found to allow students to learn clinical techniques properly and flexibly at their own pace (McAlister, 2014).

In the flipped classroom approach, self-directed online learning is a common element (DeLozier & Rhodes, 2017). For example, OTseeker (http://www.otseeker.com), an online database containing systematic reviews and randomised controlled trials related to OT, has been proven to enhance students' learning of evidence-based practises (McCluskey et al., 2010). To date, there have been few databases constructed to enable students to search for information about OT theories. Students may, therefore, use common search

engines, such as Google, to search for information on a specific OT theory. Most search engines are not dedicated to OT knowledge and may return many irrelevant results. Furthermore, the information provided on open-source websites can be unreliable and it can be difficult for students to evaluate its level of relevance to their studies. It is necessary to construct a database that archives information about OT theories to enhance the effectiveness of the self-directed online learning of theoretical knowledge using the flipped classroom pedagogy.

Thus, an online database named the 'Hub of Occupational Therapy Theory' (abbreviated as 'HOTheory' and available at https://ottheory.com/) has been available since January 2018. The development of this database was grounded in systematic searches conducted in 2017 using three main computerised bibliographic databases (MEDLINE, CINAHL and PsycINFO). These systematic searches aimed to identify the existing OT theories in literature published between 1997 and 2017. Approximately 110 theories were identified. Due to the lack of manpower and time constraints, merely 65 theories were included in the prototype of the HOTheory database when this study was conducted. A customised form with several categorisation schemes was used to extract relevant information from the included theories. Trained assistants and students performed the basic data extraction, and the first author verified the categorisation of each OT theory. After the data-extraction process was completed, each included theory was summarised in a 200-word description. The included theories were categorised according to target population(s), type(s) of disability and domain(s) of occupation. Two search functions, basic and advanced, were designed to enable simple or targeted searches of OT theories within the HOTheory database.

The HOTheory database was developed with the goal of enabling students to search for OT theories of interest. In the present study, we aimed to evaluate the effect of the HOTheory database in enhancing students' understanding and level of interest when learning about OT theories. We also aimed to explore students' learning experiences when using the database to further improve its content and layout.

Methods

Participants

Participants were undergraduate students who had taken OT theory courses at (The Hong Kong Polytechnic University) in the second semester of the 2017-18 academic year. They included 100 first-year students who took a basic theory course and 89 third-year students who took an advanced theory course, where the basic and advanced theory courses were the main sources of the participants' theoretical knowledge in the curriculum design. These courses were coordinated and taught by the first three authors. Students

were informed that their participation in this study was completely at their own discretion and would not affect their grades or relationship with the teachers. Ethical approval for this study was obtained from the (Human Subjects Ethics Sub-Committee) at the university (approval number: HSEARS20171130001).

Instrumentation

This study adopted a mixed-method approach including the use of paper-based surveys and focus groups, to examine students' learning of OT theories, experiences, and opinions about the HOTheory database.

The surveys included a pre- and post-class questionnaire. The pre-class questionnaire consisted of two parts. The first part concerned basic demographic information (including name, age and gender). The second part concerned students' knowledge of OT-specific theories and consisted of three questions. First, students were asked to list as many OT theories as they could. In the second and third questions, two 11-point visual analogue scales (0 = *Completely Low*; 10 = *Completely High*) were used, and students were asked to rate their perceived understanding of and level of interest in learning about OT theories, respectively.

In the post-class questionnaire consisting of four parts, the first two were identical to the corresponding parts of the pre-class questionnaire. Students also needed to provide their names in the post-class questionnaires in order to match their pre-class results. The third part concerned the students' number of visits to the HOTheory database and the fourth assessed user experiences of the database. Students were asked to rate the (1) clarity of the layout, (2) ease of conducting searches, (3) adequacy of the information included in the OT theory summaries, and (4) satisfaction with using the database to facilitate their understanding of OT theories, and (5) their learning of OT theories using the 11-point scales. Two open-ended questions were used to assess students' general impressions of the database and possible areas for improvement.

