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Exploring student confidence within case-based learning: An action research study

The evidence supporting the use of case-based learning to build student confidence in applying theory to practice is developing. With the aim of addressing some identified concerns around occupational therapy students' confidence in applying clinical skills, modifications were made to an undergraduate case-based learning module. The impact of a student-written case-study session during which students could self-select their own groups was explored. Findings indicate that this session had a significant impact on improving student confidence in one of three clinical skills within the module content. Within this session, more students valued active learning approaches, than they did in the tutor-led case studies, where they tended to identify more didactic approaches as positively impacting on their confidence. The modifications made appear to have more effectively scaffolded engagement with case-based learning and perhaps consequently enhanced students' confidence in their abilities in applying their clinical skills.

Keywords: clinical skills, confidence, case-based learning, student-written cases, group allocation, scaffolding, pedagogy, health professional education

Introduction

Case-based learning (CBL) is a pedagogical approach often used to support pre-registration health professional students to prepare for clinical practice (Kantar & Massouh, 2015; Thistlethwaite et al., 2012). Students work through authentic case studies which provide repeated opportunities to apply theoretical knowledge and practice the skills required for their clinical roles in a 'real-world' context, during academic teaching sessions (Grendell, 2011; Richards & Inglehart, 2006; Thistlethwaite et al., 2012).

Within pre-registration health education there is a developing evidence base suggesting that CBL may improve critical thinking (Allen & Toth-Cohen, 2019), clinical reasoning and the ability to apply theory to practice (Murphy & Radloff, 2019). However, the body of research supporting the positive impact of CBL on students' knowledge and skill development remains variable (Kantar & Sailian, 2018; Mauldin Pereira, Artemiou, Conan, Köster, & Cruz-Martinez, 2018; Thistlethwaite et al., 2012). Allen and Toth-Cohen (2019) hypothesize that the research into the efficacy of CBL may be mixed because there is often insufficient attention paid to appropriate lesson design. They suggest that implementing strategies to improve confidence and reduce anxiety amongst students when using a CBL approach would allow a more comprehensive exploration of the effectiveness of this teaching and learning strategy.

There is a wide diversity of delivery approaches used within CBL, including variation in case presentation formats; case study duration, group size, and degree of lecturer facilitation (Murphy & Radloff, 2019; Thistlethwaite et al., 2012). One developing area of research in CBL is the use of student-developed rather than lecturer-developed case studies. This approach has been found to improve confidence in students in the fields of marketing (Boulocher-Passet, 2015) and social psychology (Saldaña et al., 2015). Within student-led CBL, students are encouraged to develop case studies using their own personal experiences and to draw upon their existing knowledge. The approach, in line with the theory of constructivism, supports the students' active exploration of new concepts by providing them with a familiar foundation to build upon. The opportunities for active learning are enhanced as students are involved in both the development and the analysis of the cases (Boulocher-Passet, 2015; Corrigan & Craciun, 2012; Escartín et al., 2015; Saldaña et al 2015). Additionally, when students develop cases themselves, they view CBL as more realistic and relevant, and become more emotionally involved in the process (Ashamalla & Crocitto, 2001; Boulocher-Passet, 2015; Corrigan & Craciun, 2012; Escartín et al., 2015; Saldaña et al., 2015; Saldaña, Carballeira, Espelt, & Antelo González, 2017). These are important factors in enhancing the motivation of adult learners (Wlodkowski & Ginsberg, 2017). Student-led CBL has been found to enhance interest and engagement and encourage a deeper approach to learning (Ashamalla & Crocitto, 2001; Boulocher-Passet, 2015; Careaga, Rubaii, & Leyva, 2017; Corrigan & Craciun, 2012; Vega, 2010). In some cases using student-led case studies has also been found to enhance academic performance (Escartín et al. 2015; Saldaña et al., 2017).

Thistlethwaite et al. (2012) have identified that further research is needed to better understand how students learn through CBL, particularly the relevance of the way case studies are prepared, and the impact of the approach on applying theory in practice, and preparing students for clinical experience.

Reflecting on my own delivery of CBL within a pre-registration undergraduate occupational therapy programme and observing the anxiety and issues with confidence in clinical skill development experienced by the students I teach, I have explored CBL as a teaching and learning strategy within my own practice with the aim of answering the following research questions:

1. How does CBL impact on students' confidence in their ability to apply three clinical skills in academic and practice settings?
   a. Interpreting assessments
   b. Intervention planning
   c. Clinical reasoning
2. What aspects of the CBL approach positively and negatively impact on students' self-confidence in demonstrating clinical skills?

