Digital badges for teacher professional development: Exploring possibilities for their design and implementation in India

Abstract

As teaching quality has become recognised as a crucial component of student learning, we have seen an increasing emphasis on teacher professional development. Numerous studies explore the characteristics of effective teacher education programmes in low- and middle- income countries but few pay attention to how teachers' professional learning is evidenced and recognised outside the award of formal qualifications. Most professional development programmes merely distribute certificates of participation or completion. However, capturing and validating improvements in teachers' classroom practice is important. It rewards teachers who engage actively with professional development, supports their planning of future learning and provides evidence for career advancement.

Digital badges awarded on completion of online open courses can give focus and motivation to in-service and pre-service teachers alike. But does such use of digital badges simply substitute one means of recognition – a hard copy certificate – with another – a virtual badge? Could digital badges be integrated into a learning design so as to support formative assessment and engagement with authentic professional tasks? How might badges be operationalised outside high income contexts to inspire and recognise effective classroom practices, while meeting each teacher's professional learning needs?

Our paper draws on findings from a recent three-day workshop held in Delhi with key education stakeholders from three Indian states as part of the TESS-India teacher education initiative. We bring together views from teachers, teacher educators and software developers to explore possible responses to these questions. In particular, we discuss potential structures and designs, assessments, and support and facilitation mechanisms for awarding badges in professional learning courses for teachers. Analysis of the workshop outputs highlights the need for digital badge frameworks that are nuanced, embedded and participant-informed, and for an accompanying shift in how evidence of practice is recorded and assessed.

Introduction

Open digital badges are visual representations of skills, accomplishments, status, activity, identity, or qualities recorded in a symbol that are commonly awarded by an issuer and embedded with a link to evidence that supports the earners claim to the badge. The Mozilla Foundation has defined an open standard for digital badges in education defining the badge as a 'digital credential … earned by an individual through specific projects, programmes, courses or other activities' (Mozilla Foundation, 2013). However, the educational value of using badges extends beyond that of a digital credential, with research indicating value for strengthening student motivation, promoting deeper learning experiences, goal setting, helping learners understand and value their achievements, building confidence, demonstrating commitment to learning, and taking greater control over what is learnt and how this learning is curated and represented in public (e.g. Gibson et al, 2015; Botha et al, 2014). Open badges can therefore support transparency in the process of learning and in the recognition of learning for all stakeholders yet learner motivations are nuanced and complex so not all learners will engage in the same way, if at all (Abromovich, Schunn & Higashi, 2013; Coleman, 2018; Fanfarelli & McDaniel 2015).

As with any educational technology, the success of digital badge implementation will depend on how well the process of earning and displaying badges is integrated into the learning and assessment design (Coleman & Johnson, 2016). Achieving design coherence and effectiveness is a complex interplay of pedagogic, psychological and sociological factors and requires a sound understanding of learner needs and the contexts in which the badges are to be displayed and used. Carey & Stefaniak (2018) quote one open badge expert as noting that a critical question is 'how will what I'm designing mesh into the world that this person is going to move into' (p1224). There is clearly value to the earner (learner, professional), issuer (teacher, organisation, peers) and the viewer (teacher, peers, employer) (Cross, 2014) yet stakeholder perceptions of this value may differ. For example, whilst often implicit, the benefits of awarding badges to the issuing educational institution or organisation are currently less well articulated but may align with strategic goals such as improving retention and learner satisfaction, building a bond between issuer and earner, data for monitoring and learning analytics, reducing the cost or effort of assessment, and bolstering the issuer's image or profile.

The mechanics of awarding a badge consist of three stages. First, a graphical badge symbol is created along with the criteria for success in qualifying for the badge. The badge is most commonly developed by a teacher or learning/instructional designer although some implementations have sought greater involvement of learners. A badge structure – the conception or map of how each badge relates to other badges and the awarding criteria – will be established and, although there is no standard, a categorisation or grouping of badges (such as activity-based, grade-based or hierarchical) may be made (Facey-Shaw et al., 2018). The badge and criteria will be set-up on an online issuing platform that is compatible with open standards.

