***Promoting Teacher Confidence With Technology Through Risk Taking and
Organisational Changes: A Welsh Perspective***

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Abstract
There is no doubt that technology is a powerful pedagogical tool, playing an important role in learning within and outside of the curriculum at varying levels of education. In Wales, the recent curriculum changes, and the emergence of the Digital Competence Framework (DCF) means that primary and secondary schools and teachers across are now responsible for creating "learners [who can] thrive in an increasingly digital world". To nurture digital competence in school pupils in Wales, we need to understand how teachers feel about using technology in their teaching practice and how confident they are with promoting and cultivating digital competency amongst their learners. This paper aims to give a snapshot of how teachers are feeling, particularly after a disruptive shift to moving learning and teaching online during the COVID-19 pandemic. For many teachers, this dramatic shift in their practice took them totally out of their comfort zones and presented many challenges along the way. Through findings from a longitudinal qualitative study with one school in Wales, specifically through a series of semi-structured interviews, we learn that taking risks is an integral part of changing teachers' practice with technology. Whilst COVID-19 presented many challenges for teachers, positive experiences during this period has the potential to foster confidence amongst teachers for the future. The question now is, how do we support teachers to take risks with technology and make this change in their practice?

Keywords: Online Learning, Teacher Confidence, Best Practice, Risk Taking

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Introduction

The ongoing development of digital technologies is undoubtedly one of the most prominent features of the past thirty years and although education is an integral part of the ever-changing contemporary world, it is impossible to ignore its connection with technology (Selwyn, 2012). Teachers are being challenged to improve student learning by effectively integrating new pedagogies and technologies (Beetham & Sharpe, 2013).

Previous research into technology in education has highlighted that many approaches to technology integration offer a one-size-fits-all approach when, arguably this does not always fit teachers' existing pedagogical beliefs and practices (Mishra & Koehler, 2007).

It has been argued that the most common reasons teachers are often most reluctant to using technology is largely down to existing beliefs and a lack of knowledge and self-efficiency (Ertmer & Ottenbreit-Leftwich, 2010). The challenges faced by teachers when using technology for teaching and learning have been largely exacerbated during the COVID-19 global pandemic (Crick et al., 2020). During lockdown and school closures, learning, teaching and assessment was delivered solely through the means of technology, presenting a whole new wave of challenges for teachers across the education sector.

It's no surprise that school closures due to the pandemic have increased teachers' engagement with technology. While access to technologies has significantly increased and some teachers have rapidly adopted this new practice, adopting new technologies and related teaching practices still presents significant challenges for many teachers and continues to cause considerable uncertainty and anxiety. Altering teacher beliefs is one of the key challenges of adopting the use of technology and it has been suggested that this immediate change may begin with developing teacher confidence (Ertmer, 2005).

When a teacher is asked to use technology, it is suggested that at least some degree of change is required (Ertmer & Ottenbreit-Leftwich, 2010); risk is an integral part of change (Howard and Gigliotti, 2015). Teachers' concerns about technology integration are indeed related to confidence, beliefs and attitudes about teaching and technology (Ertmer, 2005; Petko, 2012); but it is also about how teachers feel about taking risks and experimenting in their practice. In the following sections, the authors of this paper will address how teachers can be encouraged to take risks with technology. In particular they will, use the experiences and lessons learned from the study as a motor for increasing teachers' overall confidence with using technology effectively in their practice.

Literature Review

Leadership and risk taking

Educational leaders play a pivotal role in determining a school's climate and reputation; it is this culture that forms the environment within which teachers and pupils work. Leithwood (2009) found that successful leadership can play a highly significant and frequently underestimated role in improving student learning. Sun & Leithwood (2015) discussed that this learning/ impact happens directly through the teachers. In their study they 'identify four distinct teacher emotions which have significant effects on student learning—collective teacher efficacy, teacher commitment, teacher trust in others, and organisational citizenship behaviour' (Sun & Leithwood, 2015, p.1). Indeed, resilience in teachers is not just a personal

attribute or trait, it is something that is nurtured by the intellectual, social and organisational environments in which teachers work and live (Day & Gu, 2013). The culture of a school for teacher's learning, attitude and confidence building is crucial. However, like most similar initiatives 'encouraging collaborative teacher inquiry focused in classrooms and finding strategies to facilitate 'double-loop learning' at school level, is challenging and demands the development of cultures and structures of support' (James et al., 2007, p.1).

