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## A Proposal of a Framework for Preparing Pre-service Teachers for Continuing Professional Development

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### Abstract

Teacher Education is intended to not only prepare pre-service teachers (PSTs) to teach but also to continue learning themselves. This paper, which is drawn from a Masters level qualitative research study, in the Mathematics Education field and involving Mathematics-major PSTs as research participants, focuses on the aspect of preparing pre-service teachers for continuing learning. It reports on a framework comprising two Interrelated Plans named: PSTs continuing professional development (CPD) preparation Plan and PSTs CPD Plan, which are being proposed and recommended to support the preparation of Mathematics PSTs for continuing learning. The proposed framework presents a structure to facilitate intention-illuminated action toward preparing PSTs for CPD in a Teacher Education context. Its use in the preparation of PSTs for CPD could contribute to boosting the PSTs' ability to identify with and prioritise CPD and uptake of CPD when they start serving as teachers.

**Keywords:** *Continuing professional development, Continuing learning, Mathematics pre-service teachers, Framework*

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### 1. Introduction

Teacher education covers learning for pre-service and in-service teachers (Villegas-Reimers, 2003). In-service teacher education is for already serving teachers and generally designed to improve their knowledge, skills, competences and keep them to stay abreast of significant developments in their professional work (Mgaiwa and Milinga, 2024; Osamwonyi, 2016). Pre-service teacher education also known as initial teacher education (ITE) involves preparing future teachers. It has a responsibility to prepare pre-service teachers (PSTs) to teach effectively and enhance learners' learning (Sandholtz, 2011). It is at the same time argued that it also has a role to play in initiating, or introducing and developing the idea of continuing teacher development and learning (Patterson, 2002) to the pre-service teachers. In this, the aim is to help the pre-teachers become aware of the need for continuing growth and development as a critical component of their (future) professional lives. Bubb and Earley (2007) state that apart from ITE training being valuable in its own right it can also be viewed as providing a platform on which continuing professional development (CPD) can be erected. Therefore, suggesting that it is expected to support the vision for continuing and lifelong learning and where such vision or prospect is not obvious to help develop it.

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Overall, the preparation and preparedness of mathematics pre-service teachers, at a selected university in central Zambia, for continuing learning is what concerned the masters research study (for the Master of Education in Mathematics Education programme) from which this paper is drawn. One of the arguments for it being that while several studies in the Zambia context and beyond (including Calleja, 2022; Muyunda, 2022; Mansour *et al.*, 2014) have been done on varied aspects of CPD and the focus has generally been on CPD with respect to in-service teachers. There has been a lack of specific consideration of CPD with respect to PSTs in general. Specific attention has not been paid to the preparation or preparedness of Mathematics pre-service student teachers for CPD. Not preparing the PSTs for CPD could have negative consequences on their ability to identify with and prioritise CPD when they start serving as teachers. One of the key outcome of the study is the development and hence key recommendation of the proposed CPD preparation framework comprising two interrelated plans: CPD preparation plan for PSTs and PSTs CPD Plan. The paper presents the two interrelated plans designed to help with the preparation of students for continuing learning. It first presents the methods used for the broader research study from which the paper is drawn followed by the proposed framework and ends with concluding remarks and way forward.

## 2. Materials and Methods

The broader research study from which this report is drawn was a qualitative research employing a case study research design. The 68 (57 male and 11 female) PSTs pursuing Bachelor of Science in Mathematics (and the course representing the minor subject) with Education in 2022/2023 academic year made the population for the study. They were Mathematics major students and were in their fourth and final year of their ITE programme. They were purposively chosen because they had: already done the courses generally designed to contribute to providing general knowledge and skills for teaching and a foundation for professional growth and development as already indicated above in the introduction section: done the practical aspects of their programme including peer teaching, and School Teaching Practice (STP) or practicum and: had learnt or covered most, and all in some cases, of the course content for their courses in their whole ITE programme. At this stage of their programme, the PSTs had already covered all the content for their minor subject of specialisation (which included Physical Education Studies or Geography or History or Chemistry or Physics). They were taking only Mathematics-related content and methodology courses (as Mathematics was their major) and some fourth year education-related elective courses. With the above presented, it was considered that they had been exposed to CPD both in the lectures on the same and practically such as during their STP. They were highly likely to have learnt about and experienced forms of CPD than the third, second or first year pre-service teachers specialising in mathematics and as such considered well-positioned to offer richer and comprehensive insight in CPD related matters as needed in this study.

