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Lan Luo

Jian Chen

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Asian Adult Education Annual Conference

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Using Micro-Credentials to Promote Effective Teacher Professional Development: A Case Study from Xi'an Jiaotong-Liverpool University

Lan Luo¹ & Jian Chen¹

¹Academy of Future Education, Xi'an Jiaotong-Liverpool University

Abstract

This study illuminates the characteristics of micro-credentials, which can effectively meet the needs of working professionals in higher education for teacher professional development and career competence-building. Through examining the PGCert programme offered at XJTLU, we find that micro-credentials can be beneficial to TPD in terms of integrating instruction strategies and technological tools into classroom settings and applying blended learning model to achieve interactiveness in hyflex teaching contexts. However, some issues are also identified with the PGCert programme because teacher-trainees' differentiated level of teaching experience and lack of continuous collaboration makes it difficult to customize individualized needs which senior faculty cohort considers more desirable. Based on the findings, recommendations are given that needs analysis shall be conducted prior to TPD training programs and a self-directed learning community could be organized to ensure customization and longlasting values of micro-credentials.

Keywords: Micro-credentials (MCs), teacher professional development (TPD), higher education (HE)

Introduction

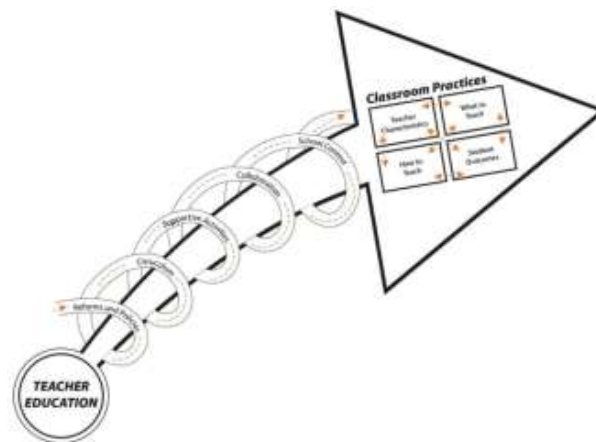
Given the paradigm shift in employment that has resulted from industry upgrades and the integration of AI-enhanced technologies, upskilling and reskilling are increasingly in demand for professionals in different sectors. However, employees rarely have sufficient time to study as full-time students and consequently, they prefer to develop applicable work-related skills more effectively in a shorter period. According to extensive research, micro-credentials can play a critical role. This paper examines credit-bearing micro-credentials, such as the Post Graduate Certificate in Teaching and Supporting Learning in Higher Education (PGCert) adopted by Xi'an Jiaotong-Liverpool University (XJTLU). Employing the perspective of teacher-learners through an effective teacher professional development (TPD) framework, the paper aims to discover what impacts these micro-credentials have had on university teachers' continuing professional development.

Literature Review

Effective Teacher Professional Development

The need for high-quality education and pedagogical standards has raised expectations for teacher professionalism and skill (Bubb, 2004). Furthermore, teachers expect new expertise for continuous improvement (Collinson et al., 2009). To determine an effective TPD, many researchers have evaluated it by employing a range of dimensions. Hunzicker (2011) proposed a guide list for professional development design, suggesting that effective

professional development (PD) is supportive, job-embedded, instruction-focused, collaborative, and ongoing. The Reading Recovery programme identifies seven characteristics of effective professional development through a year-long, graduate-level training course for teachers: a focus on content, active learning methods, job-embedded contexts, the use of models and the modelling of effective practices, coaching and expert support, feedback and reflection, and sustained duration (Darling-Hammond et al., 2017). The “third-generation framework” for PD proposed by Sancar et al. (2021) noted that TPD is an ongoing process, which involves classroom practices characterised by the instructor’s personal traits, curriculum or educational content, teaching methods and approaches, and student learning levels and styles (Sancar et al., 2021).



A conceptual framework of teacher professional development (Sancar et al., 2021)

Despite some differences among the dimensions they list, researchers agree that effective PD is job-embedded (emphasising a school context), instruction- and content-focused (focusing on what and how to teach), collaborative (providing peer feedback and active learning), supportive (utilising coaching or the guidance of experts), and ongoing (eschewing one-time training programs).

