Problem based Learning - a review of students' perceptions in an Occupational Therapy Undergraduate curriculum

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ABSTRACT

Background: *The Occupational Therapy department of the University of the Witwatersrand (Wits) has been following a hybrid Problem Based Learning (PBL) Model to teach its undergraduate students since 1993. It was introduced to better equip students with the skills to cope with the evolving healthcare sector in South Africa. Internationally, studies indicate that students have a positive attitude towards this method of instruction as it promotes lifelong learning skills, but South African data are lacking in this regard.*
Summary of Work: *A retrospective record review of existing data was used to ascertain students' opinions of the PBL process. Data were made available from a routine student assessment undertaken annually over two years. First to fourth year students completed questionnaires rating their opinions of the PBL process.*
Summary of Results: *Results identified that students were positive towards aspects of the PBL process, specifically around working in groups and carrying out self-directed learning tasks. But it was evident that this positive attitude fluctuates in the second to third year of the course as students have difficulty managing the work load before demonstrating improved coping skills in their final year. However, a majority of the students had a negative perception of the PBL process overall.*
Conclusions: *A variety of factors could be impacting on the students' overall perceptions of the PBL curriculum, possibly related to the hybrid nature of the course, and the work load. It is clear they also are distrustful of the process in supporting their skill and knowledge development.*

Keywords: Problem based learning, occupational therapy education, student perceptions

INTRODUCTION

The complexities of occupational therapy (OT) practice in an ever-evolving healthcare environment require the development of an innovative and flexible curriculum, to prepare graduates for practice within the South African healthcare sector[1,2]. Problem based learning (PBL) is a teaching method based on adult learning principles, aimed at supporting active participation to enable the acquisition of new knowledge and skills for use in practical situations[3]. Problem based learning as an instructional method was introduced in the 1980's by Howard S Barrows, following his research at McMaster University[4]. Whilst PBL has proved to be a popular method of instruction for health sciences, research around the efficacy for supporting clinical reasoning and problem solving is variable[5]. Colliver's[6] review of the literature around PBL efficacy in 2000, revealed limited evidence

that PBL significantly improves clinical skill and knowledge given the amount of resources that it requires. However these claims are ardently contested by supporters of PBL who identify the benefits of PBL as being more apparent in the long term[7]. Even though this method claims to facilitate deeper learning, it has frequently been documented that this learning process is often met with anxiety by the student population[8-11]. This is because students anticipate that PBL will result in knowledge gaps, and that the method takes too much time[2,8,9,12]. The Occupational Therapy Department at the University of the Witwatersrand (Wits) endeavoured to explore the perceptions of students in this regard, so as to enhance the integration of PBL into the curriculum. This article will address how the students have responded to the specific aspects of PBL such as working in groups, establishing learning objectives, carrying out self-directed learning, and working with facilitators, as well as how they feel about the curriculum overall, to assist with gathering evidence for PBL use within the South African context of allied health education.

In 1992 discussions commenced around a proposed change to the O T curriculum at Wits as it was becoming apparent that the client population was undergoing a metamorphosis due to socio-economic and political changes in South Africa[1]. A working party including clinicians, academics and key stakeholders in the community was formed to develop a "strategy for excellence in teaching…within the scope of the profession in Southern Africa"[13]. The working party identified that socio-economic and socio-cultural issues, medical condition trends, health politics and the distribution of occupational therapists, would require an adaptation of the curriculum. This discussion was fruitful as it prepared the department to be in line with objectives set by the future government's national health plan, which aimed to ensure access for all South Africans to adequate healthcare from 1994[1]. It was anticipated that these changes would have influence over where occupational therapists would be working, conditions to be treated, access to resources, and the population groups in their care.