The PSTs participated in the study by first completing the questionnaire, after ethical clearance was granted and consent obtained, and thereafter by being interviewed. The questionnaire with open ended-ended questions was distributed to all the 68 PSTs. Twenty-five (25) out of the 46 (37 male and 9 female) who completed the questionnaire indicated their willingness to participate in the one-to-one in-depth follow up interviews. This formed the basis of the decision to include them among those to be interviewed. The researcher was conscious of saturation point as explained in literature by scholars such as Guest *et al.* (2020). With this, only 15 out of the 25 were interviewed. Only 2 out of the 4 Mathematics teacher educators were willing to be interviewed. Their willingness was also the basis for interviewing them as key informants. The data collected from the Mathematics teacher educators (lecturers) helped with crosschecking that from the PSTs. The length of the interviews with the 15 PSTs ranged from 9 to 22 minutes while with one lecturer it was 25 minutes and 33 minutes for the other. The interviews were conducted at the convenience of the research participants. In all, data collection methods for the bigger study from which this paper is drawn encompassed questionnaire, semi-structured interviews and document review. The collected data was analysed using thematic analysis as elaborated by Joffe (2011) and content analysis (Elo and Kyngäs, 2008). This was done without using any computer based qualitative data analysis software apart from Microsoft word which was used to create tables where need be to present the summary of the analysis and findings. The proposed PSTs CPD preparation Plan and PSTs' CPD Plan are a synthesis of some of the findings of this broader study on which the paper is based and ideas extended in the works of various authors including Ouane (2002); Cropley and Dave (1978); European Union (2019); Ooi (2020); Mann and Webb (2022) and; Kilag *et al.* (2023).

### 2.1. Proposed CPD Preparation Framework

The framework comprises two Interrelated Plans named: the PSTs' CPD preparation plan and the PSTs CPD Plan. The former to be mainly used by the teacher educators in planning for, guiding and preparing the PSTs for CPD and the later

to be used by the PSTs themselves. The plans present some kind of structure to facilitate intention-illuminated action toward preparing PSTs for CPD.

## **2.2. Rationale for the Proposed CPD Preparation Plans for PSTs**

This paper is derived from a broader study guided by the following research questions: a. What are mathematics pre-service student teachers' conceptions of CPD?; b. How are mathematics pre-service student teachers' prepared for CPD? and; c. What are the perceptions of mathematics pre-service student teachers' regarding the way(s) by which they were prepared for CPD? Based on the collected and analysed data for the broader research, the PST research participants indicated divergent conceptualisation of CPD which were largely limited and limiting. An example being CPD '*... is the meeting which is conducted by the department to present work*'. The PSTs' views of CPD could have been based on their context and experiences such as experience of School Teaching Practise (STP). However, if focus is on CPD being meetings or attendance of meetings, then it shifts attention from what is considered as holistic picture of PD as presented by Day (1999). The central theme of the interpretation and discussion of data collected was around exposing PSTs to a holistic view of CPD and to a wide variety of CPD supporting initiatives which may be formal and structured, and recognised informal and self-directed CPD activities. The PSTs generally did not share a confident sense of CPD and of preparedness for it.

