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Developing an Educational Digital Mindset: Voices from an Inter-disciplinary Community of Practice

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Abstract

Further, Adult and Vocational Education (FAVE) is changing - in the need for new pedagogical responses to digitalization as well as programmes designed to help students acquire the knowledge, skills and experience necessary to prepare them for digitalization and the digital world. It is increasingly clear that FAVE teachers must develop new and different skills and perspectives. Programmes worldwide are responding with innovative models of education and embracing fundamentally different ideas of educational digital pedagogy and curriculum. Yet evidence that these 'new' responses are effective is limited and we need additional research to understand the experience and the impact of these models on FAVE teachers. This paper shares the findings from an online questionnaire (Phase 1) of a study of FAVE teachers' evolving professional identity to become critically reflective digital practitioners. The genesis of this



study was pre-COVID but is all the more relevant and pressing now as digital technologies have transformed lives, jobs and organisations.

Keywords

digital mindset; identity self-states; habits of mind; perspective transformation; further, adult, vocational education (FAVE)

1 Introduction

Digitalization and new digital lives are identified as some of the most pressing concerns facing our society today. Ubiquitous (Jing, Conway, & Yong Zhao, 2008) and invasive (Turkle, 2017) the digital world has changed forever the way we live, work and how we should educate. Evolving social and industry practices, standards and expectations make it increasingly clear that further, adult and vocational education (FAVE) teachers must develop new and different skills and perspectives in order to engage in and support flexible responses to these societal changes.

Programmes worldwide are responding to changed and changing contexts with new and innovative models of education and training. Key features of the challenges facing the sector include the need to provide high quality teaching and training, interdisciplinarity, partnerships with communities and industry, and a mentality of innovation and enterprise including social enterprise. FAVE teachers are now required to be individuals with the interdisciplinary skills, qualities and dispositions to work within these sectors in an increasingly complex and digital world. This requires competences that include a breadth of knowledge about ICT, internet, media, information and digital literacy.

Digital technologies have been reshaping the nature of jobs and the workforce of tomorrow. FAVE programmes are designed to help students acquire the knowledge, skills and attitudes that enhance their competency and prepare them for this future world. While digitalization has radically changed peoples' lives and their learning, being surrounded by the digital world and digital technologies does not necessarily mean that an individual is 'digital' or has developed a 'digital mindset'.

This paper reports on results from a digital synchronous online questionnaire conducted during a HETL Forum Educational Digital Mindsets seminar with FAVE practitioners. Results shared in this paper have led to the design of a collaborative qualitative research study by nine FAVE teachers who wished to document their views and experiences of becoming critically reflective digital practitioners. Extant literature on developing a digital mindset identifies the importance of specific knowledge, skills and attitudes combined with particular behaviours and ways of thinking. Final results from this study will shed light on what has to change within the educator to support an evolving educational digital mindset. The following questions were developed by the research group as an emergent area of shared mutual interest. They are:

- What has to change within the educator for them to become critically reflective digital practitioners?
- How do individuals experience changes in their professional identity as a result of engaging with 'educational digital mindsets'?

2 Theoretical Framework

The study is grounded in a theoretical frame comprised of three areas of literature: transformative learning (perspective transformation), identity self-states and digital mindsets combined with a review of recent studies that focus on digitalization in vocational education.

Transformative Learning is a cognitive/rational approach to adult learning that emphasises the critical role experience and reflection play on existing assumptions about the world in order to arrive at a new worldview (Mezirow, 2012; Graham Cagney, 2019).

Beliefs, attitudes or points of view, when expressed as opinions shared with others, often result in feedback that can cause a revolution of an entire perspective or habit of mind. Perspective transformation results in significant changes in sociolinguistic, psychological, epistemic, philosophical, moral-ethical and aesthetic generalized predispositions or habits of mind (Cranton, 2006). These shifts in consciousness alter in a dramatic and permanent way our ‘being in the world’; changing how we know. This different kind of thinking and being enables individuals to become more open to revisiting their interpretations of the meaning of their experience: in turn guiding future action (Cranton, 2006; Tennant, 2012). By definition, transformative learning leads to a changed self-perception; individuals experience changes in their thinking that lead to new worldviews, and new perspectives on their personal and professional lives.

Identity self-states pinpoint a ‘motivational self-systems’ framework that incorporates a ‘possible selves’ and ‘ideal selves’ theory (Markus & Nurius, 1986). Three seminal reviews of the literature on educator identity in the last decade (Beauchamp & Thomas, 2009; Beijard et al., 2004; Rodgers & Scott, 2008) highlight the importance of and interrelation of notions of identity, context, emotion and agency.

Working self-concept is continuously active in interpreting and integrating accessible self-knowledge into a wide range of self-representations. A person can move from the present toward the future by using their possible selves as ‘future self-guides’. In the context of adult learning, factors that impact on whether the possible self has motivational power include the level of detail associated with a possible self and the extent to which it is psychologically available to a person. Thus, it could be argued that socially constructed roles, the existence of contextual cues, levels of self-efficacy as well as the availability of role models play a significant role in this regard.

Digital Mindsets can be explained as a set of assumptions, beliefs and values that determine how individuals understand and interact with others, and relate to the world around them (Mezirow, 2000). There are significant multi-disciplinary variations within the field of study (French, 2016). These include mindset agency theory (Sagiv & Schwartz, 2007), mindscape theory (Maruyama, 1980), fixed and growth mindsets (Dweck, 2006), benefit mindset (Buchanan & Kern, 2017), habits of mind (Cranton, 2006), and digital mindsets (Benke, 2013).