The second stage comprises the issuing of the digital badge. Usually, this involves the learner visiting the issuing platform and submitting evidence that demonstrates they meet the award criteria, followed by an assessor (e.g. teacher/expert) verifying this evidence and finally approving the award (in cases of computer marked assessment such as a quiz, such approval may be automatic).

The third stage involves the ongoing management and use of the badge. Learners can store badges in digital backpacks, export the image (with an embedding link to evidence attached), and share this on social networks or their CVs.

Since their advent digital badges have been proposed as a vehicle for lifelong learning (MacArthur, 2013; Finkelstein, Knight & Manning, 2013) and there are numerous examples of how badges have been used in different disciplines and fields to enable adult learners to evidence specific competencies (Aberdour, 2016). However there has been relatively little research into the use of open digital badges in teacher professional development. In the US a number of states have started to use digital badges as micro –credentials with teachers in school based professional learning to capture and validate their learning, make visible improvements in their practice and increase motivation to participate in professional learning opportunities (DeMonte, 2017). Each micro credential is designed to addresses a discrete small set of education practices. Teachers demonstrate mastery of the associated competencies in each set through submission of samples of student work, videos and other artefacts, working at their own pace on a personalised learning pathway. Their submissions are vetted, scored and either approved (awarded a digital badge) or returned with a request to go back to 'dig deeper' (DeMonte, 2017). Studies indicates that these micro-credentials give focus and coherence to professional learning with teachers using what they have learnt in their classrooms (Acree, 2016). Teachers like the approach and the way it enables teachers to choose what to focus on in their professional learning (Digital Promise, 2016).

However there is little evidence of open badge research from the Global south either related to digital badges for learners or especially for teacher professional development. A review of literature published between 2010 and 2015 found that most research was concentrated in the US and Europe, with only four countries evidencing five or more studies (Lijanagunawardena, Scalzavara & Williams, 2017). It remains unclear whether findings so clearly linked to particular geographic contexts are applicable to low- to middle-income contexts, educational systems and teaching cultures. In a rare study from outside the global north, the Technology for Rural Education programme in South Africa developed a mostly linear learning path consisting 18 badges focussed on building proficiency in teachers' use of technology. Feedback on the badges, to be achieved over a year, was overwhelmingly positive (Botha et al, 2014). Given the paucity of evidence from the global south it seems legitimate to ask if teachers would interpret, use and value open digital badges differently in different contexts. This is the focus of this paper.

Meeting the challenge of improving the quality of teaching and learning is becoming a strategic focus in low- to middle-income countries. In India, the publication of the 2009 National Curriculum Framework for Teacher Education (NCFTE, 2009) marked a major policy shift and foregrounded the need to see teachers as 'crucial mediating agents through whom curriculum is transacted and knowledge co-constructed along with learners' (p4). However, entrenched teacher education practices, discourses, and pedagogic conceptualisations (Poonam, 2014) and variations in the effectiveness of teachers (Azam & Kingdon, 2014) continue to present substantial challenges and pupil learning outcomes remain low (ASER, 2018). Historically in-service provision in India has been dominated by cascade type programmes involving workshops led by external Master Trainers. But such initiatives have rarely lead to significant improvements in classroom teaching and there is increasing recognition that they have limited effectiveness (Ramachandran, Beteille, Lindne, Dey, Goyal & Chatterjee, 2016). They have limited relevance to the classroom situations faced by teachers, they are fragmented, rarely focused on pedagogy, have little impact on teacher motivation and lack any element of personalization (GoI, 2012). But teacher motivation and professional incentives are increasingly being seen as an important link to teacher effectiveness and movement in teachers' classroom practices (Mualidharan & Sundararaman, 2013). In this

context there seems potential in investigating if there might be a role for digital badges in addressing the needs and challenges of teacher professional development. The two research questions examined in this paper are:

> RQ1. To what extent is the use of digital badges likely to motivate teachers working in public schools in India?

