Developing a Digital Badge System for Personalized Teacher Professional Development in a Private School

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Abstract

This journal addresses the significant shortcoming in private schools where professional development is often provided without considering teachers' specific learning needs, and substantial parts of teachers' professional learning occur informally without formal recognition due to a lack of tangible evidence. To overcome this issue, we propose a system that leverages digital badges to personalize and acknowledge teachers' professional learning. Our approach includes a comprehensive needs analysis to understand the specific learning requirements, followed by defining clear learning outcomes and competencies. We then determine appropriate badge types and criteria for earning them, select suitable technology, and outline effective implementation strategies to ensure the system's success. This methodical framework aims to bridge the gap between informal learning and formal recognition, providing a structured yet flexible means for schools to acknowledge and incentivize teachers' ongoing professional development. The adoption of digital badges can thus enhance the effectiveness of professional learning by aligning it with individual needs and offering tangible proof of teachers' growth and achievements.

Keywords: Digital badge system, Teacher professional development, Personalized learning, Private school

1. Introduction

Private schools typically feature a teacher professional development programme that is integrated with a performance evaluation system for evaluating teachers' strengths and areas for improvement (Önen & Sincar, 2019; Sarwar et al., 2014; Sims, 2017; Türkoğlu et al., 2022). Nevertheless, these schools often provide top-down professional development that rarely match teachers' perceived needs. Due to a lack of suitable development opportunities, this has inadvertently created tension between the teachers and the school, given that access to relevant learning opportunities has a significant impact on their performance (Badri et al., 2016; Haroon et al., 2023; OECD, 2009). The situation is exacerbated when teachers do not have enough time for professional learning, given that majority of teachers spent more hours each week marking, performing administrative tasks, and teaching (Haroon et al., 2023; Omar et al., 2017). Similarly, substantial part of teachers' professional learning occurs informally, however, without tangible evidence of participation, such as certification, these autonomous learning activities are often not recognized formally (OECD, 2020). Thus, capturing and validating teachers' professional learning has become equally important since supervisory recognition on staff commitment could have a favorable impact on teachers' motivation for continuous learning (Nyakaro, 2016).

Reflecting on these collectively unfavourable circumstances, it is clear that the challenges to teacher professional development in schools seem to be systemic. The lack of structural support to facilitate teachers' engagement in self-directed study through formal recognition demonstrates the need to reorienting professional development towards the more effective forms of continuing learning. Simply put, policymakers and school administrators must not only provide better support for teachers to participate in professional development, but also ensure that the development opportunities available are effective and meet teachers' needs. Such support can include creating opportunities for teachers to engage in personalised professional development by providing a tentative, non-exhaustive list of learning activities, including both formally and informally structured activities that teachers could consider, as well as recognising teachers' efforts in participating these professional learning activities.

One transformative tool, "digital badges system", has emerged as a promising innovation to tackle the aforementioned challenges in novel ways. For example, it offers a dynamic and flexible approach to recognizing and showcasing teachers' accomplishments and skills (Risquez et al., 2020). Besides, digital badges provide a visually appealing and easily shareable representation of achievements, allowing educators to exhibit their expertise and dedication to continuous learning. This transparency can foster a sense of pride and motivation among teachers, driving them to actively engage in professional development initiatives (Jones et al., 2017; Stefaniak & Carey, 2019). Furthermore, the digital badge system can efficiently address the issue of time constraints and scheduling conflicts, which often hinder traditional training programs. Teacher can pursue digital badge at their own pace, integrating learning seamlessly into their busy routines. Additionally, the digital nature of badges enables administrators to track and assess progress more effectively, allowing for personalized support and guidance when needed. Moreover, digital badges can enhance the overall quality of professional development by encouraging a competency-based approach (Diamond & Gonzalez, 2014; Wolfenden et al., 2019). They can be tailored to align with the specific goals and needs of both the school and individual educators, promoting targeted skill development and growth. This approach not only ensures that teachers receive training that is directly relevant to their roles but also contributes to improved classroom instruction and student outcomes.