Methodology

This study is an exploration of my 'everyday' teaching practice within higher education. I undertook it with the aim of developing possible solutions to the problems I identified within my role as a lecturer delivering content on a BSc occupational therapy programme at an English university. I used an action research approach as it aligns to this purpose (Denscombe, 2014; Riel & Rowell, 2017). I used the 'observe – reflect – plan – act' action research cycles (McDonnell & McNiff, 2016) to support development of new perspectives of my teaching approach but also, in line with action research methodology, to deepen my understanding of the students' perspective on their learning and how I could improve upon this (Cousin, 2009; McNiff & Whitehead, 2011). There were several uncontrollable variables that were likely to impact on this research, such as variation in teaching staff, rooms, timings, student attendance, and engagement. However, using the action research approach, I could acknowledge the unpredictability of the 'real world' in this context and through critically reflecting on this variability, improve my understanding of problems and issues that arose (Cousin, 2009).

In this report I have presented the methodology, findings, and discussion within the action research cycle structure.

Preliminary observations and reflections

At the time this study commenced I had been involved in the delivery of a first semester, second-year BSc occupational therapy module for two years. The aim of this module was to facilitate students to apply theory to practice and develop three key professional skills: interpreting assessments, intervention planning, and clinical reasoning. This module was delivered through CBL focusing on two lecturer-developed case studies interspersed with directive lectures. Students worked in groups of six to seven individuals to interpret an assessment carried out 'with' the individual presented in the case study and subsequently developed and justified an intervention plan.

In April 2019, reflecting on my observations of student performance and engagement, together with student and clinical educator feedback, I identified some key themes which suggested the need for improvement in teaching delivery. Although almost all students in each cohort passed the end of module summative assessment, there was evidence that many students were not transferring their knowledge and

skill development into practice. Clinical educators working with students in place-ment settings reported that students were either unable or unwilling to demonstrate the skills taught in the module in practice. On discussion with some of the students concerned, it appeared that this was often due to low confidence in their application of these skills. By not practicing these skills on placement, this could be potentially negatively impacting on the students' consolidation and further development of these skills (Allen & Toth-Cohen, 2019; Ikiugu & Smallfield, 2015) which are central to occupa-tional therapy professional practice.

I reviewed the summative assessment scripts for this module, and it appeared that many students were rote learning and minimally modifying the information presented to them in teaching sessions to reproduce in the examination. This suggested that students had been taking a surface learning approach within the module rather than developing an innate understanding of the principles (Biggs & Tang, 2011) and utilizing this to effectively implement the clinical skills.

I explored some of these issues with the students and they expressed anxiety around several issues within the module delivery which appeared to be impacting on their confidence and thus, likely to be encouraging them to take a more surface learning approach. Students reported that they had difficulties understanding the experiences of individuals in the case studies and therefore utilizing the cases authen-tically. These second-year students had minimal clinical experience to draw upon and so felt that they had to make unjustified assumptions about the person in order to complete the tasks set. For them, this felt in conflict with the person-centred approach that is central to occupational therapy practice.

In addition, most students had not yet encountered the skills covered in the module in practice, and so students reported feeling overwhelmed with the volume and complexity of the new module content and frustrated that more directive guidance was not provided within the CBL approach.

Planning and taking action

With the aim of addressing some of these challenges, I added an additional modified CBL session (case study 2, CS2) to the module, which differed from the traditional CBL delivery of the two other case studies within the module (CS1 and CS3) (Table 1). The modifications made in this session aimed to reduce students' anxiety around CBL delivery and the development of the complex skills within the module in order to improve their confidence in applying these skills. CS2 was delivered in one day, in contrast to CS1 and CS3 which were worked on over several weeks. The delivery of CS2 replaced some of the teaching time previously allocated to CS1.

Table 1 Structure of the module and data collection schedule

Weeks	Case focus	Teaching and learning activities	Number of directed teaching hours
1	N/A	Directive teaching (lectures and worked examples), group work, and independent study	21
2			
3			
4	CS1 – older adult, experienced a stroke	CBL with tutor-allocated groups plus independent study and formative assessment and feedback.	17
5			
6	Survey 1 completed		
	CS2 – teenager with anxiety	CBL with student-selected groups.	6
	Survey 2 completed		
7	CS3 – adult with a diagnosis of schizophrenia	CBL with tutor-allocated groups plus independent study and formative assessment and feedback.	22
8			
9			
10			
	Survey 3 completed		
11	N/A	Directive teaching (lectures), group work, tutorials, and independent study	13
12			

The key modifications I made for CS2 were:

1. *Using a more familiar case study*

   It was clear that the CBL approach required further scaffolding within the module. Students needed support to build their new skills and knowledge onto an existing foundation. Focusing on a case based around a person and condition the students were likely to have had some experience of within their personal life (a teenager with anxiety), students could draw upon previously developed understanding of a similar situation to apply their developing skill set. Their skill development and application of the CBL approach was therefore scaffolded, and the complexity of the teaching content was reduced to a level perceived as manageable by the student (Persky and Robinson, 2017; Saldaña et al., 2017).