> RQ2. What conceptions of digital badge do educators develop during the ideate phase of learning design and how are these situated within the narratives of motivation?

Methodology

The study uses data collected during a three-day workshop and symposium held in January 2019 in New Delhi, India. This event was attended by 14 delegates from three Indian states who had, in some capacity, been involved in the TESS-India teacher development programme (www.tess-india.edu.in) (Wolfenden et al., 2017). Participants were senior educationalists and included the directors of teacher education. On the final day, the state teams were joined by technology experts from technology companies and philanthropic trusts involved in supporting the development of digital platforms for teachers in India.

The five workshop objective were: (a) to engage in future thinking about teacher professional learning in their context, (b) to consider what is meant by a 'digital badge' and how it is created and used, (c) to explore how teachers are motivated to engage in professional learning episodes using resources such as TESS-India OER and MOOCs to change their practice, (d) to articulate visions of how, when and with whom teachers might study courses that include digital badges, and (e) to develop outline ideas for 'badged open courses' that may be relevant to particular states and discuss these with technical experts. These activities represent the exploration and ideate phases of a badged learning design (e.g. Coleman & Johnson, 2016) and included:

- *Personal experiences of badges activity* – delegates were invited to 'bring' a badge, explain why it was awarded, what it represented to them, and what they believed it meant to others. This activity helped participants reflect on multiplicities of representational meaning.
- *Exploring digital badges activity* –groups reviewed examples of open digital badges and discussed what the badges represented, how they were earned and their reaction to the badges.
- *Planning a badged open course activity* – an extended task in which state group had to design an outline of a badged course for teacher professional development drawing on TESs-India OER that they were familiar with. Ten core questions were provided to structure the design activity.
- *Presentation of plans to experts* – state groups delivered a formal presentation to technology experts followed by a roundtable discussion.

The workshop was underpinned by a two-hour seminar by a member of the UK academic team introduced the concept of digital badges and explained outlined the key academic and practical narratives and research. This presentation summarised the roles that digital badges perform and how digital badges can be created, awarded and shared. Case studies describing use of digital badges were followed by an examination of how badges potential differ from other forms of award such as certificates.

All physical outputs produced during the activities were collected including Powerpoint presentations, proposed course plans, and photographs of post-it and flip-board activities. Audio recordings were made of key discussions and plenary sessions and the research team held a debrief session after each day.

Results

Narratives of teacher motivation and reward

Understanding how teacher motivation is discussed and framed by practitioners is essential to identifying when and how digital badges might be used. Participants were asked what could be done to motivate teachers to engage in professional development relating to their classroom practice. The specific example of the TESS-India teacher development resources was used to initiate this discussion, after which participants were encouraged to think more widely.

Four key themes were identified from the analysis of a post-it activity and plenary discussion involving X educators. These themes can be summarised as (a) personal recognition of achievement (b) inspiring practice, (c) practice as a teacher (d) alignment with policy and governing structures.

With respect to the first theme, recognition of achievement as certification at state or country level was most commonly mentioned, but participants also suggested leaderboards, awards and badges as means to motivate. One participant observed that having '… just a little appreciation would be good' and another mentioned monetary benefit or promotion as an incentive. Teachers were also described as being motivated by witnessing the inspiring practice of peers or 'other teachers and teacher educators already engaged with [the] OER' and by seeing them enthuse learners. Motivation derived from social engagement was frequently mentioned and included (a) hearing or reading case studies related to teachers in their state (b) mentoring – both being mentored by or receiving recognition from being a mentor – and (c) sharing good practice by having the opportunity to showcase success within the teaching community (e.g. seminar presentations, , online, discussions at regular teacher meetings). Such support and exchange and could 'create a fellowship of engaged teachers.'

