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## Navigating the contradictions of ePortfolio implementation: A practice-based approach through the lens of Activity Theory

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### Abstract

ePortfolios have emerged as promising technology and practices to redefine pedagogical and learning practices in higher learning institutions. This study examines ePortfolio technology and practices implementation at a dual-sector educational institution offering higher education and vocational training programs. The implementation, spearheaded by a dedicated central teaching and learning unit in collaboration with faculty academics, signifies a strategic institutional shift towards enhanced reflective practice and learning documentation. While prior research has acknowledged the general integration of ePortfolios within university pedagogy, there exists a lack of literature examining the nuanced challenges and prospects presented by learning design frameworks. Our paper seeks to address this gap by employing activity theory as an analytical framework to dissect the complexities of ePortfolio implementation within higher learning environments. Through the methodological lens of action research, we provide a nuanced narrative of the multi-faceted hurdles encountered during the roll-out of the ePortfolio platform and practices. Our findings not only delineate these obstacles but also showcase ePortfolios' potential for pedagogical innovation. The paper aims to contribute to the ongoing discourse on digital pedagogies, offering valuable insights for educators, administrators, and policymakers to navigate the challenges of ePortfolio implementation process. This way the study offers ways to navigate such challenges to harness the full spectrum of ePortfolio systems and practices to support successful implementation in higher education institutions.

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## Keywords

ePortfolios, Activity theory, PebblePad Implementation, Learning design, Technology adoption, Digital pedagogies

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## Practitioners Notes

1. Acknowledge the added workload ePortfolios may introduce and collaborate with faculties to manage responsibilities effectively to achieve the intended outcomes of successful integration in the teaching and learning practices.
2. Prioritise comprehensive training in ePortfolio workflow and troubleshooting to ensure educators can support students effectively.
3. Aligning technological deployment with clear pedagogical objectives.
4. Recognising the multi-faceted impact on the stakeholders' workload and providing adequate support systems.
5. Addressing the requisite for comprehensive training tailored to the varied needs of users across the institution.
6. Fostering a community of practice that encourages sharing ideas and collaborative problem-solving.

## Introduction

EPortfolios are “digitised collections of artefacts, resources, demonstrations and accomplishments by groups, individuals or institutions” (Lorenzo & Ittelson, 2005, p. 1). This definition has extended to include practices and purposes that underpin ePortfolio uses. Over two decades, universities have increasingly adopted ePortfolios as multi-faceted tools to offer students opportunities to showcase their learning journey and evidence professional competencies beyond the collection and curation of diverse and comprehensive learning evidence (Campbell, 2019; Cain and Campbell, 2021; Lumsden, 2007). Further, ePortfolios in the current educational landscape serve as a bridge between theory and real-world applications of concepts to enable students to reflect on and present their growth and achievements. In the face of changes forced to higher education with industry employers requiring graduates with practical skills, academic integrity issues, and rising use of artificial intelligence, among others. If designed well, the e-portfolio practices can offer opportunities to scaffold and evidence learning, moving away from traditional ways of assessing learning in higher education. Thus, the move to ePortfolios can be linked to an increased call to shift learning to the Work-Integrated Learning model, potentially bridging the disconnect between theory and practice to support students’ practical knowledge and skills development for employability (Mitchell et al., 2021). For instance, in specialised professions, ePortfolios are being used to collect and aggregate evidence to meet accreditation requirements in a way that facilitates student reflection and contains evidence against professional competencies, which makes the learning artefacts more meaningful and have value outside of academia (Cain and Campbell, 2021).

While the merits of ePortfolios in higher education are well-documented, their practical applications and adoption strategies within tertiary institutions seem to be limited within the Australian higher education context (Campbell, 2019). Building on an earlier investigation into ePortfolio university-wide deployment at Griffith University, which scrutinised usage, training, and academic feedback (Campbell, 2019), this study investigates the learning design team’s perspective. It illuminates the untapped potential and hurdles encountered during the broad implementation of ePortfolio system and practices, employing activity theory to formulate a structured inquiry into two primary research questions: the nature of opportunities and barriers impacting ePortfolio implementation and strategies for their successful integration in support of teaching and learning. Thus, the study aims to address the following research questions:

1. What opportunities and barriers influence the implementation of ePortfolios in learning institutions?
2. How can ePortfolios be successfully implemented in higher learning to support learning and teaching practices? The conclusions from inquiry are essential. They aim to inform other institutions embarking on similar paths, allowing them to draw lessons from our empirical findings on the intricacies of executing the ePortfolio within the diverse educational landscapes of Vocational Education and Training (VET) and higher education.

### Our context

Charles Darwin University (CDU) is situated in the regional Northern Territory of Australia, operating as a dual-sector institution offering both higher education and vocational training. The

institution's reach extends beyond its primary location, with additional campuses distributed across various Australian cities and online learning opportunities for undergraduate and postgraduate students. With the evolving educational landscape, the institution initiated the implementation of the ePortfolio to respond to the trends in tertiary education teaching and learning practices and how students evidence learning and respond to external work-integrated learning opportunities.

Implementing new learning technologies in institutions requires alignment with institutional strategy and aims to establish a supportive learning environment. The university used a top-down approach to understand priority areas, targets, and direction towards introducing the ePortfolio technology and practices at the institution. The institution's consideration for the introduction of ePortfolio and practices was to support faculties to re-imagine learning, assessments and how to evidence learning in tertiary education and industry. This decision was endorsed by a university technology-enhanced learning group (constituting faculties associate deans of teaching and learning and a central learning and teaching team). The PebblePad ePortfolio platform was selected for its wide use across higher education institutions in Australia, the UK and the USA and its potential to serve institutional ePortfolio needs (PebblePad, 2023 <https://pebblepad.com/>). The university initially procured 3000 user licenses for students and staff in higher education and Vocation Education Training (VET) as a three-year pilot project. The faculties and educators were invited to participate in the three-year ePortfolio trial to determine their needs in their respective disciplines before adoption. The earlier adopters were prominently in the faculty of health, Technical and Further Education (building and construction), and faculty of arts and society (school of education). At the point of this study, 3500 user accounts were active and still rapidly evolving into the third year of implementation.

