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## Preparing for Problem-based Learning (PBL): Evaluating expectations and readiness for programme change

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### ABSTRACT

Problem-based learning (PBL) is a student-centred pedagogy that utilises complex instructional scenarios to aid students in transitioning from theory to practice. PBL may offer a pertinent and effective strategy for developing fundamental competencies, skills, and attitudes in physiotherapists. PBL as a pedagogical practice is controversial, though, with arguments for and against the approach. As such, the University of Nottingham has reaccredited the BSc Physiotherapy program, which uses PBL as a pedagogy. This study analyses staff and student readiness before implementation.

This study, conducted by the School of Health Science (SoHS), seeks to evaluate the preparedness and anticipations of students, staff, and clinicians regarding programme change. The findings will provide a set of initial measures for implementing the programme. The evaluation follows a mixed-methods, sequential design. The collection of quantitative data was achieved by a newly developed and validated questionnaire with first-into-second-year students. The qualitative data were obtained from focus groups and interviews. The collection of qualitative data investigates the perspectives and expectations of several stakeholders, including first-into-second-year students, staff, clinician and a patient, regarding the implementation of PBL and the new curriculum.

The internal consistency of our questionnaire was assessed using Cronbach's alpha, which yielded a value of 0.83 for a total of 19 items. Additionally, the KR-20 coefficient was calculated to be 0.86 for a subset of two items. The content validity was assessed by calculating the item level content validity index (I-CVI) scores provided by three experts and ten students, and the I-CVI was 0.88. Thirty first-into-second-year students completed the questionnaire. Nine first-into-second-year students participated in focus group interviews. Seven staff, a clinician, and a patient participated in individual interviews. Results from the questionnaire are presented in a narrative report. Five domains summarise the stakeholder perspectives about programme change, including: Quality of communication, Consistency of teaching, Approach to learning, Attitude to change, and Support structures. Analysis of the data collected indicates the need for proficient preparation. This evaluation demonstrates the importance of evaluating stakeholder perspectives prior to the implementation of an educational approach.

**Keywords:** problem-based learning, PBL, evaluation, expectations, readiness

### Introduction

#### Background

Problem-based Learning (PBL) is a student-centred pedagogy that has existed in the education of health professionals since McMaster University pioneered the curriculum in the 1960s (Tejeda Castellanos et al., 2022; Wondie et al., 2020). Barrows (1968) first published the PBL approach, although Servant (2016)

highlights several founding fathers for the PBL curriculum. PBL requires well-designed clinical scenarios for problem-solving and the accumulation of knowledge (Marwa Ahmed et al., 2014).

PBL integrates the acquisition of knowledge with the development of basic skills necessary for clinical application (Avrech Bar et al., 2018). Consequently, PBL is an appropriate educational approach for physiotherapy and sports rehabilitation curricula. PBL presents current, relevant, and challenging instructional scenarios to help students transition from theoretical comprehension to practical implementation in complex service situations (Spalding & Killett, 2010).

According to a recent integrative literature review analysing the use of PBL in physiotherapy education, PBL is a pertinent and effective strategy for developing fundamental competencies, skills, and attitudes in physiotherapists (Silva et al., 2022). Furthermore, the systematic review by Pathmanathan et al. (2022) concluded that PBL is effective (when compared to traditional methods) in developing competencies, such as evidence-based practice, although further research is required. Students are also able to define their personal goals for learning using the case as stimuli (Kibret et al., 2021).

The success of an intervention depends on more than its theoretical soundness (Azer, 2009). Dos Santos (2016) suggests that the need for more well-defined practices for implementing PBL is a significant obstacle. To identify and address potential challenges, it is essential to evaluate PBL prior to implementation (Almulhem & Almulhem, 2022; Nilson, 2016). It has been claimed that solely assessing the results of PBL is inadequate for evaluating its effectiveness (Moallem et al., 2019). Instead, the success of PBL is also influenced by the evaluation of its implementation (Moallem et al., 2019). Consequently, it is critical to provide equal consideration to the viewpoints of both students and facilitators in order to enhance this process (Almulhem & Almulhem, 2022).

## Rationale

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The University of Nottingham's recently reaccredited BSc Physiotherapy programme is a PBL curriculum and is integrated with a BSc (Hons) Sports Rehabilitation programme. Learning is designed to focus on key, generic aspects of physiotherapy and rehabilitation. However, knowledge is developed through a series of authentic case studies that encourage students as self-directed learners to prepare for the future challenges of healthcare. The programme cohort size of 70 is around average in the UK sector. Cohort size is an important consideration with learning design, especially PBL as group size can influence outcomes (Lohman & Finkelstein, 2000). Staffing and estate resources need to be considered in-line with cohort size. The shift to PBL is a move away from a curriculum which, although included elements of case-based and collaborative learning, was predominantly traditional and didactic.

Research suggests clinicians consider PBL to be particularly effective in developing domain-independent skills and fundamental competencies in entry-level physiotherapy education (Lennon et al., 2019; Silva et al., 2022). However, students' acceptance and expectations of their role and that of the facilitator are largely influenced by their exposure to traditional education (Al-Kloub et al., 2014). Effective problem-solving is not always instinctive for many students. Therefore, in the absence of adequate planning and satisfactory preparation, the initial implementation may not always be a smooth process (Al-Kloub et al., 2014). Throughout problem-based learning (PBL), students may encounter feelings of doubt and confusion, a substantial workload, and a dearth of confidence (Al-Kloub et al., 2014). Students see PBL as time-consuming, with limited guidance, resulting in feelings of stress and frustration (Yuan et al., 2011).

When implementing new educational methods, Azer (2009) argues the significance of investigating students' views and perceptions of the approach. Students' perspectives on PBL can provide insightful information about their learning process (Turcotte et al., 2022). In turn, this allows tutors to meet the needs of their students better (Ghani et al., 2021).