2. *Student-selected groups*

   As the students reported feeling low in confidence in applying these skills, I decided to ask students to select their own groups during this session, to potentially enhance the peer-support available to them and reduce the requirement for students to have to negotiate interpersonal challenges that might come with randomly assigned groups. This would potentially allow more focus on skill development. There is evidence to suggest that when students are working in groups with peers they have selected themselves they feel more satisfied with their working relationships, trust the members of their group more, are able to

communicate more effectively, and feel more comfortable asking each other for help (Chapman, Meuter, Toy, & Wright, 2006; Myers, 2012). As had been observed on placement, the students were reluctant to practice their clinical skills when they did not feel confident, therefore again increasing the familiarity and support within the learning environment may potentially increase skill practice, discussion of issues within the case, and resolution of challenges.

3. *Student-developed case studies*

   To support students to be able to feel they were taking a more person-centred approach and to encourage a holistic and in-depth consideration of the case, I asked students to develop the case of a teenager with anxiety, themselves. In this way I aimed to support the students to create and connect with the person as if they were 'real' (Boulocher-Passet, 2015; Saldaña et al., 2015; Saldaña et al., 2017). This may then allow the students to feel that they could identify 'authentic' responses to assessments and intervention approaches without feeling that they were making assumptions about a person they did not know.

4. *Encouraging a creative approach and relaxed learning environment*

   At the start of this session, and before we introduced the health difficulties within this case, I asked students to use A1-sized paper and coloured marker pens to 'draw out' the person and the key elements of their lives; interests, hobbies, social circumstances, physical environment, strengths, personal difficulties, etc., which they would then share with the other groups in the room. Students could use descriptions, pictures, colours, and quotations to present a holistic overview of the person, encouraging them to interact in a creative and informal way with the aim of establishing a more relaxed learning environment. The creative nature of the student-led CBL approach has been found to enhance student enjoyment and engagement (Jones & Russell, 2008). As creativity is a core practice skill of newly qualified occupational therapists (College of Occupational Therapists, 2016), and one which attracts many students to the profession, I felt it would be beneficial to enhance this aspect of the session, drawing on a strength many students already held.

Participants

To determine whether these modifications had an impact on student confidence in applying these skills in practice and in the academic assessment, and to explore how the students experienced these differences I asked all fifty students (Table 2) enrolled in the module to participate in a research study. These fifty students constituted the whole second-year cohort, as this was a compulsory module. I handed out participant information sheets to each student before each survey and each of the students who did participate provided written informed consent.

Table 2 Descriptive characteristics of student cohort

	Number of students
Male	7
Female	43
Aged over 21	17
Aged 21 and under	33
Home/EU students	41
International students	9
Whole cohort	50

Instruments

I collected both numerical and textual data through self-administered paper-based surveys (Appendix 1). I handed these out to all students during teaching time, after each case study had been completed to maximize response rate (Table 1). I asked the students to identify a three-word 'code' (colour – shape – animal) that would be easily remembered and that they could use on each survey which would maintain their confidentiality and still allow me to identify the same respondent across the different surveys. As I was both the module lead and the researcher in this study, anonymity was particularly important to ensure that students did not feel coerced to participate or to respond positively.

I developed a bespoke survey tailored to the content of the module and the research questions. The surveys contained five-point Likert scales to measure students' self-perceived confidence in demonstrating three skills: interpreting an assessment, developing an intervention plan and clinical reasoning (Figure 1). Students were asked to identify their confidence in each of these skills in both an academic and clinical setting. The surveys also posed open ended questions to gather textual data to identify which elements of the teaching sessions had greatest impact on the students' confidence in applying each skill and which they most enjoyed.

1) *If you were to go on placement right now*, how confident would you feel **about demonstrating your clinical reasoning when justifying your intervention plan** *within clinical practice?* (please circle)

1	2	3	4	5	6
Not at all confident, would not know where to start	Not confident	Not very confident	Quite confident	Confident	Very confident, no concerns

Figure 1 Example of a survey question and the accompanying Likert scale

Ethical approval

I obtained ethical approval through a collective ethics application from the University of Liverpool Research Ethics Committee.

Analysis approach

I carried out Wilcoxon paired signed ranks tests on the numerical data to identify any significant difference in the students' confidence in demonstrating each skill between CS1 and CS2 and between CS2 and CS3. This non-parametric test was used due to the small sample size and absence of normal distribution. I only used the matched data collected from students who completed all the surveys in the statistical analysis, to provide a more accurate measure of confidence change between each case. However, I analysed the textual data from all participants, regardless of the number of surveys they had completed, to ensure that all students' views could be considered. This would ensure any modifications made to the teaching and learning approaches would benefit the greatest number of students.

I carried out a quantitative content analysis (QCA) on the textual data (Mayring, 2015) collected after each case study to identify the aspects of the teaching and learning strategies that most students felt impacted on their confidence for each case study. Most responses were too brief and not sufficiently descriptive of individual experiences to allow identification of subjective meanings and carry out a full qualitative analysis. QCA was an appropriate choice for analysing survey data as the same questions were asked to all participants in the same way (Pope, Ziebland, and Mays, 2020). It also allowed a representation of the opinions of the whole cohort with reasonable confidence. Where longer textual responses were given by participants, they were used to illustrate possible explanations and provide context to the findings.