The ePortfolio project was rolled out by a central teaching and learning unit consisting of the Director of Learning futures, learning environments project coordinator, Associate director of digital learning design, Learning Management Systems (LMS) manager, LMS system specialist, Learning environment project specialist, MS trainers/Support officers, Academic lead- digital initiatives, Digital learning designers, Learning resource developers with the help of the PebblePad customer success manager. This core team engaged with educators in various faculties to scope and understand their ePortfolio needs before implementing multiple projects across the university.

### **Project Implementation Framework: Applying the SAMR model.**

In our current exploration, we diverge from the previous university-wide implementation of the ePortfolio, which employed the ADDIE framework (Campbell, 2019), and instead adopt the SAMR (Substitution, Augmentation, Modification, Redefinition) model as our guiding structure (Puentedura, 2006, 2014). This choice was strategic, leveraging SAMR to critically assess the deployment process of ePortfolio platform and practices at the university, ensuring our efforts transformed and enhanced pedagogical practices through technology integration. Implementing ePortfolio platforms across various university programs demonstrates a spectrum of integration levels (see Table 1). This table exemplifies how each discipline has applied the SAMR model from essential substitution to redefinition—to enhance and transform pedagogical practices through this versatile platform.

### **Substitution**

In this stage, technology acts as a direct substitute for traditional methods, with no functional change in the case of ePortfolios. The ePortfolio allowed the digitisation of existing paper-based assessments into digital formats, in our case, mostly placement workbooks with digital signatures. The digitalisation of the processes streamlined the manual processes that involved printing paper-based workbooks.

### **Augmentation**

At this stage, the ePortfolio system was used across courses in addition to substituting the current practices with functional improvements. In this context, the ePortfolio platform features were deployed to enhance the traditional portfolio, such as accommodating Third-party Assessor accounts to validate placement evidence and improve the integrity of the assessment and reliability of the process.

### **Modification**

At this stage, the ePortfolio allowed significant task redesign. In our project, we used the ADDIE (Analyse, Design, Develop, Implement, Evaluate) learning design model to design and develop learning activities and templates for consideration across various disciplinary contexts. Such developments include redesigning learning tasks to accommodate multimedia evidence such as images and videos and mapping against professional competencies and placement (work-integrated related) assessments.

### **Redefinition**

This phase involved evaluating the activities and approaches used in the initial ePortfolio implementations and considering the creation of new tasks that were previously inconceivable. For instance, in some courses, educators found opportunities to scaffold learning activities and assessments from the initially designed as one-off and standalone activities into scaffolded course-wide activities. This has created new assessments considering the iterative growth and achievements throughout the course.

**Table 1**

*EPortfolio projects mapped into the SAMR model across the institution's programs.*

### **Course-Wide ePortfolio Progress Tracking and Implementation**

<b>Project Description</b>	<b>Substitution</b>	<b>Augmentation</b>	<b>Modification</b>	<b>Redefinition</b>
Nursing (RP)	x	x		
Midwifery	x	x	x	x
Speech Pathology	x	x	x	
Paramedicine	x	x	x	x
Pharmacy	x	x	x	x
Audiology	x	x	x	x
Health Sciences	x			
Dietetics	x	x	x	

Psychology	x	x		
CDU Careers Centre	x	x	x	x
Teaching	x	x	x	x
Occupational Therapy	x	x	x	x

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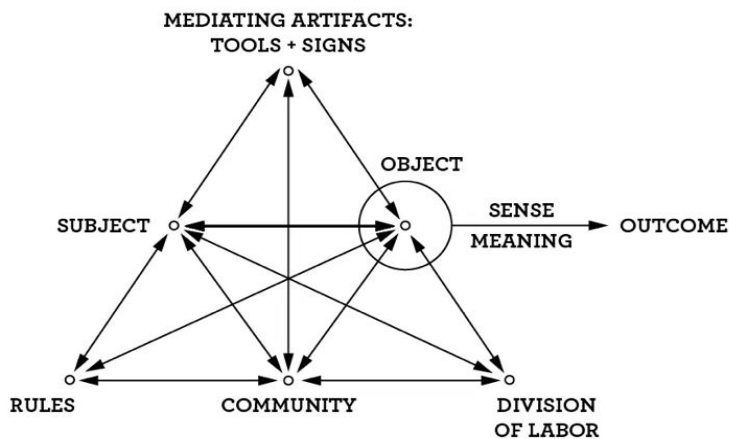
### **Theoretical Framework: Activity Theory**

In this inquiry, we harness the robust framework of Activity Theory articulated by Engeström (2009), which serves as the theoretical backbone of our examination. At its core, Activity Theory asserts the centrality of mediation in human endeavours, encapsulated within a dynamic triangular model (Engeström, 2009). Figure 1 below illuminates the interrelationship between the subject (the doer), the object (the goal), and the community (the collective sphere), all organised through mediating artifacts, a division of labour, and a set of rules that govern interactions (Engeström, 2009). Such scholarly pursuits in implementing higher education technology are multi-faceted and complex. Activity Theory offers analytical tools to analyse the interdependent factors influencing technology integration (Issroff, 2002; Dobson, 2004). It probes beyond mere functionality, considering the socio-cultural influences that influence decisions within higher education (Anthony, 2011; Scanlon, 2005). We have applied Activity Theory to examine and understand the implementation and adoption of the ePortfolio system within CDU. This approach sheds light on how ePortfolios, as mediating tools, not only facilitate educational activities but also reflect and influence the beliefs and practices of academics (Anthony, 2011). It outlines the significance of aligning technological tools with pedagogical objectives alongside alignment with institutional goals (Scanlon, 2005). The application of Activity Theory moves beyond a mere diagnostic of the current state; it reveals the dynamics of technological adaptation as an ongoing process deeply embedded within the socio-cultural and institutional fabric of the university (Engeström, 2009). Through this lens, we unravel the challenges encountered by our learning design team, offering a reflective narrative that is as critical as it is informative for the ePortfolio community (Issroff, 2002; Dobson, 2004).