Credit-bundled micro-credentials and their features

Micro-credentials are prominent as a possible solution. Micro-credentials are also known as alternative credentials, nano-degrees, digital badges, and certificates (Brown et al., 2021), and though delivered through multiple courses, their content is not sufficient to confer a degree. Micro-credentials can be acquired from professional associations, online providers, and traditional higher education institutions (Fong et al., 2016; Pickard et al., 2018). According to the Quality Assurance Agency for Higher Education, micro-credentials are “credit-bearing courses or modules designed to be self-standing or could be studied as a component of a larger award. Micro-credentials, which are awarded by bodies authorised to award academic credit, are subject to proportionate quality assurance mechanisms and are mapped against the levels of the Framework for Higher Education Qualifications of Degree-Awarding Bodies in England, Wales and Northern Ireland (QAA, 2021).” There is broad consensus on the definition of micro-credentials as a certification of assessed learning outcomes that are additional, alternate, complementary to or a component of a formal qualification (Oliver, 2019). Although there is no uniform definition of the term ‘micro-credential’, micro-credentials are competency-based, self-paced, and have short-term features

that can enhance personal strength and employability (Maina et al., 2022).

A micro-credential's characteristics make it effective for professional development. It equips learners with industry-aligned competencies that respond to market needs, thereby promoting their professional development (Ahsan et al., 2023; Wheelahan & Moodie, 2022). Many countries have established micro-credential programmes for professional advancement. In Australia, for example, micro-credentials were used during the COVID-19 pandemic to contribute to individualised professional development in both technical and soft skills (Desmarchelier & Cary, 2022). Micro-credentials are included in the Qualifications and Certification Framework by the New Zealand Qualifications Authority and are part of the regulated education and training system that the country uses to meet the needs of learners and industries (NZQA, 2023). SkillsFuture in Singapore (SSG) provides individuals with the general and technical skills needed for the current and future economy. These courses can be completed at an individual's pace, and earned credits accumulate for future career advancement.

A micro-credential's characteristics also make it effective for an educator's professional development. Credit-bearing micro-credentials provide adult learners with the flexibility to design their learning by addressing self-identified skills gaps; they also allow educators the autonomy to work towards a formal qualification over time (Oliver, 2019; White, 2021). Teachers expect their professional development to relate to their own work experiences and want to demonstrate growing capability while ensuring a flexible learning schedule (DeMonte, 2013, 2017). Micro-credentials can provide the knowledge and skills educators need to improve their teaching while also allowing them to balance their time between work and study. Micro-credentials not only improve the quality of teaching but also allow teachers of all degrees and experience levels to display their skills through competence assessments (Tooley & Hood, 2021).

Although many countries utilise micro-credentials to address the skills gap for working professionals, the effectiveness of micro-credentials in professional development is still unclear (Carey & Stefaniak, 2018). By targeting an educator's professional development, this research explores the effectiveness of professional development using micro-credentials. The credential studied in this paper is the PGCert offered by XJTLU.

The PGCert programme at XJTLU

The PGCert programme is set at the master's level (Level 7). Mirroring the University of Liverpool's provisions and academic expectations, it focuses on increasing capacity for long-term professional development. The programme's target learners are early career teachers and individuals who seek professional development to support teaching. The certificate is designed to help learners understand the principles of effective teaching and research in higher education, applying them to develop practical teaching and research skills and forging links to practice. This certificate consists of two stages. The first stage, D1, may also be pursued as a stand-alone programme and consists of the course Learning, Teaching, and Assessment (PGC401(AY)), which is designed for both postgraduate students with teaching responsibilities and professional staff who interact with students in a pedagogical capacity. The second stage, D2, consists of three courses. Among those three, two are core courses: Learning, Teaching and Assessment (PGC401(AY)) and Pedagogic Research to

Enhance Professional Practice (PGC402(AY)). For the third course, students may choose either Teaching in Transnational Contexts (PGC403(AY)) or Using Technology to Enhance Learning and Teaching (PGC404(AY)). Both the entire PGCert programme and its component programme, D1, have been submitted by XJTLU for accreditation by the Higher Education Academy. The programme's learning outcomes meet the UK Professional Standards Framework. A learner can complete D1 or the PGCert as a whole to gain recognition as a Fellow of the Higher Education Academy.