Facilitators play a crucial role in guiding students through PBL (Ahmad et al., 2021). However, many tutors find relinquishing their traditionalist, administrative position uncomfortable and, at worst, challenging (Lim & Choy, 2014; Mitchell & Rogers, 2020). Pedagogical success hinges on the execution of a standardised operation (Lim & Choy, 2014). Thus, education as content transmission must be overcome for facilitators to collaborate with the PBL process (Silva et al., 2022). The readiness of staff and students for a new pedagogy, that may be at odds with their accustomed practices, is of the utmost importance.

Moreover, clinical facilitators' guidance can contribute to the cognitive demands of the PBL sessions (Burgess et al., 2018). According to Burgess et al. (2018), students expressed that having clinician facilitators proved to be more effective in achieving their learning objectives with respect to a particular problem scenario. Students perceived that the comments provided by a seasoned clinician as a facilitator were precise and pertinent to their clinical needs (Burgess et al., 2018). Consequently, a decision was made to additionally solicit the perspectives of clinicians regarding the transition to problem-based learning (PBL).

Conducted by the School of Health Science (SoHS), the following evaluation aims to assess the readiness and expectations of students, staff and clinicians for programme change. The findings will inform a set of baseline measures for programme implementation and key programme outcomes that can be utilised in a longitudinal design and follow-up.

### Aim and objective

The main aim of this study is to identify the variables that may influence the implementation of a problem-based learning (PBL) pedagogy at the School of Health Sciences (SoHS). This will be achieved by evaluating the students, staff, and clinicians' levels of knowledge, expectations, and readiness.

### Methodology

This evaluation is based on a mixed-methods sequential design. Quantitative data was collected through a newly developed and validated online questionnaire of "Students' Readiness and Expectations for Programme Change" (Figure 1 A&B) administered to incoming, prospective students for the academic year (23/24), and existing physiotherapy students. Questionnaires provide participants with anonymity, which may encourage more honest responses than alternative data collection methods (Sutton & Austin, 2015). The qualitative designs employed for data collection involved triangulation of qualitative data obtained from focus groups (FGs) and interviews. These designs were utilised to investigate the perceptions and expectations of 18 stakeholders about the implementation of PBL. With the objective of affording students more flexibility in articulating their viewpoints, the FGs with first-into-second-year students encompassed similar questions to those outlined in the questionnaire, with a question asking about students' perspectives about staff readiness. Such approaches enable in-depth, extended discussion that may not be gleaned from isolated questionnaires (Young et al., 2018) as there is an opportunity to observe nonverbal cues, emotions, and surrounding variables that may influence participant responses (Guest et al., 2020; Young et al., 2018).

## Instrumentation

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The data-gathering process involved the utilisation of three distinct methods: 1) a questionnaire to first-into-second-year students; 2) semi-structured interviews with a total of seven staff members, one clinician, and one patient; and 3) semi-structured FGs with first-into-second-year students, consisting of five and four students, respectively.

The collection methods were developed following an informal sensitising activity on the new programme implementation, which highlighted facilitators' attitudes towards PBL. To contextualise the study and inform the research design, two researchers (EV and WM) attended several staff meetings about the preparation of the curriculum transition. Notes were recorded during these meetings to document the primary discussions, concerns, and proposed actions associated with the transition to PBL in the curriculum. This multifaceted approach contributed valuable insights from lecturers' perspectives, thereby facilitating the organisation of the research context, especially the semi-structured interview guide.

Moreover, observations made from this activity were collated and used while creating questionnaire items based on recurring concepts. These meetings were held in the process of preparing for the implementation of the new programme. Observations were made during lecturers' meetings at the SoHS at the University of Nottingham, during which strategies were deliberated, tasks were assigned, and efforts were coordinated to ensure a successful implementation.

The questionnaire and semi-structured interview schedules were piloted and adjusted with the guidance of a PBL expert, who is an assistant professor in adult nursing at the Faculty of Medicine & Health Sciences, University of Nottingham. The expert is imminently completing a PhD at the University of Lincoln, exploring PBL in nursing education. A second resource informing the preliminary list of items was literature on the characteristics associated with successful performance in a PBL environment (Fisher & King, 2010; Hawkins et al., 2016; Rovers et al., 2018).

Items were categorised into seven subscales: Demographics, Principles of PBL, Readiness, Self-assessment, Expectations, Concerns, and further comments. Responses were anonymous and collected using two types of Likert Scales, and a multi-answer framework. Sections 3-5 used a 5-point Likert scale ranging from 1 ('Strongly agree') to 5 ('Strongly Disagree'). Section 7 is a text-based response that was added to the end of the questionnaire for further comments.

The questionnaire was piloted with 10 students to establish internal consistency, calculated using Cronbach's alpha and Kuder-Richardson Formula 20 (KR-20). Subsequent feedback provided on item relevance, layout, and clarity was utilised for validity calculation and questionnaire modification. Three PBL experts also reviewed it to ensure content validity. The index of content validity (CVI) was computed using the Item-CVI (I-CVI), as suggested by Yusoff (2019).

The pilot showed acceptance from participants, and revisions and reductions were made, resulting in a 24-item questionnaire. Data from the pilot phase were only used to pilot-test and evaluate the reliability and validity of the questionnaire and were not included in the main data analysis.

## Sampling and data collection

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The study comprised a sample size of 48 individuals, consisting of 39 first-into-second-year students (30 completed the questionnaire, and nine participated in FGs), seven staff members, and two public engagement participants (a clinician and a patient). The rationale behind administering the questionnaire

to first-into-second-year students was to evaluate their readiness and expectations regarding the PBL pedagogy. On the other hand, for first-into-second-year students, our objective was to assess their readiness and expectations regarding the PBL pedagogy, as well as their perspective on the faculty's readiness for the change. To provide them with greater flexibility in expressing their viewpoints, we conducted FGs with them.

To conduct pilot testing, first-year prospective students were emailed with the link to the questionnaire. The purpose of this administration was to obtain 10 responses, after which the collection of responses was discontinued, and the data from these 10 responses were used to analyse the internal consistency.

Consequently, as a method of open recruitment, the online questionnaire was administered by one researcher (EV) to all first-into-second-year students who were preparing to commence physiotherapy and sports rehabilitation programmes (n=107). Daily or bi-daily reminders were sent out to the students.