This study evaluates the ePortfolio implementation at CDU as an activity system, focusing on the role of learning designers who facilitated the pilot program's execution. The objective underpinning this system is the effective integration of the ePortfolio system, complemented by the SAMR Model, which serves as a strategic framework for this implementation. The system's structure encompasses various tools, including ePortfolio platform and the SAMR Model, governed by various rules, such as assessment and feedback policies, accreditation standards, utilisation principles, and the support infrastructure established by CDU. The community within this system is diverse, consisting of educators, the learning design team, support staff, students,

**Figure 1:**

*Interrelationships of Activity Theory devised by Engeström, 2009*



external placement supervisors, and vocation education quality officers, all of whom interact within the established division of labour. This division sees learning designers coordinating the foundational stages of scoping, designing, and providing ongoing support. At the same time, educators, students, and other stakeholders engage with the ePortfolio to varying extents, contributing to the system's ultimate goal to elevate pedagogical practices through an institution-wide deployment.

### **Contradictions**

Within the framework of Activity Theory, analysis pivots on the perspective of the subject, whose actions within an activity system set the stage for interaction among various elements, potentially reinforcing or opposing each other (Engeström & Sannino, 2010). Contradictions, defined as conflicts, disturbances, or mismatches, emerge as critical catalysts for change, propelling actors to seek resolution and thereby driving transformation within the system. These contradictions are categorised into four distinct types:

#### **Primary Contradictions**

These are internal contradictions within each component of the activity system. They are essentially conflicts within a single element, like a tool not being adequate for its intended task.

#### **Secondary Contradictions**

These occur between the components of the activity system. For example, a contradiction between the subject (the individual or group engaged in the activity) and the tools or instruments they use. These contradictions highlight misalignments or conflicts between different system elements, such as when the subjects' goals do not align with the existing rules or community norms.

#### **Tertiary Contradictions**

With the introduction of a novel element, these surfaces may generate friction as it disrupts established activity patterns. For example, integrating a new technological tool into a traditional work process might lead to a contradiction as the subjects adapt to this new element.

### ***Quaternary Contradictions***

These contradictions are between the newly reorganised activity and its neighbouring or connected activity systems. They represent conflicts or inconsistencies between different networks of activities. For instance, a contradiction might arise between an educational institution's objectives and the industry it serves, leading to discrepancies in expectations and outcomes.

For Engeström (2009), individuals and organisations are perpetually involved in learning processes that navigate through evolving and unstable practices. The evolution of organisational practices demands adopting new, emergent activities learned with their development while addressing systemic contradictions. This dynamic process of learning and adaptation was exemplified at CDU during the implementation of the ePortfolio tool, reflecting Engeström's assertion that activity forms are concurrently learned and created within a changing environment.

## **Literature**

In higher education, the use of ePortfolios arguably supports more authentic learning with the promise to innovate pedagogical approaches (Porter, Cleve & Palermo, 2015), develop students' practical workforce-oriented skills (Mitchell, 2021), support professional development, and provide means for students to demonstrate their competencies (Lu, 2021). Other benefits of ePortfolios are opportunities to foster and add value to learning in terms of critical thinking, facilitate deep and self-regulated learning (Sanchez, 2014), and assist learners in drawing connections across diverse educational contexts (Campbell, 2019; O'Keefe & Donnelly, 2013). Further, integrating ePortfolio assessments influences curriculum decisions and can facilitate continuous refinement of teaching practices and course content (Kelley-Riley et al. 2016). Studies have further demonstrated how ePortfolio practices can provide valuable feedback for educational improvement, especially when linked to course grades and learning outcomes (Kelley-Riley et al. 2016). Hence, ePortfolios serve both a quality and retention agenda that allows for high-impact practice for course alignment through the demonstration of essential learning outcomes and digital, oral, and written competencies (Eynon & Gambino, 2023a; Lehman et al., 2021).

ePortfolios effectively deliver and design professional development for students (Carraccio & Englander, 2004; Scheele et al., 2008) and enhance students' reflective practices (Ahmed et al., 2012; Cheung, 2011). It has also been effective in self-assessment (Zeiger, 2005) and self-directed learning (Nagler et al., 2009). Other studies outline its ability for continual and lifelong learning (Gibbs et al., 2005) and the provision and support of continual feedback (Van Tartwijk & Driessen, 2009). Especially feedback provided by non-instructors such as mentors, assessors, and peers (Buzetto-More, 2010; Duncan-Pitt & Sutherland, 2006). It has also effectively linked theory with practice (Chittum, 2018) and increased learning competencies (Nguyen & Ikeda, 2015).

As ePortfolio practices and platforms evolve, several studies have reported successful implementation and integration in higher education teaching and learning contexts (Campbell, 2019; Lumsden, 2007). Griffith University's first-year engineering course used the ePortfolio personal learning environment to enhance students' design and employability skills, with over 80% of students recognising its effectiveness and recommending its future use (Michael et al., 2019). Various factors are critical to their successful implementation in higher education contexts.



An early study indicated the number of users as a critical success factor (Lumsden, 2007), with recent studies identifying users' satisfaction, actual usage, and continuance usage, as well as planning, readiness, and support (Campbell, 2019; Rizana et al., 2020). Others offer more practical suggestions for success, such as training, frequent reviews, adopting a process approach through change management, and integration into universities' vision and implementation plans, to name a few (Balaban, 2020).