Programme Structure PGCert/D1	
OVERVIEW	
<ul style="list-style-type: none"> • D1 participants will complete PGC 401 • PGCert participants: PGC 401 and 402 are mandatory, as is a third module; enrolees can choose between 403 and 404. 	
PGC 401 Learning, Teaching and Assessment 5 credits	PGC 402 Pedagogical research to Enhance Professional practice 10 credits
PGC 403 Teaching in Transnational contexts 5 credits	PGC 404 Using technology to enhance student learning 5 credits

The effectiveness of a teacher's professional development is evaluated along multiple dimensions. Previous research suggests evaluating professional development through activities designed to prepare the teacher's practice, the activities' duration, the role of colleagues, the focus of professional development, active learning, how coherently the teacher's professional development activities align with their personal goals, and local supports and barriers (Penuel et al., 2007). A more concise version, however, assesses the effectiveness of professional development activities for teachers by using just four dimensions: how supportive the activities are, whether they are job-embedded, whether they are instruction-focused, and whether they are collaborative and ongoing (Hunzicker, 2011).

Research Questions

To gain an insightful understanding of what impacts PGCert (as one of the credit-bundled micro-credentials) can have on TPD, particularly in the context of XJTLU, this paper proposes two research questions.

- Examining the PGCert through the lens of an effective TPD framework and considering it as a programme leading to credit-bearing micro-credentials, to what extent does it meet the professional learning needs of XJTLU teachers?
- Is individualised professional learning achieved in the PGCert learning experience, and how can micro-credentials be further modified to improve customisation?

Methodology and Data Analysis

In this research, interviews were conducted to collect qualitative data from the PGCert participants. The five selected participants varied in their academic backgrounds (education,

physics, mathematics and biology), genders, and number of years teaching (both junior and senior teachers being included). Semi-structured interviews (Creswell, 2002) and template analysis (Brooks et al., 2015) were used to analyse the interview contents and identify patterns in the participants' perspectives on the PGCert. The themes were categorised based on dimensions of the effectiveness of teacher professional development (see Table 1).

Table 1. Interview Analysis

Themes	Number of Mentions	Example Quotes
Job-Embedded	4	<p><i>“They asked us to connect our learning with our current teaching.”</i></p> <p><i>“It is suitable for higher education in the UK, but I’m not sure about its recognition in Chinese universities.”</i></p> <p><i>“It is useful for helping me understand teaching in a university and in the UK educational system.”</i></p>
Instruction- and Content-Focused	7	<p><i>“They taught some education technologies that are very useful.”</i></p> <p><i>“At least 50% of the contents is theoretical, but I gained some practical insights, such as tools to make teaching interactive and tips to improve student engagement.”</i></p> <p><i>“It targets all teachers at XJTLU, and therefore, it’s hard to make it more content specific. Also, some sessions have overlapping content.”</i></p> <p><i>“Some of the content is inspiring, such as the flipped classroom.”</i></p> <p><i>“The programme itself is a demonstration of how to interact and engage students in class discussion.”</i></p> <p><i>“Most of the modules are teacher-led and cover too many theories that I am already familiar with.”</i></p>
Collaborative	6	<p><i>“The teaching is very interactive.”</i></p> <p><i>“Teachers who administer the programme tried to include everyone in group discussions.”</i></p> <p><i>“Participants online are less involved in collaboration than on-site participants. Also, I noticed that our international staff were more active in these discussion sessions.”</i></p> <p><i>“Senior staff share some very insightful</i></p>

		<p><i>thoughts when they talked about their experiences and observations.”</i></p> <p><i>“Discussing difficulties that I met in my current teaching practice was helpful for me in this programme.”</i></p> <p><i>“(This programme is) interactive, but studying with different cohorts of teachers makes it hard to establish long-term collaboration.”</i></p>
Supportive	2	<p><i>“We have peer observation to provide suggestions about improving our teaching, especially for blended learning practices due to COVID-19.”</i></p> <p><i>“Support is available if needed.”</i></p>
Enduring and Ongoing	3	<p><i>“Sessions do not last long because we are quite busy with teaching and research.”</i></p> <p><i>“For new staff or teachers, I think the current duration is useful. But for senior teachers, it would be better if we could tailor our study. For example, for teachers in higher education, teaching is not the only responsibility. We also have to produce research. For teachers with years of experience, our professional development should be more flexible and based on personal development preferences.”</i></p>