Observations and reflections

Thirty-two students completed the first survey, twenty-seven students completed the second and twenty-two students completed the third survey. Thirteen students completed all three surveys (response rate 37.5%).

After completing CS1, the median students' confidence score was 3 (not very confident) for all skills except for *intervention planning in the exam*, where the median score was 4 (quite confident (Table 3). After completing the newly designed CS2, students' confidence significantly increased in two areas; *interpreting assessments in the exam* ($p=0.01$) and *interpreting assessments in a clinical setting* ($p<0.05$). After completing CS3, there was a significant increase in student confidence in *intervention planning in a clinical setting* ($p<0.05$).

Table 3   Median student confidence ratings

Skill	Context	Median confidence after CS1 (week 6)	Median confidence after CS2 (week 6)	Median confidence after CS3 (week 10)
Interpreting assessment	in the exam	3	4*	4
Interpretation assessment	on placement	3	4*	4
Intervention planning	in the exam	4	4	4
Intervention planning	on placement	3	3	4*
Clinical reasoning	in the exam	3	4	4
Clinical reasoning	on placement	3	3	4

*indicates a significant change, $p < 0.05$

Over 30% of students found four aspects of CS2 most important in enhancing their confidence: group work, developing their own case study, skills practice, and peer review (Figure 2).
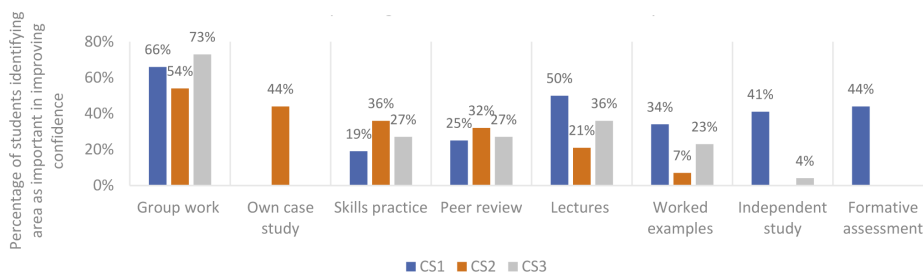

Figure 2   Variation in percentage of students who found different aspects of CBL important in improving confidence for each case study

These findings provide some evidence to suggest that the CBL approach may have a positive impact on confidence in skill application and self-perceived preparedness for clinical placements which is consistent with other research findings exploring CBL in a range of health professional pre-registration programmes; nursing (Kantar & Massouh, 2015), occupational therapy (Allen & Toth-Cohen, 2019; Murphy & Radloff, 2019), and veterinary science (Patterson, 2006).

Incorporating CS2 into the module did not negatively impact student confidence, and over much shorter duration of teaching and learning compared to CS1 and CS3 had a significant positive impact on student confidence in interpreting the assessment in both an academic assessment and clinical context.

Working in groups

Working in groups was the most divisive area in terms of impact on confidence across all three case studies. Most students found that group work was a key factor in improving their confidence in all three case studies (Figure 2). However, during the CBL sessions where the groups were allocated by the lecturer, a large proportion of students also reported that group work reduced their confidence (CS1: 44%; CS3: 36%).

There were clear issues with managing interpersonal difficulties within the tutor-selected groups. For example, *Pink hexagon otter* found that, in CS3, their confidence was affected by 'not feeling comfortable in the group to say maybe the goal could be improved'. Variable contribution of individuals within the group, which is an issued commonly raised by students in tutor-selected groups (Careaga et al., 2017; Weidenbusch et al., 2019) was described in CS3 by *Orange cone flamingo*, 'Not everyone in the group contributed to this but then criticized what was done by others'.

In contrast, a much smaller proportion of students (7%) identified that working in self-selected groups (in CS2) had this detrimental effect and several explained that this aspect of the session was particularly important in boosting their confidence.

> It was good to go through different ideas with people I was confident and comfortable around (*Black octagon dog,* CS2)

Self-selecting groups, has been found to positively impact on student satisfaction (Mantzoris & Kehrwald, 2014; Rusticus & Justus, 2019) and reduce issues with group dynamics (Chapman et al, 2006) and shared contribution (Myers, 2012; Rusticus & Justus, 2019). *Orange hexagonal parrot* described the difference in their experience based on how the groups were allocated:

> CS1: Not having choice of group [negatively impacted on my confidence] as some people are very difficult to work with as they like being in control and it makes group work not enjoyable.

> CS2: Choosing our own group [positively impacted on my confidence] as I felt comfortable saying my ideas even if they weren't correct.