On these bases, this paper proposes a shift to competence-based continuing professional development that emphasizes self-directed learning processes and promotes the role of assessment as a professional expectation. To achieve the aforementioned aims, a digital badge system has been proposed as an innovative tool for providing customizable professional development experiences for private school teachers, which can be systematically validated and certified based on demonstrated competencies regardless of whether the learning is done formally or informally.

2. Background and Context

In the realm of private school administration, the decision to offer teacher professional development for training new and existing teaching staff is situated within a complex and dynamic context. Private school administrators are entrusted with the task of providing high-quality education, often in competitive environments with a commitment to maintaining excellence. They must carefully consider various factors when contemplating professional development initiatives. Budgetary constraints pose a significant backdrop, as private schools must allocate financial resources judiciously to ensure the sustainability of their programs. Identifying the specific training needs of educators and aligning them with the school's distinct mission and educational philosophy is crucial for the effectiveness of the training. Administrators must navigate the delicate balance between the demands of teachers' regular classroom responsibilities and the imperative of continuous growth and improvement. Resistance to change among teaching staff can present challenges, as can staff turnover and the need to measure the impact of professional development on student outcomes. Against this intricate backdrop, private school administrators play a pivotal role in shaping the professional development landscape, striving to foster a culture of lifelong learning and ensuring their teachers remain at the forefront of educational innovation.

Enter digital badge systems, which have gained significant traction in the field of education. These systems offer a promising solution to the challenges of personalization and recognition of teacher achievements, promoting a culture of lifelong learning among educators, and ultimately enhancing the quality of education within these

institutions. This paper will delve into the innovative strategies employed by a private school in Malaysia as they envision, design, and develop a digital badge system aimed at revolutionizing teacher professional development. Within the context of this study, we will explore how this forward-thinking institution envisions a personalized education landscape for its teaching staff, where learning is tailored to individual needs and preferences. Additionally, we will examine the intricacies of the digital badge system, which serves as a means to not only acknowledge but also celebrate the diverse skills and achievements of teachers. Through and in-depth analysis of this initiative, we will gain insights into how private schools can harness the power of digital badges to foster a culture of continuous learning and growth, ultimately elevating the quality of education provided within their hallowed halls.

3. Designing the Digital Badge System

3.1 Needs Assessment

The needs assessment conducted at the private school, which follows the Cambridge International Curriculum by Cambridge Assessment International Curriculum (CAIE), revealed the imperative of ensuring that all teachers, regardless of their experience level, meet the rigorous Cambridge Teacher Standards. These standards, which meticulously specify the requisite knowledge, pedagogical practices, and student connections, are fundamental to fostering improved learning outcomes (Cambridge Assessment International Education, 2019). The school's decision to focus on this instructional goal was prompted by the astute observations of school administrators, who noted that a substantial majority of teachers were grappling with the challenge of substantiating their teaching effectiveness and determining specific areas and priorities for their professional growth. These difficulties were further exacerbated by the diverse backgrounds and experiences among the teaching staff. Recognizing that teachers' impact on educational outcomes plays a pivotal role in their appraisal, the school decided to embrace the Cambridge Teacher Standards as the gold standard for teacher quality. By encouraging teachers to employ these standards to evaluate their own practice and guide their ongoing professional development, the school is confident that they will be well-positioned to realize the desired student outcomes within the Cambridge program, thereby fostering a more robust and successful educational environment.

3.2 Defining Learning Outcomes and Competencies

Defining clear learning outcomes and competencies aligned with the school's goals and individual teacher needs is a meticulous process that involves a deep understanding of both the Cambridge Teacher Standards and the specific objectives of the school. From the CAIE document, the school identified eight Cambridge Teacher Standards, each comprising a set of individual standard statements outlining what teachers should demonstrate in terms of professional knowledge, practice, and engagement. Among these standards, the school strategically chose to place a preliminary focus on Standard 5, "implement effective planning, teaching, learning, and assessment practice," and Standard 6, "demonstrate innovative and effective classroom practice." These standards bear direct relevance to the daily teaching routines of teachers, aligning closely with the school's overarching goal of establishing improved routines and a consistent approach to students' learning.