The attributes of an individual with a digital mindset include being flexible and adaptable, having a wide intellectual curiosity, a hunger for new knowledge, passionate about what they do, able to think outside the box and are comfortable with uncertainty. Competencies that are fundamental to developing and supporting a digital mindset, comprise digital knowledge, digital skills and digital attitudes (Benke, 2013). Digital knowledge, refers both to i) differentiation: a breadth of knowledge about ICT, internet, media, information and digital literacy; and ii) integration: how that knowledge is absorbed or included into an existing life context (Jansen et al., 2009). Digital skills include operational and technical competencies, in addition to strategic ICT skills that enable the achievement of more specific professional and educational goals rather than just for personal entertainment (van Dijk, 2005, Van Deursen & van Dijk, 2009; Ilomäki et al., 2011; Ferrari, 2012). Digital attitudes are based in the affective domain and are strongly influenced by cognitive, emotional and behavioural elements. Therefore, three core components include i) knowledge of digital technology; ii) feelings toward digital technology; and iii) usage of digital technology (Donat et al., 2009).

2.1 Recent VETNET research on digitalization in vocational education

Research on digitalization in vocational education was reviewed to develop a holistic view of the new and different skills and perspectives required to meet the needs of the sector. In VET there are tensions between the needs of various stakeholders: learners, employers, the providing organisations and the teachers. In this constantly changing landscape there is pressure on the educator to meet the needs of all stakeholders. These include the digitisation of industry as well as changing examination approaches and regulations (Deitmer et al., 2018). Benedek et al.

(2018) found that rapid changes mean that textbooks and materials are often out of date and available technologies are often insufficient or tending towards obsolescence, leaving the educator to bridge the gap. The European Commission indicate that VET requires highly qualified teachers and trainers. They are a key factor in the contributing to high quality provision and equity in access to learning (European Commission, 2010). Thus, the VET educator requires specific digital competencies (Redecker, 2017).

In any education sector the role of the educator is more than a mechanism for the delivery of information. They are also a role model for learners to develop the ability to adapt to change and adopt new tools and methods to remain current and relevant, including technical and pedagogical knowledge and skills (Redecker, 2017). The VET view of professional competence (Lehtonen et al., 2019) should also encompass an educational digital mind-set that is proactive, rather than reactive; characterised by particular behaviours and attitudes that are agile, collaborative, curious, “tech savvy” and comfortable with change (Gössling & Emmmler, 2019).

There is a general consensus that communities of practice are a way of developing and supporting the competencies and mind-sets of the teachers (Attwell & Gerrard, 2019). Deitmer et al. (2018) identified a need for the provision of technical as well as pedagogical development in a variety of formats to meet the needs of teachers, while also advocating opportunities to meet and collaborate. Benedek et al. (2018) focused on creating a solution through Open Education Resources comprised of an open network for innovative teachers aimed to support and enable the use of digital technology for teaching and learning.

There are also institutional barriers. Often, they are characterised by a lack of physical infrastructure (broadband and the availability of applications) and compounded by bureaucratic processes of procurement. Deitmer et al. (2018) identify silos of disciplinary expertise within organisations that offer no incentive for those working in the sector to surmount the established and traditional subject divides. This is compounded by widespread casualisation of the teachers and/or segmentation of instruction and working conditions that tend to be isolated, combined with a lack of pedagogical training, competences and/or qualifications and a lack of digital competencies.

3 Methods

3.1 Research Design

Phase 1 (Completed). The National Forum for Teaching & Learning seminar series provided the resources for a seminar on leading educational change with a particular focus on educational digital mindsets. Attendance was open to all current and aspiring educational leaders and other interested parties. There were 98 pre-registrations via Eventbrite with 43 participants registering their attendance on the day. Attendees included those from higher, secondary and primary education, in addition to those from further, adult, vocational and community education. During the seminar 31 participants completed an interactive anonymous online questionnaire on digital mindsets which was then displayed for them and led to an engaged discussion on educational digital mindsets. Following the close of the seminar, a group of FAVE practitioners agreed to collaborate and share their experiences of their developing digital knowledge, skills and practice. Following discussion an in-depth analysis of the seminar online questionnaire was completed. The results of this analysis are shared in this paper and offer a preliminary understanding of educational digital mindsets and has informed the design of this qualitative research study.

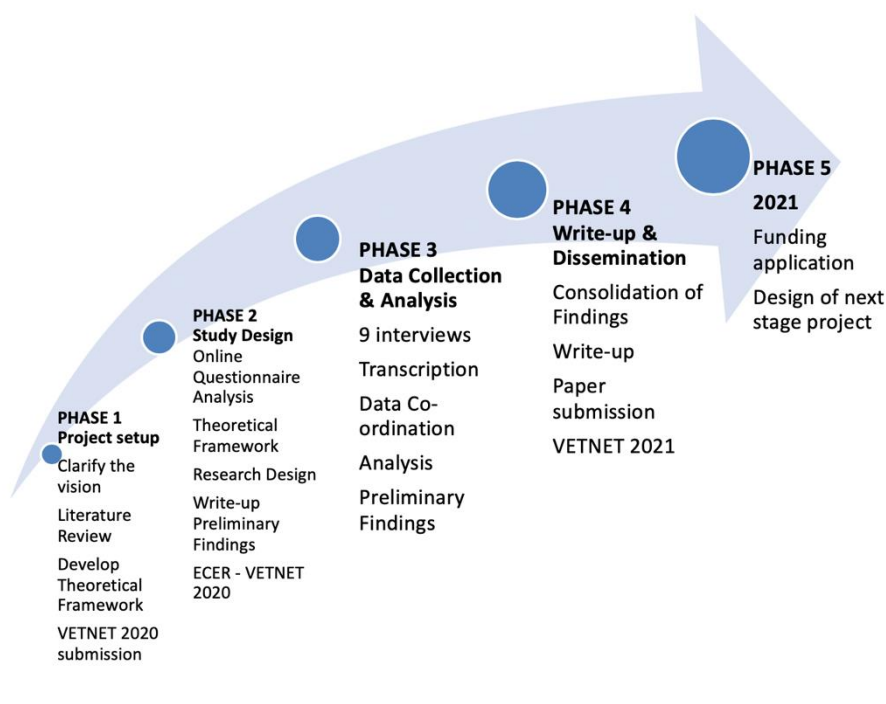
Phase 2 (Ongoing). Key themes to emerge from analysis of the online questionnaire guided the interview design and protocol. During Phase 3 data will be collected from the nine members of the research study through interactive participant interviews. These interviews will be collaborative, communicative events that evolve participants’ own norms and rules (Briggs, 1986; Kvale, 1996). There will be a relational aspect to these interviews and an interactional construction of meaning in the interview context (Holstein & Gubrium, 1995; Langellier & Hall, 1989).

