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New technology, changing pedagogies? Exploring the concept of remote teaching placement supervision

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ABSTRACT

Mobile technologies continue to have a growing influence on contemporary society, are becoming more commonplace within tertiary educational settings and hold the potential to impact on the learning process. This project evaluation considers the perspectives of participants who trialled the use of new technology to enable remote supervision and assessment of situated learning on teaching placement in schools in the UK. The discussion focuses on the impact that the use of new technology may have on established practices for assessment and models of supervision. Consideration is given to how the use of such technology may enable new pedagogical pathways with particular reference to reflective practice and self-assessment. The findings from a specialist Teacher Education programme (Deaf Education) within this study have direct implications for practice-based learning, both within teacher preparation programmes and in the wider field of professional practice.

Introduction

Programmes of higher education which incorporate a vocational placement have potential to enable opportunities for students' professional development and consolidation of skills. This model of situated learning (Lave & Wenger, 1991) forms part of programmes of study in the health care professions (Nicolini, Scarbrough, & Gracheva, 2015; Penman & Oliver, 2004), a range of other professional fields (Cooper & Ord, 2014; Smith, Smith, & Caddell, 2015) or in any learning environment where the practicum is of value (Hughes, 1998; Ryan, Toohey, & Hughes, 1996). Practicum learning is integral to skill development in teacher education, particularly in the light of the increasing diversity of training models now available to those seeking to qualify (Lawson, Cakmak, Gunduz, & Busher, 2015; Musset, 2010). The development of skills for those training to teach is supported by ensuring that appropriate supervision is implicit within the community of practice (Wenger, 1998). It is the delivery of the supervision of practical skills within the training of Teachers of the Deaf (ToDs) that forms the focus of this paper.

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Considering the presence of supervision within situated learning, models of supervision identify three clear stages of 'clinical supervision' applied to the community of practice within school-based teacher education: the pre-observation/planning stage; the lesson, and the feedback/post-observation discussions (Acheson & Gall, 1997, 2003). Within these stages, it may also be considered that there are key aspects to the supervisor's role. Zimpher, deVoss, and Nott (1980) examined the role of the university supervisor and described the duties such as setting goals and expectations, providing constructive criticism and serving as a personal confidant. Zeichner and Tabachnick (1982) identified roles in three domains: technical–instrumental (focusing on teaching techniques), personal growth (focusing on the developing of the student-teacher's goals) and critical (focus on classroom and school change). The literature demonstrates the value of both school-based supervisors (also referred to as school-based mentors and co-operating teachers) and those who visit from the university as being pivotal within the traditional model (i.e. pre-observation, lesson, post-observation conference) of situated learning in teacher education (Bouchamma, 2005; Clarke, Triggs, & Nielsen, 2014; Range, Young, & Hvidston, 2013) although this is balanced with criticism of inconsistent quality of supervision within the traditional triad (school-based mentor, university personnel and student) in enabling a strong learning experience for the training teacher (Zeichner, 1990).

Beyond consideration of the stages and roles within supervision, the approach adopted by individual supervisors within the community of practice may also impact on the nature of the supervision process. The assignment of supervisors within a clinical supervision model works on the premise that student-teachers will gain insight into the perceptions of experienced practitioners. However, the approach of the supervisor may impact on the student's ability to access this insight and may also influence the ongoing development of the student-teacher as a professional. In considering the approach of the supervisor, Zahorik (1988) identified that supervisors had preferred 'types of supervision', and provides a definition:

- Behaviour prescription: focuses on the use of instructional or management act. The 'what to do and how to do it'.
- Idea interpretation: focuses on the potential to bring about change and the improvement of classroom practices. The supervisor supports the students in developing their understanding of what the classroom and school ought to be like.
- Person support: focuses on the student-teacher's ability to make decisions by encouraging the student-teacher to think for themselves.

Focus of this paper

The supervision of student-teachers on placement may be considered to be malleable and influenced by many factors within the community of practice including the stage of supervision, the supervisor's adoption of key roles and the preferred 'type' the supervisor brings to the role (Zahorik, 1988). This paper considers the impact that the adoption of new technology may have in supporting the supervision process within a traditional model of clinical supervision: at pre-observation, during the lesson and at feedback stages.

When qualified mainstream teachers aim to become ToDs they complete a postgraduate programme of study (on campus or e-blended) with a registered training provider. A