Some also shared what they perceived as concerns and shortcomings associated with the lack of practical focus of their teacher education and preparation for continuing learning. '*... it is bookish and remains unreal...*' one PST stated during an interview and another stated in the questionnaire that '*...emphasising the importance of CPD to us, making it practical, real... and helping us see the link between what we are being taught and what is happening practically on the ground in relation to CPD ...can help us a lot...*'. Thereby suggesting that there was a need to address the concerns raised. While the importance of empowering pre-service to actively engage in their CPD is acknowledged in literature including Mann and Webb (2022) there appears to be a gap regarding frameworks or structure that could be used to achieve this goal in teacher education. The proposed PSTs CPD plan may not only contribute to this goal and show how practical and real CPD-related matters are, but also guide and contribute to empowering PSTs to (further) reflect on their learning needs and possible wide range of CPD-supporting activities that could be accessible in specific contexts and could meet their identified learning needs. Context matters. It is in the context of different pre-service student life situations and learning needs that key competencies could be contextualised (Ouane, 2002). The use of the proposed plans could be a start for the Mathematics teacher educators in their preparing PSTs for CPD and boost their ability to take responsibility of their own learning and development. The plans are meant to be flexible enough for both the lecturers themselves and the PSTs. They allow PSTs flexibility, during university learning times or during school teaching practice (STP) or Practicum times to reflect, profile and clarify their learning needs and engage in PD-supporting activities in order to meet the identified needs and for assessors or monitors to keep track of PSTs' progress in the process.

## **2.3. Structure of the Proposed CPD preparation Plans for PSTs**

### **2.3.1. The proposed PSTs' CPD preparation Plan**

The proposed PSTs' CPD preparation Plan and may have to be used by the lecturers as a guide as they plan and implement CPD preparation for the Mathematics PSTs. Reference is made to Table 1 below with 6 columns. Column one indicates CPD -supporting activities categories. Three categories have been presented and examples of CPD -supporting activities under each shared. A mixture of activities is encouraged in recognition of the different ways of learning available and of the point that PSTs are highly likely to have different learning needs that can be met in different ways. The list of examples provided is not exhaustive, but simply there to give ideas of what could be done in different contexts and keep the PSTs aware. Column 2 indicates the timeline within which CPD-supporting activity could be undertaken. The third column shows the expected outcomes. These could have to be in line with growth mind-set for CPD; lifelong learning and CPD competences; knowledge increase as may be facilitated by each CPD supporting activity (to be) undertaken. The fourth column is meant for the evaluation method to be employed to help ascertain the achievement of the expected outcomes. The fifth and last column are also self-explanatory and as briefly under Table 1.

The whole process of preparing PSTs for CPD and planning for it in this manner starting with considering the information to be presented in a plan of this nature may not be readily accepted by lecturers. This could be because it could be regarded as an additional responsibility by lecturers who are generally said to have heavy workload and time constrained. However, it may need to be considered necessary as it could be one way of being more intentional about

<b>CPD - Supporting Activities Categories</b>	<b>Time Line</b>	<b>Expected Outcome</b>	<b>Evidence and Cvaluation Strategy/Method</b>	<b>Responsible Personnel</b>	<b>Comment(s)</b>
Each category and as many necessary examples given.  <b>Compulsory</b> Examples include:- Peer teaching-Lesson study  <b>Self-Directed</b> Examples- Reading a Journal article-Webinar attendance  <b>Others</b> Examples- Voluntary work (e.g tutoring)	An expected completion date to be defined for each CPD supporting activity (to be) undertaken	Expected outcomes:-to be defined for each CPD supporting activity (to be) undertaken.	The evidence for and evaluative measure to be defined for each one of the CPD supporting activity	Responsible individual(s) to be identified for (facilitating) each one of the CPD supporting activity	While this may be optional comments can be made with respect to (no) progress made/not made

and providing evidence of being aware of relevance of laying a solid foundation for CPD and acting in line with the goal of preparing PSTs for their CPD.

2.3.2. *The proposed PSTs CPD Plan*

The lecturers of Mathematics may have to lead the PSTs to developing what is here considered as a PSTs’ CPD Plan. Table 2 shows the structure of the proposed generic PST CPD Plan. This plan is not meant to be complex or extensive, but to simply show the PSTs’ reflection regarding their own learning and what could potentially be done to meet the learning needs and when.