Upon completing the questionnaire, students were invited to attend a follow-up, semi-structured FG interview on Microsoft Teams®. Of the sample, nine students were selected on a first-come, first-serve basis.

<b>Section 1: Demographic Information</b>				
Q1: Programme of study:		Physiotherapy [ <input type="checkbox"/> ]	Sport Rehabilitation [ <input type="checkbox"/> ]	
Q2: Gender:		Female [ <input type="checkbox"/> ]	Male [ <input type="checkbox"/> ]	Non-binary [ <input type="checkbox"/> ]
		Prefer not to say [ <input type="checkbox"/> ]	Other [ <input type="checkbox"/> ]	
Q3: Current Year of Study: _____				
<b>Section 2: Principles of Problem-based Learning (PBL)</b>				
Q4: Are you aware of the new programme?				
Yes [ <input type="checkbox"/> ]	No [ <input type="checkbox"/> ]	Somewhat [ <input type="checkbox"/> ]	Not sure [ <input type="checkbox"/> ]	
Q5: Do you feel you have an adequate understanding the new programme aims?				
Yes [ <input type="checkbox"/> ]	No [ <input type="checkbox"/> ]	Somewhat [ <input type="checkbox"/> ]	Not sure [ <input type="checkbox"/> ]	
<b>Section 3: Readiness for Programme Change</b>				
Q6: I am open to adopting the new programme.				
Strongly agree [ <input type="checkbox"/> ]	Agree [ <input type="checkbox"/> ]	Neutral [ <input type="checkbox"/> ]	Disagree [ <input type="checkbox"/> ]	Strongly disagree [ <input type="checkbox"/> ]
Q7: I feel adequately prepared to adopt the new programme.				
Strongly agree [ <input type="checkbox"/> ]	Agree [ <input type="checkbox"/> ]	Neutral [ <input type="checkbox"/> ]	Disagree [ <input type="checkbox"/> ]	Strongly disagree [ <input type="checkbox"/> ]
Q8: I expect to enjoy actively participating in Problem-based Learning through the new programme.				
Strongly agree [ <input type="checkbox"/> ]	Agree [ <input type="checkbox"/> ]	Neutral [ <input type="checkbox"/> ]	Disagree [ <input type="checkbox"/> ]	Strongly disagree [ <input type="checkbox"/> ]
Q9: I feel anxious about adopting the new programme.				
Strongly agree [ <input type="checkbox"/> ]	Agree [ <input type="checkbox"/> ]	Neutral [ <input type="checkbox"/> ]	Disagree [ <input type="checkbox"/> ]	Strongly disagree [ <input type="checkbox"/> ]
Q10: I would prefer to learn through only traditional teaching methods (e.g., lectures).				
Strongly agree [ <input type="checkbox"/> ]	Agree [ <input type="checkbox"/> ]	Neutral [ <input type="checkbox"/> ]	Disagree [ <input type="checkbox"/> ]	Strongly disagree [ <input type="checkbox"/> ]
<b>Section 4: Self-Assessment of Skills and Attributes</b>				
Q11: I am comfortable working in groups and collaborating with my peers.				
Strongly agree [ <input type="checkbox"/> ]	Agree [ <input type="checkbox"/> ]	Neutral [ <input type="checkbox"/> ]	Disagree [ <input type="checkbox"/> ]	Strongly disagree [ <input type="checkbox"/> ]
Q12: I can think critically and analyse complex problems.				
Strongly agree [ <input type="checkbox"/> ]	Agree [ <input type="checkbox"/> ]	Neutral [ <input type="checkbox"/> ]	Disagree [ <input type="checkbox"/> ]	Strongly disagree [ <input type="checkbox"/> ]
Q13: I am motivated and self-directed in my learning.				
Strongly agree [ <input type="checkbox"/> ]	Agree [ <input type="checkbox"/> ]	Neutral [ <input type="checkbox"/> ]	Disagree [ <input type="checkbox"/> ]	Strongly disagree [ <input type="checkbox"/> ]
Q14: I am confident in my ability to communicate effectively with others.				
Strongly agree [ <input type="checkbox"/> ]	Agree [ <input type="checkbox"/> ]	Neutral [ <input type="checkbox"/> ]	Disagree [ <input type="checkbox"/> ]	Strongly disagree [ <input type="checkbox"/> ]
Q15: I am open to receiving feedback and incorporating it into my work.				
Strongly agree [ <input type="checkbox"/> ]	Agree [ <input type="checkbox"/> ]	Neutral [ <input type="checkbox"/> ]	Disagree [ <input type="checkbox"/> ]	Strongly disagree [ <input type="checkbox"/> ]
Q16: I can manage my time effectively and meet deadlines.				
Strongly agree [ <input type="checkbox"/> ]	Agree [ <input type="checkbox"/> ]	Neutral [ <input type="checkbox"/> ]	Disagree [ <input type="checkbox"/> ]	Strongly disagree [ <input type="checkbox"/> ]

Figure 1A 'Students' Readiness and Expectations for Programme Change' questionnaire (sections 1 -4)



Section 5: Expectations of PBL

Q17: The new programme will improve my understanding of Physiotherapy/ Sport Rehabilitation.

Strongly agree [ ]      Agree [ ]      Neutral [ ]      Disagree [ ]      Strongly disagree [ ]

Q18: The new programme will provide a more interactive way of learning.

Strongly agree [ ]      Agree [ ]      Neutral [ ]      Disagree [ ]      Strongly disagree [ ]

Q19: The new programme will help put concepts into practice.

Strongly agree [ ]      Agree [ ]      Neutral [ ]      Disagree [ ]      Strongly disagree [ ]

Q20: The new programme will better prepare for clinical scenarios.

Strongly agree [ ]      Agree [ ]      Neutral [ ]      Disagree [ ]      Strongly disagree [ ]

Q21: The new programme will foster deeper understanding of content.