COVID-19 increased this challenge and teachers more than ever needed the support within their schools to be able to take risks to ensure that their pupils were educated (i.e. challenged, nurtured and encouraged). In their study, Wahab et al. (2020), show that there was a significant relationship between the headmaster instructional leadership practice and the performance of the teachers. Virkus & Salman (2020) identified 'encouraging open communication and creating a positive and collegial work atmosphere' as one of six of the effective leadership behaviours within a higher educational setting. Countering this, when there is the absence of leadership, the demands often exceed the worker's abilities, causing exhaustion, depression and/or stress (Saldaña Orozco, 2019). In this current online learning climate, teachers need the confidence to be able to try a new software application or a new online communication platform etc. But more than this, they need an open dialogue in their schools, a culture to be able to plan for risk taking and the ability to leverage a community to share best practice. As Radloff et al. (2019) found there are four types of perceived risks which included practical, pedagogical, conceptual, and personal; these varied between different generations of teachers. Significantly, they found that the benefits of risk-taking include increased student engagement, improved self-confidence, and greater teacher collaboration across generations (Radloff et al., 2019). Furthermore, Slavit et al. (2016) highlight the power of doing and risk-taking in teacher development, particularly in the ways in which teacher collaboration advances curriculum and instruction. In their research, Grohnert et al. (2019, p.1) emphasises 'Learning from errors is crucial for individuals' as well as organisations' performance. In terms of education, school leaders need to give teachers the freedom to take risks, to make mistakes and to evolve and learn (i.e. to be actively encouraged to figure out what works for them).

Sharing best practice and creativity

The rapid increase in the number of school pupils, particularly during COVID-19, that needed flexible and remote digital learning experiences, highlighted the limited teaching resources, skills and often confidence of many teachers to deliver these experiences. For example, in their paper, Asgari et al. (2021) talk about urgent and careful planning that was needed to mitigate negative effects of the pandemic on education (engineering) that has been traditionally content-centered, hands-on and design-oriented. Indeed, teachers being compelled to the online format of delivery and content creation during COVID-19, added a new layer of complexity to their teaching. As Maslow's hierarchy of needs highlights our motivations are dictated mainly by the circumstances, we find ourselves in, and there are certain 'lower' needs that have to be satisfied before we are motivated towards 'higher' achievements (Green, 2016). In this instance, teachers were firstly motivated by the need to establish online communications links with their pupils, secondly, if they had the capacity/motivation/ability they looked at making these communications (and the content shared during these communications) engaging and creative. In the aftermath of COVID-19, we are finding a strong need to support schools/school leaders to think about how they need to create a culture for teachers that will facilitate learning about online technology and pedagogy from one another.

In the physical and face to face classrooms, teachers have successfully engaged in varied practices to promote and develop creativity in learners and amongst one another for years. However, when everything went digital during COVID-19, things were turned upside down for many teachers. Jones & Kessler (2020, p.1) described it as 'the COVID-19 pandemic has caused the nation's teachers to enter into a shocking, and at many times painful, natural experiment'. They wrote about 'Teacher education is at a crossroads' (Jones & Kessler, 2020). As Al-Rasheed & Berri (2017, p.1) note, computer technologies have reshaped the roles of instructors and this in turn 'engenders new experiences of teaching that need to be gathered and capitalised as teaching assets to be shared among communities of instructors'. It is true that the rapid development of technology can demand innovation and creativity in learning activities (Rachma et. Al, 2020). And, for many teachers, it has been like a weather whirl wind that caught them off guard. However, many organisations are pushing the sharing of good practice and lessons learnt to support each other through this age of digital transformation (Reimers, 2020). This is encouraging some teachers to even capitalise on the digital development of technology enhanced teaching to increase the experience of connectivity and creative communities within their schools (i.e. HWB, google classroom, Microsoft teams etc.). By creativity we mean the ability of teachers to confront learners with 'challenges in which they need to share knowledge and experience with others in order to figure out and make sense of these in new and innovative ways' (Kop & Carroll, 2011, p.5). In their study, Apak et al (2021) found that that teachers' creativity-nurturing behaviour is significantly different according to teaching experience. They discussed how 'teachers should stimulate positive changes in pedagogical practice to transform the classroom into a more active learning community with greater potential for creativity' (Apak et al.,2021, p.1). For example, during Covid-19 Carpenter et al. (2021) shared collaborative models to empower the sharing of ideas, resources, best practices, and emotional support; and ultimately guide their campus communities to success.

