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ORIGINAL ARTICLE

Seeding ePortfolio into Initial Teacher Education Curriculum in Australia: To Kill Multiple Birds with One Stone

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ABSTRACT
The paper is stemmed from the Australian policy reforms between 2014 and 2015 in a concerted attempt to uplift Initial Teacher Education program quality and accreditation, enhance pre-service teacher's class-readiness and equip them with essential competencies required of the teaching profession. It is coupled with the novel, emerging challenges of the Covid-19 pandemic, international border closure and the global shift from face-to-face learning to virtual and/or blended learning mode since March 2020. Drawing on a descriptive case study (Chetty, 2013; Yin, 1994) on the Education Double Degree in an Australian institution, the paper unpacks the ways in which the unit leader of the Education Double Degree in an Australian institution innovated four Education units in response to these above-mentioned challenges. Central to this curriculum innovation is seeding ePortfolio via Mahara and Google Site tools into program and curriculum redesign. The paper showcases the road used to remap the program and curriculum; it deploys an integrative learning approach as a conceptual framework to personalise the virtual learning space where student engagement with the course knowledge, skills and values is promoted and where students' metacognition and deep learning are genuinely incubated. Insights from this paper are relevant and, therefore, applicable to curriculum, innovation, technology in education and an emerging ePortfolio pedagogy. It additionally puts forward significant implications for Initial Teacher Education reforms beyond Australia.

1. INTRODUCTION

The paper responds to the pressing issue of teacher shortage in Australia recently and a series of Australian policy reforms from 2014 onwards. These reforms have been done in a concerted attempt to uplift Initial Teacher Education (ITE) program quality and accreditation and enhance pre-service teacher's class-readiness as well as equip them with essential competencies required of the teaching profession. Further, it responds to the emerging challenges of the Covid-19 pandemic, international border closure in Australia and such a global shift from face-to-face learning to virtual and/or blended learning since March 2020. And yet, excessive attention in the research literature as well as teaching practice in the Higher Education sector has been directed towards exploring hybrid teaching pedagogy, student engagement, e-assessments, and student health and wellbeing. Unfortunately, there appears to be a significant gap at the curriculum and program design level to be tweaked swiftly to address these challenges.

Drawing on a descriptive case study (Chetty, 2013; Yin, 1994) on the Education Double Degree in an Australian institution, this paper unpacks the ways in which the unit leader of this program innovated the four Education units vis-à-vis the emergence of blended learning since the beginning of 2020. Central to this curriculum innovation is the seeding of ePortfolios via Mahara and Google Site into curriculum remapping and program redesigning towards

creating a personalised virtual learning space where student engagement with the course knowledge, skills and values is promoted and where students' metacognition and deep learning are incubated. Insights from this paper are relevant and, therefore, applicable to curriculum, innovation, technology in education and an emerging ePortfolio pedagogy which garners an effective response to blended learning in the Australian higher education context.

The paper begins with an overview of the policy reforms in the Initial Teacher Education in Australia. It reviews ePortfolio and uncovers the ways in which ePortfolio is seeded into program redesign and curriculum mapping. It is followed by a research methodology exploring descriptive case study and integrative learning conceptual framework. It subsequently analyses how the unit leader aligns the Australian Professional Standards for Teachers (APSTs for short) and course learning outcomes while remapping the ITE program and scaffolds tasks and assessments. It concludes with some insights and implications for innovations in curriculum development, program design, technology and ePortfolio assessments.

2. LITERATURE REVIEW

2.1. Research background: Teacher shortage and ITE policy reforms in Australia

There has been a growing concern about the teacher shortage in Australia across its states and territories. It is evidenced by the fact that according to the Australian Bureau of Statistics (2020), there were approximately 296,516 teaching staff in 9,542 Australian schools who were full-time equivalent (FTE) in 2020. Amongst them, 152,281 teachers work in primary schools, and 143,695 teach in secondary schools. This situation validates that a dire shortage of teachers in Australia (The Guardian, 2021) has actually existed nationwide. For instance, the New South Wales Teacher Federation estimates by 2030, 11,000 more teachers are needed. This teacher shortage situation looms large.

The Education Minister, Alan Tudge in his release of the Initial Teacher Education Review in April 2021, acknowledges that "*teacher quality was the single most important factor in improving academic standards*" (Hare, 15 April 2021). Hunter (2021), the education program director of the Grattan Institute, supports Mr Tudge's argument and remarks that "*Teaching quality is the most important in-school factor that drives learning outcomes. If we want to lift learning in schools, we need to improve teaching quality. Initial teacher education is an important lever to do this*".