Discussion and Interpretation

Data analysis revealed that TPD has several notable benefits. Firstly, the PGCert offers many pedagogical approaches that inspire junior teachers to incorporate their learning into their current teaching. Educational theories that teach students how to learn – through critical and innovative thinking, for instance, problem-solving skills, and the ability to reflect on one’s own work – are also important for the teacher’s development (Zhu, 2014). The PGCert programme applied a learner-centred approach by using active learning, collaboration and reflective assessment, all of which serve as a demonstration for educators teaching students how to learn. During the class, for instance, one of the participants mentioned adopting the flipped classroom as an instructional strategy for the current semester. Moreover, the programme’s practical content was highly regarded as it offered tangible value in improving teaching practices. For example, the participants found materials related to technology, such as using H5P to develop interactive learning content, particularly appealing. Also, teachers benefitted greatly from implementing such materials in their current teaching settings to increase student engagement. The content offered in PGCert may help educators address their skills gap and immediately transfer their new skills into their work.

Secondly, participants appreciated the content blended learning model, primarily

because they could choose to attend online or on-site, according to their schedules. That flexibility in the learning schedule also meets previous research expectations for TPD (DeMonte, 2013, 2017). In addition, using a blended learning approach in this programme's design set an example for participants, showing how they could integrate it into their teaching practice. Lastly, the interactive sessions and opportunities for peer observation and feedback were valuable for facilitating growth and strengthening teaching skills and strategies. Participants mentioned that the PGCert frequently encouraged group discussions. Sharing among teachers from different subject and cultural backgrounds with varied teaching experiences can provide insights to junior teachers, helping them improve their teaching. In this process, senior teachers can self-reflect and summarise their previous practice. As an international joint venture university, XJTLU has a special working environment, and the intellectual exchanges among international and local teachers further contribute to the participants' professional development. One of the participants reported an experience of peer observation during the pandemic, a period when the university was utilising a blended learning approach. A peer fellow attended a trainee teacher's online and on-site classes, observing the teaching practices, interacting with students, and providing feedback to help the trainee teacher better integrate blended learning methods. The trainee teacher found this observation and feedback valuable because the peer observer could offer advice from a different perspective. These benefits highlight the importance of practicality, flexibility, and a collaborative and interactive learning experience when designing TPD micro-credentials.

Nevertheless, several issues were identified by the data analysis. By targeting the general teaching population, the programme selects theories and other content that may not be attractive to senior teachers. Additionally, teachers in the higher education sector have different goals in future career pathways, which include not only teaching but also research and management. Although as the current micro-credentials programme, PGCert is required for all teachers, it employs a single approach for all participants, overlooking adult learners' need for credit-bearing micro-credentials to include the flexibility to design their learning based on self-identified skills gaps (Oliver, 2019; White, 2021). Adult learners have rich experiences and predefined expectations for what they need to learn; they are also problem-oriented, seeking skills or immediate knowledge that can be put into practice (Merriam & Brockett, 2011). The desire to learn is crucial for personalised professional development, which requires educators to be open to finding solutions in learning methods (Berger & Berger, 2004) and exploring new techniques to improve teaching practices (Bartz & Kritsonis, 2019). The participants found some theoretical content challenging to implement immediately in their teaching practices, however, which potentially hindered both their application and reflection. Some teachers have non-educational backgrounds and need time to comprehend educational theories and link them to their teaching practices. For instance, one of the participants found certain learning activities difficult to apply to science classes that were primarily knowledge-based. Effective TPD builds in time for adequate contemplation and integration of knowledge and practice. An earlier micro-credential programme, the Learning Differences MOOC-Ed, required teachers to submit artefacts demonstrating how they apply their learning to their teaching practices; while those applications need not be revolutionary, evidence of their attempts was required (Acree, 2016).