Unsurprisingly alignment with policy and government structures was also considered by these senior educators to be important in motivating teachers to engage in professional development, perhaps reflecting the strength of institutional structures in India. This is necessary at all levels: 'state and country support is essential but I think at the ground level [also]'. State government endorsement (and financial support) was seen as necessary to 'percolate deeper into the [local] system' for teacher needed to feel the 'weight and association with capacity building programmes with their awards,' whilst support from headteachers, state administration, state education directors and education officers was also mentioned. Intrinsic motivation was referred to less often, although sub-themes can be discerned relating to feeling more satisfied and competent in day-to-day work as a teacher, in building skills, and in developing a greater professional identity.

Figure 1 summarises the themes and sub-themes identified in the workshop activity. Twelve potential motivators for practice change were identified. Those considered most directly relevant to the daily activity of teaching are located in the centre of the diagram, whilst those relating to more abstract or distant social, political and economic structures are outmost. This is a provisional visualisation for Indian teacher motivations but could provide a useful framework for further analysis.
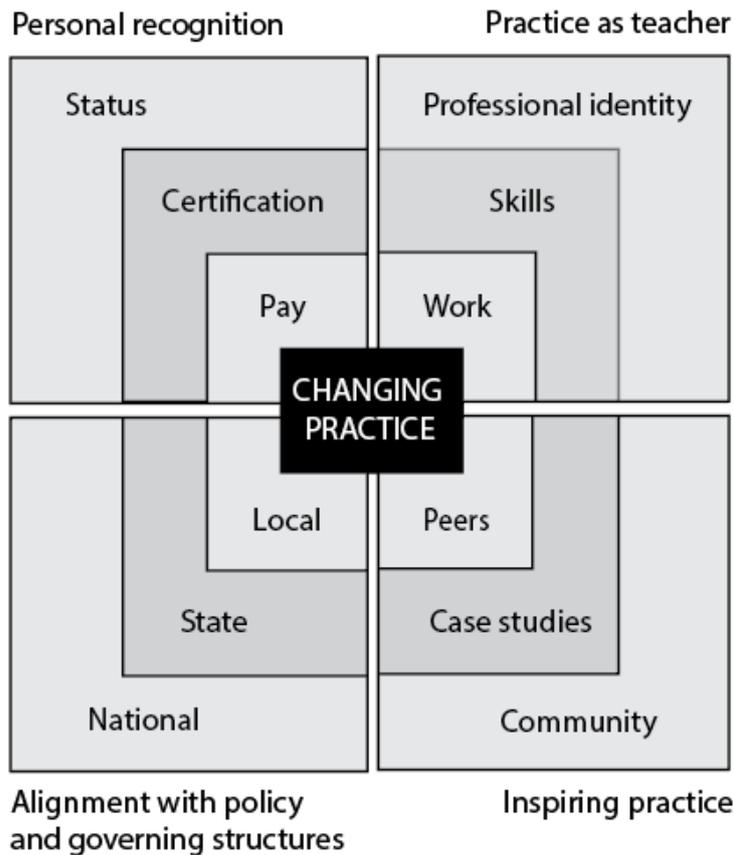
Figure 1. Motivators for participation in professional learning relating to classroom practice change

Designs for potential badged courses from state educators

During the workshop each state groups was asked to develop a conception of course that used digital badges. This activity was intended to capture how these three groups of Indian educators conceived of and situated the operation of badges and to assess how well existing badge award technologies would meet this need.

Case study 1: Pair work with pupils

Group 1 choose to focus on teacher use of pair work and its role in promoting active pupil learning, in line with the national curriculum for teacher education (NCFTE 2009) In their conception, Group 1 identified three learning outcomes for teachers: to gain an understanding of pair work, to develop skills in organising pair work in different curriculum areas, and to achieve involvement of all pupils (a key theme of the National Curriculum NCE 2005). They envisaged offering teachers a large number of activities to select from, all with associated assessments and a digital badge. Figure 2 shows a number of activities related to the learning outcomes and the proposed assessments. This mapping also categorises the type of digital badges proposed, these arose from participants' discussions.

