

Case Simulations to Discover Clinical Reasoning Skills in Occupational Therapy Students

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Abstract

Students need to learn clinical reasoning skills in order to address the ill-defined problems of clinical practice. They need to be able to reflect on clinical issues and use appropriate reasoning to direct treatment intervention. By understanding the present reasoning level of the students, faculty will be more attuned to the students' learning needs and be better equipped to promote appropriate learning.

This study was proposed in order to understand better the level of reason skills of students at different stages of learning in the BScOT programme. Using content analysis, the interview transcripts of 30 full time occupational therapy students were coded and categorised according to various levels of reflective thinking as defined by King and Kitchner (1985). Outcomes indicated that all of the interviewed year one students, 70% of the year two students, and 20% of the third year students tended to be functioning at a level of pre-reflective thinking, while no first year or second year students and only 20% of third year students were functioning at a level of reflective thinking. Implications for teaching strategies are discussed.

Introduction

Students need to learn how to manage the ill-defined problems of their clients in clinical practice through the use of appropriate clinical reasoning skills. Clinical reasoning actively employs the knowledge of the profession as a way of seeing, understanding, and acting on problems in practice (Sinclair, 1998). This type of clinical reasoning in occupational therapists involves a complex ongoing intervention programme which takes into account the uniqueness of the client's needs, background and specific circumstances. This study investigated levels of reasoning skills of occupational therapy students at the Hong Kong Polytechnic University, based on a taxonomy similar to that of reflective judgement established by King and Kitchner in 1985.

Literature Review

It has been well-documented that health care workers deal with multi-faceted and ill-defined problems which have no ideal solution. Many variables need to be taken into account in addressing such problems. Clinical reasoning is used to deal with problems the occupational therapist needs, to make judgements based on bio-psycho-social and professional knowledge. Clinical reasoning has been defined in occupational therapy literature (Dutton, 1996) as involving three aspects of reasoning beyond the medically oriented procedural reasoning for problem identification and treatment selection. Interactive reasoning involves interacting with, and understanding, the person as an individual during face-to-face encounters, and developing trust which facilitates the development of matching goals. Conditional reasoning refers to the

global assimilation of the problem and its solution or the accumulation of schemata to guide practice. Narrative reasoning involves relating the content of reasoning to the individual client, and is described by Mattingly (cited in Dutton, 1996) as the central mode of clinical reasoning in occupational therapy. The 'story-telling' describes the therapist's understanding of the patient's way of dealing with disability and includes pondering about how to handle clients' problems. Story creation is the process of envisaging or imagining the future.

Reflective judgement is defined as the ability to deal with ill-structured problems. The model of reflective judgement was proposed by King and Kitchner in 1984 to illuminate the development of reflective judgement in the college context. They state that reflective judgement is conditional on epistemic assumptions made about knowledge. Seven stages of developing ability to reflect on ill-structured problems is characterised by increasingly sophisticated assumptions about knowledge. These assumptions are used to make sense of their experiences and, in turn, depend upon the learning environment, which includes cognitive and emotional supports and challenges. King and Kitchner state that there is a consistent interrelationship between the individual's assumptions about the nature of knowledge and how they justify beliefs in the face of uncertainty. The stages indicate a developing sense that knowledge is the outcome of a process of reasonable inquiry in which solutions to ill-defined problems are constructed. The solutions are based on what is most reasonable on the basis of the current evidence and may be re-evaluated when new evidence becomes available. A reflective person understands the problematic nature of knowing, thus leading to more active inquiries involving the critique of conclusions. Criticism and evaluation of self and others, and the generation of new hypotheses are an end product of this development.

Many existing measures of reasoning skills have been developed but are unsuitable to measure reflective thinking and judgement because they are based on well-defined problems which have logical and definitive solutions or conclusions. The Reflective Judgement Interview (King, & Kitchner, 1994) has been developed and tested on high school juniors, college juniors and doctoral students to 'tap' people's underlying assumptions about knowledge. Questions that have no 'right' answer are used in the interview to explore the reflective thinking of these students. Similarly, the format of a clinical case study could be used which is profession-specific but deals with the ill-defined problems of 'real' people. Such a format might allow us to assess similar levels of reflective judgement since there are no absolutely 'right' answers and judgement must incorporate students' views of knowledge and the ability to justify their beliefs in the face of uncertainty.

Method

Subjects

The subjects in this study were 30 full-time students of the Bachelor of Science course in Occupational Therapy at the Hong Kong Polytechnic University. Ten students were randomly selected from each year - the first, second and third years of the course - to participate in the study. The interviews took place in the middle of the first semester. First year students had been introduced to anatomy, physiology, and psychology, and had received lectures and tutorials in their professional theory subject in occupational therapy. They had not been on clinical practice or seen actual clients. Second year students in the middle of their first semester had studied several occupational therapy professional subjects and had experienced two weeks of clinical observation during the previous summer. Third year students had completed most of their applied professional occupational therapy subjects and had been in clinical practice for a total of over twelve weeks.