Alongside the burgeoning teacher shortage, pressure on the Initial Teacher Education program quality and accreditation has indeed surged, resulting in a radical shift in entrance selection criteria. Noteworthy also is a series of policies implemented in ITE has substantially fuelled radical educational reforms. In 2015, in their report entitled, *Action Now: Class Room Ready Teachers. Australian Government Response*, the Teacher Education Ministerial Advisory Group urged the need to select the right candidates for the Initial Teacher Education program, which depends not only on the Australian Tertiary Admission Rank (ATAR) cut-off but also on crucial personal qualities required of the teaching profession (AITSL, 2016; Department of Education and Training, 2015). Delegated by the Australian government, the Australian Institute of Teaching and School Leadership (AITSL for short) develops and sets up clear expectations of universities to rightly combine academic achievement requirements and personal qualities and thereby use the right tools to choose suitable candidates. Accordingly, as tasked by the Australian government, AITSL develops a framework for robust assessments in the ITE program and makes it explicit that assessments in these programs must be continuous and aligned with the Graduate level of the Australian Professional Standards for Teachers (APSTS). ITE program providers need to support student teachers to collect evidence of their classroom readiness to showcase their knowledge and skills fundamental to the teaching profession to potential employers. These reforms introduced in the ITE program have made room for transformative curriculum development, teaching, learning and assessments. ePortfolio has, therefore, gained prominence in ITE since it responds effectively to changes outlined in these policies.

Despite these new policies and entry requirements for candidates who wish to pursue an ITE program, pre-service teachers, especially those who are international students, upon their pursuit of this program, seem to have faced numerous challenges such as limited understanding and thus, interpretation of and alignment with APSTs, teaching and learning experiences, leading to either limited or incomplete insights into teaching and learning. Our research indicates that these pre-service teachers often hold taken-for-granted beliefs and somehow naïve, untested assumptions about students, teaching, curriculum, pedagogy, classroom management, and teacher's roles and responsibilities. Their skills to support learning and teaching remain largely insufficient (Nguyen & Whippy, 2019, July 2019; Whippy & Nguyen, 2017); these have resulted in their weakened self-esteem, inept or slow adaptability and fragmented shaping of professional identities. For those international pre-service teachers estranged from the Australian schools, these challenges are mounted. The Unit Leader of this ITE program identified these challenges

and gaps witnessed in the international pre-service teachers and saw the potential benefits of embedding ePortfolios in the process of innovating curriculum, program redesign, and teaching and assessments in order to close these gaps.

2.2. ePortfolio and typologies

ePortfolio stemmed from the concept of the portfolio, became popularised in the 1990s and flourished in the 2000s with the widespread of Web 2.0, hypertext, multimedia, etc. Barrett (2005) regards ePortfolios as a digital container which can store visual and auditory content such as text, images, video, and sound. Eynon, Gambino and Török (2014) share a similar view with Barrett (2005), contending that ePortfilio is a collection of electronic evidence presented on the Web; it is collated and managed by a user. This electronic collection has different formats, such as texts and electronic files. It can include images and multimedia. Alternatively, it can be presented in other formats: blog entries or hyperlinks. Further, ePortfolio showcases one's capabilities and serves as platform where one can express themselves. ePortfolio presented, these scholars conclude, online can allow for different degrees of access to audiences; one ePortfolio can serve various purposes (ibid.).

Matthew-DeNatale (2014) outlines three main types of portfolios. *Documentation/directed portfolios* are the ones created in light of professional standards or program outcomes. The students are required to use the highly structured templates to exhibit their accomplishments against these standards or outcomes. These portfolios are intended for outcomes mapping and assessments. The second type, *the integrated learning/developmental portfolios*, argues the scholar, moves closer to augmenting metacognition and shaping professional identity. This comprises of vicious cycles of pre-service teachers creating work, reflecting on work and revising the work in response to unpack their behaviours associated directly to the control and monitoring of their own learning and thinking about the units. More specifically, these behaviours induce subtle observation of emotions attached to the individual process of learning and thinking, which is broadly defined as *metacognition*. Importantly, this cycle of creating, reflecting and revising one's work has been located within a broader diameter, that is, the professional or learning identity formation. The compatible pedagogy underpinning this type of portfolio is what we call the social pedagogy, the one which widens the audience circle beyond the academics to incorporate peer feedback, discussion and group work. The last type, *the showcase portfolios*, are to testify the educational experiences accumulated within a capstone project or throughout the course. These portfolios are, in the eyes of career advisors, useful for students to prepare for their future job interviews (ibid.).

This research is located within the spectrum of Matthew-DeNatale's portfolios typologies. It describes an in-depth documentation portfolio, integrated learning/developmental portfolios and showcase portfolios in the process of carefully mapping out the program and curriculum and adopting the social pedagogy in promoting metacognition and personalising virtual learning space in the Initial Teacher Education Program to be elaborated further in the coming sections.