Within the selected standards, the school honed in on specific standard statements that resonated most with its objectives. For instance, Standard 5.7, which emphasizes "making effective use of formative and summative assessment to support student learning and monitor levels of achievement and attainment," has been renamed the "Assessment for Learning" digital badge. Similarly, Standard 6.3, which encourages the use of "active learning approaches and activities that encourage students to think hard for themselves and extend their learning," has been transformed into the "Active Learning" digital badge. Lastly, Standard 6.5, which promotes the use of "teaching and learning strategies that encourage the development of students' problem-solving, metacognition, critical and creative thinking skills," is now represented by the "Metacognitive" digital badge.
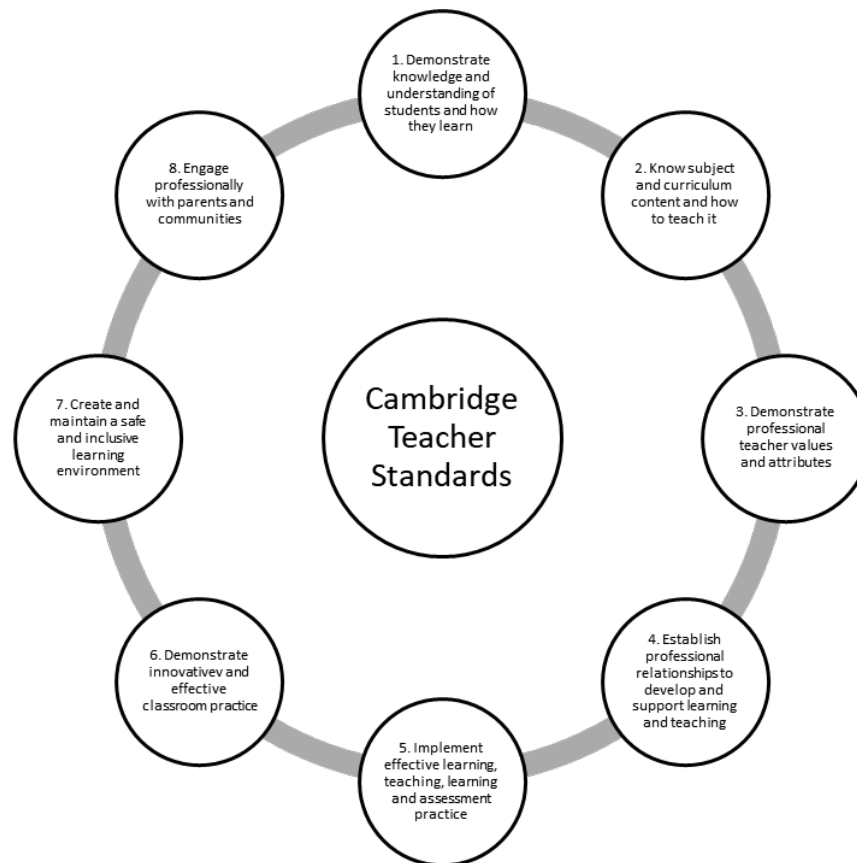
Figure 1. The structure of the Cambridge Teacher Standards

Figure 2. Developed Digital Badges Based on Corresponding Cambridge Teacher Standards

The individual standards have provided a robust foundation for crafting the learning outcomes and competencies associated with each digital badge. These badges now serve as tangible indicators of teachers' proficiency in these key areas, aligning perfectly with both the school's objectives and the Cambridge Teacher Standards. By honing in on these specific standards, the school is effectively equipping its teachers with the skills and knowledge necessary to establish consistent routines, minimize disruptive behavior, and maximize instructional time—all in the pursuit of enhanced student learning and success.

3.3 Badge Types and Criteria

Within this study, three distinct digital badges have been meticulously designed to recognize and affirm the competencies of teachers in the realm of effective classroom practice, as stipulated by the Cambridge Teacher Standards. These badges are considered competency-based badges as teachers earn these badges by

demonstrating their proficiency in a particular skill through real-world application. By emphasizing the acquisition of practical skills and knowledge, these badges offer a granular and transparent representation of what teachers can do. Consequently, they emerge as invaluable tools for teachers seeking to showcase their expertise in the dynamically evolving landscape of education. Additionally, digital badges provide tangible evidence for school administrators to assess the competencies of existing teachers, offering a robust means to gauge the impact of ongoing professional development initiatives. These digital badges thus play a dual role, empowering teachers in their professional journey while offering a structured mechanism for administrators to evaluate and enhance the overall competency landscape within the educational setting.