<b>Table 2: Proposed PSTs CPD Plan</b>					
<b>Name of Student:</b>		<b>Student Identification Number:</b>		<b>Signature:</b>	
Area/Skill I need to develop	Action to be taken	When action is to be taken	Expected learning outcome	Actual learning outcome	Next Step(s) to be taken
Lecturer/Supervisor/Mentor’s name:				Signature:	

The accompanying information for each row/column is generally self-explanatory, but is briefly explained below: The first row is meant to capture each PST’s identification details including the name and the student identification (SI) number. The second row shows 6 columns within it. The first column in row 2 is designed for the PSTs to identify their area of need which could be professional and or personal area of need with respect to (technical or non- technical mathematics) knowledge or skills or competences relevant to their (future) teaching career. The second column is meant to be completed with a mixture of CPD-supporting activities as explained above with respect to Table 1 and as guided by the lecturers. The third column is meant for indicating when action is planned to be taken. This is about the date/time period when the CPD-supporting activity is to be undertaken. The PST would be expected to indicate the date/period they attended a CPD-supporting activity to meet the identified area of need (as would be shown in the first Column of

Row 2). The fourth column is meant for the expected learning outcome and the fifth for recording the actual learning outcomes from the CPD activities engaged in. Recording the (expected) learning outcome(s) of the CPD-supporting activity undertaken/attended is meant to encourage the PSTs to reflect upon and evaluate what they would have learnt. It is also meant to facilitate identification of future learning needs and next possible actions to be taken which would then have to be recorded in the last column. A copy of the completed plan is to be shared with the PSTs' assigned lecturer(s) in the university and filed in the PST's teacher's teaching file when PSTs on STP. Other copies could also be shared with supervisors such as the Mathematics Head of Department (HOD) when on STP. Thus the lecturers would also have a plan to use as reference or guide or assessment tool for matters of CPD in their context. Additionally, the PSTs' teacher mentors in schools, supervisors including HOD, can use it to monitor and assess the PSTs engagement and commitment to CPD while on STP.

Similar to the lecturers' perspective, PSTs may perceive completing the CPD Plan form as an additional responsibility, particularly amid their already-considered demanding work/course loads and academic obligations. However, it may need to be considered necessary as it would be one way of providing evidence of awareness of, engagement and commitment to CPD. This would be one way of practically preparing the PSTs to adapt relatively well when they commence teaching, after successfully completing their studies, as the teaching profession involves meeting CPD requirements and expectations. While CPD supporting activities may arise opportunistically, at the core of one's development and growth is being intentional and (pre)planning for it- a lesson the PSTs may have to learn too.

### 3. Conclusion

Teacher Education is intended to not only prepare pre-service teachers (PSTs) but to also continue learning themselves. This paper has presented an overview of a framework comprising two interrelated CPD plans, named: PSTs CPD preparation Plan and PSTs CPD Plan, that has been developed and proposed to contribute to preparing PSTs for CPD. They are designed to contribute to Mathematics teacher educators' efforts at preparing PSTs for CPD and at the same time enhance PSTs engagement in their own preparation for CPD while also raising awareness among them of the importance of CPD and lifelong learning. The plans demonstrate intention-illuminated action that could be taken toward preparing PSTs for CPD and potential practical benefits to their usage.

The broader research study from which the framework reported has been drawn was qualitative in nature. This implies that the findings of the study including the framework may not be generalizable in the traditional sense. However, it provides insight into a framework or structure that could be used to achieve the goal of empowering and preparing pre-service to actively engage in their CPD. The proposed and recommended plans may have their own limitations and downsides, but their adoption or adaption still worth considering in enhancing preparation of Mathematics (and possibly of other teaching subjects or subject specialism) PSTs for CPD. Further research may help refine it. Additional exploration may be needed to further understand how Mathematics and or possibly other disciplines and across diverse cultural contexts might adopt/adapt and benefit from (using) the framework for preparing PSTs for continuing learning.

