

Facilitating student engagement and initiative-taking with workplace learning challenges: The change laboratory methodology

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ABSTRACT

Introduction: Workplace-based learning (WBL) or Work-integrated learning (WIL) is an important pedagogy that prepares students for the world of work. However, students may experience challenges during their work practice, inhibiting their learning. Through reflecting on their WBL experiences and understanding the historical and systemic nature of challenges they experience, students may be able to take the initiative in raising and potentially addressing some of these challenges. This sort of reflection and initiative-taking can be facilitated by engaging students outside the workplace in a series of structured workshops collectively called a 'change laboratory' (CL). This paper reports on the students' engagement in a CL and assesses the potential of the CL in promoting students' initiative-taking in WBL. **Methods:** Eight structured CL workshop sessions were held with seventeen final-year Bachelor of Radiography Degree students who voluntarily participated in the CL sessions after ethics approval was obtained.

Results: Alongside other challenges, qualified radiographers were sometimes dismissive and unsupportive of students' WBL. To address these and other difficulties, students suggested an improved WBL system focusing on teamwork between students and qualified radiographers to facilitate patient-centred care and student learning.

Conclusion: CL is proposed as a valuable tool for students learning about and taking initiative in addressing WBL challenges.

Implication for practice: The research is expected to open new avenues for improving radiography students' WBL experiences at this specific university.

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Introduction

In this paper, the authors argue that students would benefit from a reflective space, a change laboratory, through which they can take the initiative to deal with the challenges they experience during workplace-based learning (WBL). Taking note of the advantages of WBL, the article highlights potential challenges and outlines the theory behind and methodology of the change laboratory. Results from a student WBL change laboratory were then analysed to illustrate students' initiative-taking attempts to address the challenges raised.

The history of learning by doing dates to the work of Dewey.¹ The workplace offers a space for authentic vocational learning² to attain skills and different forms of knowledge. Examples are collaboratively constructed cognitive development,³ dispositions required for the workplace, problem-solving and decision-making.² Supervised by qualified radiographers, WBL extends theoretical learning into clinical practice to enhance the students' learning experiences. Clinical placements, referred to as WBL in this paper, are essential to the radiography curriculum. Like the practice in other countries, WBL is classified under the umbrella term Work-integrated learning (WIL) in South Africa (CHE, 2011).⁴

Several authors⁵ (p492) refer to the clinical practice or the workplace as a 'classroom' where theory and clinical skills are integrated. Others⁶ have emphasised that the clinical setting offers a space for learning about adhering to regulatory requirements and becoming a professional. WBL enables learning through

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observation, practice and reflection,⁷ to bridge the theory-skills gap and apply the principles of patient-centred care, and radiation safety. These activities stimulate students' critical thinking, clinical decision-making, and self-confidence while they shape their professional identity.^{7,8} As such, this learning plays an important role in preparing the graduates for the world of work and facilitating their employability.⁹

Although much of the literature on students' WBL provides evidence of its advantages, there are also challenges to its efficacy as a part of a learning programme, mostly associated with the learning environment. In a systematic review of clinical education, Cunningham, Baird and Wright¹⁰ found that several factors potentially influence the quality of clinical education. Among others, there are differences in infrastructure, procedures and supervision models that students must deal with in clinical centres. Reference was also made to personal stress factors such as students' fatigue and burnout due to extended hours and different shifts.^{6,11,12,10} Furthermore, students may experience a lack of role modelling,⁶ unprofessional behaviour and not being treated professionally (e.g. being shouted at) by their supervisors as demotivational.^{12,13} However, the inadequate guidance and managerial support could be ascribed to the fact that student supervision work is over and above the qualified radiographer's patient workload.¹⁴