However, achieving such success in ePortfolio implementation can be challenging, making it essential for institutions to address these challenges (Chatham-Carpenter, Seawel, & Raschig 2010). Some of the difficulties identified included information overload, technology adoption, privacy and copyright issues, and training of developers and users of ePortfolios (Lumsden, 2007). It is also important to note studies using activity theory to analyse technology and educational challenges. One study identified two main types of contradictions that hindered consistent ePortfolio usage: issues related to the tool itself, such as lack of awareness of its capabilities and resource misplacement, and issues related to the community, like unclear roles and conflicting feedback expectations (Kwong & Churchill, 2023). Another study combining activity theory, action research, and portfolios offered valuable insights into implementing an ePortfolio system at a Malaysian engineering university. The approach provided a framework to understand the roles of artifacts, community norms, and division of labour in developing the ePortfolio, highlighting the practical use of activity theory in research in examining both individual and group interactions within a particular socio-cultural context (Abidin et al., 2014). Activity theory was critical in understanding the factors regarding the failed adoption of ePortfolios within the Malaysian higher education environment (Abidin et al., 2013). Moreover, research utilising activity theory concerning reflection and ePortfolios has lacked a robust theoretical framework (Chye et al., 2019).

From the pedagogical perspective, it is an instrumental resource for educators to enrich online learning communities. Extensive eight-year empirical research involving English as a second language learners reveals that ePortfolios contribute significantly to resilience in blended learning settings and community engagement in both language learning and graduate programs (Lehman et al., 2021). This research was also guided by earlier research on practical ePortfolio adoption recommendations (Marín, 2020). Recommendations for effective group ePortfolio development based on blogs within Design-Based Research (DBR) included hands-on training, regular tool familiarisation, resource provision, role clarity, and a secure collaborative environment. Further guidelines cover documentation support, template offerings, peer feedback, and media integration for creative prototyping, all facilitating reflective practice and public communication of student work (Marín, 2020). Furthermore, ePortfolio development should also provide evidence of the competencies acquired by students for them to be effective so students can easily demonstrate skills and competencies (Alajmi, 2019; Ciesielkiewicz et al., 2024).

For institutional adoption, Slade et al. (2017) noted that the core indicators of success are rooted in meticulous strategic planning and adaptability, strong leadership, adept stakeholder engagement, clear communication, and the enduring viability of programs. Donnelly (2021) also offers several recommendations for widespread ePortfolio adoption. These include a) securing buy-in from programme chairs, b) showcasing successful examples, c) developing a clear purpose, d) emphasising the role in fostering holistic learning, e) highlighting the integration of

research with practical f) forming partnerships and utilising innovation diffusion tactics g) a clear action plan with clear benchmarks and h) dedicated support, potentially via small-scale funding, to enhance teaching and learning (Donnelly, 2021). Another study suggested that without student buy-in, student voice and student involvement in its implementation, inclusivity and student engagement cannot be comprehensively achieved within ePortfolios (Urtel et al., 2023). While the research on ePortfolios utilising Activity Theory is not new, there is a lack of research that examines ePortfolio adoption as it relates to the nature of opportunities and barriers impacting ePortfolio implementation and the particular strategies used for their successful integration.

## **Research Design**

This study used action research to reflect on implementing the ePortfolio platform in the university (Cohen et al., 2017). It served as an initial assessment of the effectiveness and challenges encountered during the university-wide implementation of the ePortfolio platform and practices across various courses. The methodology involved learning designers in evaluating and improving their approaches to ePortfolio implementation, reflecting through current practices, identifying areas for improvement, and implementing changes. The action research cycle in this study comprised how we assessed our approaches, what actions were taken to address identified issues, the outcome, and what that means to sustain ePortfolio practices across the university (Cohen et al., 2017). This cyclical process not only facilitated continuous improvement in the refining process of the implementation process of ePortfolio but also served as an opportunity to trial various learning designs and support academics to be self-sufficient to successfully implement the ePortfolio in their teaching and learning practices and support students better.

## **Data Sources and Analysis**

The source of data for this paper is based on the reflective experiences of the learning design team that played a crucial role in the implementation. The other data source comprised the artefacts collected from the workbook sample we created and implemented in teaching/learning and assessment practices. To this end, the study took a reflective approach to action research (Kemmis, 2009; Kemmis et al., 2014) that also considered meaning making and emotion of the subjects and objects of the study (Leitch & Day, 2000). Alternatively, what Kemmis (2011) refers to as a self-reflective practitioner in the more 'critical' areas of action research. This involved ensuring the data was comprehensive, capturing the implementation's intricacies that involved stakeholders' cognitive and emotional experiences and their reflections in detail. Organising this data involved meticulously reflecting on the implementation processes, which the research team repeatedly reviewed to comprehend the implementation process as an activity system. The reflective account was labelled and segmented using the activity system framework and then analysed how these different items interacted with each other without imposing pre-determined categories. Our subsequent analysis aimed to uncover the contradictions, what we did (or are doing) to address those, and what we have learned from that. This required an iterative and reflexive approach to ensure accuracy (Leitch & Day, 2000). Integral to our process was continuous self-reflection, recognising our biases and their influence on the analysis while also contemplating how our findings aligned with our practice, a core aspect of action research and ePortfolios more generally (Slepcevic-Zach & Stock, 2018). Our analysis carefully examined the emergent themes related to the research question, situating them within the broader scholarly

discourse. We ensured the robustness of our findings through meticulous cross-verification within the research team, or what Webb and Scoular (2011) call the reflection-on-reflection process concerning team-based action research. Our reporting aimed to convey the results in a manner that is both accessible and substantiated by in-depth reflective narratives. This approach highlights the iterative nature of action research (Kemmis, 2011; Leitch & Day, 2000; Webb & Scoular, 2011) highlighting the pivotal role of reflection in both the analysis and the subsequent informed action, thus framing our study as a dynamic interrelationship of, and for, continuous learning.