The working party established that the undergraduate curriculum should be based on the following criteria - (i) it should have a problem solving approach, (ii) incorporate principles of adult education, (iii) explore the unique contribution of OT in primary, secondary and tertiary healthcare, (iv) become more community based/orientated, considering both urban and rural communities, (v) teach effective communication and management skills, (vi) address the needs of the total population, and (vii) shift the focus from learning skills to analysis and application[13]. These new curriculum objectives aimed to prepare the new graduate to cope with the evolving health care system in South Africa. It was decided that a PBL curriculum would be best suited to meet these development objectives.

LITERATURE REVIEW

Kahn and O'Rourke[14] described PBL, "as an instructional method in which the handling of a problem defines and drives the whole learning experience of the students"[14:3]. Barrows further describes PBL as a specific teaching method that addresses educational objectives, which supports the "..acquisition of a rich body of deeply understood knowledge; development of effective clinical problem-solving skills; and development of an insatiable curiosity …"[15:630]. These educational objectives foster self-directed learning, team and interpersonal skills, and a desire to continuously learn[16]. Constructivist theorists identified the effectiveness of PBL being due to it meeting their requirements of learning occurring as a result of interaction with the environment, cognitive conflict being the stimulus for learning, and social negotiation developing knowledge[17]. PBL as a practical method for learning the relevance of theoretical constructs can be support by other educational theorists such as Kolb[18], who advocate for the use of concrete experience and reflective observation. Some studies across the medical field have identified that problem based learning is linked to improving clinical reasoning skills, of which many authors argue is the basis to efficient practice in OT[2,3,5,19]. This was highlighted in a study by Scaffa and Wooster[3] which investigated the effects of PBL on clinical reasoning on 48 undergraduate OT students following an intensive 5 week PBL course. The results using the Self-Assessment of Clinical Reflection and Reasoning (SACRR) tool, indictated that a PBL course could significantly facilitate the development of clinical reasoning skills[3]. However another study by McCarron and D'Amico[5] contradicted the above findings by identifying that an 8-week intensive PBL course had little effect on 22 undergraduate OT students' clinical reasoning skills. It must be noted that both these studies highlight several limitations in their research, and that studies around PBL related to clinical reasoning in OT are scarce, with the majority of research focusing on students' perceptions rather than effectiveness of the method. It can be argued that OT literature around PBL only provides superficial evidence in terms of its effectiveness, with the majority of references being made to general educational theories and principles[5].

However research to support education in the health science and medical field is vast and extends back to the nineteen eighties and many allied health professions such as dentistry have adopted this method[15]. With regards to occupational therapists, authors have argued that in training the undergraduate therapist, enabling problem-solving skills and the ability to search for information has greater bearing than striving to learn facts and skills[20]. As a result PBL methods are becoming increasingly popular in occupational therapy training[5].

Following the outcome of the 1992 working party around the Wits OT curriculum, the PBL method of training was incorporated into the teaching of OT subjects from 1993 into all 4 years of the undergraduate programme. This included PBL sessions, enquiry seminars, workshops and skills laboratories interspersed with fieldwork opportunities. As the OT curriculum is integrated with courses from other schools within the University, a hybrid model had to be developed as courses such as anatomy; physiology, physics and chemistry follow traditional lecture based methods. An 8 year longitudinal study was commenced from 1994 to evaluate the effect of PBL on teaching and learning in the department, using the Biggs[21] study process questionnaire as well as the Course Evaluation from the Centre for Teaching and Learning at Wits. The results identified that the PBL method appeared to be a good strategy in assisting the students to think critically enabling deeper learning, as well as supporting them to become lifelong learners. However the department was aware that the students' opinions and perceptions about the course had not been adequately explored, as well as how they were coping from the change of learning from a traditional didactic style in secondary school to the PBL method in university. Through anecdotal evidence it was anticipated that learners would struggle to cope with this more self-directed change in learning.

This adaptation to a learner directed process in tertiary education is accurately reflected in Taylor's model which illustrates how students work through the change process. Wood[22] uses this model to reflect how students struggle with the change from traditional teaching to the PBL process. Students go through an initial period of shock and denial where they may work harder to try and cope, before the stronger emotions of resistance and withdrawal appear. It is illustrated that they then progress to a more affirmative stage of acceptance, direction and integration[22]. It can also be reasoned that learners have different styles of learning information, which can also affect their perceptions of education. It proves a challenge to institutions to cater for this, but it can be argued that PBL is the most adept method at incorporating a variety of learning styles to support the leaner[17].