Strongly agree [ ]      Agree [ ]      Neutral [ ]      Disagree [ ]      Strongly disagree [ ]

Section 6: Concerns

Q22: What apprehensions, if any, do you have about the new programme? *Select all that apply.*

[ ] Difficulty navigating the transition

[ ] Lack of accustomed support systems

[ ] Difficulty understanding the new concept

[ ] Fear of having to relearn skills

[ ] Uncertainty of outcome

[ ] Additional workload expectations

[ ] None of the above

Q23: What challenges do you foresee in the new programme? *Select all that apply.*

[ ] Time management, organisation and deadlines

[ ] Understanding complex topics

[ ] Adapting to group learning

[ ] Keeping track of progress

[ ] Studying in a non-traditional way

[ ] None of the above

Section 7: Further Comments

Q24: Do you have any further comments regarding the new programme?

Figure 1B ‘Students’ Readiness and Expectations for Programme Change’ questionnaire (sections 5 -7)



Seven members of the teaching staff, together with two individuals from the public (a clinician and a patient), were invited to participate in semi-structured individual interviews. Incentive vouchers were offered accordingly. Each interview discussed the stakeholders' perceptions and expectations of the new programme. Interviews with staff also discussed implementation preparation to assess readiness. All interviews followed a semi-structured format to elicit stakeholders' views on specific constructs. However, open-ended questions were used to allow for conversation and extended discussion.

### Data analysis

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A hybrid approach of inductive (for interviews) and deductive (for questionnaire) analysis was used to conduct this evaluation. The questionnaire data was exported from Microsoft Forms® to an Excel sheet and then analysed by the Statistical Package for Social Sciences (SPSS) version 28.0. The data were analysed using descriptive statistics (e.g., percentages).

All interviews were audio-recorded and transcribed verbatim on Microsoft Teams®. The evaluation team corrected the auto-transcribed text manually, and the interview transcripts were carefully read and re-read. This familiarisation phase ensures that independent ideas are identified and understood. Data were subject to thematic analysis using semantic coding analysis (Braun & Clarke, 2006). Each transcript was coded by identifying comments that seemed relevant to the evaluation, which were grouped into developed domain summaries.

### Ethical considerations

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This study has been reviewed and given a favourable opinion as an educational evaluation by the Research Ethics Committee at the School of Health Sciences, University of Nottingham (Ref: FMHS 315-0623). Written consent was obtained from all participants prior to data collection. To reward participation, students were given the opportunity to enter a raffle to win a £100 Amazon Voucher. Pseudonyms have been employed instead of real identities to maintain individuals' confidentiality throughout this research.

## Results

### Measurement quality

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Reliability statistics are as follows. The Cronbach's alpha was 0.83 (n of items = 19), showing very good internal consistency and reliability of items (Ursachi et al., 2015). The KR-20 was 0.86 (n of items = 2). This is considered excellent (El-Uri & Malas, 2013; Streiner, 2008).

Content validity was calculated using the I-CVI scores of three experts and ten students. The overall CVI of the instrument was 0.88, indicating a high representation of the construct (Surip et al., 2019).

### Participant demographic characteristics

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Thirty students (24 female and six male) completed the questionnaire (a response rate of 28%). Of the students who participated, 20 studied Physiotherapy, and 10 studied Sports Rehabilitation. Nine first-into-second-year students participated in FG interviews. Seven members of staff participated in an individual interview. Most of the staff participants were PBL facilitators (57.1%), while the remaining

participants were experienced lecturers who were responsible for leading new accompanying facilitators. One clinician and one patient were interviewed for public engagement purposes.

### Questionnaire results

Below are the results of the descriptive statistics of the student questionnaire with the frequency distribution for each question.

**Table 1** Student questionnaire responses (%) for Section 2.

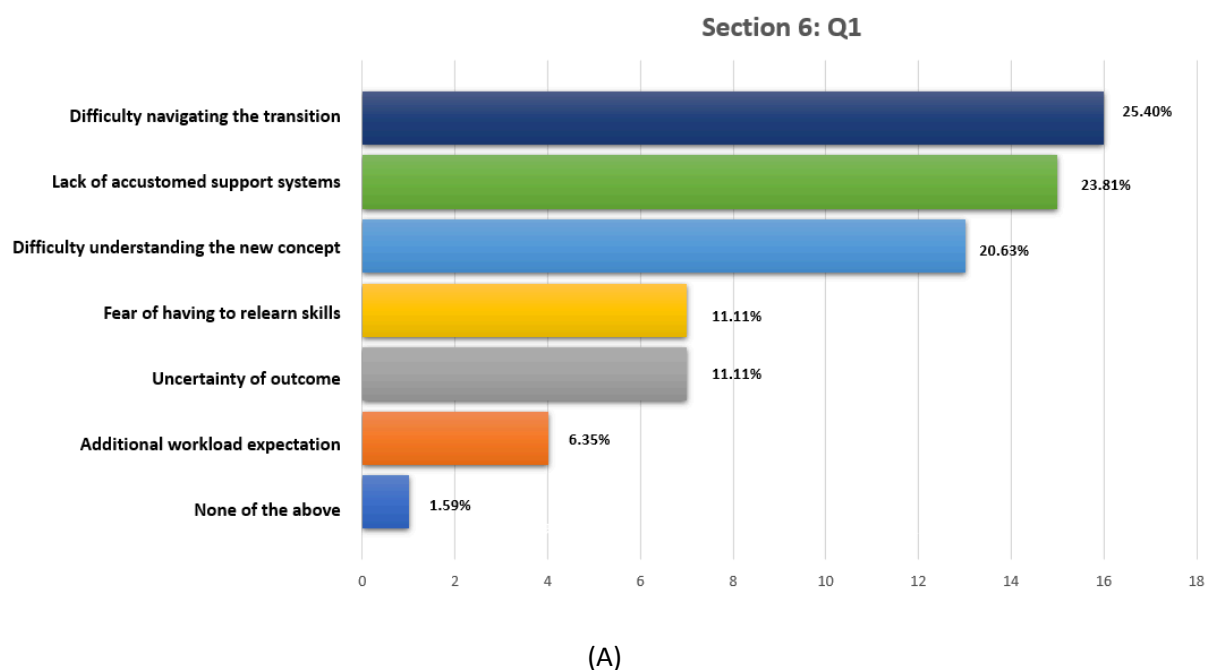
Section	Question	Yes	Somewhat	Not sure	No
2	Are you aware of the new programme?	50.0 %	43.3%	--	6.7%
	Do you feel you have an adequate understanding of the new programme aims?	10.0 %	60.0%	6.7	23.3 %