Procedure

A client referral and a videotaped assessment of the same client were used as a basis for interviews of the Hong Kong Polytechnic University occupational therapy students.

The students were interviewed individually, and were asked to respond to information provided and to generate possible hypotheses. They had to report what they were thinking while reading a client referral and watching a video of the client during a clinical assessment. Probe questions were asked when students lapsed into silence for a long period, or if they just read aloud the information given. Interviews were conducted in Chinese and then transcribed into English. Each interview was tape-recorded for later coding and analysis.

Client Referral

A referral was presented in a paper format similar to the introductory information a therapist would receive in actual clinical practice. Students were asked to initiate their clinical reasoning by finding relevant information in the referral, prioritising any issues which they felt needed to be further investigated in order to plan interventions for the client. They were asked to interpret the evidence in the referral and justify their beliefs. The referral in a paper case format is shown in Figure 1. In a tape-recorded interview, students were asked to verbalise their thinking after reading this referral.

Figure 1: Case format - referral to occupational therapy

Referral to Occupational Therapy	
Name:	Mr C.
Sex/Age:	M/35
Diagnosis:	Cut 100% ulna nerve Cut 100% FDS & FDP at M/F & R/F Cut 100% FCU muscle at wrist level (At the right wrist level)
	Referred 2 months after injury
Medical History:	Repair of tendon, nerve and artery
Occupation:	Urban Council worker (Rubbish Collector)
Hand Dominance:	Right
Status:	Married with 2 children
Date of injury:	13/5/97
Reason:	Picked up broken glass from the basket of rubbish by accident during working hours
Source of Referral:	(A & E department in QMH) - tendon, artery & nerve repair - provide Kleinnerr Splint

Videotaped Clinical Assessment

A short video showing a part of a clinical assessment including the client performing tasks, was played when there was no more to be discussed about the referral. After watching the video, the students were asked to describe what they saw happening, describe their thinking about the

client's problems during the time they watched the video, and their thoughts about the future for this client.

Data Analysis

The interview transcripts were coded for levels of reflective judgement. The ideas or hypotheses generated by students were analysed through content analysis. The results of the three year groups of students were compared to discover any differences.

Referral and Video

In order to 'tap' the students' cognitive processing, an adapted version of the seven stage model of reflective judgement suggested by King and Kitchner (1985) was used (see Figure 2). The seven stages were collapsed into four, emphasising the distinction between *pre-reflective thinking*, *quasi-reflective thinking* and *reflective thinking*. The final stage was re-titled *reflective thinking-knowledge construction* to distinguish the highest level of reflective thinking according to this model. Students were categorised according to each level.

Figure 2: Stages of Reflective Judgment (adapted from King, & Kitchner, 1985)

Stage	View of knowledge	justification	Concept of
pre-reflective thinking	<ul style="list-style-type: none"> believes knowledge to be absolute knowledge can be obtained by direct observation knowledge is absolutely certain or certain but not immediately available views authorities as the source of all knowledge 	<ul style="list-style-type: none"> beliefs need no justification issues assumed to have right answer authority knows alternative beliefs are not perceived "I know what I have seen", "if it is on the news, it has to be true" 	
quasi-reflective thinking	<ul style="list-style-type: none"> knowledge is uncertain in certain areas, knowledge is contextual and subjective lost evidence allows ambiguity develops a beginning ability to interpret evidence 	<ul style="list-style-type: none"> chooses evidence that fits established beliefs context-specific interpretation of evidence "I'd be more inclined to believe evolution if they had proof. It's just like the pyramids: I don't think we'll ever know. Who are you going to ask? No one was there." 	

reflective thinking-	<ul style="list-style-type: none"> integrate evidence into coherent point of view information from variety of sources contributes to knowledge interpretation based on evaluation of evidence across contexts and evaluated opinion of reputed others solutions to ill-structured problems must be constructed rather than simply 'found' 	<ul style="list-style-type: none"> compared evidence and opinion from different perspectives across different context & by constructing solutions evaluate by criteria like weight of evidence, utility of solution, pragmatic need for action "it's very difficult in this life to be sure. There are degrees of sureness. You come to a point at which are you sure enough for personal stance on the issue"
reflective thinking-knowledge construction	<ul style="list-style-type: none"> outcome of reasonable inquiry with solutions to ill-structured problems objective judgments based on reasoning and evidence modify judgments based on new evidence if necessary 	<ul style="list-style-type: none"> conclusion defended as most complete with compelling understanding of issue with available evidence, open to criticism and reevaluation. "one can judge an argument by how well thought-out the positions are, what kind of reasoning and evidence are used to support it, and how consistent the way one argues on this topic is as compared with other topics"