3. MATERIALS AND METHODS

3.1. Research methodology

This research adopts a descriptive case study approach (Chetty, 2013; Yin, 2009) which elucidates the natural phenomena occurring within the data in question, and it is set to describe the data as they occur. In regards to this research, it is set to answer an emerging question that is "How to integrate ePortfolios into curriculum mapping, program design, pedagogy and assessment in the ITE program?" Upon unpacking the research, a case study (Hesse-Biber & Leavy, 2004) is chosen as it equips the most suitable method to help the researcher explore the principal research question, dealing with '*what*' and '*how'* (Creswell, 2007; Merriam, 1998; Yin, 2009, 1995). This is because a descriptive case study allows an 'insight', a 'discovery' and an 'interpretation' in context; it is particularistic, descriptive and heuristic. In combining different sources of data (documentation, interviews, reflection, and workshop artefacts), a descriptive case study allows for triangulation of data to make the research rigorous (Chetty, 2013, Yin, 2009) and engenders a 'thick description' of social life and the theory premised on both micro and macro levels of analysis. Correspondingly, this research provides 'a thick description' of the ways in which curriculum is remapped and the program is subsequently redesigned in response to emerging changes in the Australian ITE policy context, let alone the urging need to tweak this program and curriculum to respond effectively and timely to the Covid-19 pandemic. Precisely, it describes how the unit leader of this ITE program aligns the course learning outcomes with the APSTs (predominantly three key domains including Professional Knowledge, Professional Practice and Professional Engagement) for graduate ITE students during the course of redesigning and remapping the curriculum in 2020. It also uncovers how the unit leader aligns assessments and pedagogies - although briefly -

and utilises ePortfolios in every aspect with curriculum remapping and program design. In doing so, the ITE can maintain its compliance with policy requirements, APSTs and teaching and learning quality while allowing room for personalisation and metacognition building in the hybrid learning environment.

Based on the single case of the Double Degree in Teacher Initial Education in an Australian institution adapts an *interpretative* approach; that is, how individuals or groups ascribe to social or human problems in terms of the meanings held by these people (Creswell, 2007; Denzin & Lincoln, 2005; Gay & Airasian, 2003; Hesse-Biber & Leavy, 2004; McMillan & Schumacher, 1993). Insights from this curriculum remapping are, as a result, *valuable in providing particularities*, rigorous *descriptions* and *first-hand experiences* (Merriam, 1998) *where the author of this paper - as well as the unit leader of the ITE program - writes the curriculum on the go*. This also validates claims made by Chetty (2013), as discussed elsewhere in this paper.

However, due to the scope and limit of this paper, the author finds it impossible to cover all research components, including findings from interviews with students. Therefore, the paper leaves out a typical description of research participants, participant recruitment and research procedure. Instead, the author looks closely at specific steps in which the unit leader of these ITE units redesigns the program and maps out the curriculum of these four Education units so as to create a more personalised virtual learning space for pre-service teachers. Also, the researcher collects artefacts and self-reflection writings of the unit leader and artefacts from a series of learning design workshops, as well as portrays and analyses three major themes in greater depth: curriculum remapping, matching APSTs with course learning outcomes and aligning APSTs with assessments and teaching pedagogies using integrative learning conceptual framework.

3.2. Integrative learning as a conceptual framework

Towards curriculum design, the constructive alignment proposed by Biggs (2003) is fundamental. Constructive alignment focuses more on students' actively constructing meaning and knowledge through a series of learning activities. Meanwhile, *'alignment'* refers to the fact that the teacher sets up the learning environments appropriate to achieve these learning outcomes. Teaching methods and assessment tasks are, as a result, aligned with learning activities in the assumed learning outcomes. There are four steps outlined in constructive alignment: (1) Defining intended learning outcomes (ILOs); (2) Selecting teaching/learning activities which support ILOs; (3) Assessing students' actual learning outcomes to determine how well they match with the intended ones; and (4) Finalising grade.

Although constructive alignment is imperative in curriculum design, it is not adequate. A substantial research literature on ePortfolios and curriculum design has underlined the unequivocal stance of integrative learning and its impacts on curriculum design (Huber, 2006; Huber et al., 2007; Morreale et al., 2017; Rowley & Dunbar-Hall, 2012). In the Catalyst Learning project conducted at the State University of New York at Oswego, Huber (2006, p.3) found that students are explicitly interested in integration. And yet, this interest seems to fade away as they proceed with the detached divisions of the curriculum and the disruptions they face in their campus life. The scholar critically remarks that integrative learning should be, amongst many others, the goal and the hallmark of undergraduate education quality. Integrative learning allows students to contribute themselves to and connect the dots of various fragments of their studies and campus life to a broader network of meanings and construct a big picture of the complex, sophisticated real world. Huber (October 2005) further accentuates student's integrative learning capability to make connections has been recognised as an important course learning outcome and should not be interpreted as a merely superficial, misperceived combination of undergraduate's mixed experiences.