The formulation of the digital badge earning criteria is rooted in a structured approach influenced by Mager's framework for writing effective performance-based learning objectives (Mager, 1997). Following this framework, the badge criteria encompass three crucial components: performance, conditions, and criteria for acceptance. Firstly, the performance aspect entails a detailed description of the behavior that learners are expected to exhibit. This description ensures that the desired behavior is well-defined, measurable, and observable, leaving no ambiguity in what is expected of learners. Secondly, the conditions delineate the circumstances under which this performance will occur, including any necessary resources or support available to learners during the process. Lastly, the criteria for acceptance establish a clear benchmark for determining the sufficiency of performance, indicating the level of mastery required to earn the badge. In essence, this structured approach to badge criteria ensures that learners have a comprehensive understanding of what is expected of them, how it will be assessed, and the level of proficiency they must attain to achieve mastery in the specified objective.

Based on this framework, the earning criteria for these badges, namely "Assessment for Learning," "Active Learning," and "Metacognition," are as follows:

1. Assessment for Learning Digital Badge: To earn this badge, teachers must demonstrate their proficiency in employing formative and summative assessment techniques effectively to support student learning and monitor achievement. The earning criteria entail completing a reflective writing that discusses effective strategies for supporting student learning and providing feedback for subsequent teaching. The reflection should score 80% on average.
2. Metacognition Digital Badge: This badge is dedicated to recognizing teachers who excel in fostering metacognitive skills ins students, promoting critical and creative thinking, and encouraging problem-solving abilities. Earning this badge involves completing an assessment of knowledge quiz with a minimal attainment of 80%.
3. Active Learning Digital Badge: This badge acknowledges teachers who excel in implementing active learning approaches and activities to challenge students and extend their learning. Earning this badge involves designing a lesson plan that incorporates active learning strategies to engage students and enhancing their understanding of the subject matter. A minimum attainment of 80% is required for badge attainment.

3.4 Assessment Methods and Evidence

Given the competency-based nature of the badges, our assessment strategies were aligned with the principles of project-based learning. This approach, recommended by the experienced school improvement specialist coach, ensures that teachers' proficiency in specific skills is not merely theoretical but demonstrated through practical, real-world applications. The incorporation of project-based learning into the assessment methodology emphasises the hands-on, experiential aspect of skill acquisition, reinforcing the notion that the badges truly represent a mastery of competencies in the context of actual teaching practices (Miller & Krajcik, 2019). A pivotal element of PBL is the formulation of the inquiry question, which serves as the linchpin of the entire learning process. This question empowers teachers to craft inquiries that resonate with their own interests and passions, thereby kindling a sustained sense of motivation that fuels the entire learning journey. For that reason, all assessment items are context-centered, mirroring the complexities and authenticity of real-world performance settings.

Take, for instance, the Active Learning Badge, where the assessment requirement involves designing a lesson plan. This particular task goes beyond a generic evaluation and delves into the specific context of a teacher's

classroom. By necessitating the incorporation of active learning strategies, the assessment item ensures that teachers are not only demonstrating theoretical knowledge but are applying it in a manner directly applicable to their teaching environment. The requirement to engage students in the learning process and align strategies with lesson objectives emphasises the practical, context-driven nature of the assessment, highlighting its direct impact on enhancing teaching practices in the real world. This approach ensures that the badges are not merely symbolic but truly reflective of a teacher's competence in their day-to-day instructional responsibilities.

The Assessment for Learning (AFL) Badge takes a contextualised approach in its assessment item, compelling teachers to complete a reflective writing assignment. In this task, teachers are prompted to articulate effective AFL strategies that have proven useful in supporting student learning within their specific teaching context. This requirement not only encourages teachers to critically evaluate their practices but also necessitates an introspective exploration of strategies that have been effective in their unique classroom setting. By focusing on strategies that have directly contributed to supporting student learning, the assessment item becomes inherently relevant and context-driven. The reflective nature of the assignment underscores a teacher's ability to adapt and refine their approach based on the needs and dynamics of their students, emphasising the practical application of AFL strategies in the intricacies of daily teaching. This contextualised assessment ensures that the AFL Badge truly signifies a teacher's proficiency in fostering effective learning environments through assessment within their specific teaching context.