Therefore, the interaction is situated in the context of an ongoing relationship where the personal and social identities of both interviewer and interviewees are important factors (Collins, 1986; DeVault, 1990). In this way we will create a space for individuals' own stories to be heard. Results from this data will shed light on the experiences and feelings of FAVE teachers as critically reflective practitioners focused on their evolving digital mindsets.

Table 1
Demographic Description of Participant-Researchers

	Discipline	FAVE context & teaching experience	Title	Previous Career/ Background	Gender
1	Technology	Adult (10 years)	TEL Support	Manufacturing & Information Technology	M
2	Technology	Adult Basic Education /Literacy (20 years)	Tutor	Office Administration	F
3	Computing	Adult Education (15 years)	Data Analyst	IT Customer Service	M
4	Psychology	Adult (30 years)	Senior Lecturer	Strategy & Organisational Change	F
5	Technology	Adult (25 years)	Ass Professor	Nursing	F
6	Data Information	Further, Adult & Vocational (34 years)	Senior Manager	Secondary Level Teacher	F
7	Engineering	Vocational (38 years)	Lecturer	Motor Trade	M
8	Early Childhood	Vocational & Adult (25 years)	Lecturer	Community Education	F
9	Education	Community (23 years)	Lecturer	Not disclosed	F

Consistent with qualitative methodology, the interview data will be analysed with respect to the research questions using a mix of inductive coding and the constant comparative method. Thematic analysis within each category will produce the findings in the final paper to be presented at ECER in Geneva in 2021.

Figure 1*Developing an Educational Digital Mindset (Timeline 2019-2021)*

3.2 Progress to date

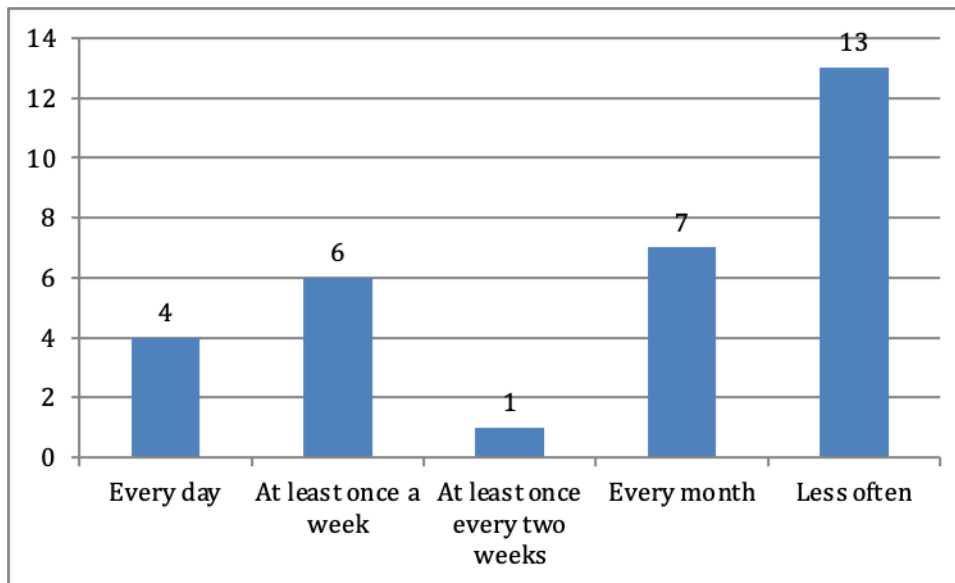
Phases 1 and 2 are completed. The vision for the study is clarified. The literature review has been completed and the theoretical framework for the study has been articulated. In-depth analysis of the Forum seminar online questionnaire is completed (including write up in this paper) and the research design is completed. Phases 3 and 4 are scheduled to take place with a December 2020 deadline. A final paper submission for publication will be made to the VETNET journal and the results disseminated at the EERA-ECER VETNET conference in Geneva 2021.