Today PBL remains a fundamental element of the OT curriculum at Wits. Students are introduced to PBL in their first year and it is reinforced throughout the four years of study. By the time the students reach their final year they are accustomed to this method of study and can often complete the process independently with very little facilitation. The department is aware of the adjustment required by the students to this method and the need for further exploration around their adaptation to learning so that additional support can be provided or change to the curriculum made where necessary.

Purpose

The purpose of this study was to explore students' perceptions of learning in a PBL based curriculum, as these perceptions would be relevant when reviewing the curriculum on an annual basis to ensure students' needs were being addressed. The information gathered would also support ongoing evidence that the PBL curriculum is still an effective method of teaching the occupational therapy course content.

Objectives of this study

1. To review and analyse retrospectively departmental questionnaires on PBL for 2011 and 2012.
2. To explore the opinions of Occupational Therapy students regarding PBL method of instruction.

METHOD

Design

From 2011 all first, second, third and fourth year BSc Occupational Therapy students at Wits are requested to complete a PBL questionnaire, as part of a routine annual review process. The students participate voluntarily, and questionnaires are given out at the end of the year for students to return to the lecturer on completion. For the purposes of this study, the data from these questionnaires were used to explore student perceptions of the PBL curriculum (see *Table 1*).

Table: 1 Student response rate

Total students	Year	Return rate	Percentage compliance
1st – 40	2011	1st – 32	84%
2nd – 42		2nd – 39	
3rd – 43		3rd – 38	
4th – 36		4th – 26	
Total = 161		**Total = 135**	
1st – 54	2012	1st – 51	91%
2nd – 45		2nd – 39	
3rd – 36		3rd – 37	
4th – 37		4th – 31	
Total = 172		**Total = 158**	
333	**Total**	**293**	**88%**

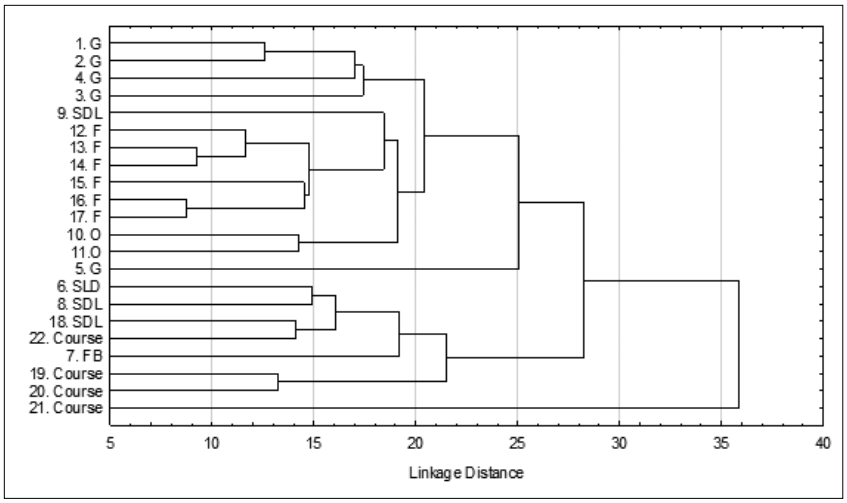

Figure: 1 Hierarchical Cluster Analysis

The questionnaire was developed by lecturers in the Occupational Therapy department who coordinated the PBL course. Existing questionnaires from the literature were reviewed; however a suitable questionnaire that covered the objectives of the research was not available. A questionnaire was therefore compiled using ideas and questions from various qualitative studies. The questionnaire consisted of 22 closed questions using a visual analogue scale and 3 open ended questions to ensure subjective and objective responses. Three negative questions were included in the 22 closed question set to avoid an all positive response. As this is part of a larger departmental research, this study only analysed the close ended questions.