Last but not least, the Metacognition Badge adopts a targeted approach by requiring teachers to achieve at least an 80% score on a knowledge quiz specifically focused on metacognition. This assessment item specifically centered on metacognition, is thoughtfully crafted to align with the context-driven nature of effective teaching practices, particularly those fostering metacognition. By focusing on a knowledge quiz that delves into metacognitive principles, the assessment ensures that teachers not only possess theoretical knowledge but can also apply these concepts in their unique teaching contexts. The 80% threshold serves as a benchmark, emphasising the importance of a comprehensive understanding of metacognition, which directly translates into the ability to foster a reflective and critical thinking culture within the classroom. This context-driven assessment ensures that the Metacognition Badge signifies a teacher's practical competence in integrating metacognitive strategies tailored to the specific needs of their students and teaching environment.

3.5 Technology Selection

A major component of the implementation strategy is carefully selecting the correct technical tools to support the envisioned digital badge system. Given the school's desire to increase flexibility and empower teachers to adapt their professional development, the school is keen to create an environment in which educators can choose digital badges depending on their relevance and learning needs. Furthermore, the intention is to enable teachers to complete these badges at their own pace, ensuring a personalised and self-paced approach to professional growth. Acknowledging the paramount importance of ensuring the sustainability of personalised professional development initiatives, the school highlighted the critical necessity for a badge system that is not only cost-effective but also features simplicity and efficiency. The emphasis lies not only on the initial implementation but on establishing a sustainable model that requires minimal financial investment, is easy to administer, and demands little to no learning curve.

In our quest to identify the most suitable digital badge system for teacher professional development, we strategically employed a comprehensive evaluation matrix (refer to Table 1). This evaluation matrix strategically assigns specific weightages to criteria crucial for the effective implementation of a digital badge system. The selected criteria are integral to the success of the system and include user interface and experience (15% weight), features and functionality (20% weight), cost and budget (15% weight), support and training (15% weight), integration and compatibility (20% weight), and security and data privacy (15% weight). This careful consideration of weighting emphasises the strategic importance placed on criteria that are pivotal for the system's overall effectiveness, as informed by the school administraton during the needs assessment.

Three prominent digital badge systems—Accredible, Credly, and Badgr—underwent thorough scrutiny based on these criteria. Each criterion was evaluated on a scale from 1 to 5, with 5 being excellent and 1 being poor. The

scores were assigned based on the performance of each system against the specified criteria. Following the evaluation, the scores were multiplied by the corresponding weightages to contribute to the total score for each system. This careful consideration of weightage and scoring not only facilitated a nuanced differentiation between the systems but also ensured a well-informed decision-making process aligned with the school's objectives for an effective digital badge system.

The completed evaluation matrix (Table 1) reveals that Badgr emerged as the most desirable choice, with the highest total score of 25 out of 30 and a weighted score of 4.25 out of 5.00, excelling across various criteria, including features and functionality, cost considerations, and integration compatibility. Accredible, while boasting several strengths, exhibits some weaknesses. Firstly, the initial setup costs for Accredible may be perceived as relatively higher compared to alternative platforms, potentially impacting its accessibility for budget-conscious users. Additionally, while Accredible does integrate with various platforms, the depth of integration may not be as extensive as some competitors, limiting its seamless interoperability.

On the other hand, Credly, despite its notable strengths, presents certain weaknesses. One potential challenge is the learning curve associated with Credly's interface and features, particularly for users new to digital badging. This could pose a barrier to the swift adoption of the platform. Furthermore, the costs associated with Credly, especially for premium features, might be considered moderate to high, potentially influencing the platform's attractiveness for users with budget constraints. As an outcome of weighing the strengths and weaknesses of each platform, Badgr was chosen for implementation in this study because it seamlessly aligns with both budgetary considerations and the practical aspects of system administration and maintenance.