Learning Outcome	Example activity linked to achievement of outcomes	Assessment method	Badge category
Understanding strategies	> Reading theoretical background and understanding concept	> Questionnaire or assignment	> Knowledge badge
Develop skills using in different contexts	> Demonstration of classroom use in four curriculum areas	> Video of classroom practice	> Practice badge
	> Refective case study about the challenges of using pair work	> Audio recording of reflections	> Reflective badge
		> Written notes of reflections	> Reflective badge
	> Discuss with colleagues	>	**?**

Figure 2. Summary of Group 1 proposed digital badge structure showing alignment between badge, assessment method, activity and learning outcome.

This course was for 4 hours' study per week over 4 weeks with teachers seen to be motivated by recognition through the award of digital and *non-digital* badges and the sharing of good practice online and during teacher meetings or seminars. Flexibility in learning would be offered as to when to study, a choice of topics and a choice of assessment methods and critically, support for teachers would be provided both online (social media and through the SCERT website) and offline from facilitators (local teacher advisers and teacher educators from blocks and District Institutes of Education and Training (DIETs)) . Of interest is the way in which the design has started to disaggregate the complex skills required to successful use pair work with pupils and a broadening of the range of assessment methods being suggested, including direct observation of classroom practice.

Case Study 2: Using local resources

The focus of Group 2 was on promoting the use of resources adapted and appropriate to the local educational and linguistic context. Four learning outcomes were identified for the course: to explore and integrate local resources, to forge connections between the curriculum and pupils' lives, to make the classroom an interesting and attractive place to learn, and to integrate and adapt local resources for the classroom. Examples of seven badges were given (Figure 3), each linked to an assessable activity, though the assessment method was not specified (this may have been a result of the group not having sufficient time in the workshop). Proposed badges recognised teaching practice, achievement of particular teaching tasks, and knowledge of the subject (Figure 3). These were described, using the term given to the group in the introductory presentation, as 'formative badges.' Whilst there was an implied assumption that completing these activities would deliver a more interesting and attractive learning experience, this was not explicitly articulated and no method of assessing learners' increased interest or badge to recognise this were mentioned in their presentation.

Learning Outcome	Example activity linked to achievement of outcomes	Assessment method	Badge category
	> Understanding local resources available	>	> Knowledge badge
Explore and use local resources	> Using appropriate resources	> *Unspeficied demonstration of practice*	> Practice badge
	> Use case studies	>	> Task badge
	> Use videos	>	> Task badge
Connect curriculum with students' lives	> Make use of the outside environment	> *Not Specified*	> Practice badge
	> Inviting a local expert into the classroom	>	> Task badge
Adapt and adopt local resources	> Adapt a local resource	> *Not Specified*	> Practice badge
Make classroom interesting and attractive	> *Culmination of activity outlined above*	> *Not Specified*	> Task badge

Figure 3. Summary of Group 2's proposed digital badge structure showing alignment between badge, assessment method, activity and learning outcome.

The course proposed by Group 2 would take 4 hours per week over 7 weeks. The group spoke of teachers using the badges as evidence for becoming local teacher advisers (Cluster Resource Coordinators and Block officials) reflecting their concern that such badged courses align with existing structures and other teacher education interventions. This group were concerned that a recent survey in their state had indicated less than 50% of teacher educators were familiar with digital technologies and there was a deep aversion to the use of innovative and experimental methodologies amongst the teacher educator cadre.

Case Study 3: Multilingualism

Group 3 focused on challenges faced by teachers working in multilingual classrooms and encouraged them to value the languages spoken by their pupils, drawing on them as resources in learning activities. . Their interpretation differed slightly from the other two groups and they drew a clearer distinction between broader conventional summative assessment (writing a short reflection on their experience, evidence of using audio-visual material with pupils, and a video example of classroom practice) in which they were looking for evidence of teachers involving all pupils, and use of formative badges for recognising smaller practice tasks. Less detail was specified so a mapping was not possible. The proposed course was to be shorter at 2-4 hours over 2 weeks with teachers motivated by the accomplishment of the formative digital badges and an opportunity to work as a 'master facilitator.' Flexibility was to be offered with respect to learning at teacher's own pace, and choice of when and if to complete the formative assessment.