Essentially, integrative learning is a learning approach in which learners generate meaningful connections between new knowledge and existing/prior knowledge, skills and/or experiences. However, it should not stop short at that. Rather, it must be viewed as "larger leaps of imagination rather than little ones, about mastering intellectual arts that can be used to make productive, provocative, and memorable connections between domains that have usually been - in one's personal, academic, or cultural experience isolated, separated, or kept apart" (ibid, p. 4). Inherited the spirit of integrative learning, this research utilises this approach to program design and curriculum mapping in the Education program, which will be analysed in the detail subsequently.

4. RESULTS AND DISCUSSION

4.1. Step 1 - Aligning APSTs with course learning outcomes

Central to documentation ePortfolio is pairing the professional standards with the course learning outcomes (Matthew De-Natalie, 2014). Essentially, the Double/Honoured Degree in Education was launched in January 2017.

It is the pathway program in which the students study the first-year units with the Diploma and transition into the second year in university. This program has two compulsory Education units: MCD 8010, Understanding Learners and Learning and MCD8020, Understanding Teaching for Learning. In 2021, these two units were archived and replaced by MCD8010, Working in Education: An Introduction to the Profession and MCD8020, Approaches to Teaching. Accompanying these units are professional experience units, including MCD8030, Professional Experience 1A and MCD8050, Professional Experience 1B. Echoing Matthew De-Natalie's synthesis of documentation ePortfolios, the unit leader is keen to embed integrative learning in curriculum design, connect the theoretical and practical skills of these units with APSTs core competencies of the teaching profession, enrich students' educational experiences and help them connect the dots of their first year in the college with a broader picture of the ITE program in the university, the profession and a "*more sophisticated pictures of the world"* - to borrow Huber's (2016, p.3) phrase. Such rationale underscores integrative learning in redesigning the ITE first year program and remapping the curriculum in light of the Australian Professional Standards for Teachers (APSTs) and the unit learning outcomes.

APSTs Domain 1, Professional Knowledge

Underpinned by Matthew-DeNatale's classification of portfolios (2014) and the reforms in Initial Teacher Education (AITSL, 2016; Department of Education and Training, 2015), especially the documentation or the directed portfolios, the very first unit of the Education Double Degree program, entitled *Working in Education: An Introduction to the Profession*, aims to orient education student as closely as possible towards the Australian Professional Standards for Teachers. Amongst three key domains outlined in the APSTs, two of which are the epicenter of this unit: professional knowledge and professional engagement. There are some elements of professional practice woven throughout the unit; however, these elements remain ad-hoc and lie at the margins of the course outcomes.

Essentially, APSTs proposed by the Australian Institute of Teaching and School Leadership (AITSL) are constitutive of three key domains: professional knowledge, professional practice and professional engagement (AITSL, 2014). In the first domain [*professional knowledge*], teachers are required to use professional knowledge and research to cater for diverse student needs within a specific educational context. They have to understand the physical, cognitive, social, emotional and moral development of the students (Ewing et al., 2020; Hoy & Margett, 2016; McInerney, 2010). Teachers grasp a sound knowledge fundamental concept of the subject and curriculum, structure and inquiry process associated with the program/subject they teach and thus structure the lesson according to the students' needs and abilities. They use Information and Communication Technology (ICT) to contextualise and expand learning beyond for students.

APSTs Domain 3, Professional Engagement

Domain 3, P*rofessional Engagement* (AITSL, 2014), looks closely at how teachers engage professionally with colleagues, parents/carers and the community. Within this domain, teachers must possess duo roles: a teacher and a learner (Ewing, Kervin, Glass, Cornu & Groundwater-Smith, 2020). As learners, they must identify their own learning needs and thereby assess and seek to broaden their professional learning opportunities in collaboration with colleagues or by themselves (Ewing et al., 2020). Besides, they are respectful and professional when interacting with students, colleagues, parents/carers or the community.