In South Africa, as in other countries, clinical centres must adhere to the minimum requirements of the accrediting body, the Health Professions Council of South Africa (HPCSA). Accreditation is valid for five years. The programme at the university where this CL study was conducted has a block system to integrate theoretical learning and WBL. In this system, the number of weeks that the students spend in clinical centres increases from the first (one to two weeks per year) to the fourth year (a minimum of 16 weeks per year). During WBL, qualified radiographers and a clinical tutor, supervise the students. Upon their return from WBL, students participate in reflection and simulation-based learning designed to promote critical thinking, clinical reasoning and problem-solving skills.^{15,8}

Informal discussions with radiography students at the research site highlighted challenges that align with those reported in the literature. Consequently, the students' suggestions and proactive approaches to navigating a complex and often problematic learning environment were deemed crucial. As Billet¹⁶ emphasises, successful WBL relies on both a supportive learning environment and deliberate actions by students to optimise their learning opportunities. While it is anticipated that students should take the initiative to enhance their WBL experiences, they likely require guidance in doing so. This realisation led the researchers to explore the following question:

How can students be supported in taking the initiative to deal with WBL challenges and enhance their WBL experiences?

To address the research question, the researchers implemented a formative intervention known as the Change Laboratory (CL) with a group of final-year radiography students. The CL is designed to actively engage participants in resolving the challenges they face by participating in structured, collective, and reflective actions.^{17,18} At its core, the CL emphasises deliberate actions aimed at transforming one's circumstances,¹⁸ making it an ideal approach for fostering student-driven initiatives to improve WBL experiences. Moreover, cultivating the ability to take initiative is a vital skill for lifelong learning, especially within the framework of educational systems.¹⁹

The Change Laboratory (CL) is rooted in Cultural–Historical Activity Theory (CHAT), which serves as its theoretical foundation. CHAT emphasises the study of collective activity systems,

mediated by tools and oriented toward specific objectives. CL builds on this by applying the principles of expansive learning, a concept within CHAT, to foster innovation and transformation in practices.

Activity theory attempts to simplify and clarify participants' understanding of practice, for example WBL, through representing it as an activity system (Fig. 1). In this systematic depiction, participants engaging in the practice, in our case the students, are referred to as 'subjects' and their understanding of the purpose of their practice is called the 'object'.²⁰ Subjects' (the students) attempts to fulfil this purpose are always supported or constrained by the other elements of the activity system. The 'tools' element at the top of Fig. 1 refers to the resources subjects have access to, to try and achieve this object or purpose. But subjects' work does not happen in isolation, they also must work with other practitioners and constituencies, referred to as the community. Different members of the community play different roles in the activity and hold different positions of authority, referred to as the 'division of labour'. For example, in WBL the supervisors hold the most authority over the students whose role is the acquiring of workplace knowledge and skills. Furthermore, the students (subjects) are enabled or constrained by the rules they must operate under, for example, hospital systems and protocols.²⁰ The activity system is dynamic and is riven with historically-rooted contradictions, which provide the impetus for new possibilities for change, in particular change in the activity's' object.²¹

Change Laboratory (CL) research has been widely applied to support practitioners in taking initiative to enhance clinical practices in Northern European healthcare settings.¹⁷ However, to the best of the authors' knowledge, it has not yet been employed to tackle challenges related to university students' WBL. Consequently, the research presented here represents a pioneering effort, advancing our understanding of both WBL and CL research, and making a significant contribution to these fields, particularly radiography.

A CL typically consists of 6–10 cumulative workshops. Each workshop addresses one or more of the learning actions shown in Fig. 2. The learning actions constitute what Engström, Rantavuori and Kerosuo²³ refer to as expansive learning. This learning is 'expansive' because it enables participants to gain a deeper understanding of the problems they encounter and through so doing, opens new possibilities to improve practices.^{24,25} The details of the learning action are given in the methodology section below. For clarification, the CL is a separate space (hence the term 'laboratory') from actual practice in which participants can more openly engage in reflective discussion in workshops. Expansive learning is what the participants do, stage by stage, in the CL workshops and activity