### References

- Bubb, S. and Earley, P. (2007). *Leading & Managing Continuing Professional Development: Developing People, Developing Schools*. Sage.
- Calleja, J. (2022). Changes in Mathematics Teachers' Self-reported Beliefs and Practices Over the Course of a Blended Continuing Professional Development Programme. *Mathematics Education Research Journal*, 34(4), 835-861.
- Cropley, A.J. and Dave, R.H. (1978). *Lifelong Education and the Training of Teachers: Developing A Curriculum For Teacher Education on the Basis of the Principles of Lifelong Education*. *Advances in Lifelong Learning* 5.
- Day, C. (1999). *Developing Teachers: The Challenges of Life-long Learning*. London: Falmer Press.
- Elo, S. and Kyngäs, H. (2008). The Qualitative Content Analysis Process. *Journal of Advanced Nursing*, 62(1), 107-115.
- European Commission, Directorate-General for Education, Youth, Sport and Culture, (2019). *Key Competences for Lifelong Learning*, Publications Office. <https://data.europa.eu/doi/10.2766/569540>
- Guest, G., Namey, E. and Chen, M. (2020). A Simple Method to Assess and Report Thematic Saturation in Qualitative Research. *PloSone*, 15(5), e0232076.
- Joffe, H. (2011). Thematic Analysis. *Qualitative Research Methods in Mental Health and Psychotherapy: A Guide for Students and Practitioners*, 209-223.

- Kilag, O.K.T., Malbas, M.H., Miñoza, J.R., Ledesma, M.M.R., Vestal, A.B.E. and Sasan, J.M.V. (2023). [Education Programs in Developing Lifelong Learning Competence. \*European Journal of Higher Education and Academic Advancement\*, 1\(2\).](#)
- Mann, S. and Webb, K. (2022). [Continuing Professional Development: Key Themes in Supporting the Development of Professional Practice. \*Research-publishing.net\*.](#)
- Mansour, N., Albalawi, A. and Macleod, F. (2014). [Mathematics Teachers' Views on CPD Provision and the Impact on Their Professional Practice. \*Eurasia Journal of Mathematics, Science and Technology Education\*, 10\(2\), 101-114.](#)
- Mgaiwa, S.J. and Milinga, J.R. (2024). [Teacher Preparation and Continuous Professional Development: A Review of 'Missing Links'. \*Social Sciences & Humanities Open\*, 10, 100990.](#)
- Muyunda, G. (2022). [Continuous Professional Development: Perceptions of Secondary School Teachers in Zambia. \*Electronic Journal of Education, Social Economics and Technology\*, 3\(1\), 1-7.](#)
- Ooi, P. C. (2021). [Students' Continuing Personal Development \(S-cpd\)-a Scheme to Promote Student Engagement in Extra-curricular Activities. \*Higher Education, Skills and Work-Based Learning\*, 11\(3\), 672-682.](#)
- Ouane, A. (2002). [Key Competencies for Lifelong Learning. \*Institutionalising Lifelong Learning: Creating Conducive Environments for Adult Learning in the Asian Context\*, Madhu Singh \(Ed.\), 311-325.](#)
- Osamwonyi, E.F. (2016). [In-service Education of Teachers: Overview, Problems and the Way Forward. \*Journal of Education and Practice\*, 7\(26\), 83-87.](#)
- Patterson, M. (2002). [The Professional Development of the Future English Teachers: A Reflective Perspective \(Doctoral Dissertation, Tesis Presentada En Opción Al Título De Master En Enseñanza De Lenguas Extranjeras. Santa Clara\).](#)
- Sandholtz, J. H. (2011). [Preservice Teachers' Conceptions of Effective and Ineffective Teaching Practices. \*Teacher Education Quarterly\*, 38\(3\), 27-47.](#)
- Villegas-Reimers, E. (2003). [Teacher Professional Development: An International Review of the Literature. Paris: UNESCO International Institute for Educational Planning.](#)