Discussion and conclusion

This study has worked with leading teacher educators and technology experts to explore whether there might be traction in using digital badges in teacher professional learning and interrogated their nascent conceptions of how digital badge structures could be designed. The motivators for participation in professional learning relating to classroom practice change diagram (Figure 1) presents key elements to the discourses that workshop participants used to describe what would motivate change in practice and our next steps will be to validate this understanding with teachers themselves in varying locations across the three states However this initial work indicates many potential roles for open digital badges within this emerging motivational matrix. Personal

reward (i.e. reputation, status and formal recognition), social activities (discussing, sharing and exchanging with peers - within public spaces or in online communities) and support for improvements in practice were all mentioned. It is likely that a badging structure could align with a combination of these. It is also interesting to note the importance attached to endorsement from education authorities as a motivational driver perhaps reflecting the significance of formal qualifications in academic and professional life in India

As an analytic tool, mapping proposed learning outcomes to the learning activity, means of assessment and type of badge was useful for identifying good alignment in the plan and areas where badges remained ill-conceived or poorly articulated. This is commonplace practice in learning design but this representation was new to all participants. They found it easier to work out how to 'badge' some outcomes but struggled with others. Measuring more general outcomes such as 'involvement by every pupil' or 'making the classroom a more interesting place' can present greater methodological challenges, yet solutions are required otherwise badges will continue to be used to reward that which can be measured easily rather than that which supports productive learning experiences for pupils.

Our analysis of the workshop data indicates four findings pertinent to the challenges of designing effective teacher education in India. Firstly the emphasis by all the groups of teacher's own classroom as a site of professional learning. There were multiple mentions of face-to-face support sessions outside the school but an important shift towards situated learning, a recognition that teachers learn through practice with their own students. Second, and somewhat in tension with the first finding, we observed only limited blending of 'theory and practice'. Discourse across the groups tended to isolate theory (seen as being assessed by a 'knowledge' badge) and practice. Third, there was a recognition that teachers' practice is not homogeneous and that teachers have differentiated learning needs requiring different kinds of support. Lastly, the findings indicate that educators are interested in using a greater range of authentic assessment methods than perhaps are currently being employed. For example, the use of video or audio recordings of teaching practice as evidence with reflective accounts. How these could be assessed at scale was not resolved in the workshop – whether through peer rating, random sampling by teacher educators or through assessment by a trusted local educator eg the headteacher. How video and audio recordings of classrooms are shared could also raise ethical considerations in respect to both allowing others to verify the evidence submitted for a badge award and to sharing on social media.

Conceiving of open digital badges as a method of assessment means that use may consist of a summative assessment role (e.g. Reid, Paster & Abramovich, 2015; Lijanagunawardena, Scalzavara, & Williams, 2017) and/or a formative assessment role (e.g. Coleman, 2018). There are digital badges 'of' learning and digital badges 'for' learning (Cross, 2014) and each will function differently depending on its implementation. Badges of learning will operate outwardly as external symbols whilst badges for learning operate within the teaching frame where the meaning that earner themselves place on badge attainment is foregrounded.

Workshop participants were all highly enthusiastic about the potential of digital badges for teachers and we suggest the concept is worthy of further investigation with teachers themselves perhaps through piloting badged courses to understand whether and how earning them influences teachers' classroom practice. Further areas for investigation include how such courses could be integrated into existing and future teacher education strategies and linked into career structures for teachers. Workshop outputs indicate that the design process linked to a 'badged course' is useful in disrupting established ways of thinking about teachers' professional development but the concept of breaking down complex teaching skills into smaller parts is unfamiliar to teacher educators. Finally assessing movement in teachers' practice must involve assessment of their classroom practice; undertaking this online and at scale poses challenges which have yet to be overcome.

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