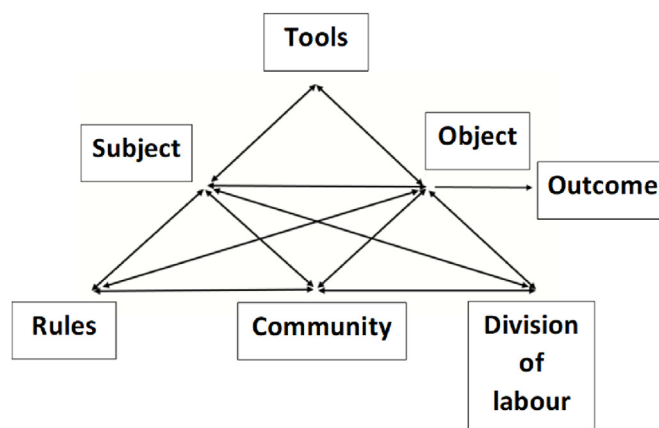


Figure 1. Model of an activity system (Engeström²² p63).



Figure 2. Expansive learning cycle in the change laboratory.²³

theory provides an analytic and modelling tool for participants in support of expansive learning.

Action research also represents a type of formative research in which practitioners address challenges within their practices through reflective activities, aiming to find resolutions in the process. While Change Laboratory (CL) research shares similarities with action research, it differs significantly in its structure and guiding principles. CL research is rooted in expansive learning theory,²³ emphasising collective rather than individual transformation. Furthermore, it aids participants in overcoming obstacles to their learning and development,^{17,26} making it a distinctive and targeted approach to addressing systemic issues.

Methods

A qualitative study based on the CL cycle (Fig. 2) was used as an inquiry strategy within CHAT, expansive learning and the participative research design paradigms.²⁷ The CL process expands learning by developing new practices.²⁸ In the current project, students presented their opinions and experiences about the WBL environment through the CL. As such, students had to critically examine their existing practice, identify tensions, and develop solutions.²⁹

After obtaining ethics approval (UFS-HSD2018/0628/2808-0001), eight structured workshops were held with seventeen final-year Bachelor of Radiography Degree students who volunteered to participate in the study. The students reflect the diversity of the university's population and speak a variety of local languages, but are fluent in English as this is the language of instruction at the university. Student voices were anonymised, and workplace practice sites were not identified.

Two facilitators shared written minutes and recordings of key moments in the workshops with participants as a form of member checking to enhance the trustworthiness of data gathered.³⁰ One facilitator was a staff member of the faculty but not involved in teaching in the programme. The students were unfamiliar with the other facilitator, who was an external consultant. The participants were assured of an environment of trust so that opinions could be shared without fear of penalty or victimisation.

The CL workshop processes were structured according to the expansive learning actions in Fig. 2 but were also open-ended in that the students populate each learning action by drawing on their knowledge and developing understandings, which cannot be predetermined.²⁶

The physical environment of the workshop reflects the sayings, thinking and analysis brought forward by the students through extensive use of newsprint panes. The panes are populated with the issues raised by the students, new ideas they bring forward and activity system analyses of both the issues and new ideas, as shown in Fig. 3. During the workshops, there is constant lateral movement between the three panes.