Two focus groups were arranged to facilitate in-depth understanding of students' experiences and opinions of using the HOTheory database. The areas of discussion concerned (1) their experiences when using the database, (2) the benefits of the database in enhancing their learning of OT theories, (3) opinions about the information provided by the database, and (4) possible areas for improvement. Separate focus group sessions were conducted for the first- and third-year students.

Procedure

The pre-class questionnaire was distributed to all students during the first lecture of both the basic and advanced OT theory courses. The students, on a voluntary basis, completed and returned the questionnaires. Next, the course lecturers introduced the HOTheory database and demonstrated its use. Between the second and 11th weeks of the semester, the students attended regular lectures and tutorials to foster their understanding of OT models, practises and roles. Several basic models and FORs were covered in the lectures and tutorials (see Appendix 1). The students also completed group-based assignments that required them to search for relevant OT theories via the HOTheory database. For example, the first-year students were required to identify an OT theory of interest, interview the developer, and compose an introductory presentation about it. The third-year students were required to identify a case from their past fieldwork experiences, search for relevant OT theories, learn how the theories could be applied to the case for intervention planning during tutorials, and present their case studies. At the end of the semester, the post-class questionnaire was distributed to the students. They were again asked to return their questionnaires voluntarily.

After the final examinations of the courses, 11 students (five first-year students and six third-year students) were invited by email to participate in the focus groups. The students were selected based on the diversity of their access counts (i.e. one time, 2–5 times and >6 times) and levels of understanding of OT theories as reported in the post-class surveys (i.e. below and above the mean). Students who did not access to the database were excluded from the invitation for the focus group. To achieve optimal group dynamics, students pursuing the same course of study were interviewed together. Each group was motivated by an interviewer. Semi-structured guidelines were used when gathering information regarding students' opinions of the database. The two group sessions were conducted simultaneously and lasted for 15 min each. Audio-recordings were made of each group's responses.

Data analysis

Statistical Package for the Social Sciences (version 25) software was used to analyse the survey data. As the data were not distributed normally, the Mann–Whitney *U*-test and Wilcoxon signed-rank test were used to compare the differences between and within the groups, respectively. To calculate the number of OT theories that students could learn about using the HOTheory database, we applied a filtering mechanism in which the OT theories, models, frameworks and FORs that were covered in the basic/advanced courses were eliminated from the calculation.

The recordings of the focus groups were transcribed by an independent transcription company. Based on the transcripts and students' responses to the open-ended questions in the post-class surveys, inductive thematic analysis was conducted by three researchers on the research team. The major and associated themes were first identified independently by each researcher and were then subjected to

Table 1. Demographic characteristics of participants and their frequency of database access.

	First-year students (n = 63)	Third-year students (n = 57)
Gender, n (%)		
Male	14 (22.2)	10 (17.5)
Female	49 (77.8)	47 (82.5)
Age, n (%)		
18–19 years old	58 (82.0)	0 (0)
20–21 years old	4 (6.4)	53 (93.0)
22–23 years old	1 (1.6)	2 (3.5)
>23 years old	0 (0)	2 (3.5)
Database use, n (%)		
Yes	56 (88.9)	39 (68.4)
No	7 (11.1)	18 (31.6)
Frequency of database use, n (%)		
None	7 (11.1)	18 (31.6)
1 time	6 (9.5)	7 (12.3)
2–5 times	46 (73.0)	24 (42.1)
6–10 times	3 (4.8)	7 (12.3)
>10 times	1 (1.6)	1 (1.8)

group discussion among the entire team until an agreement was reached on all issues.

Results

One hundred and 42 pre-class questionnaires were collected initially, 79 from first-year students and 63 from third-year students. After the semester ended, 138 post-class questionnaires were collected, 66 from first-year students and 72 from third-year students. After eliminating the responses of the students who had not completed both surveys, 63 first-year and 57 third-year students remained. Table 1 shows the demographics of the students who completed both questionnaires. Most of the students were female (77.8–82.5%) and aged between 18 and 21 years. Fifty-six (88.9%) of the 63 first-year students and 39 (68.4%) of the 57 third-year students reported that they had accessed to the HOTheory database at least once.