The interpersonal challenges that arise when students work in tutor-allocated groups could, in time, lead to development of, and an increase in confidence in, skills that are crucial for student health professionals in the workplace: improving team working skills and building empathy, understanding, and appreciation of individual differences (Careaga et al., 2017; Rusticus & Justus, 2019). However, Weidenbusch et al. (2019) emphasize the importance of scaffolding interactive engagement by initially setting a 'low threshold' for student contribution. Cooper, Downing, and Brownell (2018) found that group work has the potential to both increase and decrease student anxiety. When students fear negative evaluation by their peers, their anxiety increases. However, working in a group can also provide social support to calm concerns around areas of confusion and allow normalization of aspects the students are finding challenging. Students may therefore need to first build confidence in more familiar groups during

CBL, before being allocated to new groups where they may then experience less performance-related anxiety and can benefit from a diversity of viewpoints and work on developing their team working skills (Careaga et al., 2017). *Purple triangle alpaca* recognized some benefits of group working but only when they were working with familiar peers*:*

> CS1: Different approaches from different people can be confusing. Everyone had different ideas of goals and interventions.

> CS2: Working as a group helped as we all have different ideas and experiences.

Student-led case studies

Developing and using student-written case studies was the third most cited area that students felt improved their confidence across all the three case studies, with 44% of students reporting this as a key factor in improving their confidence in CS2. Almost half of the students (48%) reported that developing and working on their own case study was the most enjoyable aspect of the teaching and learning delivery. Students commented that they enjoyed the 'more visual' approach (*Purple cylinder meerkat*) and that this task involved 'creative/ innovative thinking' (*Pink pentagon panther*). Other studies exploring student-led case studies have also highlighted the increase in students' tendency to use more creative and imaginative approaches when using CBL in this way (Bailey, Sass, Swiercz, Seal, & Kayes, 2005; Escartín et al, 2015; Vega, 2010).

The novelty of the approach clearly enhanced interest and engagement which Boulocher-Passet (2015) also found among marketing students. In line with the same research study, a large number of comments relating to CS2 also emphasized that students felt the cases were more grounded in the 'real world' which was a key factor in the development of their confidence. *Blue triangle owl* stated 'Actually using the case study itself was beneficial as it made it more realistic'.

The benefit of the student-led case study approach and the related sense of enhanced familiarity with the case, was particularly highlighted by students in relation to interpreting the assessment tool, the skill where there was a significant increase in student confidence.

> Creating our own character was helpful to use with MOHOST [the assessment tool] as it gave us a better understanding of a person to apply assessment to. (*Yellow triangle horse*)

> Linking the person to the MOHOST was quite easy because you were able to see what they found difficult (*Black octagon dog*)

The lack of significant change in students' confidence in the other two skill areas (intervention planning and clinical reasoning) could be explained by the shorter time spent on these areas in the session. Assessment skills are covered first when working

on the case study, and this needs to be addressed thoroughly before moving on to the other skills. As CS2 was covered in a much shorter timeframe than the other case studies, there was less time available for students to practice their intervention planning and clinical reasoning. It is therefore possible that with additional time and further opportunity to practice, confidence in these areas using this approach to CBL may have also increased significantly.

It was clear that students drew from and shared their own lived experiences which brought a richness and a holistic approach to the development of the cases, deepening the learning experience (Ashamalla & Crocitto, 2001; Boulocher-Passet, 2015). For example, students who had lived outside of the U.K. explained how their physical and cultural environments and daily activities differed from others in the group and their case focused on how transitioning to a different country could impact on the mental health of the individual in their case. Students also incorporated a range of issues particularly relevant for adolescent development; for example, bullying, sexuality, gender identity, family breakdowns, and social media influence, which led to enthusiastic and spontaneous debate and discussion. This emotional involvement in learning has been found to enhance both motivation and performance among adult learners (Wlodkowski & Ginsberg, 2017). An additional benefit with this approach was that other students within the group gained greater empathy and insight into the lives of their peers, which could potentially support the reduction of bias within the case and enhance the inclusivity within the students' future practice (Ashamalla and Crocitto, 2001; Careaga et al., 2017).

Active learning approaches: skills practice and peer review

More students identified that active, student-centred strategies (skills practice, peer review) positively impacted on their confidence when completing the student-led case study (CS2) than when they were working on the tutor-led case studies (CS1 and CS3) (Figure 2). In contrast, didactic approaches (lectures and worked examples) were cited by a larger proportion of students as important in improving their confidence during the tutor-led case studies.

The increased value placed on active learning approaches and the decreased reliance on didactic teaching in CS2 could have been due to the students experiencing lower levels of anxiety during this session. Cooper, Downing, and Brownell (2018) found that active learning approaches within groups can both increase and decrease anxiety. However, anxiety is reduced if students' fear of negative evaluation from others can be minimized, for example by students working with more familiar peers or more accessible content, as was the case in CS2, and if they feel able to share any challenges they are experiencing about the session content. The increased familiarity with both the individual in the case, and the individual's diagnosis, along with the social support from their peers may have provided sufficient scaffolding to allow the students to replace the lecturer's external direction with their own internal guidance and therefore feel more confident in engaging with student-led approaches (Kirschner, Sweller, & Clark,

2006; Persky & Robinson, 2017). In addition if students felt a greater sense of 'ownership' or connection with the case and how it progressed, rather than being 'passive observers' of the tutor's case study, this may also explain their reduced reliance on the lecturer's 'expertise' (Bailey et al., 2005).