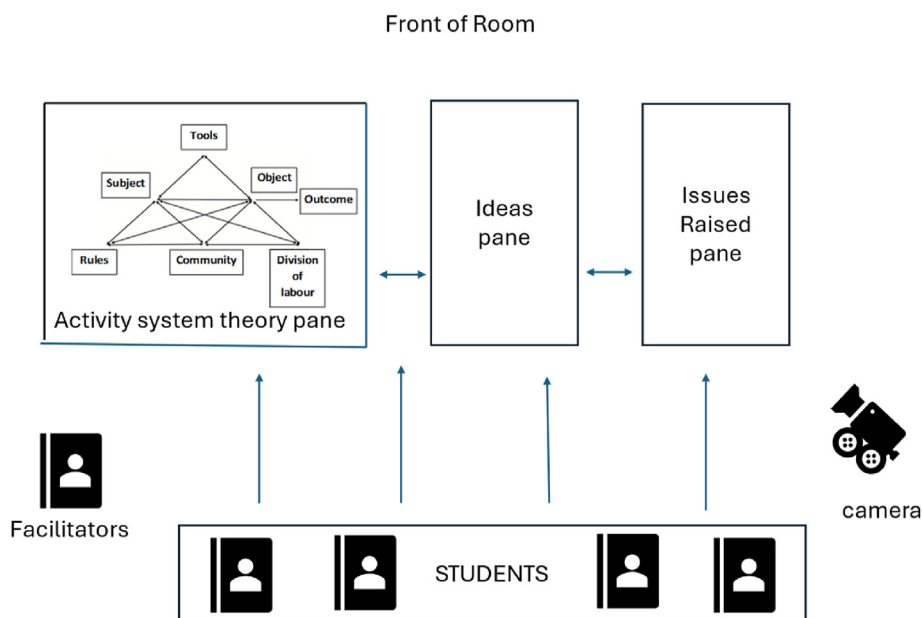


Figure 3. Structure of the change laboratory workshop.³¹

The facilitators recorded student input on the newsprint panes, which accumulated over successive workshops, providing data on the present situation, the past and a potential future. For example, students raised the current problematic issues they experienced in early workshops and the problematic issues from the past in later workshops. The panes provided a rich stimulatory environment for students, which reflected the progressive developments unfolding in the workshops.³¹ Furthermore, each workshop began with video excerpts of the main issues raised from the previous workshop, again stimulating participants to confront difficulties and, in later workshops, to develop new ideas to resolve these difficulties.^{18,31}

The facilitators provided pre-recorded video material, which reflected conflicts and dilemmas experienced by past students and teaching staff involved with WBL as a stimulus to promote discussion amongst the students. Students also presented anecdotes and photos of their difficulties, questioning the current situation (learning action 1). Collective understanding was encouraged through students engaging in workshop tasks such as 'what would an ideal learning environment look like?'. Students were also tasked with constructing a future, ideal vision of a beneficial WBL environment. This vision acted as a future possibility that CL participants may strive to achieve during the subsequent workshops.³²

Prompted by the facilitators, students collectively combined their current and historical understandings to construct an activity system model of WBL, and to highlight where the main contradictions were situated which had led to the challenges they experienced (Fig. 4).

This historical and empirical analysis (learning action 2 in Fig. 2) enabled students to model a new system in which contradictions were potentially resolved through the development of new practices (learning action 3 in Fig. 2) to model a new, expanded object of the system.²³ Thereafter, the new model was examined within the workshops for its feasibility and adjusted further (learning action 4). In addition, in the final CL workshop session, three students were elected by their peers to give feedback to WBL coordinators, lecturers, clinical tutors and hospital clinical coordinators. At the

meeting, the students highlighted the challenges they experienced and how they proposed to address these by presenting the new WBL model they had developed. However, the student participants in the CL can only go so far as to make recommendations to staff who design and implement WBL. Thus, the final 'implementation' action (5, 6 in Fig. 2) was not covered in this research.

Results

The findings are from student input in the workshops, broadly following the learning actions in Fig. 2.

The first challenge for the students was that the qualified radiographers did not provide adequate supervision, were often rude and disdainful of the students' work, and that the hospital environment was generally not conducive to learning:

The qualifieds often do not treat you with respect, calling you idiots or stupid. The qualifieds give a lot of negative feedback. You wonder if the qualifieds like students or know how to teach them ... They often do not compliment you on your work which you feel makes you unmotivated and you lose confidence in yourself ... sometimes they ask you 'what are you doing here?'.