Results of quantitative analysis of survey data

On the post-class survey, the students named an average of 0.79 additional OT theories (standard deviation [SD] = 0.99) than they had on the pre-class survey (mean = 0.03, SD = 0.26). The students also exhibited a mean increase of 3.35 points in their perceived understanding of OT theories. The increases in the number of OT theories named and students' perceived level of understanding of OT theories before and after the semester were all significant ($z = -7.152$ and $-9.330, p < .001$). However, there was no significant difference in the students' level of interest in learning about OT theories ($z = -1.299, p = .194$).

Because 25 students did not access the database, their survey results were compared with those of the students who accessed it

(see Table 2). No significant difference was found in the number of OT theories named by the two groups before the semester began ($z = -0.729, p = .466$). After the semester ended, however, the students who had accessed the database named significantly more OT theories than those who had not ($z = -3.321, p < .001$). Conversely, the students who did not access the database were found to have a higher level of perceived understanding of OT theories before the semester than those who did ($z = -1.974, p = .048$). This difference in the perceived level of understanding of OT theories was not found between the two groups after the semester ended ($z = -0.411$, $p = .681$). Additionally, the students in both groups showed significant improvements in the number of OT theories named ($z = -6.782, p < .001$ and $-2.333, p = .020$) and their perceived level of understanding of OT theories ($z = -8.320$ and -4.314, $p < .001$) throughout the semester. No significant differences in the students' level of interest in learning about OT theories were found before or after the semester or between the two groups in either the pre- or post-class surveys (Table 2).

Table 3 shows a comparison of the results of the first- and third-year students who accessed the HOTheory database. Regarding the number of OT theories named, no significant difference was found between the two groups in the pre-class surveys ($z = -1.187, p = .235$), but the first-year students named significantly more OT theories than the third-year ones after the semester had ended ($z = -7.636, p < .001$). The first-year students showed a significant increase of 1.37 additional theories ($z = -6.441, p < .001$) during the semester. The third-year students also exhibited a significant increase of 0.09 additional theories ($z = -2.236. p = .025$).

The third-year students showed a significantly higher level of understanding of OT theories than the first-year

Table 2. Difference in perceived levels of understanding and interest in learning about OT theories between the students who accessed the database and those who did not (*n* = 120).

	Students who accessed the database (*n* = 95)		Students who did not accessed the database (*n* = 25)		Statistical testing of the differences between the groups
	Mean (SD)	Median (IQR)	Mean (SD)	Median (IQR)	
Number of OT theories named					
Pre-class survey	0.04 (0.29)	0 (0)	0 (0)	0 (0)	z = −.729, p = .466
Post-class survey	0.93 (1.03)	1 (1)	0.28 (0.54)	0 (1)	z = −3.321, p= .001
Statistical testing of the difference between pre- and post-class surveys	z = −6.782, p < .001		z = −2.333, p = .020		
Understanding of OT-specific theories					
Pre-class survey	3.00 (2.07)	3 (3)	3.84 (1.75)	4 (3)	z = −1.974, p = .048
Post-class survey	6.55 (1.16)	7 (1)	6.44 (1.19)	6 (1)	z = −0.411, p = .681
Statistical testing of the difference between pre- and post-class surveys	z = −8.320, p < .001		z = −4.314, p < 0.001		
Level of interest in learning about OT-specific theories					
Pre-class survey	7.55 (1.46)	7 (1)	7.12 (1.09)	7 (1.5)	z = −1.305, p = .192
Post-class survey	7.24 (1.35)	7 (2)	7.40 (1.12)	7 (1)	z = −0.373, p = .709
Statistical testing of the difference between pre- and post-class surveys	z = −1.935, p = .053		z = −1.186, p = .236		

OT: occupational therapy; SD: standard deviation; IQR: interquartile range.

students in the pre-class surveys (z = −7.189, p < .001) as well as the post-class ones (z = −2.274, p = .023). Both groups showed significant improvements in their perceived levels of understanding of OT theories during the semester (z = −6.487 to -5.210, p < .001). The first-year students showed a significantly higher level of interest in learning about such OT theories than the third-year students in the pre-class surveys (z = −3.272, p = .001), and they showed a similar level of interest in the post-class surveys. However, the first-year students exhibited a significant decrease in their level of interest in learning about OT theories during the semester (z = −2.684, p = .007), whereas a corresponding decrease was not identified in the third-year students.