Results

Of the thirty students interviewed, 19 students from all three years of the programme were found to be pre-reflective thinkers (see Figure 3). Nine students from years two and three were found to exhibit quasi-reflective thinking being able to acknowledge that knowledge is not absolute and were able to develop a beginning ability to interpret evidence. Two students appeared able to integrate evidence into a more coherent point of view, and drew information from different sources to contribute to their discussion and were therefore categorised as reflective thinkers. As expected, no students were found to be at the highest level of knowledge construction.

Figure 3: Analysis of stages of reflective thinking by year group

Stage of reflective judgement	Year 1 students	Year 2 students	Year 3 students
1 Pre-reflective thinking	10	7	2
2 Quasi-reflective thinking	-	3	6
3 Reflective thinking	-	-	2
4 Reflective thinking- knowledge construction	-	-	-

Pre-reflective Stage

At the pre-reflective thinking stage, students believe knowledge to be absolute and obtainable from direct observation. They view authorities as the sources of all knowledge. 'If the teacher said it, then it must be true.' An example of this level of thinking was expressed by the following students:

(Year 1 Student)

Q: As far as you can see from the video, what other information do you need?

S3: Em ...perhaps I need to know his psychological condition.

Q: Why?

S3: I learned in class that the psychological condition will affect the attitude of patients to the treatment. But what the video includes is about physical part, thus I can't think of anything else.

(Year 2 Student)

Q: What's your next step?

S14: Jot down assessment results.

Q: And?

S14: Plan the treatment goal ... oh, no. I should identify the problem of the patient first. I may check this from books. Then I try to find the most suitable treatment. I will decide short-term and long-term goals. Then I will match them with appropriate activities.

It would be expected that most first year students would not be able to think at a higher level in relation to client care because of their lack of knowledge and experience.

Students at this stage still use the knowledge obtained from authority figures but may guess, or volunteer their own opinion if no sure answer exists. The student feels that knowledge will be known in the future, that there is a correct answer, but may not know how to proceed:

(Year 3 student)

Q: What are your first thoughts?

S24: I read all the information provided in the referral.

Q: What comes up in your mind after reading them?

S24: When he comes, I will look into something superficial such as the condition of his hand and the healing of the wound. As he is transferred two months after injury, he may wear a splint. If it is true, I have to check whether I should modify it. Then I try to test his strength and ROM (range of motion) and their impact on his job.

Q: What will you do next?

S24: I will stop at this stage. If it is suitable, I will continue and revise.

(Year 2 student)

Q: Did you identify any problems of the patient according to the video?

S12: No.

Q: Why?

S12: His ROM was quite good, but I don't know his strength and sensation. I couldn't observe this from the video.

A student at this stage may also show a developing situational thinking that goes beyond the basic pre-reflective view of knowledge:

(Year 2 student)

Q: What else?

S15: I guess the patient was working, but he may stop working since he hurt his hand.

Q: What gave you such an idea?

S15: Most people's dominance hand is right, so this may cause greater inconvenience ... he didn't seem to get a good job and I guess he was a blue collar labour.

Quasi-reflective Stage

Quasi-reflective students are developing a beginning ability to interpret evidence but tend to base it on preconceived or established beliefs. They were able to identify problems of the client and consider alternative explanations. They had developed some situational thinking, but tended to first focus on facts such as what the video clip was about. They were able to consider some alternative explanations such as Year two student (S18) considering the cause of the problem was possibly an injury to the (finger) extensors or possibly rheumatoid arthritis. They were unable to give detailed information for further assessment except for the range of movement (ROM), and did not elaborate their ideas further. They were not well organised in their discussion and had difficulty prioritising information.

(Year 2 student)

Q: What is the impact?

S19: He may not be able to take care of himself, for example, he can't twist the towel. I need to determine its impact on his working ability by examining his job duties. He hurt his right hand and the influence of it is quite serious.

Q: How do you know that?

S19: If his dominance hand is his right hand, it causes more troubles and lots of inconvenience. This patient has dark skin (from the sun) and he looks strong, so I guess he is a labourer.

(Year 3 student)

S21: Although the referral provides diagnosis and medical history, but it doesn't mention the present situation of the patient.

Q: Why do you think this is important?

S21: The response or result of patient will vary from the notes written by the doctor. That's why I decide to do assessment right at the beginning. As a result, I would find out which part should be emphasized while I plan the treatment.