Some of the clinical centres were short-staffed, leaving students with the perception that they have a heavier-than-expected workload. As a result, students had the impression that the focus is on working rather than on their learning:

Am I supposed to be learning or being at work in a high-pressure environment? What happens if I make a mistake in the pediatric ward if there are no qualifieds around? Sometimes it is just an uninspiring environment.

Students reported on conflicts arising between what they were taught at the university and the practices in the hospitals, which were sometimes, in their understanding, detrimental to patient

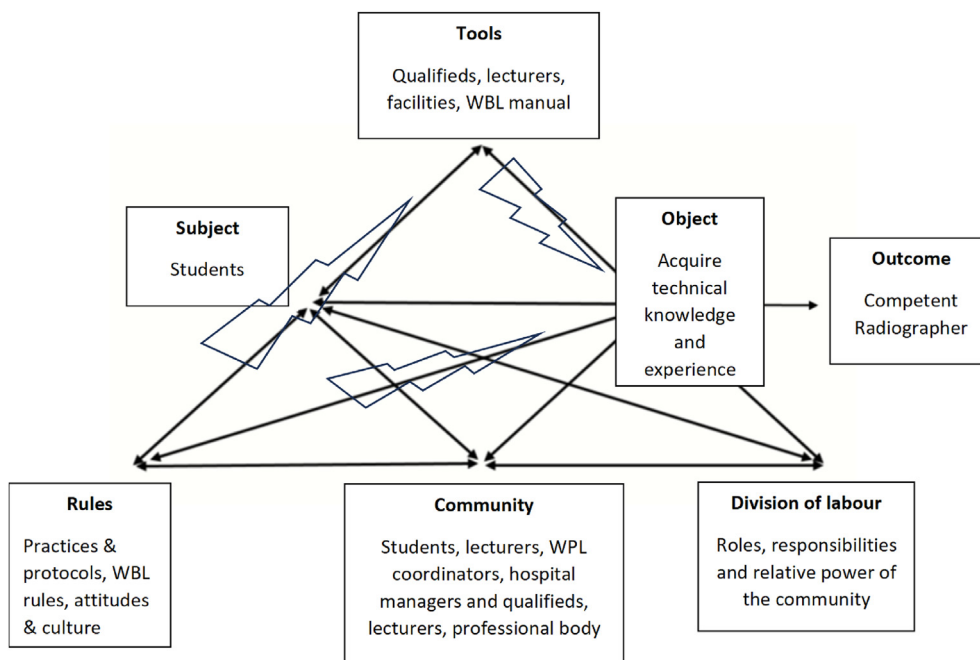


Figure 4. Activity system for WPL, as depicted by students.

care. Furthermore, some students did not feel that their professional knowledge was respected or valued.

At the university students are taught about how to operate properly and safely, but the correct protocols are not always followed by the qualified radiographers in the workplace, when they are busy with a lot of patients. Students do not feel that they can correct the qualified radiographers.

After raising difficulties, students constructed an ideal vision for their WBL, of a hospital where qualified radiographers had time and were willing and keen to teach, and who encouraged students' learning. In addition, a hospital which provided all the learning resources students required and, in general:

A healthy, happy less stressful learning environment with a focus on learning rather than just doing work.

In the following two workshops (three and four), students were tasked with investigating WBL in the past, or the historical analysis learning action 2a. From interviewing qualified radiographers, students became aware that though much has changed, what was similar was the problematic attitudes of qualified radiographers to students in the past. As the qualified radiographers reported 'the qualifieds were strict and scary, like dictators'. Students were able to see that their negative experiences were perhaps part of the historically-rooted culture of radiographer training, rather than being about their cohort or their lack of skills.

Towards the end of workshops three and four, students moved into learning action 2b. Students were tasked with drawing an activity system for WBL. They first described the object of the activity as 'acquire technical knowledge and experience', which would in turn support the outcome of their becoming a qualified radiographer. Thereafter, they populated the other elements of the activity system which together constituted the context in which this object and outcome may emerge, as shown in Fig. 4.