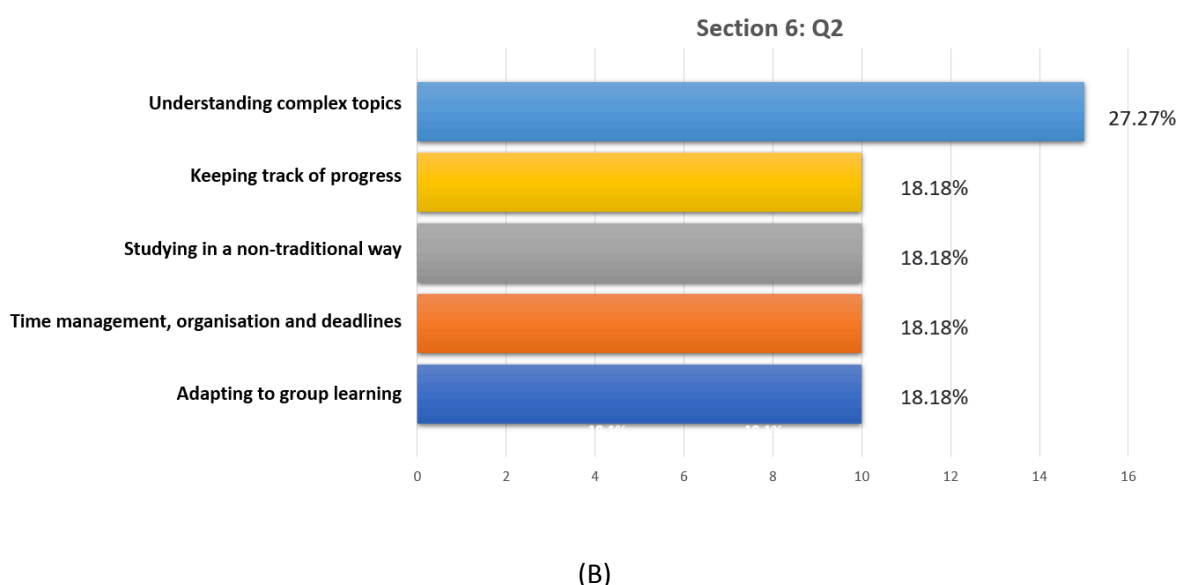
**Table 2** Student questionnaire responses (%) for Section 3-5

Section	Question	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
3	I am open to adopting the new programme.	23.3%	66.7%	6.7%	3.3%	--
	I feel adequately prepared to adopt the new programme.	6.7%	30.0%	46.7%	16.7%	--
	I expect to enjoy actively participating in Problem-based Learning through the new programme.	26.7%	66.7%	6.7%	--	--
	I feel anxious about adopting the new programme.	--	23.3%	40.0%	36.7%	--
	I would prefer to learn through only traditional teaching methods (e.g., lectures).	--	10.0%	30.0%	40.05	20.0%
4	I am comfortable working in groups and collaborating with my peers.	33.3%	43.35	23.3%	--	--
	I can think critically and analyse complex problems.	10.0%	70.0%	20.0%	--	--
	I am motivated and self-directed in my learning.	30.0%	46.7%	16.7%	6.7%	--
	I am confident in my ability to communicate effectively with others.	36.7%	53.3%	10.0%	--	--
	I am open to receiving feedback and incorporating it into my work.	63.3%	33.3%	3.3%	--	--
	I can manage my time effectively and meet deadlines.	30.0%	60.0%	10.0%	--	--
	The new programme will improve my understanding of Physiotherapy/ Sport Rehabilitation.	13.3%	30.0%	56.7%	--	--

5	The new programme will provide a more interactive way of learning.	13.3%	53.3%	33.3%	--	--
	The new programme will help put concepts into practice.	16.7%	60.0%	23.3%	--	--
	The new programme will better prepare for clinical scenarios.	16.7%	56.7%	26.7%	--	--
	The new programme will foster a deeper understanding of content.	6.7%	46.7%	46.7%	--	--

Most students (90%) indicated that they are open to adopting the new programme, with a large proportion of respondents expecting to enjoy PBL as opposed to only traditional teaching methods. The results suggest that students encompass the skills to succeed on a PBL pedagogy, where 75% perceive themselves as motivated and self-directed in their learning. However, over one-third of students still have some anxiety about the new programme. As is evident above, students agreed that the new programme would provide a more interactive way of learning and help put concepts into practice. However, nearly 60% of students remain indifferent about the impact the new programme would have on their understanding of physiotherapy and sports rehabilitation. It seems most students (90%) are not certain of the new programme aims. Figure 2A and B provide student questionnaire results for questions 1 and 2 in sections 6 (questions 22 and 23).





**Figure 2** Section 6 results. (A) Student questionnaire results for question: ‘What apprehensions, if any, do you have about the new programme. Select all that apply.’ (B) Student questionnaire results for question: ‘What challenges do you foresee in the new programme? Select all that apply.’

As the results in Figure 2 indicate, evidence suggests that students might be apprehensive about the implementation of PBL, potentially due to the lack of accustomed support systems and expected difficulty navigating the transition. Most of the students’ concerns reside with understanding complex topics. However, Table 1 (Section 4, Q2) shows that 80% of students agreed (including 10% strongly agreeing) that they may be able to think critically and analyse complex problems, although it is recognised that cognitive processing was not ‘measured’ using a specific tool in this questionnaire. The remaining 20% were indifferent to this statement.