Limitations

This study had several limitations. The small convenience sample limits the applicability to other contexts. A baseline measurement of confidence in each of the skills would have provided a useful comparison of change for CS1. It would also have been useful to survey the impact of a second student-led case study to more accurately explore whether impacts on confidence were due to the 'type' of case study or the increased familiarity with the CBL approach.

There were many variables that changed during the delivery of each case study, some of which are discussed in this report, though it was not possible to identify and review them all. These additional variables may also have impacted on the findings of the study. Further research could focus on modifying only one aspect of the CBL approach at a time, such as authorship of the case studies and aim to control all other variables, such as duration of delivery of the case study.

The brevity of the textual responses within the survey limited my understanding of students' experience and it was a challenge to ensure fidelity to the students' opinions in presentation of the results. Use of focus groups or interviews, or, in greater fidelity to the action research approach, reviewing the findings with the students would have confirmed the accuracy of the representation of the participants' views (Cousin, 2009).

Planning for future practice

This study provides evidence of some positive impacts of CBL and the use of student-led cases in my own practice: building confidence in skill acquisition, scaffolding knowledge and skill acquisition, developing enhanced awareness of the perspectives of others, and increasing the perceived value of student-centred learning strategies. As an educator on a health professional programme, the students' perception of working on student-led cases as more authentic and person-centred is also an important factor in enhancing engagement in this teaching and learning strategy. In addition, I am encouraged by the impact that this university-based teaching approach has had on enhanced student confidence in applying skills in clinical settings. If students can develop this confidence before they attend clinical placements, this could then encourage them to practice and therefore develop these skills in 'real-world' settings, maximizing learning opportunities within their placement experiences.

Within my practice I will continue to use self-selected groups and familiar case backgrounds to provide scaffolding to allow students to build familiarity with module content and develop their confidence in using the CBL approach. The transition to tutor-allocated groups, to allow students to allow students to benefit from the advan-

tages of these, and the introduction of more complex cases will be introduced later in the module once basic knowledge and skills and a sufficient level of confidence has been established across the cohort.

Conclusion

This study suggests that modifications in the delivery of CBL did impact on student confidence in interpreting clinical assessments within this second-year pre-registration module. Over 40% of students found that developing their own case study was an important factor in both enhancing their confidence and increasing their enjoyment within the teaching session. When engaging in a session that involved developing their own case studies, the findings suggested that students valued the role of more active learning approaches over more directive methods. The students also identified that group work played an important role in building confidence within the CBL sessions. However, some students reported that being allocated to groups, rather than being able to select their own, had the opposite effect, negatively affecting their confidence in the development of their skills.

Although the limitations of this study, and the nature of action research as a methodology, do limit the generalizability of the findings, I hope that the planning considerations I have outlined for my own practice may be useful to other educators to reflect upon. Further research is needed to explore the delivery and impact of student-developed cases within CBL for health professional education and other specialisms to explore the benefits and challenges of this approach.

Acknowledgements

References

Allen, D. D., & Toth-Cohen, S. (2019). Use of case studies to promote critical thinking in occupational therapy students. *Journal of Occupational Therapy Education*, *3*(3). https://doi:10.26681/jote.2019.030309.

Ashamalla, M. H., & Crocitto, M. M. (2001). Student-generated cases as a transformation tool. *Journal of Management Education*, 25(5) 516–530. https://doi:10.1177/105256290102500504.

Bailey, J., Sass, M., Swiercz, P. M., Seal, C., & Kayes, D. C. (2005). Teaching with and through teams: Student-written, instructor-facilitated case writing and the signatory code / Enseigner avec et par le travail en équipe : écriture de cas par les étudiants aidés par l'enseignant. *Journal of Management Education*, (29)1, 39–595. https://doi:10.1177/1052562904269641.

Biggs, J. B., & Tang, C. (2011). *Teaching for quality learning at university: What the student does* (4th ed.). Maidenhead: McGraw-Hill.

Boulocher-Passet, V. (2015, 3–5 June). *Shifting the challenge to students in an international marketing class: The value of having students write teaching cases* [Paper presentation].

Annual EDINEB International Conference: Critically questioning educational innovation in economics and business: Human interaction in a virtualising world, Brighton, UK. https://cris.brighton.ac.uk/ws/portalfiles/portal/391436/V+BOULOCHER-PASSET+-+The+value+of+having+students+write+teaching+cases.pdf.

Careaga, M., Rubaii, N., & Leyva, S. (2017). Beyond the case method in public affairs education: Unexpected benefits of student-written cases. *Journal of Public Affairs Education*, *23*(1), 571–590. https://doi:10.1080/15236803.2017.12002270.

Chapman, K. J., Meuter, M., Toy, D., & Wright, L. (2006). Can't we pick our own groups? The influence of group selection method on group dynamics and outcomes. *Journal of Management Education*, *30*(4), 557–569. http://dx.doi.org/10.1177/1052562905284872.