Moving to an innovative mindset

However, it seems educators have lost their passion for innovation and creative engagement, perhaps because of the incessant requirements through pandemic emergency teaching that requires a high level of learning, passion and supporting of students ((Kunnari & Ilomäki, 2016). So, how do we balance these new demands of being online educators, who are expected to be working 24-7 online, with still being enthusiastic for the facilitation of creative and active engagement? Can understanding how academics innovate, for instance by understanding how they move from a fixed mindset to being geared towards a growth mindset (Dweck, 2015) actually help learners become engaged in a similar process, from being outcomes based towards being process based. Are there commonalities in how academics are innovating, who they are, or what they are innovative in, contributing to how an academic department supports evolutionary practices to become more widely adopted? How important is the taking of risks in this transition?

The purpose of education

But before discussing how teachers might feel more confident in using technology in creative ways, it is important to reflect on the purpose of and how this might relate with technology. Biesta (2015) highlighted the purposes of education; to have three components: accreditation (working towards a diploma), socialization (supporting people in society) and as third what he called subjectification, in effect encompassing human growth. These three components should be kept in mind when developing educational experiences as all three are vital in our

work, to help institutions, students and society evolve. In the past educators have emphasised that it would be desirable to move the control over the educational experience from the institution to the learner (Illich, 1971, 1972). Illich's ideas of 'community webs' can be seen as examples of how to arrange the connections people might foster during the learning process and are a strong precursor to the online networks envisioned by Siemens (2005) and Downes (2019) that they say could break the institutional grip over learning and foster the development of informal personal learning ecosystems with the learner firmly in control over their own intentions, activities and interests. Moreover, Freire emphasised already some time ago (Freire & Macedo, 1999) the need for teachers to help people's conscientisation, becoming aware of the unequal power relations in society and how to teach and learn in ways that help people work toward achieving more just outcomes in society. This involves being a teacher in the sense that Palmer (1998) describes as: "being present with heart and soul"; being authentic in the work as teachers and ensure a personal connectedness with the students. This is a very different role than that associated with a facilitator in an online environment, or as a node on a network. It means that in the complex everchanging context of education, the role of educators is not simply to transfer knowledge or facilitate information sharing, but rather it involves the engagement in dialogical interaction with learners and to ensure the active engagement of learners in their own learning process with support from knowledgeable others.

Research Design and Methodology

Purpose of the study

This study forms part of a wider in-depth longitudinal PhD research programme, exploring Welsh secondary school teachers' understanding, perspectives of and attitudes towards digital competency and using technology in their teaching practice, in light of the new DCF (2018) for Wales.

This study has revealed some interesting findings around how enabling teachers to take risks with technology and positive experiences of technology use during the pandemic has helped teachers' grow their confidence and practice with technology. In particular, this paper will share some key findings from one school (School Z) in Wales who has been involved in the wider PhD research programme.

Approach

This longitudinal (Mar 2020 – Mar 2022), qualitative study used a Design-based research (DBR) approach; Often the challenge with research in education is the detachment between the research and practice in context (Shulman, 1999). DBR has the ability to posit a synergy between research and real-world practices(Wang & Hannafin, 2005) and affords greater teacher input and agency in the design of desired outcomes/recommendations (Zinger et al., 2017).

An initial online survey was sent out to participants and was used to gather teachers' initial thoughts on using technology in their practice which was then followed by a series of semi-structured interviews to provide deeper insight into teacher attitudes and perceptions towards using technology and their own digital competence. These were followed by a series (4) of action learning workshops which were designed to provide participants with an opportunity to share their thoughts and experiences of using technology and to identify successful

approaches to effective technology integration in the curriculum. This paper will discuss the results from the interview data alone, which highlights some interesting findings about the importance of encouraging teachers to take risks with technology and how positive experiences of COVID-19 have fostered confidence amongst teachers for the future.