Upon completion of the questionnaire, students were afforded the opportunity to provide further comments in an open-ended text box. Most spoke of needing more information about the new programme. This was discussed further in FG interviews.

### Results from focus group and individual interviews

This section presents a concise overview of the findings derived from the FG interviews conducted with students, as well as individual interviews conducted with staff members, a clinician, and a patient. Five domain summaries were developed from stakeholder narratives on programme change that may influence the future implementation of a PBL pedagogy in the SoHS, including: Quality of communication, Consistency of teaching, Approach to learning, Attitude to change, and Support structures.

#### *Quality of communication and knowledge*

During the FG interviews, students were asked to discuss their awareness of the new programme. Student Charlie responded:

I don’t really know what to expect [...] I’ve got quite a lot of anxiety about it because we don’t seem to have had much information about how our learning is going to change. (Student Charlie, July 13, 2023)

Across both FGs, there was consensus that students had limited awareness of how they would learn (the pedagogy) on the new programme. This suggests that a lack of information is hindering their transition.

Clear and effective communication is pivotal when implementing a new educational approach. Staff also reported confidence in their understanding of the new programme. However, it was apparent that a PBL pedagogy would push some staff out of their traditional comfort zone. Many staff discussed involvement in the preparation phase of implementation as a cause for concern. Staff Riley and Staff Taylor explained that the lack of (initial) involvement was unsettling:

[...] broke the team apart a little bit in the very, very early stages. (Staff Riley, July 11, 2023)

I just have had no idea what is going on. (Staff Taylor, July 14, 2023)

Changes in the overall structure of a pedagogy can be uncomfortable for the stakeholders involved (Vreuls et al., 2022). There is clearly a need for improved communication as some staff explained they felt disconnected from the programme.

#### *Consistency of teaching*

The *consistency of teaching* was particularly evident in the second FG. Students were concerned that the quality of teaching may hinder the delivery of the new programme. For example, Student Casey stated:

It's the quality of what's going to be delivered for our money. That's what we're worried about [...]  
We're not convinced that it's going to be of a high calibre. (Student Casey, July 14, 2023)

Furthermore, first-into-second-year students discussed how first-year experiences led them to this belief that quality might be reduced, particularly due to issues with course organisation, lecturers and inconsistent teaching. Similarly, staff recognised the importance of consistency when approaching facilitation. Some respondents noted that their colleagues may struggle with the PBL approach and the transition from didactic teaching to facilitation. For example, Staff Harper described the process as a paradigm shift for facilitators:

It is quite a paradigm shift really, in terms of how you approach it [...] I think that a lot of them [facilitators] will find it really hard, because the ability to actually not give an answer [...] is really quite tricky. I think [the programme lead] found the same thing when he went in and and watched some of the sessions, to actually stand back and not default to that educator role is a really hard thing. (Staff Harper, July 6, 2023)

Similarly, the clinician (Clinician Charlotte) recognised risks associated with facilitator skills:

The skills of the facilitators that need to facilitate the learning, is also a potential risk. (Clinician Charlotte, July 5, 2023)

Stakeholders agreed that establishing a standardised teaching approach with a rigorous framework and marking criteria ahead of programme implementation would be most beneficial in ensuring constructive alignment (Biggs and Tang, 2011).

#### *Approach to learning*

Despite negative discussion on the practical implementation, students appeared to be excited about the approach to learning. Students described PBL to be as follows:

[...] really important (Student Charlie, July 13, 2023); a big improvement (Student Skyler, July 14, 2023); so much more interactive and so much more fun (Student Reese, July 14, 2023).

Similarly, Clinician Charlotte (July 5, 2023) recognised the approach ‘fits well with how adults learn’ and is ‘certainly relevant for healthcare’ education. This supports the implementation of PBL in the physiotherapy curricula.

Stakeholders expected that the new programme will better prepare students for clinical practice post-university. For example, Student Dakota explained that by learning through practical scenarios:

‘We’re not just going off theory, we actually have more of an idea what [physiotherapy] looks like in the real population.’ (Student Dakota, July 13, 2023)

Other stakeholders agreed that due to the diverse nature of healthcare, an undergraduate programme cannot possibly cover every aspect of physiotherapy. Thus:

Students need to know how to find out that information for themselves. Which resources to use. Where to go for that type of information. In order to be able to navigate the healthcare system as it exists today. (Clinician Charlotte, July 5, 2023)

However, staff cautioned that existing students undergoing a change to the PBL approach may encounter difficulties navigating the transition:

Because they’re [students are] going into the second year of a PBL course, without having the first year PBL course backing. (Staff Harper, July 6, 2023)

While most staff expressed confidence in the students’ adaptability, staff recognised varied attitudes on PBL:

PBL probably suits some people and not others. (Staff Taylor, July 14, 2023)

[...] [high achieving] students will like [PBL] more than the below average performers. (Staff Jamie, July 13, 2023)

[...] will be particularly helpful to international students and students from more diverse backgrounds. (Clinician Charlotte, July 5, 2023)

Although PBL is largely dependent on group work (Servant, 2016), students were apprehensive about this requirement. Stakeholders recognised that the composition of a group “heavily impacts the quality of those group sessions” (Student Charlie, July 13, 2023). While students suggested that “if a lot of the year were based around [group work], it would probably become a little bit stressful” (Student Charlie, July 13, 2023). It seems this opinion is informed by their previous experience with student-led activities.

Staff and students shared reservations that important content to students may not be covered in the new programme. Patient 1 (July 7, 2023) suggested that staff may need to guide students on where to look for information towards epistemic sources to avoid missed content or outcomes:

I understand that. And so I guess it's the job of the facilitators to an extent, direct the students on where best to find [...]. (Patient 1 July 7, 2023)

The practicalities of PBL (e.g. group size) may mean staff struggle ‘to get everybody involved and have their voice heard’ (Staff Riley, July 11, 2023). However, students discussed a need to be active and engaged in learning.