The questionnaire was designed to identify students' perceptions of the specific characteristics of PBL instruction methods within the four year OT course. The closed questions were structured to explore how students felt about (i) working in groups, (ii) working with a facilitator, (iii) establishing their own learning objectives, (iv) conducting self-directed learning and (v) whether the Occupational Therapy PBL curriculum was beneficial overall.

Ethics

The data were initially collected for departmental developmental purposes; however formal approval was obtained from the Committee for Research for Human Ethics in order to use the responses for secondary analysis.

Data Analysis

For the purposes of this study, the visual analogue scale used on the 22 closed questions was converted to a 5 point Likert scale to assess responses to each of the 22 closed questions, ranging from strongly agreed (5) to strongly disagreed (1). The internal consistency demonstrated by Crombach's alpha ranges between 0.68 – 0.81, indicating that all the items on the test were reliable for the population of students[23].

The Hierarchical Cluster analysis is a statistical method, which identifies groups of samples that behave similarly or show similar characteristics, where a tree like structure is created to see the relationship among entities. This allows the researcher to identify what/who belongs in which group, with the aim of minimising variability within clusters and maximising variability between clusters. The clusters are determined by joining together similar observations (agglomerative method), which results in a sequence of groupings. The distance is based on Euclidean (measured with a ruler) distance in the sample axes. The complete linkage technique is based on the maximum distance between any two individuals in a cluster which represents the smallest (minimum diameter) sphere that can enclose the cluster[24]. This complete linkage technique analysis produced five clusters of questions for this study, between which the variables were different. The first cluster was predominant and characterised by group behaviour based questions (G). The second cluster concentrated on how students felt about the facilitator role (F). The third cluster was essentially around the achievement of objectives (O). The fourth cluster identified students' perceptions of self-directed learning (SDL), and the last cluster questioned how they felt about the OT course overall (Course) (see *Figure 1*). The clusters were then given headings as per the original questionnaire structure of Groups (G), Facilitator role (F), Objectives (O), Self-directed learning (SDL) and the overall Course (Course). Questions 5, 9 and 21 were excluded as they demonstrated insignificant pairing with other questions. Question 22 was also excluded, even though the variance it measured is closely related to the self-directed (SDL) cluster, as the question overall is very general and does not contribute to understanding the students' perceptions of PBL.

The frequency of the first – fourth year student responses to each of the cluster/grouped questions was then analysed using Statistica version 10 (Stasoft USA). These frequencies, expressed as percentages were displayed in a graph format and used to support the description of the data collected (see *Figure 1*).

Table 2: Student responses to group work

Responses	1st year	2nd year	3rd year	4th year
Strongly disagree %	6.9	8.0	9.3	3.1
Disagree %	4.5	7.8	10.0	7.5
Neutral %	12.7	14.4	27.0	16.7
Agree %	19.3	20.8	26.7	25.3
Strongly agree %	56.6	49.0	27.0	47.4

Table 3: Student responses to the facilitator role

Responses	1st year	2nd year	3rd year	4th year
Strongly disagree %	4.4	5.8	12.0	2.9
Disagree %	3.2	11.5	9.1	6.1
Neutral %	10.8	19.0	24.9	17.6
Agree %	25.5	27.8	33.8	38.0
Strongly agree %	56.1	35.5	21.1	35.4
No response %	0.0	0.4	12.0	0.0

Table 4: Student responses to establishing learning objectives

Responses	1st year	2nd year	3rd year	4th year
Strongly disagree %	16.3	5.8	12.0	4.4
Disagree %	9.1	13.5	16.0	16.7
Neutral %	15.2	30.8	34.7	24.6
Agree %	29.7	24.3	26.0	33.3
Strongly agree %	29.7	25.6	11.3	20.2
No response %	0.0	0.0	0.0	0.8