College of Occupational Therapists (2016). *Entry level occupational therapy care knowledge and practice skills.* London: College of Occupational Therapists.

Cooper, K. M., Downing. V. R., & Brownell. S. E. (2018). The influence of active learning practices on student anxiety in large-enrollment college science classrooms. *International Journal of STEM Education*, *5*(23). https://doi.org/10.1186/s40594-018-0123-6.

Corrigan, H., & Craciun, G. (2012). Wearing more than one hat: Improving student-authored case longevity while encouraging additional student roles. *Marketing Education Review*, *22*(1), 33–38. https://doi: 10.2753/MER1052-8008220106.

Cousin, G. (2009). *Researching learning in higher education: An introduction to contemporary methods and approaches*. London: Routledge.

Denscombe, M. (2014). *The good research guide: For small-scale research projects* (5th ed). New York: McGraw-Hill Education.

Escartín, J., Saldaña, O., Martín-Peña, J., Varela-Rey, A., Jiménez, Y., Vidal, T., & Rodríguez-Carballeira, Á. (2015). The impact of writing case studies: Benefits for students' success and well-being. *Procedia – Social and Behavioral Sciences*, *196*, 47–51. https://doi:10.1016/j.sbspro.2015.07.009.

Grendell, R. N. (2011). Narrative pedagogy, technology, and curriculum transformation in nursing education. *Journal of Leadership Studies*, *4*(4), 65–67. https://doi:10.1002/jls.20197.

Ikiugu, M. N., & Smallfield, S. (2015). Instructing occupational therapy students in use of theory to guide practice. *Occupational Therapy in Health Care*, *29*(2), 165–177. https://doi:10.3109/07380577.2015.1017787.

Jones, K. A., & Russell, S. (2008). Using case method teaching and student-written cases to improve students' ability to incorporate theory into practice. *Journal of Teaching in the Addictions*, *6*(1) 35–47. https://doi: 10.1080/15332700802126278.

Kantar, L. D., & Massouh, A. (2015). Case-based learning: What traditional curricula fail to teach. *Nurse Education Today*, *35*(8), e8–e14. https://doi:10.1016/j.nedt.2015.03.010.

Kantar, L. D., & Sailian, S. (2018). The effect of instruction on learning: Case based versus lecture based. *Teaching and Learning in Nursing*, *13*(4), 207–211. https://doi:10.1016/j.teln.2018.05.002.

Kirschner, P. A., Sweller, J., & Clark, R. E. (2006). Why minimal guidance during instruction does not work: An analysis of the failure of constructivist, discovery, problem-based, experiential, and inquiry-based teaching. *Educational Psychology*, *41*(2), 75–86.

Mantzoris, E., & Kehrwald, B. (2014). Allocation of tertiary students for group work: Methods and consequences. *Ergo*, *3*(2), 3–13.

Mauldin Pereira, M., Artemiou, E., Conan, A., Köster, L., & Cruz-Martinez, L. (2018). Case-based studies and clinical reasoning development: Teaching opportunities and pitfalls for first year veterinary students. *Medical Science Educator*, *28*(1), 175–179. https://doi:10.1007/s40670-017-0533-y.

Mayring, P. (2015). Qualitative content analysis: Theoretical background and procedures. In A. Bikner-Ahsbahs, C. Knipping, & N. Presmeg (eds). *Approaches to qualitative research in mathematics education: Examples of methodology and methods* (pp. 365–380). Dordrecht: Springer.

McDonnell, P., & McNiff, J. (2016). *Action research for nurses*. London: Sage. https://doi:10.4135/9781473967342.

McNiff, J., & Whitehead, J. (2011). *All you need to know about action research* (2nd ed.). London: Sage.

Murphy, L., F., & Radloff, J., C. (2019). Using case-based learning to facilitate clinical reasoning across practice courses in an occupational therapy curriculum. *Journal of Occupational Therapy Education*, *3*(4). https://doi:10.26681/jote.2019.030403.

Myers, S. A. (2012). Students' perceptions of classroom group work as a function of group member selection. *Communication Teacher*, *26*(1), 50–64.

Patterson, J. S. (2006). Increased student self-confidence in clinical reasoning skills associated with case-based learning (CBL). *Journal of Veterinary Medical Education*, *33*(3), 426–431. https://doi:10.3138/jvme.33.3.426.

Persky, A. M., & Robinson, J. D. (2017). Moving from novice to expertise and its implications for instruction. *American Journal of Pharmaceutical Education*, *81*(9), 72–80. https://doi:10.5688/ajpe6065.

Pope, C., Ziebland, S., & Mays, N. (2020). Analysis. In C. P. N. Mays (ed.). *Qualitative research in health care* (4th ed.) (pp. 111–133). Oxford: Wiley.