Reflexively, Student Jordan stated:

I don't have the longest attention span, so I find myself dozing off when the lecturer is talking.  
(Student Jordan, July 14, 2023)

This suggests that the interactive component of PBL is not a concern for students. However, Staff Harper explained that any approach to learning has a "life span". Whereby, as students become accustomed to PBL "they'll just get tired of the format" (Staff Harper). Consequently, awareness of fatigue is required. Enquiry Based Learning (EBL) fatigue is a phenomenon associated with poor engagement and motivation (Stacey et al., 2018), therefore facilitators may wish to encourage various approaches to presenting information. For example: "if they default to PowerPoints, which is a safe way of doing it [...] that's where it might become stale" (Staff Harper, July 6, 2023).

#### *Attitude to change*

Attitude to change has a great impact on students' perception of the new programme. It seems that student reservations reside with the novel change itself, as opposed to programme specifics. Students are open-minded, trusting in faculty decisions, and aware that the new programme may prove beneficial for future employment. However, their willingness to adopt such a change is contingent on the provision of sufficient information.

Students describe their exclusion from the process of change as "kind of like a kick in the teeth" (Student Dakota). For example:

We weren't actually told when we were starting our degree or having our interviews, that there was a possibility that there was going to be a change [...] but then also not even giving us the opportunity to decide. (Student Charlie, July 13, 2023)

It's our time, it's our study, it's our money. (Student Casey, July 14, 2023)

Similarly, staff teaching sport rehabilitation, which is integrated into the programme, appear disgruntled with the modification; "it's just been unfortunate that we've had to change a lot because the Physio programme changed" (Staff Taylor), with some staff stating "I think Sport Rehab gets forgotten about sometimes" (Staff Taylor, July 14, 2023).

Like most instances of change, stakeholders agreed there would be teething problems. However, some students felt disadvantaged because of the transition to PBL:

[...] because it's not been done before, we're going to be like the guinea pigs, which I'm not happy about. (Student Casey, July 14, 2023)

[...] [there's going to be] some issues in the beginning and essentially this could then overall be affecting our grades. (Student Rowan, July 13, 2023)

[...] yet we're still paying nine grand for our course. (Student Skyler, July 14, 2023)

Consequently, prospective students may benefit from reassurance and ongoing evaluation.

#### *Support structures*

It seems additional information is needed to support students navigating the transition. During the FG, students were very forthcoming with suggestions that would improve their attitude to change. Their requests included: 1) question-and-answer sessions to communicate programme changes; 2) taster



sessions, to learn and practice the PBL structure; 3) pre-start packages, with pertinent study resources; and 4) well-organised virtual learning environments to access content and interact with lecturers.

Most staff appeared to feel appropriately supported throughout the preparation phase with frequent recognition of the invaluable work of the programme leaders expressed during interviews. It seems staff readiness can be credited to ongoing group discussions. However, staff were “a little concerned that it’s going to be the usual hurtling into September and still doing it” (Staff Taylor, July 14, 2023), indicating “there’s too much change too quickly all the time, and it’s constant” (Staff Taylor, July 6, 2023). Stakeholders recognise regular evaluation is necessary to mitigate unfavourable impact post implementation.

## Discussion and implications

This evaluation used a mixed-method design to examine the readiness and expectations of stakeholders for programme change, as concepts, knowledge, expectations, and readiness are not mutually exclusive. However, their interaction plays a crucial role in moulding perceptions of a forthcoming event. The results show that the implementation of student-centred pedagogies, such as PBL, requires the provision of sufficient support structures. Whereby recognising and managing barriers are among the requirements for programme change (Nasrabadi et al., 2021).

Alike to Nasrabadi et al. (2021), resistance to change among staff and students was identified as a barrier when implementing PBL as an innovative educational approach, whereby student participants discussed some apprehension towards student-led teaching, and the dynamics of group work. However, literature suggests it is not uncommon for students to feel uncomfortable as faculty move away from lecture-dominated pedagogies (Stover & Holland, 2018). Moreover, it could be argued that readiness for a PBL pedagogy can be taught or congregated throughout learning (Banneheke et al., 2017; Hasan et al., 2013).

It could be suggested that the utilisation of Lewin's force field model might enable the implementation of PBL as a solution for the challenges posed by staff and student resistance to change to PBL (Bozak, 2003). This model examines change by distinguishing the factors that promote change (driving forces) and the factors that hinder change (restraining forces) (Bozak, 2003).

Some staff and students were notably in the ‘transitional phase’ of Lewin’s force field model, acknowledging a need for feedback and gradual implementation of PBL. However, other students were firmly in the ‘unfreeze phase’ and required a sense of urgency to fulfil the change, if desired. In the months to come, further evaluation as part of a ‘refreezing phase’ may offer further feedback to inform future pedagogical practices. Utilising Lewin's force field model in this setting, the SoHS may be capable of successfully navigating resistance to programme change, addressing concerns, and facilitating a smooth transition to PBL as an innovative pedagogical approach.

Lewallen and DeBrew (2012) suggest critical thinking, communication skills, and traits demonstrating willingness (e.g., acceptance of feedback) to be characteristics of a successful health care student. Thus, student readiness for PBL can be inferred by one’s ability to perform these characteristics. Based on this conclusion, the questionnaire results of this evaluation indicate a (fairly) high level of student preparedness for a PBL pedagogy (See Table 2). However, the interview data provide a deeper and more coherent comprehension of student perceptions. Participants emphasised the need to be active in the learning process and expected to prefer PBL to traditional teaching methods (Dahlgren & Dahlgren, 2002). Yet, they showed resistance to programme change due to a lack of preparation. The discrepancy between the

quantitative and qualitative components suggests that participants' attitudes are more nuanced and complex than can be conveyed by structured numerical responses alone (Aksu, 2009; Jain, 2021). This should be considered in future programme evaluation studies.