## **Findings and discussions**

This discussion evaluates the complex interplay between increased academic workload and the transformative potential of ePortfolio technologies. We confront the realities of educators burdened by new technical demands, starkly contrasting the intended enhancement of teaching practices. Activity theory guides our analysis, revealing contradictions in educators' roles and learning designers' responsibilities. We offer collaborative strategies to alleviate these challenges, advocating for redefined roles, streamlined workflows, and a unified institutional approach towards ePortfolio adoption.

### **Workload**

The findings reveal that adopting an ePortfolio resulted in an unintended workload for academics against the backdrop of enhanced learning and teaching practices. This contradiction was evident as educators did not have the time to upskill to develop the technical insight to understand the ePortfolios workflow and effective use to transform the learning practices as intended. Thus, the workload impacted educators' ability to support students as a first point of contact when struggling with submitting assessments in ePortfolio system (used in the subject). For instance, most of the subjects that implemented ePortfolio assessments had experienced issues, and when escalated to educators, most of the matters were referred to teacher-facing support staff (learning designers). Furthermore, their limited participation in the technical design of the ePortfolio assessment led them to be unaware of the limitations of the configuration of their ePortfolio assessment. Because of this, impacted ePortfolio workbooks undergo significant reconfigurations to better align to the needs of the educators and students in a short time and call for the need to inform and re-train.

Through the activity theory perspective, the challenges of increased workload and the need for upskilling emerge as primary contradictions for lecturers and secondary for learning designers. These issues likely stem from the dense teaching schedules of educators, leaving them with insufficient time for necessary training sessions offered by the learning design and technology support teams, as well as vendor-provided instruction (i.e. ePortfolio support). Furthermore, the initial deployment strategy may have underestimated the learning curve associated with the ePortfolio platform, assuming educators could simultaneously support students and master the system at the same time. In practice, however, learning designers have absorbed the majority of troubleshooting responsibilities, which fall beyond their primary duties.

In response to these challenges, there are ongoing negotiations to manage the increased workload effectively. One potential strategy involves integrating an ePortfolio specialist to assist

with both workload management and technical issues. Another is redistributing responsibilities and extending support duties across faculty roles, such as placement officers. There is also a call for a more structured support workflow to better assist students and placement officers. These approaches underscore the necessity of considering the workload implications for all parties involved (e.g. lecturers, students, and external stakeholders) when integrating ePortfolio systems within higher education. A robust support structure is crucial to mitigate the identified contradictions and to foster a successful implementation within the university framework.

### **Philosophy or Principles of Use**

The philosophy and principles underlying the use of ePortfolio systems are currently subject to debate, reflecting a spectrum of opinions on its optimal application. Advocates are divided between those who see it as a tool for structured learning and others who favour its potential to empower student-led experiences. These differing views have led to tertiary contradictions, creating barriers to unified practice and, at times, diluting the tool's credibility. Institutional protocols further complicate the adoption of ePortfolio practices. The requirement for assessments to be logged within the LMS contrasts with the capabilities of the ePortfolio system, necessitating additional steps for educators to reconcile feedback with grades in the system. Students' traditional beliefs about assessments have also posed challenges in adopting ePortfolio assessments. Formal assessments are submitted upon the completion of the assessment and turned in by the deadline. However, ePortfolio assessments are often iterative assessments without a definitive deadline. It leaves some students struggling to adapt to the iterative, deadline-free nature of ePortfolio assessments, leading to confusion and missteps in submission processes. In particular, students tended to submit individual parts without realising that their portfolios had already been submitted at the beginning and were tasked with completing the entire portfolio rather than individualised parts. It is not uncommon for students to find solutions to technical issues regarding ePortfolios by themselves or with their peers (Szydykova et al., 2021), however, technological fatigue weighs down on the students especially if the value of the ePortfolio system is not made clear.

Moreover, IT policies around the ePortfolio system have introduced quaternary contradictions, as the need for precise role delineations and permissions can obstruct with the execution of integral processes such as ePortfolio submission point set-up and external account management. This necessitates manual workarounds, increasing the administrative burden.

For example, without proper regions (clustering of users specific to disciplines) in place, users (lecturers) might access student assessment details beyond their own courses and would have to filter through to find relevant information to them. Also, granting relevant permissions for teaching and support staff, such as for external (facilitator) account creation and password reset, needs to be systematically implemented, as the current ad hoc approach is a bottleneck in the processes that adversely affects the student and external facilitator experience. Moreover, it is essential that relevant roles like quality officers who are tasked to validate student evidence for compliance should have easy access and navigation to the information in the ePortfolio system. The culmination of these issues has prompted a submission to the university's Learning and Teaching Committee for a thorough review. While others argued that the central learning committee should have first designed and developed an ePortfolio working party to work out these

contradictions, this was not possible due to the institutional and resource constraints (McNeill et al., 2014, p. 352). The goal is to refine the understanding and governance of ePortfolio use, achieving an institutional consensus that harmonises its structured and flexible applications, thus reinforcing its institutional value and resolving contradictions that currently impede its efficacy and credibility.

### **Division of Labour (Scope of work)**

The ePortfolio implementation journey has uncovered the inherent complexity of its workflows, highlighting a tertiary contradiction within the scope of work (for an illustrated example refer to Figure 2). Stakeholders grapple with the blurred boundaries of their roles, as the disparity between authority and expertise gives rise to overlapping responsibilities and unclear delineations of duty. This issue of division of labour of work is a sticking point in the effective adoption of ePortfolios within the literature (Kwong & Churchill, 2023). Through our work on the adoption of ePortfolios, it is revealed that its workflows are not only complex but also multi-faceted in terms of the roles and responsibilities of those involved.