Table No. (1) Digital Badge System Evaluation Matrix

Criteria	Scores					
	Accredible	Weighted Score	Credly	Weighted Score	Badgr	Weighted Score
User Interface and Experience (15%)	3	0.45	2	0.30	4	0.60
Features and Functionality (20%)	4	0.80	3	0.60	5	1.00
Cost and Budget (15%)	3	0.45	2	0.30	5	0.75
Support and Training (15%)	4	0.60	3	0.45	4	0.60
Integration and Compatibility (20%)	2	0.40	4	0.80	5	1.00
Security and Data Privacy (15%)	4	0.60	3	0.45	2	0.30
Total	20	3.30	17	2.90	25	4.25

Upon finalising the selection of the digital badging platform, our attention turned to the necessity of hosting learning materials and creating a user-friendly landing page to guide teachers through the system. While exploring various learning management systems (LMS) to fulfill this requirement, we considered factors such as ease of use, cost-effectiveness, and compatibility with the school's existing infrastructure. After careful consideration, we ultimately opted for a combination of Google Sites as the Learning Management System

(LMS) with full-page embedding of the Badgr badge platform, along with the incorporation of Google Forms for evidence submission mechanisms. This decision was driven by a keen awareness of budget constraints and a desire to provide a coherent interface which ensure ease of use for the teachers. Likewise, the familiarity of teachers with the Google ecosystem further solidified this choice, aligning with our commitment to providing an intuitive and accessible experience for educators navigating the digital badging system. By fully embedding the Badgr badge platform within Google Sites, the school can harnesse the power of Badgr's badge creation and management capabilities while maintaining a cohesive and centralised environment for badge display. This integration not only enhances accessibility but also minimises costs associated with licensing other LMS platforms.

Futhermore, the choice of Google Forms for evidence submission mechanisms was a carefully considered one. While established badging platforms like Credly or Accredible offer badge creation and issuance functionalities, they often entail substantial costs and lack the comprehensive features essential for a learning management system that supports the reviewing of learning resources and evidence submission, precisely tailored to our design intention. To address this challenge, we have embedded Google Forms into Google Sites, facilitating teachers' submission of files for evaluation. This strategic utilisation of Google Forms presents a cost-effective alternative that aligns seamlessly with the requisites, offering teachers a structured and standardised avenue to submit evidence that effectively demonstrates their mastery of specified competencies. This evidence submission mechanism not only streamlines the process but also enhances its transparency and ease of navigation, benefiting both teachers and assessors alike. Consequently, with these integrated functionalities in place, teachers can conveniently utilise a unified digital platform to review available digital badges, access learning resources, and submit evidence to earn their badges.

In essence, the selection of technology tools such as Google Sites as the LMS with full-page embed of Badgr badge platforms and the integration of Google Forms for evidence submission mechanisms has been a deliberate and well-considered choice to meet the school's expectations. These tools not only align with the goals of creating an efficient and user-friendly digital badge system but also enhance the overall learning and assessment experience for the teachers. They signify a crucial stride in actualising the vision of acknowledging and fostering excellence in teaching through the establishment of a sustainable, robust, and technologically advanced badge system that tailors professional growth initiatives to individual needs.
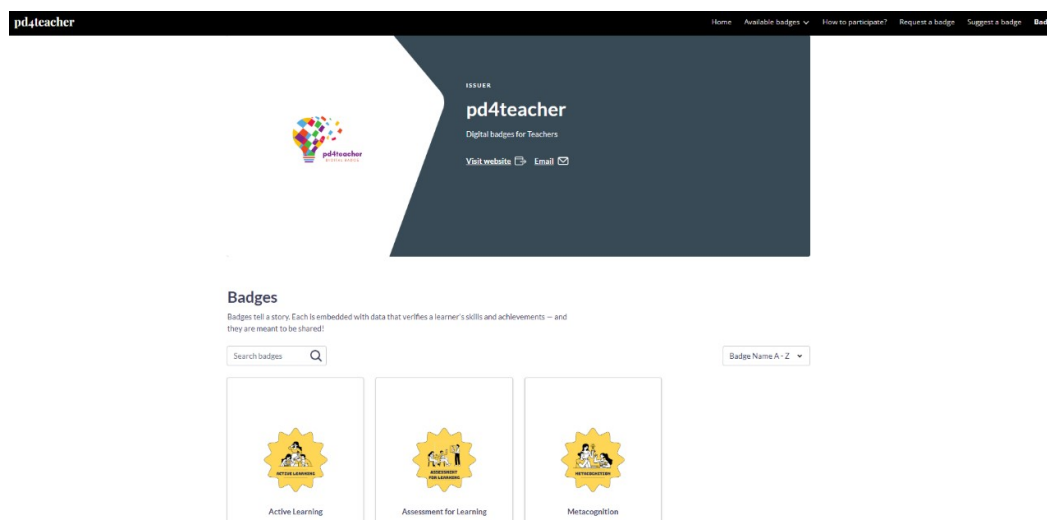