Primarily, integrative learning has been applied as a valid conceptual framework underpinning curriculum design in this research. This is evidenced by the fact that these Education students are expected to demonstrate their sound understanding of the APSTs, Domain 1, Professional Knowledge factored in *learning outcome 1*: "Show an understanding of the structures, policies, behaviours, practices and requirements of the profession" and *learning outcome 6* "Showcase foundational knowledge, skills and understandings of concepts associated with the work of teaching (curriculum, planning, pedagogy, assessment, reporting)". These two outcomes clearly required students to obtain a sound knowledge of theories relevant to every aspect of teaching and learning, curriculum, pedagogy, assessment and reporting. *Learning outcome 7* states that students are supposed to "Demonstrate understanding of a range of communication skills required in educational and professional settings". Furthermore, students are required to exhibit professional engagement. Although challenging for first-year students to make sense of the comprehensive APSTs and link them meaningfully with the course content, students exceed the unit leader's expectation in demonstrating their understanding, critical analysis and interpretation of these APSTs. This, again, validates similar research findings on the positive impacts of making the course learning outcomes compatible with the professional standards and industry requirements of university graduates featured in the Integrative Learning Project by the Carnegie Foundation for Advancement of Teaching (Huber, 2006, October 2005; Huber et al., 2007; Hutchings, 2006).

This is further backboned by comprehensive knowledge and understanding of the requirements of their emerging professional identities as pre-service teachers and professional responsibilities in *learning outcome 2*: "Orient yourself as an emerging professional within a range of frameworks and legislation that guide the profession of teaching, including curriculum, child safety, teacher standards, improvement frameworks and relevant codes of conduct and ethics". Another critical focus of this unit is the students' ability to articulate their developing understanding of everyday practices, routines and roles tied to teachers as well as the articulation of their personal and interpersonal capabilities expected of this profession. Equally important is the shaping of the teacher's professional identities and the shaping of their educational philosophies as indicated in *learning outcome 4*: "Articulate your professional obligations, emerging orientations and educational philosophies". This has been translated into a series of assessments: two major assessments in MCD8020, one major in MCD8010, Teacher Concept Map and the reviews incorporated into two professional experience units, MCD8030 and MCD8050.

APSTs Domain 2: Professional Practice

In the second domain, *Professional Practice* (AITSL, 2014), teachers make learning engaging; they create and maintain a "*safe, inclusive, and challenging*" learning environment for students (Ewing, Kervin, Glass, Cornu & Groundwater-Smith, 2020). They encourage and maximise student participation alongside teaching and maintaining student safety. They also use ICT safely, responsibly and ethically (AITSL, 2014). Simultaneously, teachers deploy fair and equitable behaviour management plans and apply comprehensive communication strategies to communicate effectively across the student cohorts. Teachers enact a wide range of teaching strategies; they constantly assess and evaluate their teaching practice in response to student needs. Teachers draw on student assessment data for diagnosing learning barriers, as well as making learning challenging to students to improve student performance. They master every stage involved in the teaching and learning cycle (AITSL, 2014; Ewing et al., 2020).

In light of the integrative learning framework, the second unit in the Education Double Degree program moves beyond developing the APSTs Domain 2, *Professional Practice*. The same is applied to Unit 3 and 4, which is heavily vested in professional experience. For instance, the students in the second unit are expected to "Demonstrate knowledge of a variety of teaching approaches and resources to accommodate a range of abilities and interests" and practice using high impact teaching strategies (HITS) (State of Victoria, 2017), including goal setting, worked examples, collaborative learning, questioning, feedback and metacognitive approaches to teaching and learning. The professional practice component takes the pre-eminence where students do "Plan and deliver an effective whole group teaching and learning episode, demonstrating a rationale and effective application of core pedagogical approaches" in *learning outcome 4*. The unit underlies classroom management strategies, as indicated in *learning outcome 5*: "Illustrate emerging approaches and techniques to positively and effectively manage teaching and learning contexts (i.e. teacher presence, learner management, resource management, discourse practices).

The last two units, MCD8030 and MCD8050 emphasise professional experience - this is the opportunity for students to gain their educational placement in an Australian educational organisation, school or centre. Each last one full week. Principally, pre-service teachers are placed in different Australian schools and work as teacher assistants, observing the classroom, documenting teaching and learning in addition to supporting the mentor teachers, and implementing administration duties. These duties are expanded to incorporate every aspect of school operation and professional development activities. Meanwhile, they are expected to engage and communicate with key school stakeholders such as parents/carers and the community. All three APST domains are best reflected in these units, especially through Mentor Report. Pre-service teachers are required to "Document their professional learning through means such as a professional experience folder which records lesson planning, self-reflection and an evaluation on developing practice" as indicated in the second learning".

Inarguably, such links between learning outcomes of Education units with the APSTs standards are significant and embrace a tenderly integrative learning framework in curriculum remapping and program redesign. Primarily, these links orient students right from the beginning of the ITE program towards the standards required of them in the teaching profession. They expose the students to three APSTs domains, including professional knowledge, professional practice and professional engagement. These direct them on how to build their theoretical understanding of learning and teaching theories relevant to teaching and learning and demonstrate these skills and knowledge both in the unit and outside into the schools and community during their professional experience. These linkages have been corroborated to be meaningful for students, as indicated in our survey and student reflection (Whippy and Nguyen, 2017, Nguyen & Whippy July 2019).