In reconceptualising the challenges raised in the early workshops as being within or between the elements of the activity system, they were able to describe them as systemic contradictions within the system, as indicated by the jagged arrows in Fig. 4. For example, the problematic attitudes of the qualified radiographers (rules or norms) to student learning were at odds with their desired object and outcome of WBL, hence the jagged arrow between rules and object; because there were too few qualified radiographers in the hospitals the 'tools' for learning were also not always provided, again leading to a contradiction between tools and object. There was also a contradiction between the knowledge and protocols taught at the university (a tool) and the rules of the specific hospitals, signified by a jagged arrow between tools and rules.

In workshop five students combined all their learnings from the previous workshops to understand the contradictions. In workshop six students conceptualised a new, possible activity system which attempted to resolve some of these contradictions. For example, under new 'rules', students proposed guidelines for qualified radiographers and students such as mutual respect; under new 'roles' an expanded role of students to actively seek learning opportunities was suggested, and more close cooperation between the university and qualified radiographers, possibly through the provision of advanced training, was put forward. Under new 'tools' students proposed weekly reflection sessions with the qualified radiographers, where challenges experienced by both sides could be raised. A key move here, emerging from the reconceptualised activity system, was the development of the object of the WBL activity from the initial 'acquire technical knowledge and experience' to the new, expanded object of 'teamwork to facilitate patient-centred care' (learning action 3).

However, the new model was still conceptual and has not yet been tested in practice. Thus, in the final two workshops, students moved on to concretising the model by examining it further (learning action 4). Students were tasked with comparing the new model to the old to identify the main conflicts between the two systems, and what forward-thinking may be required to address the systems. For example, students highlighted problems in bringing qualified radiographers together with university academics to align clinical practices. They suggested a future initiative of reflective and collaborative university-workplace sessions, which may contribute to practitioners' continuous professional development (CPD) points.

In the feedback meeting with WIL coordinators, students were applauded for their forward-thinking approaches in taking the initiative to identify challenges and in proposing an expanded object of 'teamwork', which staff suggested was a feasible avenue for further exploration. As one clinical tutor stated, 'you should never underestimate the students'.

Discussion

South Africa's healthcare landscape presents a unique duality, ranging from well-equipped private radiology centres to under-resourced government hospitals. Despite these contrasting environments, findings from the CL discussions suggest that radiography students face comparable challenges in their WBL experiences across all placements.

To address the research question, *How can students be supported in taking the initiative to deal with WBL challenges and enhance their WBL experiences?* Table 1 outlines the learning actions derived from the CL intervention, the tasks students undertook, and the insights gained about fostering student initiative. Drawing from Engeström, Rantavuori and Kerosuo,²³ as well as Morselli, Costa and

Table 1
A summary of the students' learning actions and WBL initiative-taking from the CL.

Expansive learning action (from Fig. 2)	Student WBL engagement tasks	Students' taking initiative to change WBL
Learning action 1: Questioning of current practices and envisioning	Students work on a future ideal vision for WBL.	Students propose an ideal teaching hospital environment that they can aspire to.
Learning action 3: Modelling a new solution.	Students work in detail with contradictions in the WBL system, model possible resolutions and develop a new activity system for the future.	Mutual respect guidelines and reflective sessions with qualified radiographers proposed; new WBL purpose of teamwork for learning and patient care within new WBL system put forward.
Learning action 4: Examining the new model	Students compare old and proposed new WBL systems and identify and attempt to resolve pressure points.	Collaborative WBL university-work meetings towards CPD proposed. Students argue for new initiatives with their coordinators and supervisors.

Margiotta,¹⁹ initiative-taking can be defined as proposing, committing to, or executing actions that lead to improved circumstances. Moreover, initiative-taking is inherently linked to critical thinking, as it requires evaluating situations, identifying challenges, and crafting viable solutions.