Table 5: Student responses to self-directed learning

Responses	1st year	2nd year	3rd year	4th year
Strongly disagree %	8.3	12.8	14.6	7.6
Disagree %	3.2	11.1	19.6	6.4
Neutral %	15.1	28.6	25.8	22.8
Agree %	21.8	18.0	20.9	28.7
Strongly agree %	50.0	29.5	19.1	34.5
No response %	1.6	0.0	0.0	0.0

Table 6: Students perception of the PBL course overall

Responses	1st year	2nd year	3rd year	4th year
Strongly disagree %	34.9	40.4	37.3	36.9
Disagree %	10.8	17.6	19.3	10.5
Neutral %	17.5	20.5	23.0	22.8
Agree %	18.4	8.0	13.4	17.1
Strongly agree %	18.4	13.5	7.0	12.7

RESULTS

Attitudes towards group work

Four questions made up the cluster to explore the students' attitudes to group work. Questions asked pertained to (i) working in groups, (ii) asking group members for help, (iii) if they felt respected by their group peers, and (iv), if they felt listened to. Student responses indicated that students from 1st, 2nd and 4th year had a strong affiliation with working in group settings as over 40% (148 of the 290 students) were in the "strongly agree" category. The third year cohort demonstrated a more varied response with just less 30% (103 of 375 responses) demonstrating that they had a 'strongly agree' response (See *Table 2*).

Attitude towards working with a facilitator

The questions in this cluster aimed to assess whether students perceived that the facilitator (i) assisted them in developing their reasoning process, (ii) guided and intervened when necessary to keep the group on track, (iii) promoted integration and synthesis of information, (iv) encouraged the use of a variety of resources, (v) listened and responded well to student concerns and problems, and (vi) used good judgment to provide information when necessary, but knew when to deflect some questions back to the group. The results demonstrated that most responses fell in the 'agree' to 'strongly agree' category, with 56% of the first years (279 of 498 responses) identifying that they 'strongly agree' with the facilitator performance (*Table 3)*. The second year responses also demonstrated a positive attitude with just over 35.5 % of the class (166 of 468 responses) scoring 5 (strongly agree). The fourth year responses were spread over neutral to strongly agree, however 35.4% (121 of 342 responses) identified that they did agree with the facilitator performance. Of the third years, 21.1% of the class (95 of 450 responses) scored 5 (strongly agree) for the facilitator-based questions, with 24.9% (108 of 450 responses) showing a neutral attitude. This however was still a higher percentage than the negative responses ie 1 (strongly disagree) of 12% (45 of 450 responses) of the class (See *Table 3*).

Learning objectives

This cluster contained 2 questions covering perceptions of whether students have good understanding of the learning objectives and whether they felt that they had mastered the learning objectives expected from the problems presented. The first years demonstrated a response of 29.7% (49 of 166 responses) for both the 'agree' and 'strongly agree' category, identifying that over half the class had a positive perception towards learning objectives (*Table 4*). Of the second and third years, many of responses lay within the neutral category, with over 30% of responses falling in this area for both classes, as well as the 4 (agree) category with 24.3% (38 of 156 responses) of second years and 26% (39 of 150 responses) of third years identifying this category. This was also true of the fourth years who scored a cumulative percentage of 53.5% in the positive category ('agree' – 'strongly agree') (See *Table 4*).

Self-directed learning

This research category comprised of 3 questions related to whether students felt that (i) their ability to find, read and analyse information had improved, (ii) the course helped them to obtain information from a variety of resources and (iii) they benefited from the process of researching and discussing the problems. The majority of the responses fell between the 'neutral' and 'strongly agree' categories, with a significant number (50%) of first years (126 0f 252 responses) strongly agreeing with the research process (*Table 5*). The second and third year cohorts demonstrated consistent responses over the five options, indicating that the classes had a varied opinion of self-directed learning. Over 30 % of the fourth year (59 of 171 responses) responses fell within the 'strongly agree' category.

Is the Occupational Therapy PBL course beneficial as a whole?