4 Analysis of fieldwork findings: HETL forum seminar online questionnaire

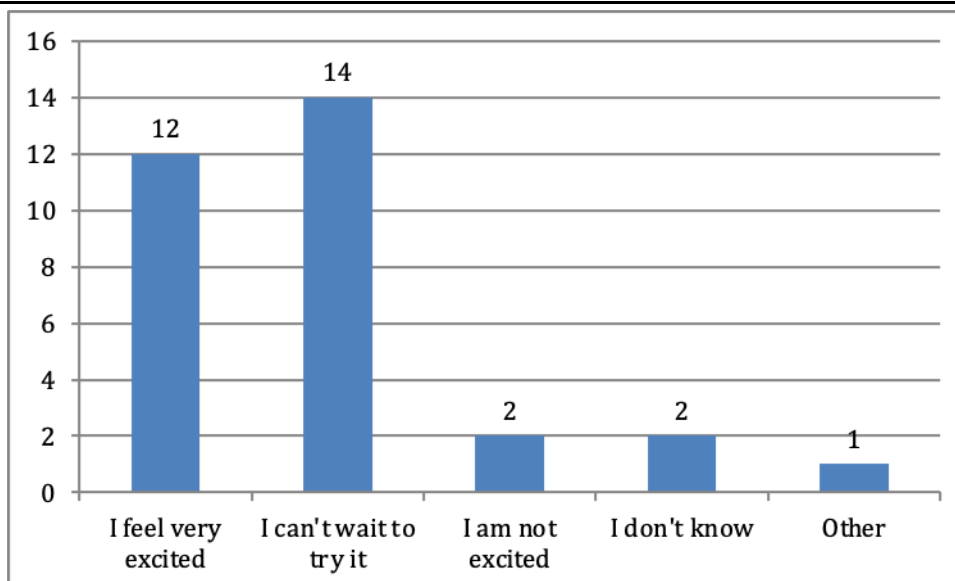
Results from this questionnaire have informed the design of the interactive interviews scheduled to take place in Phase three of the study in 2020. There were 31 respondents (11 Male, 19 Female, 1 Prefer not to say). The following analysis is divided into three sections that represent the focal areas of the original online questionnaire: Section 4.1 curiosity about digital technology and being up to date; Section 4.2 digital competencies; and Section 4.3 use of digital technologies and challenges (Benke, 2013).

4.1 Curiosity about digital technology and being up to date

The majority of respondents indicated interest in new technologies (29/31). When asked how they found out about new technologies 23 said they used online sources, while 8 used offline. 11 reported using online sources only, 17 reported using online and offline sources, and 3 said they use offline only. One measure of an individual's 'being up to date' is the frequency of using online information sources. Figure 2 highlights the fact that only 10 respondents engaged in searching online for new technologies and to keep themselves up to date on a frequent basis (at least once a week or more often).

Figure 2*How often do you search online?*

Responses for active searching for information is far lower than their level of interest in new technology. This may merit further investigation at interview. When asked whether they had made a suggestion to implement new technology in their unit/dept 24 participants claimed they had, 7 said they had not. The attitudes to acquiring new technology match reasonably well with those for suggesting new technologies at work. However, we have no information on what types of technology the respondents refer to in order to determine how 'up to date' they are with new technology innovation or digital technologies.

Figure 3*Can you describe how you feel when you acquire a new technology innovation?*

26 participants reported feeling excited and impatient to try out new technology innovations. Two follow-up questions consolidate this pattern revealing a) how fast participants say they would adopt a new technology (Figure 4) and b) how they find out about new innovations (Figure 5).