Richards, P. S., & Inglehart, M. R. (2006). An interdisciplinary approach to case-based teaching: Does it create patient-centered and culturally sensitive providers*? Journal of Dental Education*, *70*(3), 284–291. https://doi.org/10.1002/j.0022-0337.2006.70.3.tb04084.x.

Riel, M. M., & Rowell, L. L. (2017). Action research and the development of expertise: Rethinking teacher education. In L. L. Rowell, C. D. Bruce, J. M. Shosh, & M. M. Riel (eds). *The Palgrave international handbook of action research* (pp. 667–688). New York: Palgrave Macmillan.

Rusticus, S. A., & Justus, B. J. (2019). Comparing student- and teacher-formed teams on group dynamics, satisfaction, and performance. *Small Group Research*, *50*(4), 443–457. https://doi:10.1177/1046496419854520.

Saldaña, O., Carballeira, A., Espelt, E., & Antelo González, E. (2017, 3–5 July). Development and analysis of psychosocial case studies by students to build bridges between theoretical concepts and everyday reality. *Proceedings of EDULEARN17 Conference*, Barcelona, 3–5 July. https://online.une.edu/wp-content/uploads/2018/12/Development-and-Analysis-of-Psychosocial-Case-Studies.pdf.

Saldaña, O., Carballeira, A. R., Espelt, E., Jiménez, Y., Porrúa, C., Escartín Solanelles, J., … Vidal, T. (2015, 17–18 Nov.). Development of psychosocial case studies by students to improve their ability to understand and analyze human behavior. *Proceedings of ICERI 2015 Conference*, Seville, 17–18 November. http://diposit.ub.edu/dspace/bitstream/2445/114808/1/656199.pdf.

Thistlethwaite, J. E., Davies, D., Ekeocha, S., Kidd, J. M., MacDougall, C., Matthews, P., … Clay, D. (2012). The effectiveness of case-based learning in health professional education. A BEME systematic review: BEME Guide No. 23. *Medical Teacher*, *34*(6), e421–e444. https://doi:10.3109/0142159X.2012.680939.

Vega, G. (2010) The undergraduate case research model. *Journal of Management Education,* *34*(4), 574–604. https://doi:10.1177/1052562909349923.

Weidenbusch, M., Lenzer, B., Sailer, M., Strobel, C., Kunisch, R., Kiesewetter, J., … Zottmann, J. M. (2019). Can clinical case discussions foster clinical reasoning skills in undergraduate medical education? A randomised controlled trial. *BMJ Open*, *9*(9). https://doi:10.1136/bmjopen-2018–025973.

Wlodkowski, R. J., & Ginsberg, M. B. (2017). *Enhancing adult motivation to learn: A comprehensive guide for teaching all adults* (4th ed.). San Francisco, CA: Wiley.

Appendix 1 – Sample Survey

1) *If you were to take the exam right now*, how confident would you feel about **interpreting MOHOST** *as part of this assessment*? (please circle)

1	2	3	4	5	6
Not at all confident, would not know where to start	Not confident	Not very confident	Quite confident	Confident	Very confident, no concerns

2) *If you were to go on placement right now*, how confident would feel about **interpreting MOHOST** *in clinical practice*? (please circle)

1	2	3	4	5	6
Not at all confident, would not know where to start	Not confident	Not very confident	Quite confident	Confident	Very confident, no concerns

3) *If you were to take the exam right now*, how confident would you feel about **identifying appropriate goals and intervention plans** *as part of this assessment*? (please circle)

1	2	3	4	5	6
Not at all confident, would not know where to start	Not confident	Not very confident	Quite confident	Confident	Very confident, no concerns

4) *If you were to go on placement right now*, how confident would you feel **about identifying appropriate goals and intervention plans** *in clinical practice*? (please circle)

1	2	3	4	5	6
Not at all confident, would not know where to start	Not confident	Not very confident	Quite confident	Confident	Very confident, no concerns

5) *If you were to take the exam right now*, how confident would you feel about **demonstrating your clinical reasoning when justifying your intervention plan**? (please circle)

1	2	3	4	5	6
Not at all confident, would not know where to start	Not confident	Not very confident	Quite confident	Confident	Very confident, no concerns

6) *If you were to go on placement right now*, how confident would you feel **about demonstrating your clinical reasoning when justifying your intervention plan** *within clinical practice?* (please circle)

1	2	3	4	5	6
Not at all confident, would not know where to start	Not confident	Not very confident	Quite confident	Confident	Very confident, no concerns

7) What aspects, if any, of the teaching, group work and/or independent study around the Flo case study do you think improved your ability to:

   a) effectively interpret MOHOST?

   b) develop goals and intervention plans?

   c) Use clinical reasoning to justify your decisions?

8) What aspects, if any, of the teaching, group work and/or independent study around the Flo case study do you think made it more challenging to develop your skills in:

   a) effectively interpreting MOHOST?

   b) developing goals and intervention plans?

   c) Use clinical reasoning to justify your decisions?

9) What aspects of working on this case study did you enjoy the most?

10) What aspects of working on this case study did you enjoy the least?