(Year 3 student)

S22: He works in the Urban Council and I think he may have sick leave with salary paid. I must check whether he has contact with his employer or not. If he is unable to do the same job, I may do a job matching or job analysis with him. I will train him up to fit in requirements of other jobs which he is interested in.

Reflective Stage

The students identified as reflective thinkers identified the problem from the beginning without re-stating facts. They were able to integrate information from both the referral and the video in relation to low self-esteem and emotional problems of the client due to the injury as is seen in the comment by S27. They seemed to use more sources on which to reflect, such as the referral and the video provided, books, clinical placement, and personal experience. They were able to integrate evidence into a coherent point of view, take information from a variety of sources and try to find evidence to substantiate their own opinion. The following student is an example:

(Year 3 student)

S28: It is so simple. I don't know what programme the patient is receiving. Is it tendon rehab and nerve? I have to find all these by myself. I feel a bit of a mystery about the purpose.

Q: What information do you find helpful?

S28: His age and family background. I also try to have a guess at his progress from the period of his injury. And I know his occupation and his hand dominance. In fact, the treatment for the hand will depend on hand dominance ... I think that more information should be provided such as the financial condition of the client and his family, his living environment and ...

Q: Why do you think so?

S28: My intuition. I have never handled similar cases during my clinical placements.

Q: What alternatives can you think of?

S28: The therapist was measuring ROM of the patient's wrist at the beginning of the assessment. This gives me an idea that he has an orthopaedic problem. It should be a problem of the nerve or tendon. I was sure it was a hand injury once I saw the condition of his hand. In fact, I have seldom seen therapists measure ROM so carefully. I don't know why, but I have the idea in my mind that he has a problem with his ulna nerve...

Q: Why do you say this?

S28: The shape of his hand. It was the claw hand deformity caused by problems with the ulna nerve. It is similar to what I have seen in books. I had this thought because I found that sensible. If the patient had a problem with his ulna nerve, we should measure his ROM.

Discussion

The researchers found, as might have been predicted, that there was a spread of students over the levels of reflective thinking. Some students who were enrolled as final year students were still working at a pre-reflective stage. It may be these students, particularly, whom we need to

further assess to determine their specific problems in order to assist them gain the important clinical reasoning skills for clinical practice.

Although the video is short, it contains enough information for students to integrate it with previous information they received from the referral. They were not informed however that the referral and video were of the same client and some students were not able to make this connection. Most of the students, particularly the first year students, found the video task much more difficult than the paper case. Some students were not familiar with the assessment procedures shown in the video. They found the information presented in the videotape case was not as clear-cut as that presented on paper.

In first attempting to analyse the data, the researchers found it difficult to determine what theme to choose for analysis. Clinical reasoning being about client's problems, we focused on the identification of occupational performance problems. Initially, students' responses specific to client's problems in relation to their first sentence were drawn out. The numbers of students were calculated who, for their first thought, identified issues felt to be particularly relevant to this client's occupational performance. Though it provided interesting information, no pattern emerged in the data, and the analysis did not distinguish clearly between students or indicate distinct levels of clinical reasoning. Most students at all years initiated their thinking with reference to the nature of the injury. Other students started talking by first mentioning the impact of the injury - the social and work issues which were particularly relevant to the client's occupational performance.

By understanding the present level of students' reasoning, faculty will be more attuned to students' learning needs, and more equipped to promote appropriate learning. For example, students at the pre-reflective stage of reasoning should be provided with more opportunities to voice their own ideas and justify their point of view, using group discussion and feedback. Faculty should not give 'all the answers' but should indicate that there may be no 'right' answer. Emphasis should be placed on the individual nature of each client in his or her own occupational roles. Students should be lead to think in the various modes of clinical reasoning which include procedural, interactive, and conditional reasoning. They must also have the opportunity to carry out narrative reasoning, that is the 'story-telling' which facilitates the therapist's understanding of the client's way of dealing with disability and includes pondering about how to handle client's problems. Students should be encouraged to critically analyse and evaluate their own, and others' ideas, and should be given confidence to generate new hypotheses, searching for appropriate evidence from different sources.

Conclusion

Occupational therapy students must learn to deal with multi-faceted and ill-defined problems which have no ideal solution. Many variables need to be taken into account when addressing such problems. Students need to learn to make judgements based on bio-psychosocial and professional knowledge about these problems and possible solutions.

Interviews involving a case study format allowed the researchers to explore students' levels of reflective judgement in relation to the understanding of a client's presenting problems and how they might envision the future for this client. Using an adapted model of King and Kitchner's Stages of Reflective Judgment, it appeared possible to categorise students' clinical reasoning skills into various stages. By defining students' levels of reasoning, teachers are able to provide appropriate experience and input on knowledge and skill acquisition to assist students to gain clinical reasoning skills.

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