Figure 4
Speed of adaptation

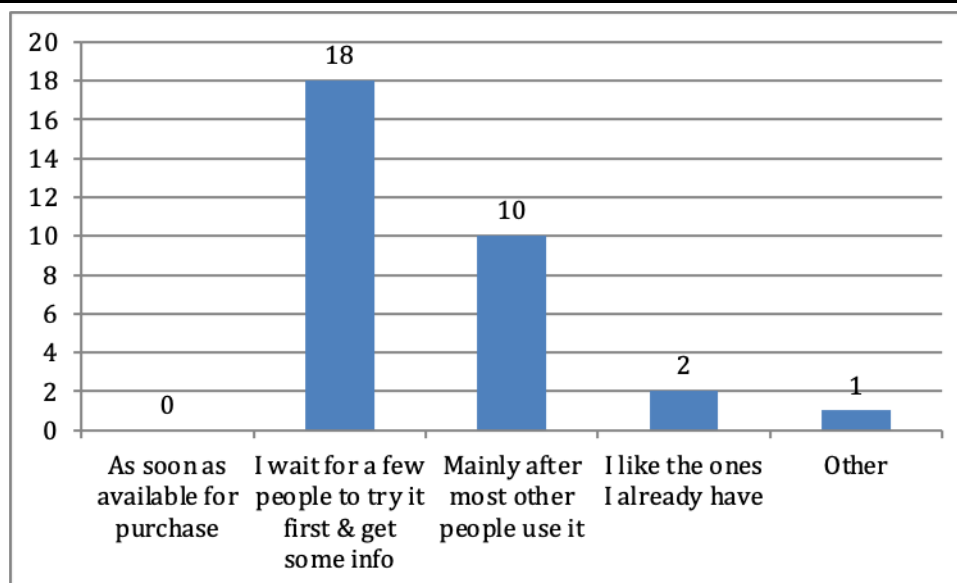
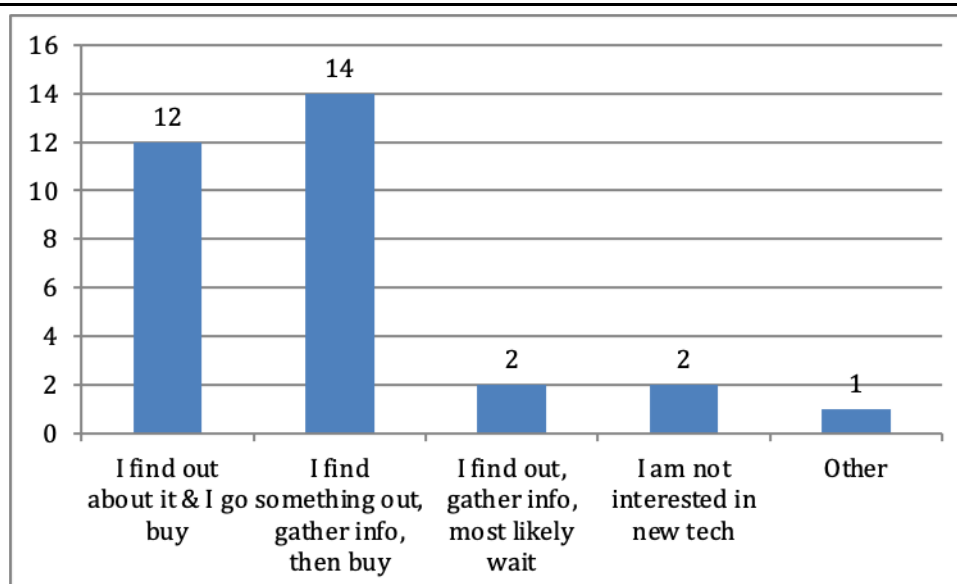
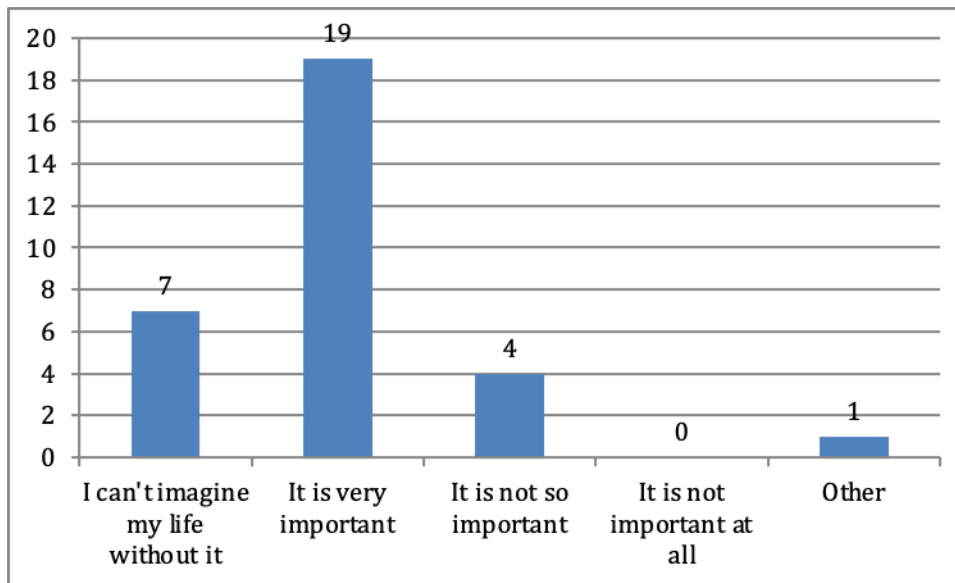


Figure 5
Process of finding new innovations

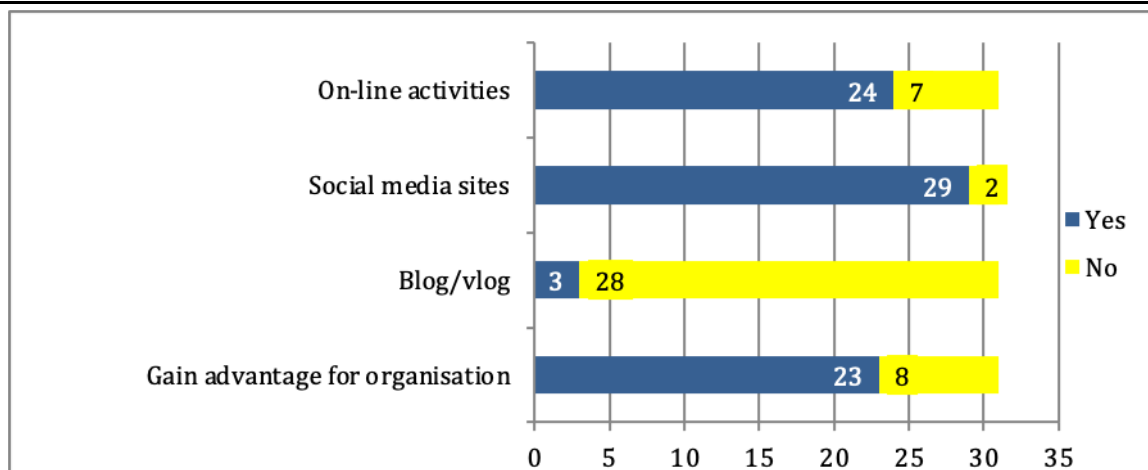


4.2 Digital competencies

Information was sought on participants' breadth of knowledge of digital technology and the extent to which that knowledge was used in their personal and professional lives. They were asked whether they used online or offline sources when searching for information. 28 stated they use online sources and 3 use offline sources. A follow-up question tested the importance of the internet to respondents: 26 couldn't imagine their lives without it/very important.

Figure 6*Importance of the internet*

Having established the importance of the internet, participants were then asked a series of questions on their use of digital technology in two areas: i) personal, and ii) professional and educational. The majority of participants confirmed their use of digital technology and the internet for personal entertainment e.g. choosing a restaurant, finding out news, and checking their profile. However, the data collected is too broad. There is no detail about the nature and extent of digital knowledge usage in an individual's daily life. Again, these results highlight an area for further exploration via the interview process.