Lastly, participants found some discussions to be superficial and unproductive, which

potentially limited the depth of exploration and success of learning outcomes. One of the participants shared that in some classes, approximately half an hour was spent discussing their understanding of educational philosophy, and it was difficult for participants to understand the connection to practical teaching skills. Also, some participants reported that the lack of collaboration that was long-term or involved different cohorts impeded group discussions from producing valuable results. One senior teacher reported that certain discussion topics were interesting enough to warrant development into research projects. However, the blended learning format and the teachers' busy schedules meant that some participants were unlikely to be able to attend regularly, which would hinder further communication about previously discussed topics. Furthermore, when involved in TPD, adult educators consider the educational community as a whole and approach problems collaboratively with their colleagues to make the solution applicable in their classrooms (Beavers, 2009). Adults learn best when learning is interactive, allowing them to reflect on their previous practices and grow throughout their teaching careers (Beavers, 2009; Tweedell, 2000). The shortcomings that participants noted indicate areas where improvements are needed to improve the design of future micro-credentials, making TPD more effective.

Recommendation

Several recommendations emerged from this study's data analysis for micro-credentials to develop effective TPD. Previous research has suggested that 'micro-credentials should not have a one-size-fits-all approach' (Acree, 2016), and this study concurs with that finding. Previous investigations found that because adult learners have two distinctive features – self-directed learning and utilisation of their experiences – provoking a conflict between their current and intended learning directions will decrease their desire to learn (Beavers, 2009; Trotter, 2006). Therefore, learner analysis should be conducted before designing the micro-credential programme to identify the participants' various levels of experience and expertise. Content should emphasise teaching practices and applications, and for early career teachers and new staff, it should include content-specific material. For senior teachers, subject-specific content, innovation in teaching strategies and collaboration to explore research opportunities are more attractive.

Furthermore, opportunities for sharing and discussing case studies were highlighted by participants as a means to foster collaborative learning and knowledge exchange. Discussing teaching practices and sharing practical examples enable participants to gain valuable insights and learn from real-life experiences. Taking advantage of these opportunities helps teachers develop professionally by advancing their knowledge and developing their skills (Bartz & Kritsonis, 2019). By creating a professional learning community, participants collaborate to collectively achieve their shared learning objectives (DuFour, 2004). These educators have similar backgrounds, and a setting that encourages them to generate solutions can also forge a positive community atmosphere for professional development (Beavers, 2009). These expectations provide valuable guidance for curriculum development in micro-credentials programmes, ensuring that each participant's needs and preferences are effectively addressed.

Limitations

Despite the valuable insights gained from the interviews, it is important to acknowledge the limitations and potential biases in the processes of data collection and analysis. Firstly, with only five participants, the sample size of the interviews was relatively small. Although efforts were made to select participants with diverse backgrounds and experiences, the findings may not fully represent the entire population of teachers participating in XJTLU's PGCert programme. Therefore, when applied to a larger setting, the findings should be carefully considered. In addition, the interviews were conducted after the programme training. During the training, the participants might have been sensitive to current circumstances or have difficulty reflecting on their experiences. These limitations should be acknowledged when considering the findings. Future research should interview a larger number of participants and also collect data on how they incorporated what they learned from the PGCert into their teaching practices.

Conclusion

In this research, we studied the PGCert as a credit-bearing micro-credentials programme that meets the needs of TPD by focusing on the school context and offering an instructional and collaborative environment. We found that teachers benefit from instruction strategies and tools that can be applied to classrooms and the model of blended learning as well as interactive activities. However, due to the programme participants' diverse backgrounds and experiences, it was not possible to achieve individualised professional learning in the learning experience. Different levels of experience among participants created a range of expectations for career development, and the lack of adequate collaboration impeded the promotion of TPD. We recommend that future micro-credentials be designed to consider the characteristics of adult learners. Customising content to diverse professional development needs may create a self-directed learning community that contributes to understanding the factors that make micro-credentials valuable for educators in promoting effective TPD over the long term.

Author Information

Lan Luo is a Master of Science student in Digital Education at Xi'an Jiaotong-Liverpool University. Her areas of interest are digital education, professional development and adult education.

Mr. Jian Chen currently serves as the Head of New Professional Education (NPE) Division within ILEAD and an Assistant Professor at the Academy of Future Education. Aaron is a part-time Ed. D student of Educational Leadership and Management program at East China Normal University (ECNU). His research interests and management practice include International Comparisons in Higher Vocational Education, Sino-Foreign Cooperative Education, Industry-Education Integration (IEI) and teacher professional development in the field of Technical and Vocational Education and Training (TVET), and educational leadership and management.

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