Interestingly, research done by Huber (2006) and Huber and colleagues (2007) has illustrated the role of integrative learning in assisting underprepared students in La Guardia Community College in the US who are overwhelmed with full-time jobs and full-time courses. Integrative learning links basic skills courses with the content courses in the liberal arts, business, or health professions which they wish to pursue. This integrative learning implemented by La Guardia Community College has actually helped "transform the hurried, fragmented nature of our students' education by creating substantial, integrated connections between their courses and helping them link coursework to the rest of their lives" (Arcacio, Eynon, and Clark, 2005, p.15, as cited in Huber, 2006, p. 3).

4.2. Step 2 - Seeding ePortfolio into curriculum mapping

The Association of American Colleges and Universities and Carnegie Foundation for the Advancement of Teaching (March 2004) criticise the mismatches, inconsistencies and disconnectedness between the educational reform efforts made by a number of US colleges and universities and the curriculum. Albeit a number of opportunities for integrative, connected learning via the introduction of first year seminars, learning communities, interdisciplinary studies, capstone projects, portfolios, novel use of student self-assessments, etc., such a gap between reforms and curriculum still exist. These influential organisations call for a concerted effort to make integrative learning consistent and coherent throughout students' years in colleges and universities. More importantly, integrative learning should be "*a cornerstone of a twenty-first-century education*" to echo their words (emphasis added). They urge to assist students in recognising and embracing the essence and strengths of integrative learning in making their college study experiences more intentionally connected and meaningful. Additionally, the faculties find it crucial to create models and built-in integrative skills and curricula as a gateway to promoting integrative learning within and across disciplines and fields (Association of American Colleges and Universities & Carnegie Foundation for the Advancement of Teaching, March 2004).