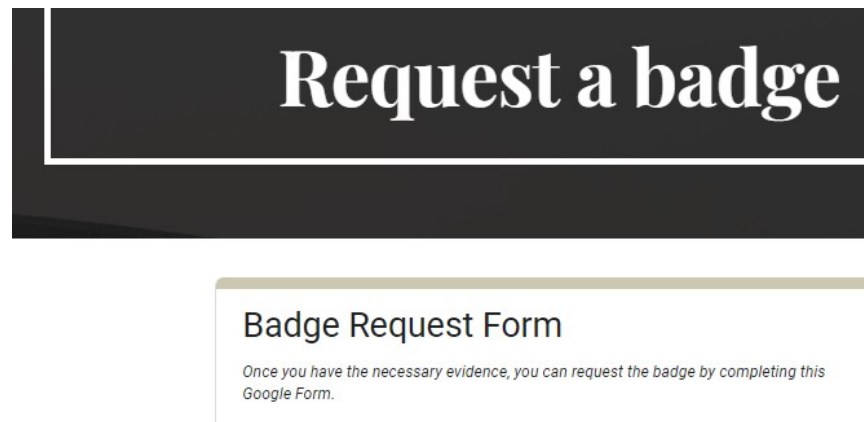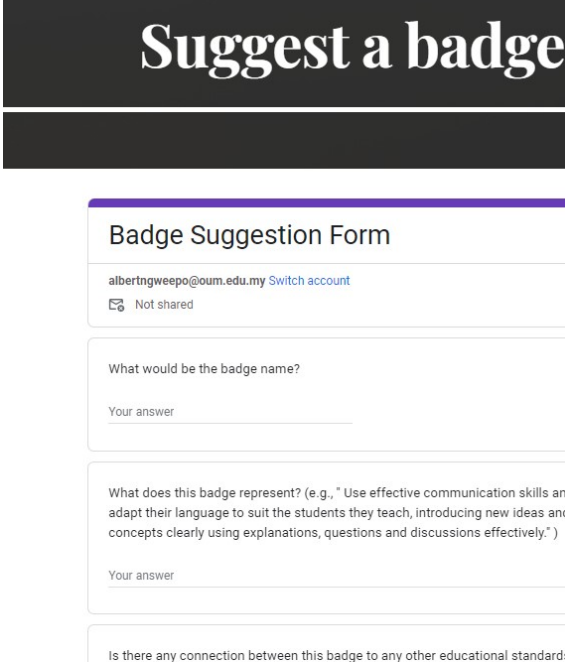Figure 3. Google Sites with Full Page Badge Issuing Platform Embed

Figure 4. Google Sites with Google Form Embed for Submission of Evidence

3.6 Personalization Pathways

A hallmark of the digital badge systems is the "suggest a badge" feature, a testament to the system's commitment to empowering teacher autonomy. With this feature, teachers can propose new badge ideas, reflecting their evolving needs and interests. Teacher is encouraged to express their choices and articulate their preferred learning opportunities, effectively shaping the direction of their professional growth. These suggestions are valuable not only as indicators of individual teacher preferences but also as sources of insights into emerging trends and needs within the teaching community. In this view, school administrators play a pivotal role in harnessing the potential of the "suggest a badge" feature. They can review teachers' suggestion, taking note of expressed choices, and collaborate with teacher trainers to curate relevant digital badges and associated materials. This collaborative approach ensures that professional development aligns with the actual needs and aspirations of the teaching staff. Moreover, administrators can use the data gathered from this feature to make informed decisions about resource allocation, departmental development priorities, and strategic planning.