The students were invited to reflect on the CL process and share their proposed WBL system with the clinical tutors and university lecturers at the Advisory Board meeting. This allowed the Advisory Board to note the students' experiences – both the advantages and challenges – during WBL and then to decide with the students, on appropriate actions to navigate these challenges. The students could already report on the positive impact of the presence of the WIL coordinator in clinical practices. The students felt supported as they had a 'go-to' person in the WBL environment to immediately provide feedback and respond to their challenges. An example is the confusion caused by the programme teaching a specific imaging protocol, while the clinical practice expects a variation of the protocol. In addition, the WIL coordinator introduced weekly debriefing and reflection tutorial sessions during students' WBL periods.

In reflecting on the CL process, the students also provided evidence of their initiative taking.

In the first example, students expressed a commitment to change:

We felt inspired because we would like to see change happening to WBL and will do whatever it takes to see this happening.

Furthermore, students were able to see the potential value of the CL in better understanding issues and so enabling them to work with new ideas, both in and beyond the CL itself, and into the future:

The change lab was a good tool or channel to voice your difficulties and to properly identify, define and analyse problems, and to reach some possible solutions which can be a future reality.

And

(through the CL) we became aware of possibilities for change and improvement in WBL for future generations of students.

Conclusion

This paper captures students' engagement and reflection on their WBL challenges using the CL methodology and assesses the extent to which it facilitated their initiative taking to deal with WBL challenges, culminating in a suggested design of an optimal WBL system. Based on the evidence provided in Table 1, and the student reflections on the CL process, the authors conclude that the CL does support students' initiative taking to address their WBL challenges.

While student challenges in WBL may be like studies previously documented,¹⁰ the focus of the present article is on the CL methodology to facilitate students' initiative-taking in response to such challenges. In so doing the authors may have painted a negative picture of the WBL environment. However, students also emphasised the importance of WBL and recounted positive WBL experiences which had contributed to their clinical learning and preparation for the world of work as qualified radiographers.

Reflection on workplace experiences is an essential component of learning in WBL, but as Boud, Keogh and Walker³³ argue it is often ineffective as it lacks structure and guidance. Therefore the

researchers propose that CL can be used in university-workplace clinical settings as an inclusive, structured and formative methodology to assist students in critically reflecting on and navigating their WBL experiences. Furthermore, as the CL methodology has not previously been commonly used in higher education WBL contexts, it is hoped that the article may open new avenues of exploration for radiography WBL.

Taking the initiative is often cited as an important graduate attribute.³⁴ CL work may therefore serve as a tool to develop WBL students' graduate attributes, as has been reported on by Morselli, Costa and Margiotta¹⁹ working in the vocational sector.

In addition to students' 'initiative taking, one important finding of the research was the need for teamwork between clinical supervisors and students, and for reflective WIL forums where issues arising between them could be discussed. In a meeting with the university staff, where the CL students presented their issues there was agreement to address these difficulties firstly through situating the WIL coordinators in the workplaces. In future CL work it could be suggested that the student voice should be balanced with the voices of the qualified radiographers and the university lecturers to gain enhanced insights into WBL difficulties and their potential resolutions. This was, though, beyond the scope of the current project.

Ethics approval and consent to participate

Ethical approval for this study was obtained from the Health Sciences Research Ethics Committee (APPROVAL NUMBER/UPS-HSD2018/0628/2808-0001).

Written informed consent was obtained from the participants' information to be published in this article.

Availability of data

Data required for this study may be made available by the author(s) upon reasonable request.

Author contributions

HFN; JG: Conceptualisation, Methodology, Software, Data curation, Writing- Original Draft preparation, Writing- Reviewing and Editing.

Declaration of Generative AI and AI-assisted technologies in the writing process

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Conflict of interest statement

None.

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