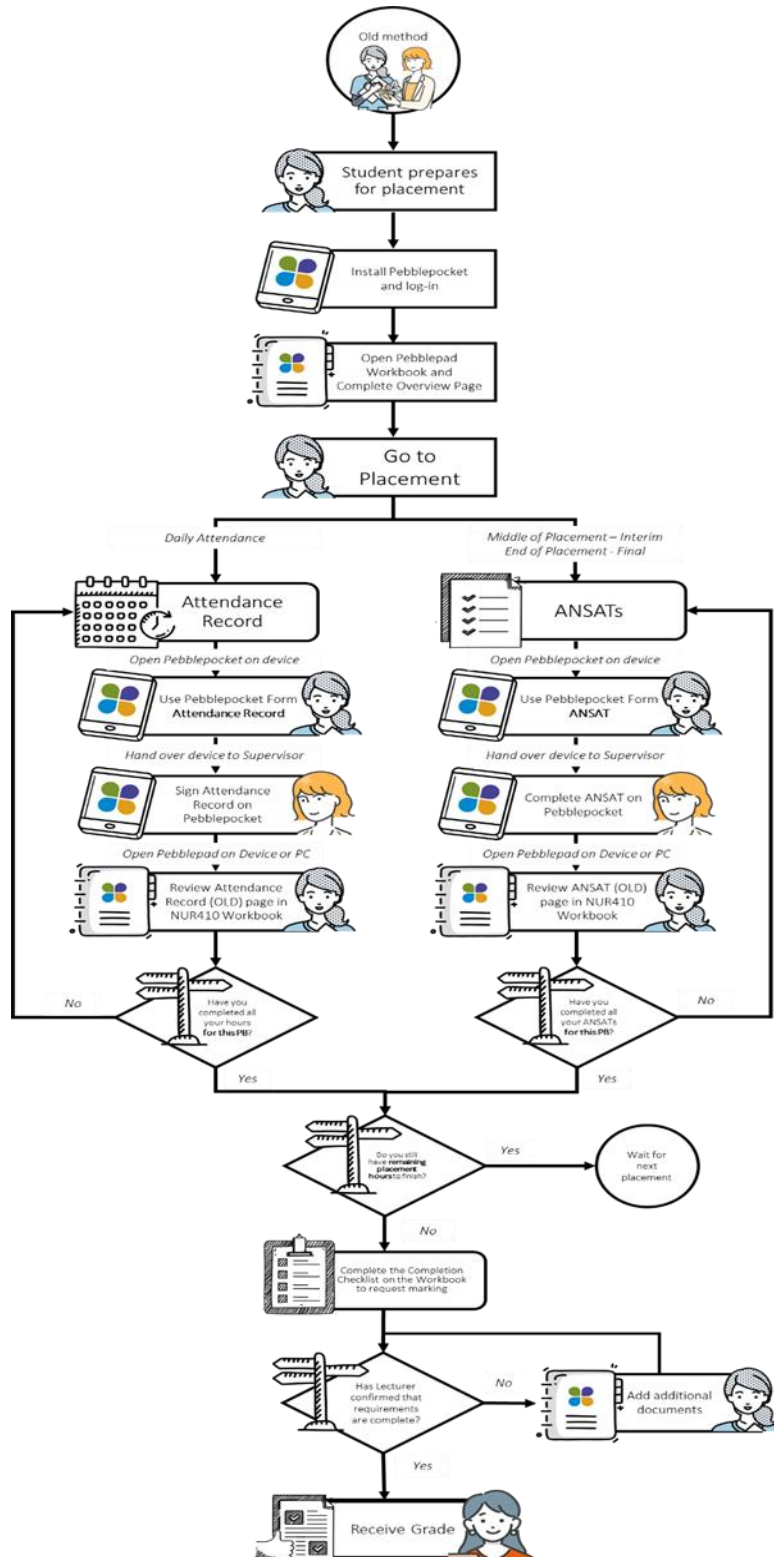
Placement officers, tasked with interfacing with external stakeholders, often find themselves at the nexus of ePortfolio enquiries, an authority in position yet sometimes deficient in the technical ability needed to resolve issues. Not to mention the reliability and validity of external assessors' judgement and preconceived biases towards students' work (Quiding, 2021). This deficit leads to an increased reliance on learning designers, whose creation of the ePortfolio system equips them with the necessary technical skills but whose primary role does not traditionally include such direct stakeholder engagement. While the literature states that such issues should be addressed before implementation and that policies should be in place prior to adoption (Harun et al., 2021), this was not practical or feasible in this current study.

Students, too, face challenges with the ePortfolio's evolving processes, indicating a pressing need for comprehensive guidance and nuanced training that spans both the pedagogical and technical domains of the system (Daim et al., 2016). The responsibility to shepherd students through the ePortfolio usage, traditionally within the educator's remit, is increasingly falling to learning designers, underscoring the critical need for role clarification and targeted training. The Learning and Teaching Committee has developed guidelines to delineate roles more clearly to address these challenges. A tiered training program is advocated, beginning with foundational knowledge the LMS support team imparted and progressing to more intricate aspects of ePortfolio management.

An improved onboarding process is recommended, providing students with a secure environment for hands-on practice that fosters confidence in utilising the tool before implementation. This is consistent with the literature, noting that when students were introduced to ePortfolio for practicum-based units, ongoing support for students was needed to increase their confidence (Roberts & Kirk, 2019). Improved self-help guides and resources, customised for diverse contexts and stakeholders within the system, are currently in development. They also guide students around its pedagogical purpose, noted in the literature as an important step (Colabella et al., 2023). Additionally, the development of bespoke self-help materials, such as instructional slide decks and embedded video guides, is underway to enhance the accessibility and usability of ePortfolio across diverse user groups. Prokopetz (2022, p. 1) states it elegantly when noting,

**Figure 2**

Example Bachelor of Nursing – Professional Placement ePortfolio workflow



“ePortfolio pedagogy is inclusive, embraces equity, and encourages the sharing of stories, beliefs, and ideas resulting in appreciation of self and others. As students engage in idea generation in terms of choice of platform, layout, content, and artefacts, they experience a shift in mindset”. The drive to implement this new ePortfolio tool underscores the need for precise role definitions and the cultivation of system-specific skills through tailored training initiatives. Such measures are imperative to navigate ePortfolio adoption's complexities effectively and foster a proficient, autonomous user base.