In the post-class surveys, the first- and third-year students who accessed the HOTheory database provided mean ratings ranging from 6.62 to 7.23 (SD = 1.16–1.71) out of 10 on the five questions related to their experiences with the database (see Table 3). No significant difference between the first- and third-year students was found in the ratings regarding their experiences of using the database.

Results of qualitative analysis of focus groups and survey data

Four major themes were identified based on the data gathered from the focus groups and open-ended questions in the post-class surveys. Each theme included 2–3 sub-themes, as shown in Table 4; they are summarised below.

Theme 1: The database provided information on OT-specific theories. The students noted that the information in the HOTheory database was OT-specific. For example, first-year student A, who visited the database 2–5 times said, '*It can sort out information that is closely related to OT*'. The database also enabled the students to search for information about OT theories which could not be easily found using common search engines, such as Google and Yahoo. For example, first-year student B, who visited the database 2–5 times, noted that '*We simply search for the keyword using the Google engine and we can't find anything that is very related to OT, physiotherapy, medicine or pharmacy*'. In addition, the students considered the HOTheory database a reliable source of information. Moreover, the students appreciated the information included in the database, as some of it was not covered in the lecture materials or course readings.

Theme 2: The features of the database facilitated students' learning and exploration of OT-specific theoretical knowledge. The search function of the HOTheory database enabled the students to search for OT theories of interest using keywords and find related theories, which enriched their acquisition of OT-specific knowledge. For example, according to third-year

Table 3. Difference in perceived levels of understanding and interest in learning about OT theories and feedback about the database between the first- and third-year students who accessed the database (*n* = 95).

	First-year students (*n* = 56)		Third-year students (*n* = 39)		
	Mean (SD)	Median (IQR)	Mean (SD)	Median (IQR)	Statistical testing of the differences between the groups
Number of OT theories named					
Pre-class survey	0.07 (0.38)	0 (0)	0 (0)	0 (0)	$z = -1.187$, $p = .235$
Post-class survey	1.48 (0.99)	1 (1)	0.13 (0.34)	0 (0)	$z = -7.636$, $p < .001$
Statistical testing of the difference between pre- and post-class surveys	$z = -6.441$, $p < .001$		$z = -2.236$, $p = .025$		
Understanding of OT-specific theories					
Pre-class survey	1.73 (1.37)	1 (2)	4.82 (1.47)	5 (2)	$z = -7.189$, $p < .001$
Post-class survey	6.32 (1.28)	6 (1)	6.87 (0.86)	7 (2)	$z = -2.274$, $p = .023$
Statistical testing of the difference between pre- and post-class surveys	$z = -6.487$, $p < .001$		$z = -5.210$, $p < .001$		
Level of interest in learning about OT-specific theories					
Pre-class survey	7.98 (1.38)	8 (2)	6.92 (1.35)	7 (2)	$z = -3.272$, $p = .001$
Post-class survey	7.39 (1.46)	7 (3)	7.03 (1.16)	7 (1)	$z = -1.171$, $p = .242$
Statistical testing of the difference between pre- and post-class surveys	$z = -2.684$, $p = .007$		$z = -0.387$, $p = .699$		
Clarity of layout	6.86 (1.39)	7 (2)	6.87 (1.30)	7 (2)	$z = -0.244$, $p = .807$
Ease of searching for information about OT theories	7.05 (1.46)	7 (2)	7.23 (1.61)	7 (2)	$z = -0.816$, $p = .414$
Adequacy of information in the overview/ summary of each OT theory	6.84 (1.71)	7 (2)	6.62 (1.60)	7 (2)	$z = -1.034$, $p = .301$
Satisfaction with using the database to facilitate understanding of OT theories	6.91 (1.51)	7 (2)	7.00 (1.26)	7 (2)	$z = -0.312$, $p = .755$
Satisfaction with using the database to facilitate learning about OT theories	6.91 (1.47)	7 (2)	7.03 (1.16)	7 (2)	$z = -0.459$, $p = .647$