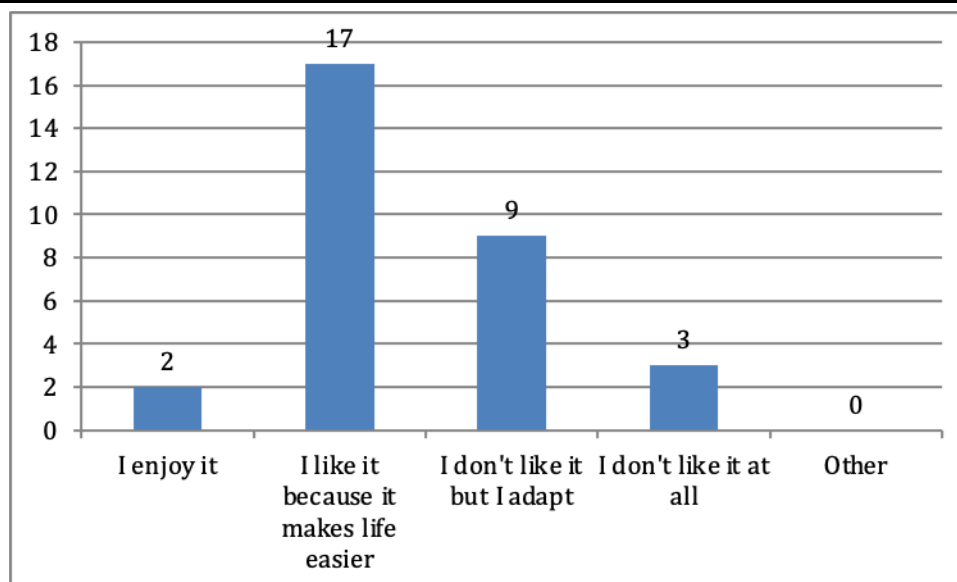
Figure 7*Specific online usage*

Questions on usage were followed by specific online activity questions (Figure 7). The purpose was to gather more information on participants attitudes and their digital skills. There is a low reported usage of blogs and vlogs. In contrast, 19 checked their online personal profiles at least several times a week. The profile activity data is ambiguous. More information is needed to establish whether the online profile being checked is recreational or professional/educational i.e. Facebook, LinkedIn, Research Gate, ORCID, professional membership sites, organisational website profile, etc. The final set of three questions in this section explore participant feelings

about: (i) living in a digitalised world; (ii) whether new technology is always better than old; and (iii) a personal assessment of their IT/computer skills.

Figure 8

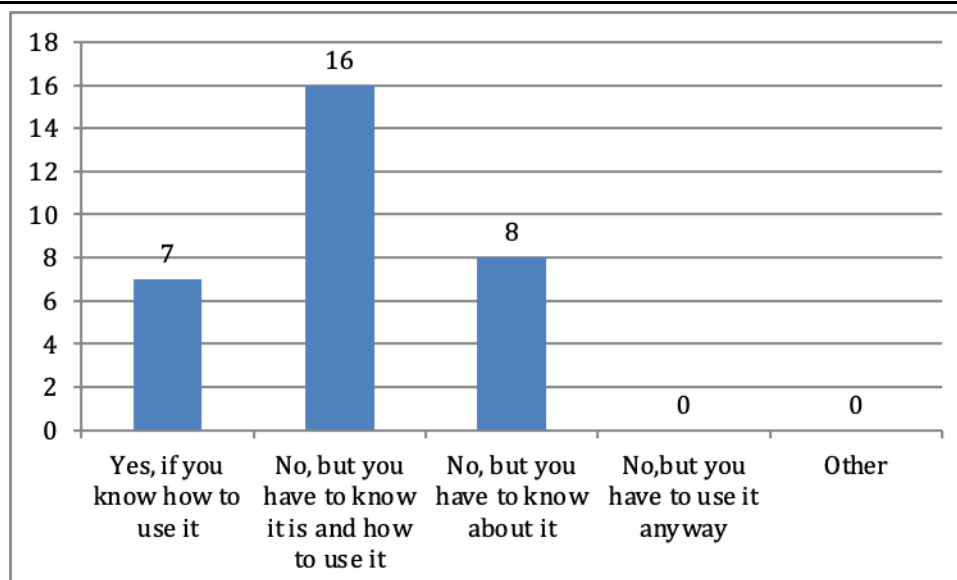
Everything is more digitalised nowadays



Results show a marked difference between the various categories of response to living in a digitalised world. 19 people enjoy or like digitalisation because it makes their lives easier. However, of 12 are either reluctant adaptors or do not like it at all.