## **Community**

Our initial projects into ePortfolio deployment have outlined the critical need for a thorough evaluation from the collective viewpoints of students, educators, learning designers, technical support, and external assessors. The challenges encountered (i.e., those that stem from divergent expectations and technical hurdles) mirror Lehman et al. (2021) assertion that such misalignments significantly impede effective adoption within learning communities. This scenario epitomises a quaternary contradiction within the activity system, where stakeholders' preconceived notions and prior experiences with ePortfolios create a complex tapestry of expectations. For instance, external assessors accustomed to a different configuration in a partner institution grapple with our system's distinct setup. This disparity fuels a stream of inquiries and necessitates individualised resolution efforts. This resonates with Rouse and Green (2018) findings that familiarity breeds confidence in system evaluations, whereas unfamiliarity can sow doubt and hesitation. Educators, too, find themselves comparing our ePortfolio system with less burdensome processes at other institutions, highlighting a gap in support mechanisms. The responsibility for handling student queries and even grading, which at some universities lies with dedicated support staff, has inadvertently fallen onto educators' shoulders within our context. This resulted in primary contradiction within the node of division of role in the ePortfolio activity system as discussed in Table 2.

Recognising the necessity for a collaborative ethos, fostering a community of practice is paramount. Such a community would serve as a crucible for the exchange of insights, promoting the uptake and innovative application of ePortfolios tailored to various disciplinary needs, something well documented in the literature (Carl & Strydom, 2017; Chaudhuri, 2017; Karkowski et al., 2023) The commitment to share best practices and address challenges collectively is essential in nurturing a robust and supportive network, facilitating the seamless integration of ePortfolios into the fabric of our educational practices. Table 2 summarises the contradictions that occurred between the community members in its adoption. These contradictions must be managed to create a conducive and effective community that supports effective ePortfolio roll-out in institutions to achieve the intended goals and outcomes.

**Table 2.**

Summary of some of the contradictions between community members in ePortfolio implementation Activity System.

<b>Stakeholder</b>	<b>Contradiction description</b>
Educators	educators endeavour to use the ePortfolio system to assess student learning, and traditionally, they have not seen it in their role to provide extensive support to the use of the learning technology, such as troubleshooting.
Vendor customer support	The PebblePad Customer Success Manager works closely with the institution and has access to a wider community of practice across their customers but has limited understanding of specific institutional Virtual Learning Environment
External stakeholders	External assessors find it challenging to understand the new system as they liaise with Placement officers who do not understand the ePortfolio system. At times, they have used the same ePortfolio system with other institutions, which creates expectations and perceptions that are not aligned with our ePortfolio configuration and support system.
Learning design and technical support teams	The support for this new tool rests on the Learning Designers and LMS support team. However, they are limited in what they can support as ePortfolios are highly contextual to the subject matter, which lies in the educator's domain.

## **Outcome**

The implementation of ePortfolios has been driven by an ambition to advance and revitalise teaching and learning methodologies. Stakeholders recognise that the ePortfolio tool elevates a range of pedagogical approaches, offering functionalities surpassing previous technology tools used within the university. This enhancement is both supplementary and transformative, especially evident through adopting cohesive, course-wide programmatic assessment strategies. These strategies have the potential to significantly refine assessment methodologies, thereby enriching the educational experience for both instructors and learners. While administrative issues have been identified as a concern in these program-level approaches, findings reveal their effectiveness for student employability by showcasing competencies and skills to prospective employers (Bhattacharya, 2007). This opportunity emerged as educators sought ways to interlink student assessments across their courses. Increased confidence in the system empowers educators to envision more personalised and robust assessments, particularly in the era of generative Artificial Intelligence (AI) (Todeschini et al., 2023). To facilitate our progress, the learning designers and educators benefited from valuable support provided by the PebblePad Customer Success Manager. The vendor support offered insights from best-use cases in their “customer base” or community of practice and shared approaches and templates, including the