Participants

Secondary school teachers often have fewer digital skills and exposure to technology for learning and teaching than their primary colleagues and therefore may be less prepared to deliver the DCF with confidence and ability (Estyn, 2018). Traditionally, the use of information communication technologies (ICTs) in secondary school tends to sit discretely in the ICT department presenting fewer opportunities to effectively embed technology across other areas of the curriculum. As a result, secondary teachers from other subject disciplines are likely to be less familiar with using technology and less experienced. Adapting convenience sampling, secondary schools who were happy to participate in the study were invited to distribute the initial survey to their teaching staff.

One secondary school in Wales agreed to take part in an in-depth case study as part of the wider PhD programme. From the individual school, (p=26) participants completed the initial survey and those that were happy to be contacted following the survey were invited to a semi-structured interview (p=3) and a series of action learning workshops (p=5). It was important that a range of subject disciplines were represented across the participant group and participants included teachers of Art, Computer Science, Mathematics, and members of senior management within the school.

Findings and Discussion

The findings of this study demonstrate how risk taking is an integral part of developing teachers' practice with technology. Findings reveal how taking risks with technology, positive experiences of technology use during COVID-19 and sharing of good practice with others can foster teachers' confidence with using technology in their practice. A thematic analysis using NVivo identified several themes from the interview data, the results are presented in the form of discussions below.

Supportive styles of leadership encouraging 'play time' with technology

Semi-structured interviews revealed the importance of positive and influential styles of leadership that foster confidence and trust amongst teaching staff within a school. School Z recently appointed a new assistant head teacher before the COVID-19 pandemic. Teacher participants (P2) (P3) during the interviews made comments on the impact that this change has had on the organisational culture of the school and the increased support for using technology. There was a real sense of positivity around how changes in leadership encouraged staff to experiment and 'play' with technology. One participant discussed in detail how the changes in leadership within the school was integral to how the school adapted to teaching and learning online during the pandemic.

'[our new head] has been integral and has pioneered a lot [during COVID]' (Participant 02).

The same participant also discussed the benefits of the supportive leadership style within the school, emphasising how being encouraged to make mistakes and learn from them, having

greater agency in decision making and being involved in new initiatives (digital working groups, digital champions) has enabled them to try out new ideas and learn from others. This in turn, has impacted teacher confidence and self-esteem across the school with using technology. Indeed, as Day & Gu (2013) suggest, teacher resilience is not just a personal attribute but something that is nurtured by the organisational environment.

'[he] allows you to empower your own learning and gives you the freedom' (Participant 02).

Members of the leadership team within the school were also interviewed as part of the data gathering process and revealed the importance of giving staff the 'space' to try new things, encouraging them to make mistakes and learn from them, in order to grow their confidence with technology. For school Z, whilst COVID-19 presented many challenges, it also presented many opportunities to use this time to try out new technologies and a new way of working. Very early on during the pandemic, the leadership team within the school set up several initiatives (digital working groups, digital champions, digital newsletters) to encourage staff to share their challenges and try out new ideas.

'…it's about doing lots of experimenting and lots of deleting/redrafting things' (Participant 03).

'many staff will say they are 'not very confident or not very experienced [with technology] …it's not my thing. But at the end of the day, if we drag the majority of this staff body, a majority of teachers are slowly getting more confidence using technology more making mistakes and learning from them' (Participant 03).

The style of leadership in school Z emphasised the importance of providing reassurance to teaching staff, both during a time of challenge (COVID) but also to enable teachers to grow their confidence using technology, a key driver for implementing the DCF in Wales. One participant (P1) made comments on the importance of embracing a non-judgmental approach to leadership and one that encourages innovation so that teachers feel well-supported and confident to try new ways of teaching with technology.

'I think the habit of teachers having that feeling of being judged in everything they do, and judged along very narrow KPI's, the shackles are slowly coming off, you know' (Participant 01).