Figure 9

New technology is always better than the old one

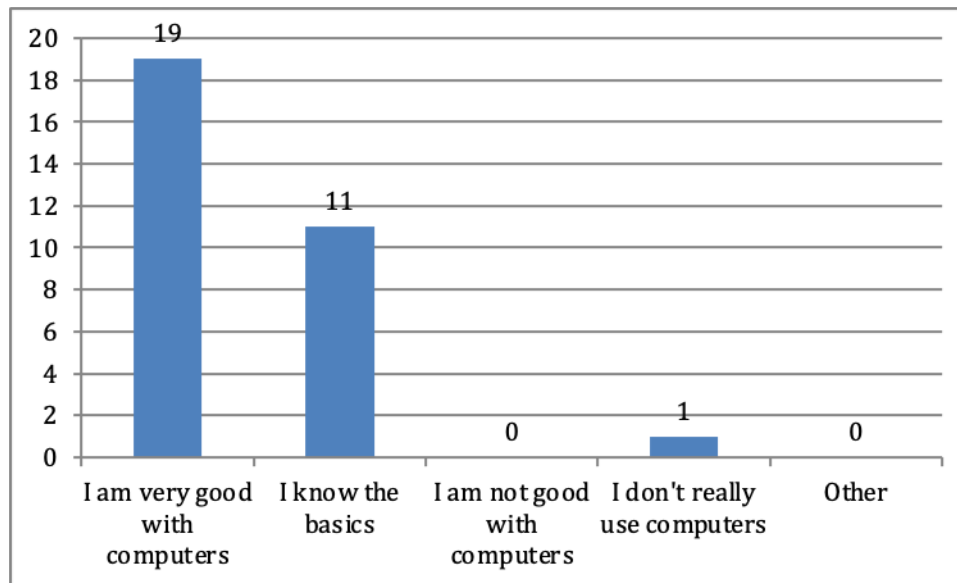


The question posed to participants does not specify the meaning of 'new' and 'old' technology, it is left to them to interpret. Notwithstanding this, an interesting result emerges from the data. 'New' is being interpreted by 7 respondents as being better, conditional on knowing how to use the 'new technology'. Just as important, for 24 of them 'new' is not always better than 'old', but that choice is not an active one for them as they feel pressurised to know about and

use new technology. This requirement appears to translate into a majority of reluctant adapters to 'new' technology based on an instrumental 'need to know' set of motivations. The final question in this section elicits responses on individuals' familiarity with IT/Computers. 19 stated they were 'very good' and a further 11 said they 'know the basics'. The responses are subjective and non-specific therefore this result represents personal perspectives on a set of non-specific skills related to IT which really does not shed light on specific digital knowledge, skills and experience.

Figure 10

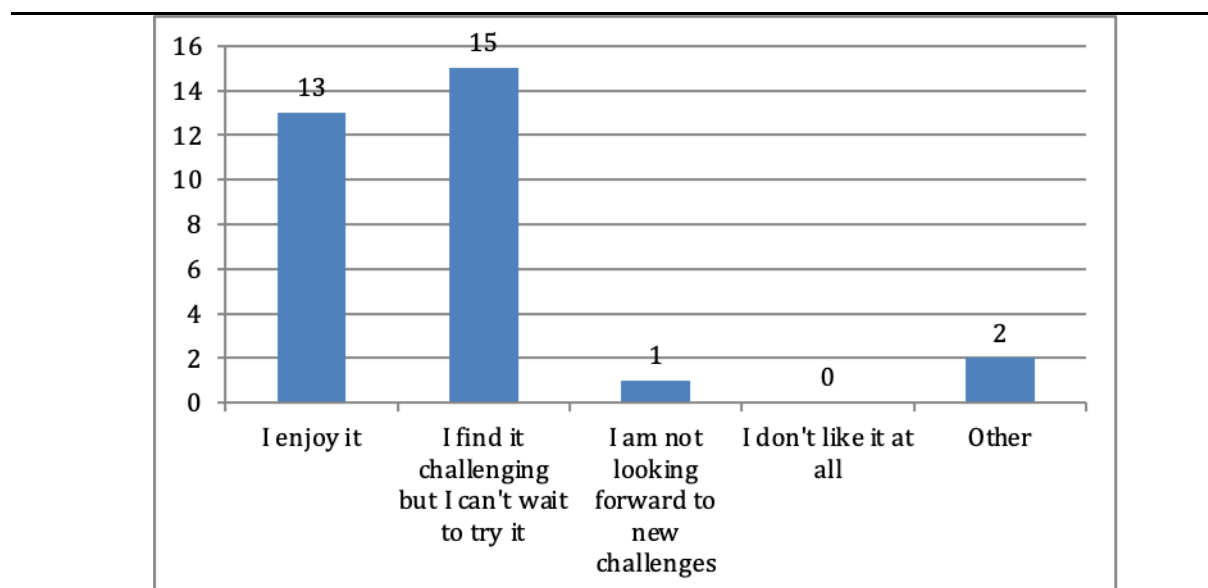
Familiarity with IT/Computers



4.3 Use of digital technology and challenges

All participants reported that their use of digital technology made their work-life more efficient. A follow-up question tested this response asking what they use it for at work. The majority 28 stated they use it for a variety of activities, the remaining 3 use it for simple activities, or for what they really need. We have no further information on what the range of those activities might be. This offers an interesting opportunity to explore the usage of digital technologies against a set of key criteria (to be developed) for FAVE teachers.

Figure 11
Feelings about new technology in your workplace



When asked whether they would like to have access to the newest technology at their workplace, 30 said yes, and 1 said no. Regarding their feelings on this (Figure 11): 13 stated they enjoy new technologies at work. Another 15 are eager to try it despite feeling challenged. These 28 participants are open and willing to try new technologies in the workplace. This is a similar response to the 26 who responded to an earlier question on their feelings about technology innovation in general. Overall, it indicates a level of coherence in the responses received in relation to openness, curiosity and being up-to-date with new technologies.

Asked which devices were most important to them and whether they would give them up or not, 18 said they would prefer to give up their computer rather than their phone. 10 would rather give up their phone, and 3 could not choose between their phone or computer. The question poses an interesting insight on dependency on connectedness to digital media and whether for some people their phone may now be a multi-tasking tool for various digital media and internet activities. When asked about their use of digital technology after a hard day at the office, a significant majority stated they would relax with an offline activity.