As the digital badge systems gains momentum and widespread acceptance among the teaching staff, the school envision the possibilities of curating personalized pathways that interlink several skill and competency-based badges, effectively guiding teacher career development. These pathways will provide teachers with a structured framework to advance their expertise, allowing them to seamlessly integrate a diverse range of skills and competencies into their teaching practices. By connecting these badges into coherent learning journeys, the school hopes to empower the teachers to not only excel in their current roles but also advance their careers with confidence, competence, and a deeper sense of purpose in the ever-evolving field of education.

Figure 5. Embedded Google Form on the Digital Badge System Enables Users to Suggest a Digital Badge

4. Implementation Strategies

To facilitate a seamless transition and foster the successful adoption of the digital badge system, the school have implemented a multifaceted approach to support and train the teaching staff. This approach encompasses a range of strategies aimed at accommodating teachers with varying levels of technological proficiency and ensuring they become adept users of the system.

The initial onboarding sessions serve as a crucial starting point in this endeavor. These sessions are meticulously designed to introduce all teachers to the digital badge system, and the intricacies of evidence collection processes. Throughout these sessions, the trainer provides comprehensive walkthroughs, elucidating how badges operate within the school educational ecosystem. Teachers are guided through the navigation of the system, enabling them to easily access relevant information and resource. Moreover, they are equipped with the knowledge and skills required to effectively collect and submit evidence, as well as express their professional development interests through "suggest a badge", a critical component of the school's continuous yet personalized professional development framework.

Recognizing that teaching staff may possess diverse levels of technological proficiency, the school have established a dedicated technical support team, functioning as an accessible helpdesk. This team plays a pivotal role in assisting teachers by promptly addressing any issues or queries they may encounter during their interaction with the digital badge system. To ensure the ease of access to this support mechanism, teachers are encouraged to reach out to the support team through multiple channels, including phone, Gmail, and Google Chat. The provision of robust technical support underscores the school's dedication to the success of their teachers in this new digital landscape.

Furthermore, the school established a systematic feedback mechanism to continually enhance the training materials and support services. The Head of Department serve as a conduit for teachers to convey their valuable insights and suggestions regarding the usability of the systems and the effectiveness of the learning resources.

This feedback loops are further reinforced during routine departmental meetings, where teachers are provided with opportunities to share their experiences, offer input, and collaboratively contribute to the ongoing refinement of the digital badge system and associated processes.

5. Conclusion

The pd4teacher digital badge system holds great promise for nurturing personalized teacher professional development within the private school context. By enabling teachers to choose badges that align with their unique needs and interests, the system encourages a customized approach to learning, ensuring that educators engage in experiences directly pertinent to their growth. This approach not only bolsters teacher autonomy but also empowers them to assume ownership of their professional development journey, allowing them to set goals, monitor progress, and select learning opportunities in alignment with their aspirations. Furthermore, the system places a strong emphasis on evidence collection, prompting teachers to showcase their skills and knowledge through practical application. This focus on tangible evidence ensures that professional growth is firmly grounded in real-world impact rather than theoretical notions, thereby enhancing the overall effectiveness of the system.

In considering future enhancements and expansions of the system, the school administrator contemplates the creation of multiple badging pathways to cater to various purposes. These pathways could encompass a prescriptive, linear approach for compliance training and onboarding, as well as a nonlinear, descriptive learning path that empowers teachers to curate custom portfolios tailored to specific roles, like assessment specialists. Such diversification promises a more nuanced understanding of teachers' expertise and growth, aligning their learning journeys with their career aspirations. To support these endeavors, a broader range of badges spanning diverse professional development areas may be introduced, reflecting the interests and specialties of educators.

Future research directions should focus on assessing the level of acceptance of the digital badge system among teachers, as its success heavily depends on their willingness to adopt it. A conceptual framework to study this acceptance could be established, framing teachers' perceptions and identifying major contributing opinion clusters. Additionally, further research should include qualitative studies to gather detailed feedback from teachers and administrators regarding the opportunities and challenges experienced with the system. This research could also explore the long-term impact of digital badges on professional development outcomes and investigate best practices for integrating this system into existing professional learning frameworks.

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