OT: occupational therapy; SD: standard deviation; IQR: interquartile range.

student C, who visited the database once, '*I was interested in some of the models, and there were some suggestions that were related to the models, so that I can get more information. And I think it's quite useful for me*'. The students commented that the summaries of each OT theory were within an appropriate length for facilitating their understanding. The students also reported that the categorisation of OT theories was clear and user-friendly, which encouraged them to explore more OT-specific information.

Theme 3: The database enhanced students' level of interest and performance when learning about OT-specific theories. The students felt motivated to explore additional knowledge in the HOTheory database because it contained introductory contents about OT-specific theoretical knowledge for students. For example, first-year student D, who visited the database 2–5 times, remarked that '*This database has aroused my interest in further exploring the OT world*'. Furthermore, the students reported that the content of the database helped enhance their understanding of OT-specific theories when doing assignments and preparing for clinical

placement. Third-year student E, who visited the database 2–5 times, said, '*HOTheory helps me do my assignments and facilitates my learning*'.

Theme 4: The database needed further improvement. Several limitations of the HOTheory database were reported by the students. One was related to the shortcomings of the search engine, which made it difficult for some students to find the desired information using their keywords. Another limitation was the cumbersome layout of the summaries, and some students suggested further paraphrasing the content or using a point form for better grouping. Some students also suggested further enrichment of the database content using diagrams or case studies as well as the inclusion of precautions when applying the OT theories.

Discussion

This study evaluated the extent to which HOTheory database enhanced students' learning of OT theories when it was used as a resource to help students complete their

Table 4. Themes and sub-themes identified in the qualitative data.

Themes	Sub-themes
The HOTheory database provides information about OT-specific theories	Information provided in the database is OT-specific OT-specific theoretical knowledge in the database cannot be easily found using common search engines Information provided in the database is reliable
The features of the HOTheory database facilitate students' learning and exploration of OT-specific theoretical knowledge	Search function of the database allows students to find suitable information and related OT theories Length of the summaries of OT theories in the database is appropriate Categorisation of OT theories is clear and useful
The HOTheory database enhances students' level of interest and performance when learning about OT-specific theories	Contents of the database increases students' motivation to learn OT-specific knowledge Database helps students complete assignments and prepare for clinical placement
The HOTheory database requires further improvement	Search engine should be more sensitive to a variety of keywords Layout of the summaries of OT theories should be more organised Contents about more OT theories should be included in the database

OT: occupational therapy.

assignments. Overall, we found that the students were able to name an increased number of OT theories and had a higher level of perceived understanding of them after the semester ended. The students who accessed the database also named more additional theories than those who did not and rated the database's layout and features as moderately good. The qualitative findings from the focus groups and surveys indicated that the database facilitated the students' learning by providing specific information about OT theories. The students pointed out that the layout and organisation of the database, summaries of OT theories and search function facilitated their learning of theories. While promoting students' interest in learning about OT theories emerged as a theme in the qualitative findings, the first-year students who accessed the database were noted to have a decreased interest in learning about OT theories after the semester ended.

It is notable that there were 25 students who did not access the HOTheory database. We found that such students appeared to have a higher perceived level of understanding of OT theories than the students who did not access it before the semester began. Hence, those students may have been high performers who did not feel the need to access a supplementary database for more information. This speculation was partially supported by the finding that more than two-thirds of the 25 students were third-year students who had learnt about the fundamental OT theories in the first year of their studies. However, we found that 89% of the students who accessed the database had an increased level of understanding of OT theories that was comparable to that of the high performers after the semester ended. This finding

implies that access to the database may have facilitated those students' learning and contributed to their perceived level of understanding being on par with that of the high performers. For example, the students who participated in the focus groups mentioned that the database served as a convenient, reliable tool for finding OT-specific information because of its search function, clear categorisation and summaries. The students' feedback in the post-class surveys also showed that the database made it easy for them to search for OT theories, and they were satisfied with the database's role in facilitating their learning. The students appeared to have compared the similarities and differences in the OT theories when browsing the database, allowing them to identify the most relevant ones for their group assignments and increase their level of understanding of OT theories.