This theme included 2 questions to ascertain students' perceptions of the course as a whole. The questions explored issues around (i) whether students would like other classes structured like their OT course, and (ii) if they learned much more compared to other courses. The result demonstrated a significant response in the 'strongly disagree' category with responses of 25%-42% of every class identifying this category (*Table 6*) highlighting that almost half the students have a negative opinion of the PBL method.

DISCUSSION

The aim of this study was to explore OT undergraduate students' perceptions of the PBL process, specifically to ascertain their opinions around the fundamental aspects of assimilating information and skill, and how they felt about the process overall. The results indicated that while the majority of students enjoyed aspects of PBL, their overall opinion of this method of learning is more negative. This is in contrast to the literature which suggests that most students respond well to a PBL, curriculum[10,11,25]. Further understanding is needed as to why this is so.

The PBL process prescribes student collaboration in small groups as part of the learning process[25]. Therefore, one of this study's aims was to ascertain students' opinions of working in small groups. In general, the questions pertaining to group work elicited a positive response in the OT student population which could be seen as typical of their generation group. Studies and literature have highlighted that 'Generation-Y' learners (born between 1980-1994) have different learning styles and methods as well as different expectations of what their education should encompass, compared to previous generations[26,27]. These authors have indicated that as 'Generation-Y' students are reliant on social networking as a primary means of communication and interaction, they like working in groups, as they identify their peers as being a noteworthy learning source[28]. This has also been identified in studies in medical faculties, where student feedback showed that small group work encourages active participation, sharing information and valuing their fellow group members' views[25]. By having learners work collaboratively to ensure a successful team outcome, students are also fostering learning skills[22]. The group PBL forum helps students to test their own knowledge against the group members' understanding of the topic[17]. They also have the advantage of accessing the experiences of other group members to solve the problem[29,30]. Constructivism learning theory states "that a learning community where understanding and thoughts are discussed enables an enrichment of knowledge, and is essential to the design of a successful learning context"[17:37]. However the third year class demonstrated a more varied response. As the workload expectations increase substantially in this year, with the students having to tackle 11 problems, along with exposure to fieldwork blocks, the students may have been cognisant of the disadvantages of group work, by having experiences of the unequal distribution of work, and the hard work it requires to develop a team.

Along with group work, the facilitator role is crucial to guaranteeing success during the PBL process as described by Hmelo-Silver[30]. Again the students' responses were mostly positive in this regard; however there was more variance from first through to the final year. It can be reasoned that the first year students have greater reliance on the facilitator as they are novices within the PBL process. During the initial stages of the process, the tutor can take a more dominant role to guide students toward self-directed learning[11]. However, the literature guides facilitators in gradually reducing their dominant role as students become more aware of what is expected of them[11]. The role of the facilitator is not to take over by telling the students what to think or attempt to demonstrate expertise in the content. Rather the facilitator should model appropriate strategies such as reflective thinking[30]. In this stage of group development, such as in fourth year, there should be less direct facilitation so that students can test their self-directed learning skills. This change in dependence could also be reflected in the third years displaying a more varied response. In third year, part of the facilitator's role is negotiating with students for the group to assume more responsibility for learning[11]. Savery and Duffy[17] state that the teacher must assume the roles of consultant and coach, so that the learners' thinking is challenged through questioning strategies. This is something that students may find more demanding as they progress through the course.

Students' responses to their understanding and mastering of objectives demonstrated more variable responses. Savery and Duffy talk about "the learner's puzzlement as being the stimulus for learning"[17:32] suggesting that this curiosity creates the practical goals for learning. The learners' needs are central in identifying what should be learnt; hence the learner needs to create the objectives for them to have meaning[17]. This is why student-led objectives are important for deeper learning and understanding, however it appears that the students are mistrustful of this process. It can be reasoned that as the exploration of learning objectives are student-led there may be some disparity in the content objectives, and this may be perceived as being inconsistent, especially if the objectives are worded differently.