Embracing a change in 'culture'

It is evident that, when teachers' are asked to use technology, at least some degree of change is required (Ertmer & Ottenbreit-Leftwich, 2010). This study revealed that this is not just about teachers' change in practice, but the culture change of an organisation and the way in which teachers' are supported and encouraged to develop their practice.

Participants with a leadership role at School Z made many references during interviews to 'embracing a change in culture' when talking about teachers use and experiences of technology and preparing for the DCF in Wales. One of the participants suggested that a core ingredient for effective use of technology 'is that culture of being supportive and non-judgemental' (Participant 03) and suggested that in order for teachers to use technology effectively, they need to think differently. This same participant made further comments on the importance of embracing a non-judgmental approach to leadership and one that

encourages innovation so that teachers feel well-supported and confident to try new ways of teaching with technology, without worrying if they get it 'wrong'.

'we need to create a culture that is non-judgemental…that is supportive and that encourages innovation and encourages risk taking…[and think] right so it's not the end of the world, where did it go wrong' (Participant 03).

Another participant (P1) during the interview made comments about the intense pressure that teachers are often working under and made comments to suggest that teachers' creativity and willingness to try new things is often down to workload and feeling 'judged'.

'there is a habit of teachers having that feeling of being judged in everything they do, and judged along very narrow KPI's' (Participant 01).

When talking about the approach to leadership within the school, it was clear that senior managers were keen to encourage and not stifle innovation with technology. The same participant (P1) made comments on how they could see the positive impact of the non-judgemental and supportive approach to leadership had on teaching staff in the school.

'the shackles are slowly coming off, you know' (Participant 01).

The importance of sharing best practice and learning from each other

Participants discussed a number of new initiatives to promote best practice with technology that have emerged in school Z since the pandemic started. These included a digital working group, a series of digital champions, a digital library, and other means of encouraging teachers to work together, share good practice ideas and learn from each other.

'thankfully, due to COVID and there's not many things that are thankfully due to COVID but we've got our own digital library [offering] tutorials and resources' (Participant 02).

'Staff themselves run tutorials for other staff and upload these to the digital library' (Participant 03).

'we've got staff giving each other hints and tips and problem solving and questions and answers' (Participant 03).

All participants commented on how these new initiatives have had a positive impact on staff confidence with technology and stressed the importance of how being able to connect and collaborate with other colleagues gave them the confidence to try out new ideas and 'give it a go'. One participant (P2) discussed the benefits of being involved in the digital working group specifically and commented on how this has improved teacher agency in decision making across the school. This group was used as a vehicle to discuss developments with technology across the school and was used to identify teacher needs and requirements to integrate technology effectively in their teaching and responded to those needs.

'being part of that group…was really interesting, really good stuff' (Participant 02).

Participants also discussed the importance and benefits of engaging with external networks i.e., other schools to share good practice and ideas. Participants discussed the benefits of

working with colleagues from other departments and schools, not only did this help provide teachers with a strong support network during COVID but has also been a key factor in preparing for the DCF and the new curriculum in Wales.

'we've actually learned from other schools and what we've looked at so starting from scratch made it easier in some ways' (Participant 02).

'Through the new curriculum we have to collaborate with other departments and other subjects …and those conversations are taking place' (Participant 01).

This collaboration and the making of connections between teachers from different subject areas can lead to cross fertilisation of good practice, heightened creativity which in turn can influence the design of effective learning experiences and the sharing of novel teaching innovations.

Conclusion

Given that this research only demonstrates a single case in Wales, although not generalisable, it is vital that teacher confidence with technology is nurtured and supported by senior leaders. Of the lessons learned, teachers must be encouraged to take risks with technology and schools need to adopt a culture that is non-judgmental and supportive, a culture that can inspire change. The COVID-19 pandemic has presented many challenges across the education sector and has no doubt pushed many teachers outside of their comfort zones with using technology. But in turn, this turbulent time has been a key vehicle in driving change amongst the sector, specifically relating to the use of technology for teaching and learning. Teachers' positive experiences of technology use during the pandemic and the significant growth of communities to share best practice amongst the profession has, inevitably increased teachers' confidence with using technology and offered many lessons than can inform innovative practice in the future.

Acknowledgements

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