It was unexpected that the first-year students who accessed the database would become less interested in learning about OT theories during the semester. While a quarter of the first-year students reported an increased level of interest, nearly half exhibited a decreased level of it. This decrease in interest was not found in the third-year students who accessed the database; thus, the characteristics of the database itself might not have been main reason for this downward trend among the first-year students. We also found that the students with a decreased level of interest in learning about OT theories reported similar user experiences to those of the students with an increased level of interest. We, accordingly, inferred that the first-year students might have had higher expectations regarding the amount of information they would receive (Cook & Lecky, 1999) and

the teaching styles of the University and that they may have expected more support from the teaching staff (Hassel & Ridout, 2018) at the beginning of their professional studies. In the present study, the first-year students who showed a decreased level of interest in learning about OT theories rated their levels of interest before the semester significantly higher than those who showed an unchanged or increased level of interest (results not shown). After the semester, the students who initially had high expectations might have found it difficult to learn about OT theories on their own, and realised the discrepancies between their expectations and the actual learning experience, leading to a drop in their level of interest in learning about OT theories.

Based on the students' feedback on the post-class surveys and focus groups, we have optimised the search function of the database. We have also followed students' suggestions to enhance the clarity of the summaries using a point form and paraphrasing. In addition, there are 109 OT theories included in the current database, and we will continue to archive more new theories. The HOTheory database, which now contains more OT theories, could become a useful tool for self-directed learning or assignments and serve many educational purposes for students and educators.

The results of this study should be interpreted with caution. First, we did not include a control group of students who were not provided with access to the HOTheory database, leading to a bias when assessing its effectiveness. The students may also have accessed other sources of information, such as lectures, tutorials, and common search engines, when learning about OT theories during the semester. Thus, the increase in the students' perceived level of understanding of OT theories might not have resulted purely from the use of the HOTheory database. Furthermore, the data-collection process may have been influenced by the voluntary nature of participation and non-response biases. In addition, 11-point visual analogue scales were used to assess the students' understanding of OT theories, interest in learning about OT theories, and experience in using the database, but their psychometric properties were not tested. Lastly, the students' understanding of OT theories, as reflected by the visual analogue scale, might not indicate their actual understanding. Future studies which use standardised assessments, case studies or quizzes to specifically evaluate the effect of the online database on students' learning about OT theories are warranted.

Conclusion

The results of this study suggest that the HOTheory database, which contains information about OT-specific theories, may enhance students' learning of theoretical knowledge when used on top of the existing curriculum. The students who accessed the database acquired more knowledge of OT theories and demonstrated higher levels of perceived understanding of them than those who did not. Several aspects of the database contributed to good user experiences. It is thus suggested that this database could be used in self-directed learning or the flipped classroom approach in OT education. The database is freely accessible to the greater OT community at (https://ottheory.com/).

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Appendix 1

Occupational therapy theories that are covered or introduced in regular lectures and tutorials

First-year students

- Model of Human Occupation
- Person-Environment-Occupation model
- Cognitive-behavioural frame of reference
- Behavioural frame of reference
- Psychodynamic frame of reference
- Rehabilitation frame of reference
- Biomechanical frame of reference
- Neuro-developmental treatment frame of reference

Third-year students

- Aforementioned theories that were learnt in the first year of their studies
- Canadian Model of Occupational Performance and Engagement
- Person-Environment-Occupation-Performance model
- Kawa model
- Sensory integration frame of reference
- Developmental frame of reference
- Acquisitional frame of reference
- Compensatory frame of reference
- Frame of reference for motor skill acquisition
- Frame of reference for visual perception
- Psychoanalytic frame of reference
- Social participation frame of reference