One of the primary objectives of PBL is to create self-directed learners. The indicators of self-directed learning is the ability to plan one's own learning, to develop and use strategies, and to use resources properly[30].This study indicated that the first years demonstrated the most positive opinion of this aspect of PBL. It can be argued that the first year students' skills in locating information and their ability to critically assess the information are still developing. However, they value the opportunity to be treated as adult learners. Their responses to this aspect of PBL may also be indicative of their stage in the change cycle, when their feelings of shock and denial at this change encourages an increased amount of effort which leads to a positive outcome[22]. As self-directed learning requires a more active process, the second and third year students may have found this difficult to manage with the increasing time pressures of the course. It can be argued that they are in the resistive/withdrawal stage of the change process, which contributes to the resistance against this learning style. The positive fourth year responses could indicate that there is an evolution in the students' perceptions of self-directed learning. They are beginning to see themselves as self-directed learners and the practical value of the problem solving approach, particularly in their fieldwork practice, which requires planning, analysis and decision-making; all of which are essential components of the PBL process[20].

Finally the results demonstrated that while the majority of students are positive towards components of PBL, they have a negative perception of the course. It can be reasoned that the students are reflecting on the time and effort required for a PBL based curriculum. This, coupled with the time and structure required due to practical exposure, may influence students' perceptions of the PBL process. Students may also perceive that the amount of content they learn is less in PBL, and this can be particularly prevalent when their objective is to pass an examination. This has also been found in other studies[2 8,9,12]. They may also perceive that they take longer to learn the content base, even though the process is facilitating deeper understanding and integrated learning[3]. Another challenge of PBL is that it assumes students have proficiency in the problem solving process, and this skill takes time to develop, which again may lead to the distrust some students have in the PBL system[22].

Students' ability to respond to changes in their learning procedures, their understanding and their evolving life roles from student to practitioner, may also account for their negative response to the PBL curriculum. This change cycle is evident in the responses between first to fourth years. The first year students tend to respond well to being treated as adult learners and so put in more effort to cope; however this then develops into distrust of the process in the second and third year. This distrust is influenced by their struggle to assimilate what is needed with regards to problem solving. In their final year they are more accepting of the process and begin to reflect and organise and integrate information, and so their responses to aspects of PBL are generally more positive[22].

The literature has argued that the PBL method of learning is most appropriate in facilitating the skill set needed for OTs, as it is a method that enhances, problem solving and inter-professional collaboration[3,9]. However some studies have shown that there is little difference in the reasoning skills between students in a conventional versus a PBL programme[5,6]. Is it therefore reasonable to expose students to the pressures of a hybrid PBL curriculum which requires extra time and effort? It can be reasoned that PBL provides the most well rounded approach to assist students with learning as it is a cognitive process that focusses both on the act of

acquiring knowledge and with the problem solving associated with the specific area or profession[17]. However we must be mindful of the challenges and evolution of the students which influences their perception of the PBL course, and of learning in OT as a whole. Being aware that their perception of the course varies between 1st - 4th years, appropriate support strategies can be put in place at these parts of the change cycle to provide the necessary support. Further review of the curriculum demands regarding paperwork, assessment and fieldwork can also be carried out to assist with the students' adaptation to the time intensive nature of PBL.

CONCLUSION

This study has illustrated that while Occupational Therapy students respond positively to aspects of PBL such as working in groups, engaging in self-directed learning and working with a facilitator, their overall opinion of PBL demonstrates some negativity, which is consistent with most literature on this subject[2,8,9,12]. It has been argued that this may be due to the nature of the hybrid OT course at Wits, where students struggle to adapt to different learning methods, as well as the amount of time required for engagement in the PBL process and the course as a whole. However, given that the needs of the South African health context are fluid and evolving, it would seem appropriate to institute the principles instilled by PBL as they are valuable in equipping students for their professional journey.

Limitations of this study need to be noted, specifically around the retrospective nature of this review, on data not captured specifically for this study. Further studies around graduate professional perceptions of the PBL teaching system, would be beneficial to further understand whether their experiences as students are beneficial in terms of skills and attitudes to problem solving and lifelong learning.

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