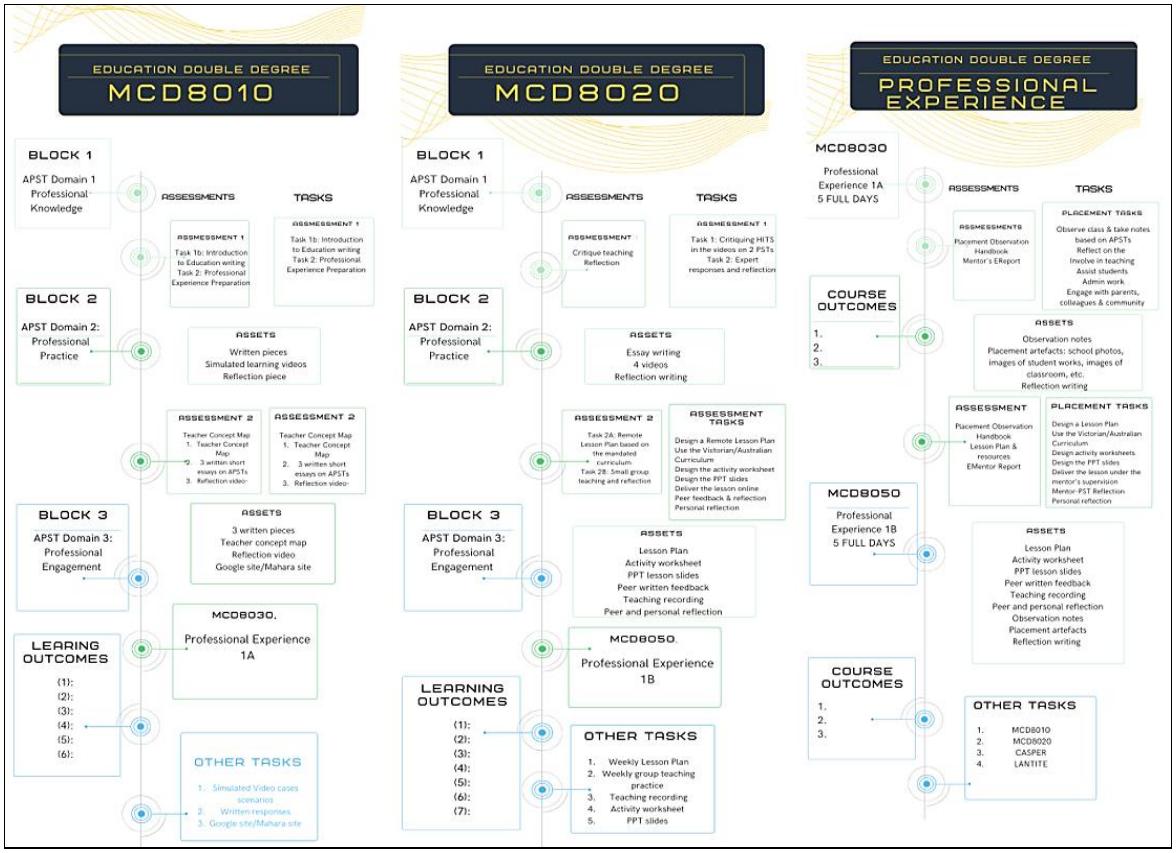

Figure 1. Education double degree curriculum mapping

Gale (2006) highlights the importance of pedagogy in integrative learning. The scholar argues that the students should be the beginning and the end of any integrative pedagogy. Specifically, their development, capability to make meanings, cultivation of skills and the capacities to create coherent connections in learning should lie at the centre of

this pedagogy. Echoing Huber and Hutchings (2006), Gale enthusiastically advocates for the scaffolding technique, which moves beyond any singular course; portfolios and self-assessment rubrics must be used as appropriate tools for students to understand their experiences via curricular and co-curricular activities and cross-campus initiatives, etc.

Inspired by the integrative learning approach to program design and curriculum remapping, the program in this research is structured on three separate blocks spreading out over a 12 weeks period of time. Each specialises in one APST domain. The Learning Design workshops highlighted the opportunity for students to use both documentation and developmental ePortfolios (Matthew De-Natalie, 2014) to build ePortfolios in light of these APSTs, document and share their reflections on their learning with their lecturer and peers, collate a rich source of evidence and assets of their learning journey to create a personalised ePortfolios channel such as Google Site or Mahara. Combing theory and practice and creating more opportunities for self-reflection throughout the trimester are key ideas carefully considered in the process of redesigning the program and remapping the curriculum (Barrett, 2005; Brooks, 2017; Strudler & Wetzel, 2005). The above figure best illustrates the curriculum mapping of these four units.

4.3. Step 3 - Scaffolding ePortfolios tasks and assessments

As previously discussed, documentation ePortfolios are often formed in alignment with the professional standards or program outcomes (Matthew De-Natalie, 2014). This type of ePortfolios largely benefits pre-service teachers in this ITE program to match their skills and competencies with the Australian Professional Standards for Teachers (AITSL, 2014). More specifically, teaching and learning activities have been redesigned and translated into authentic documentation ePortfolio (Matthew De-Natalie, 2014) and corresponding scaffolding tasks that are built toward the major assessments. This is done on the basis of maximising the use of documentation ePortfolios against the professional benchmarks and enhancing *folio thinking*. Instantaneously, they personalise the virtual learning space, promote higher thinking order and, by this means, deep learning and engagement (Douglas et al., 2019; Eynon et al., 2014; Herring & Notar, 2011) for these pre-service teachers (Chittum, 2018). Specifically, the MCD8010 assessment 1B is structured around professional experience preparation with nine modules focussing on key aspects of the teaching profession; they are Essential Policies, Working with Children Check, Preparing for Professional Experience, Australian Professional Standards for Teachers (APSTs), Becoming a Professional, Being a Professional, Being Proactive, Working with Your Mentor, Being a Role Model, and Mindset.

Towards documentation ePortfolios (Matthew De-Natalie, 2014), the MCD8010 major assessment, Teacher Concept Map requires pre-service teachers to draw upon scaffolded models, and examples presented throughout the unit and present their own concept map on expert teaching. Accordingly, they reflect on early versions of their emerging avatar and how their teaching perspective has changed over the trimester. They examine their personal strengths and weaknesses against essential teacher qualities; they list three threshold concepts and thereby articulate their new understandings. Importantly, they must create comprehensive links to artefacts/exemplars (digital, textual, oral) that showcase their well-versed set of skills, knowledge and understandings of teaching practices at the first-year undergraduate level; they understand key resources/assets (including personal assets) for teaching and explain how these relate to or are deployed to support their developing teacher identity and practice. Essentially, they catalogue their journey and reflect on their increasing skills, knowledge and understandings. This assessment is unequivocally accorded with ePortfolio essence; it underpins a variety of ePortfolio formats, including a concept map Google site for presenting their three minor essays exploring APSTs and their video/audio reflection.

Developmental ePorfolios are used to accumulate pre-service teacher metacognition and professional identity shaping, as reviewed earlier (Matthew De-Natalie, 2014), are depicted in MCD8020 major assessments: (i) Case Study and (ii) Remote Lesson Plan and Small Group Teaching. Pertinent to these assessments is a focus on a range of reflection and a rich source of collaborative activities ranging from personal reflection and group reflection to peer feedback and lecturer feedback. Besides, ePortfolio assets are composed consistently in various ways, such as student's lesson plans, teaching recording and group reflection templates. They do have a weekly Education Lab where they deliver microteaching practice to their group and record their lesson in Zoom. This is followed by weekly peer and lecturer's feedback on their teaching and personal reflection. Their teaching recordings are uploaded to their Google/Mahara site as part of an ongoing accumulation of their evidence-based teaching practices and professional learning journey. Thanks to creating these developmental ePortfolios (ibid.) via course assessments, the unit leader aims to carve out their broader path, that is, their professional identity shaping journey and portray vividly their delicate, inner-thinking and their learning process.