It seems student reservations reside with the practical implementation of novel change itself, as opposed to programme specifics. Change that one cannot consciously control is often unwelcomed (Barnes, 2021). Cohen and Sherman (2014) suggest this is because people have a basic need to protect their self-integrity. Stress is aroused by events that threaten one's sense of personal adequacy; hampering student expectations of being 'good enough' for PBL (Cohen & Sherman, 2014). To improve student perceptions, staff must respond to the psychological principles to facilitate change. There needs to be communication of what exactly is changing, adequate reasoning for the change, and the benefits of a socio-constructivist pedagogical stance (such as PBL). This is consistent with the findings of Stover and Holland (2018).

Like existing research, this evaluation indicates the need to consider student satisfaction when developing a curriculum (Ye et al., 2022). From the perspective of expectancy value theory, Abdelallem and Elzohairy (2023) suggest that student expectations are closely related to their learning quality and course satisfaction. Moreover, in line with the findings of this study, Cheng et al. (2016) suggest that students' prior experience with consistency of teaching has caused concern for the quality of programme delivery, whereby their expected usefulness of the new programme determines their satisfaction with its implementation. Facilitators must provide students with a clear success criterion that illustrates the desired learning objectives (Vega, 2012). Students need to recognise how the learning activities align with the assessment and outcomes, which, as discussed earlier, is a key consideration for constructive alignment (Biggs and Tang, 2011). Essentially, the outcomes-based requirement of higher education requires students to note value in what they are doing and why, with some students in this study suggesting PBL offers poor value.

The consumerist view of higher education is a persistent issue within higher education, with similar examples from the use of PBL in nursing studies (Lekalakala Mokegele, 2010; Spiers et al., 2014). Some students associated PBL as lower value for money, perhaps not appreciating the value of the approach. Although students are often seen as customers seeking 'value for money' (Quinlan, 2021), this may not be true. Quinlan (2021) surveyed approximately 2000 students at a mid-ranked English institution to determine if they actively sought value for money in two separate studies. Less than 2% of students in Study 1 mentioned 'value for money' when asked open-ended questions about their university learning experience and the actual outcomes. In Study 2, participants were questioned about their subject and program selection, but none mentioned value for money (Quinlan, 2021). Students value education and the educational process itself, especially their personal encounter with the process, more than a degree. Thus, they appeared as co-producers rather than customers (Quinlan, 2021). Indeed, evidence from the 1990s and early 2000s indicates that PBL is no more effective than traditional didactic teaching (Colliver, 2000; Savin-Baden, 2000; Kirschner et al. 2006). However, with technological advantages, such as the internet as an epistemic source, the findings may be outdated.

Participants in this evaluation recognise the importance of consistency, regular evaluation and feedback-guided practice to mitigate unfavourable impacts post-programme implementation (Goh, 2014). Landeen et al. (2013) reinforce a need for consistency with PBL. Consequently, facilitators should reorient regularly to ensure divergences are addressed. Mitchell and Rogers (2020) suggest confidence is a key feature in assisting the transition that staff make as they become proficient in facilitating PBL. This evaluation found most staff participants were confident in their conceptual understanding of the new programme, in turn indicating their expectations for programme change. However, it was apparent that a

PBL pedagogy would push some staff out of their traditional comfort zone. Research has seen staff struggle to redefine their role from an expert and authority figure, to a facilitator (Mitchell & Rogers, 2020). Without adequate delivery, Situmorang et al. (2020) suggests students may experience boredom and lack of interest during PBL, despite the engaging and interactive nature of the approach. This evaluation suggests staff share the belief that students may experience fatigue (Stacey et al., 2018) as they become accustomed with the structure of PBL. In line with this finding, Dos Santos (2016) suggests a well-defined process of planning, implementation, monitoring and evaluation ensures compliance with the programme goals. Subsequently, supporting the transition from facilitation theory to practice and improving the quality and efficiency PBL (Johnston & Tinning, 2001).

Furthermore, it was found that students had a limited understanding of the PBL pedagogy, or the methods of teaching and learning, that would be used in the new curriculum. Normally, first-year undergraduate students would tend to possess a low level of awareness and comprehension of PBL. However, according to Mackenzie et al. (2003), students' awareness can significantly escalate when they actively participate in PBL. In a longitudinal research study, Mackenzie et al. (2003) noted changes in medical students' perceptions of their roles and responsibilities within a PBL curriculum over their first year. At the end of the first year, a significant majority of PBL students (80.6%) said that they had developed more advanced comprehension of their responsibilities as engaged and self-motivated learners (Mackenzie et al., 2003).

This prospective evaluation demonstrates the importance of evaluating readiness during the preparation phase of implementation to ensure it is an appropriate approach for a specific context, identify potential barriers, and provide insight into stakeholder perceptions that may affect learning outcomes (Almulhem & Almulhem, 2022; Ribeiro, 2011; Wondie et al., 2020). The findings of the FG interviews can assist consideration of the unique requirements of the stakeholders involved.

## Conclusion

This evaluation used a mixed-method design to examine the readiness and expectations of students, staff, and practice partners for new (PBL) physiotherapy and sports rehabilitation undergraduate programmes at a UK higher education institute. The overall aim was to identify factors that may influence the future implementation of a PBL pedagogy in the School of Health Sciences. Five domain summaries were identified including: 1) Quality of communication, 2) Consistency of teaching; 3) Approach to learning; 4) Attitude to change; and 5) Support structures. Analysis of the data collected through an online questionnaire and semi-structured interviews indicates the need for proficient preparation. Recognising and managing barriers are among the requirements for programme change (Nasrabadi et al., 2021). Successful intervention demands communication, confidence, and satisfaction in the implementation phase, with consideration of both the PBL concept and process. Ultimately, this is what defines stakeholder readiness and expectations. These findings will aid the development of resources that facilitate pedagogy implementation and support key stakeholders in the uptake of PBL.

Findings are significant as most existing research on PBL studies programme outcomes. However, this evaluation demonstrates the importance of evaluating stakeholder perspectives prior to the implementation of an educational approach. Furthermore, participant attitudes are more nuanced and complex than can be conveyed using quantitative questionnaire data alone. It is recommended that as part of future curriculum change management processes, deeper and more coherent representations of

stakeholder perceptions are gathered, and this could be through survey methods such as interviews and focus groups.

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