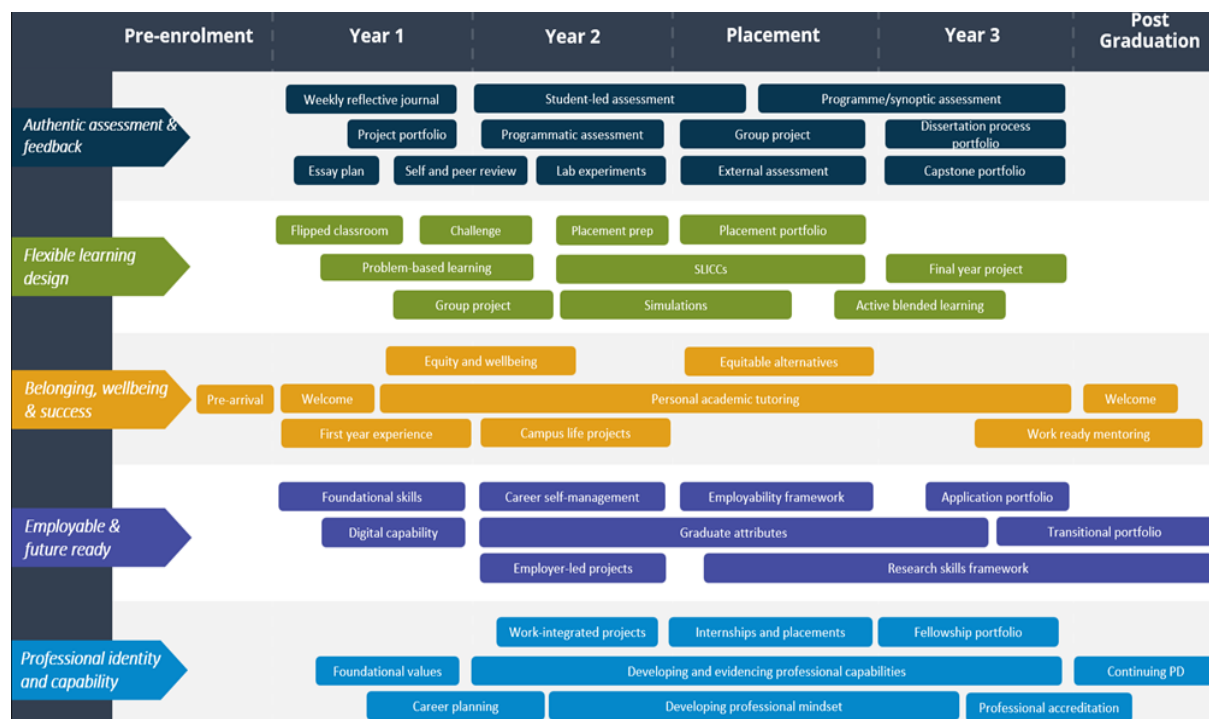


colloquially phrased ‘swim lanes’ diagram (Sutherland, 2023) (see Figure 3). This diagram depicts the broad spectrum of applications achievable at any institution, aligning with five academically based themes defined by PebblePad. However, even when technical support is not available, peer mentors effectively mediate the role of customer support to institutions (Eynon & Gambino, 2023b).

Learning Designers strive to assist educators in incorporating various ePortfolio pedagogical strategies into their practices. However, due to the steep learning curve for both students and lecturers, it is best to adopt a staged implementation strategy with capacity building in mind. The Swim Lanes diagram offers a blueprint for ePortfolio implementation by starting with introductory uses of ePortfolios in the first year to Professional Placement Portfolios in their final year. It is to be noted that obstacles to achieving these objectives include the institution’s current assessment practices and the familiarity of educators with existing learning technologies (e.g., reluctance to use ePortfolio for document submission when the LMS fulfils this function), which was a finding also noticed by Marín (2020).

**Figure 3.**

A Swim Lanes example to show potential ePortfolio system use across an institution, based on the PebblePad Themes adapted from Sutherland, 2023.



### Study limitations

The study’s scope was confined to the perspectives of learning designers, a significant limitation in comprehensively understanding the multi-faceted challenges and opportunities in the ePortfolio implementation processes. While learning design teams play a crucial role in shaping educational experiences and technology implementation in learning institutions, they represent only one of

the many stakeholders involved in the educational ecosystem. Thus, this study lacks insights from critical stakeholders: students and educators. In particular, excluding student feedback and voice as direct interactions or document experiences could have helped in assessing usability and impact, which are not captured in this study. Furthermore, the absence of educators' perspectives means the study may have missed an opportunity to understand how ePortfolios affect teaching practices and workload. The intricate dynamics of educational institutions necessitate the incorporation of a broad array of insights to truly grasp the effectiveness and impact of ePortfolio in teaching and learning interventions, particularly from educators and students. The researchers also come with their own biases and preconceived notions of learning, which should be acknowledged under a critical action research lens (McLaren, 2017; McTaggart et al., 2017). This is due to the data coming from the implementers of the system themselves, which may pose an inherent bias towards positive outcomes, underreporting, or perhaps overlooking particular issues. The contextualised focus on only one university may not account for varied implementations across different universities or contexts, limiting the transferability of conclusions made within. Future research could progress such arguments at different universities within different contexts and preferably with a longitudinal outlook to examine how such contradictions may change, transform, mitigate, or be alleviated over time.

## **Conclusion**

The study findings reveal that implementing a new ePortfolio tool introduces a new workload to be considered by university staff wherein clarity must be achieved in how it is to be used in the context of the virtual learning environment by the whole university. Also, how each and everyone's roles change to support this new tool; and understand how changes in other roles affect their own. Engeström (2009) contends that new knowledge and ideas are developed and implemented into actions when working through contradictions in an organisation. Many of such new knowledge and ideas are not pre-established. This concept is exemplified in implementing the ePortfolio tool at CDU, a novel undertaking that entailed learning new ways to use the tool for transforming assessment practices. This learning process occurred through addressing contradictions encountered during the tool's implementation, reflecting Engeström's notion of learning new forms of activity dynamically as they are being developed.

## **Key learnings and recommendations**

This research culminates in recognising that the effective implementation of ePortfolio system within educational institutions hinges on a transparent, inclusive, and supportive strategy that aligns with pedagogical goals and addresses the multi-faceted challenges stakeholder's encounter. For a successful implementation and integration of the ePortfolio systems and practices, irrespective of whether it may be - a bottom-up, top-down or bi-directional approach – there is a need to have clarity in the planning, roll-out and ongoing support. The study advocates for such clarity and the necessity of engaging all stakeholders in the process, managing the additional workload, and providing comprehensive, tailored training to empower educators and support teams. Establishing robust support frameworks, including out-of-hours assistance, is crucial for addressing technical challenges promptly. Co-creating principles of use before implementation is critical to ensure that the ePortfolio system serves its intended pedagogical purposes rather than becomes an underutilised platform.

Additionally, mechanisms for supporting external assessors need to be transparent and efficient to maintain the assessment process's integrity. Institutions should foster a reflective practice culture, inviting continuous feedback to refine ePortfolio practices. Building a collaborative community is vital for leveraging collective expertise, overcoming challenges, and driving pedagogical innovation. By integrating these practices, institutions can approach ePortfolio adoption with intentionality and responsiveness, enhancing the educational landscape and setting a strong foundation for future technological implementation.

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