5 Limitations

The original intention of the research group was to create a community of practice that would collaborate and come together to share experiences of developing their knowledge and skills of using digital technologies in their teaching practice. Face to face collaboration was quickly overshadowed by Covid-19. An option to move to online meetings seemed particularly appropriate given the circumstances, however this proved to be impossible to arrange. This was in part due to the unanticipated shift to emergency online teaching and resultant changes in all our professional and personal lives. As a result, it was decided to redesign the data collection for the study to nine individual member interactive qualitative interviews of approximately 40-60 minutes. Several limitations should be considered when drawing research and practitioner implications from analysis of the seminar synchronous (online) questionnaire. The participants were not confined to FAVE teachers, they included several teachers from primary, secondary and higher education contexts. The online questionnaire was completed in 10 minutes leaving little time for participant to reflect before answering. In addition, the questionnaire was adopted from a previous study and does not quite match the focus on educator digital mindsets that this study has taken. Finally, the question design in this instrument does not differentiate between information technology, new technology innovation, and new and old digital technologies.

6 Discussion

Our personal approaches to learning and engaging in new ideas and technologies are based on assumptions that may or may not be articulated or tested. For most teachers, their approach to learning is a combination developed through years of formal education, of learning things on their own, and of developing learning strategies for themselves and their students. Openness to digital knowledge and approaches can enable teachers to find out about and try innovations that they might not otherwise consider adopting into their teaching practice and curriculum development. With respect to perspective transformation and changes in habits of mind (Cranton, 2006), we have established that there is a need for change in one's epistemic (knowledge) habit of mind in order to develop an educational digital mindset. Specifically, there must be a change in (i) breadth/depth of digital knowledge, and (ii) scale of usage and application within an individual's personal and professional life context.

As identified by Markus and Nurius (1986) an individual teacher's identity is a complex motivational self-system. Working self-concept is continuously active in interpreting and revisiting assumptions, beliefs and values that can shift how an individual understands and interacts with others and the world around them (Mezirow, 2000). Being curious about information technology, and digital technology in particular, can help teachers not to miss important innovations in developing new pedagogical practices that positively enhance their students' experience of learning. However, a strong stated interest in new technology/digital technology and the internet does not necessarily translate into active engagement by teachers in developing an educational digital mindset.

These findings suggest that participants' feelings about digitalisation are a complex mix of whether they think new technology is always better than old. The majority share a reluctant adoption of digitalisation and new technologies based on felt levels of digital confidence and a work-related need to implement the technology. The fundamental areas for personal change for teachers who wish to become digital practitioners are curiosity and being up-to-date; having core digital competencies; a willingness to use the technology; and a readiness to meet the challenges it poses. We will attempt to elicit examples during interview that could be measured against a set of key criteria (to be developed) for FAVE teachers to explore whether they hold these attributes and engage in these behaviours. Technological terms are used interchangeably in the questionnaire and create confusion and lack of clarity with respect to the answers given by respondents. It is important for this study to clarify these terms from the beginning. The interview process will explore what distinctions FAVE teachers make between new technology and digital technologies as they apply to education, and to FAVE education in particular. Our position is that new technologies are an integral part of digitalisation, not a separate field of interest and must be explored more deeply in the scheduled interviews.

Digital knowledge is described as differentiated (breadth of knowing) and integrated (scale of usage and application in one's life). Digital skills include operational and technical competencies; while digital attitudes are strongly influenced by cognition, emotion and behavioural elements. At a broad generalised level these descriptions make sense; however, they do not offer a deeper understanding of specifically what knowledge (and how it is to be applied) and what skills and attitudes will translate into digital competencies. Consideration will be given to whether existing taxonomies of learning are helpful in informing this study on how to explore the knowledge, skills and attitudes (values, expectations and assumptions) that sit beneath the behaviours of a digitally orientated critically reflective FAVE practitioner.

7 Conclusions, Expected Outcomes and Contributions

The first two phases of this study when combined with the forthcoming interviews (Phase 3) will contribute to the professional learning and development needed by teachers to address the various challenges facing society today. Sharing experiences across a group of peers on their engagement with digital technologies allows for growth of the individual teacher and

contributes to the profession and practice of teaching in further, adult and vocational education contexts. In the current era of risk, educational processes, developments and capacity building become uncertain. Uncertainty plays out in individual lives, careers, families and social networks. Such developments are of utmost relevance to the education system as it is responsible for providing learners with the skills and capacities to live and act under given social conditions, made more uncertain by the challenges that Covid-19 poses for all educators.

Completion of phases three and four of this study will make a contribution to further research on the attributes and competencies (knowledge, skills and attitudes) required to develop a FAVE teacher digital mindset. It will also expand current research on FAVE teacher evolving identity and the conditions under which they personally engage or disengage with the resultant perspective transformation. Finally, the final results will shed light on how education systems, also operating under conditions of uncertainty, can provide a professional pathway to support the development of educational digital mindsets for FAVE teachers.

The researchers care about this domain of knowledge and hope to ‘reboot’ the community of practice as a space of learning in which we can share these emerging digital practices and identities (Lave & Wenger, 1991). Time will be needed to build a bridge of critical consciousness to robust resilience that will support the conscious and unconscious dimensions of the transformative learning process. In this way, they can question how evolving roles and changing sectoral contexts impact directly on the experiences of a small group of researcher-practitioners who wish to become critically reflective digital teachers (Bourdieu & Passeron, 1977). One outcome of this study will be to support these researchers (as digital practitioners) as they evolve their thinking and understanding of the relevance of their research interests, both to their academic community and to the practice community (Weerts & Sandmann, 2010).

The question remains as to how to facilitate teachers ‘readiness for change’ as they envisage future possible selves personally and professionally in a digital world.

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