Planting both documentation and developmental ePortfolios (Matthew De-Natalie, 2014) in curriculum mapping, redesigning teaching and learning materials, and scaffolding assessments have become paramount in this research. Drawing on Valence (1999), Rowley and Dunbar-Hall (2012) examine how curriculum mapping and ePortfolios are embedded with technology in music teacher preparation. The signpost is that curriculum mapping throughout the program allows for the opportunities to make explicit the conceptual or philosophical frames in which decisions and choices about curriculum are made. These scholars outline three essential components: the unit, ePortfolio tasks and the assets. For them, the tasks are associated with different skills demonstrated, such as audio, film, file, text documents, etc. These entail mastery of some relevant technological activities - be they recording, designing, uploading, etc. These tasks permit students to innovatively create various identities and representations which are constitutive of their music teaching profession.

Additionally, developmental ePortfolio tasks take various formats ranging from self-reflection writings, audio-visual files, images, and video recordings (Eynon et al., 2014; Farrell, 2020), featuring the triple pillars of their teaching profession: professional knowledge, professional practice and professional engagement. These assets incorporate day-in, day-out in-class portfolio activities, weekly reflection writings, lesson plans, class observation notes, mentor-preservice teacher reflection proforma and placement diaries. In many instances, they have been widened to include an assortment of communication and collaboration artefacts with colleagues, parents/carers and the community collected during their professional experiences in the Australian schools in ways that demonstrate the pre-service teachers' professional engagement.

Noteworthy also is the personalised learning space incubated through virtual platforms such as Mahara and Google site. In the Education units explored in this research, the pre-service teacher's collection of evidence on their professional learning journey starts right from the beginning of their ITE program. The collection ranges from documentation peer feedback and group feedback to group reflection and personal reflection. They serve as a catalyst for pre-service teachers to connect beyond their academic circle with the lecturers to the wider public audience, including, but not limited to, their peers, their mentors and the public audience, etc. In essence, these assets serve as essential evidence of the degree to which the pre-service teacher is class-ready, the program accreditation and prospective employers (Wayne and Faulkner, 2012). In the Education Double Degree program, two ePortfolio platforms have been activated for these purposes: Mahara and Google site, both of which have proved to be impactful ePortfolio tools.

5. CONCLUSION

Precisely, the paper has elucidated three fundamental steps from the backward curriculum design approach in which the unit leader of the Education Double Degree in an Australian institution innovated the curriculum, program design, assessment and pedagogy. This includes matching the course learning outcomes with the Australian Professional Standards for Teachers and thereby seeding documentation ePortfolios in these two alongside the changes in the Australian ITE policy landscape. Second, it remapped the ITE curriculum and program in light of the developmental ePortfolio and integrative learning conceptual framework. Last but not least, it scaffolds developmental ePortfolio into learning tasks and assessments. This procedure proves to be a viable approach to designing blended learning since it transforms the student's virtual learning space into a more personalised, socially connected and professionally engaged platform for pre-service teachers through deploying Mahara and Google Site tools into the remapping of the curriculum and program. It utilises reflection writing, audio videos, teaching, peer feedback and reflection, observation, lesson plan, lesson recordings, artefacts collated on the Australian professional standards for teachers, images, mentor-preservice teacher reflection proforma, placement diaries and the like across all Education units.

Creating close linkages between the unit outcomes and APSTs has actually encouraged PSTs to orient themselves to the Australian systems, structures and policies. It has accorded PST's knowledge, skills and values obtained from these four units with the real world of work outside of the campus - to echo the research findings in the research literature explored throughout this paper. In addition, the process of building ePortfolios through the use of Mahara and Google Site has postulated favourable conditions for augmenting pre-service teachers' metacognition and gradual shaping of professional identity. As a result, pre-service teachers can construct evocatively a big, meaningful picture of the teaching profession, as well as the macro context in which they operate as pre-service teachers and soon-to-be teachers upon their graduation. This big picture is perceived to be highly impactful for them, especially

when they start their learning journey as emerging pre-service teachers right from the very first year of their Double Degree program. Insights from this paper are relevant to curriculum innovation, pedagogy, assessments as well as reforms in Initial Teacher Education and higher education in general.

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