ToD's primary focus is to support deaf learners' linguistic and cognitive development. The practicum is typified by small group teaching (such as in a school for the deaf) and 1:1 teaching targeted specifically to the child's needs (in the case of peripatetic ToDs teaching mainstream children). Within their training, ToDs complete two teaching placements which assess their skills against the national competencies. Placement assessment has traditionally been conducted by external supervisors who visit, observe and assess the learner in liaison with the school-based mentor. Students on the e-blended route are assessed in widespread geographical locations bringing significant challenges for academic staff who are charged with the management of such placements. The challenge of supervising teaching practice within the field of UK Deaf Education can be rooted back to integral changes in how deaf children learn. Technology (e.g. auditory implants and high-specification radio aids) in the UK now enables most deaf children to be educated in mainstream schools near their homes. This means that the work (and training) of a ToD is now geographically spread across the country and relatively few ToDs work in schools for the deaf (Consortium for Research into Deaf Education [CRIDE], 2013). The geographical challenges of supervising teaching placements appears to have been identified for other settings outside the UK (Gronn, Romeo, McNamara, & Teo, 2013; Mabunda, 2013). Boydell (1986) suggested that the model of supervision employed within teacher education (i.e. visiting supervisors) incurs a substantial time and financial investment which should be maximised for optimum outcomes. Within the programme which is of this focus of study, recent years have seen a lack of availability of external supervisors in some areas, excessive supervisor travel to remote locations and inability to quality assure supervision practices. With many experienced ToDs beginning to retire (CRIDE, 2013), there was an evident need to ensure expertise of supervision for this niche area of teacher education in a diverse range of settings and locations across the UK. This was coupled with a need to quality assure effective supervision across the programme as noted by Dinkleman (2012) who considered potential subjectivity of observation reports in the USA.

The role of technology was considered as an opportunity to support these geographically widespread placements. This appeared to be timely, considering growing evidence of the widespread use of a diverse range of technology across the HE landscape, whether this be to engage learners by means of blogging to support learning activities (Duarte, 2015), to capture lessons to enable play back for learners (Ford, Burns, Mitch, & Gomez, 2012), use of mobile devices (Dale & Pymm, 2009) to social media (Nkhoma et al., 2015). Whilst the structures of HE institutions do not automatically lend themselves to the implementation of such educational technologies (Habib & Johannesen, 2014), modern-day learners have been described as 'digital natives' (Prensky, 2001) describing their ability to use and adapt to technology. The links between pedagogy and technology have similarly been noted, and the idea that not only will some forms of technology be useful to meet learner and institutional need but also the idea that *Pedagogy will evolve to fit with the capabilities of the new technologies* (Burgess & Mayes, 2003, p. 301).

The pilot project uses mobile camera technology to enable a remote supervision experience for training ToDs. A growing evidence base supports the potential for such a project. In a review of the literature, Mabunda (2013) highlights the need for consideration of the use of ICT in teaching practice supervision. The study highlighted the opportunities which may be provided (i.e. supervising at a distance, potential for reflection) but also highlighted the challenges posed by training needs, technological hitches and a more remote relationship

between school and supervisor. Similarly, previous research (Carter, 2005) identifies the potential that managed learning environments may have in supporting practicum supervision. Eröz-Tuğa (2013) supports the use of video in enabling learners to reflect and improve their own classroom performance. Whilst it was noted that this may be time consuming for the trainer, the positive impact on 'showing instead of telling' (p. 183) was discussed as an opportunity for reflection.

Trialling technology for remote supervision

This is an evaluation of a first-phase pilot of remote teaching placement supervision. In enabling this alternative route, consideration was given to the use of mobile camera technology and its ability to enable an external supervisor to work remotely in supporting and assessing the learner. Within a traditional placement supervision the HEI appoints an external supervisor who physically visits the school, observes the training ToD teaching a session and conducts a feedback session immediately after the observation. Students also work with a school-based internal mentor who provides ongoing support and advice. Grading for placement is based on agreement between the university appointed external supervisor and the school-based internal mentor.

Students within the pilot were assessed using remote supervision and not visited by the external supervisor. Each trainee ToD recorded their agreed sessions using Swivl remote camera technology. Swivl is a small remote camera incorporating a tablet computer. The system sits within the classroom and 'swivels' to film whoever is speaking or signing. The system tracks the movement of a small hand-held component which held by the speaker as a microphone or left centrally in front of the teacher/child. The training teacher films the session and uploads the video to the Swivl cloud. The student and supervisor have protected access which is ensured by the security features within the technology. A trained external supervisor watches the video asynchronously from the storage cloud and arranges phone or video call feedback to the trainee. The observation video can be accessed asynchronously by a moderator in the university. This pilot sought to understand the following:

(1) The role of mobile camera technology in supporting the assessment of vocational skills for training teachers.
(2) The views of students and external supervisor/ school-based internal mentors involved in a remotely supervised placement.
(3) The mechanisms which must be in place to ensure the effectiveness of remote supervision.

Research methodology

Participants

The views of 10 participants were elicited within the review. This was comprised of four learners studying on a part-time postgraduate qualification in Deaf Education (also known as the 'Teacher of the Deaf course'), their four external supervisors and two school-based internal mentors. The training ToDs were selected from the student cohort to try the new assessment method and associated technology based on the following:

(1) Successful and positive completion of a first placement
(2) Placement in a school or service where agreement from the host could be sought and agreement from parents of the children.

The limitations of the method of selection for the training ToDs are discussed later. The four external supervisors were experienced ToDs with a background of supervising teaching placements for the course provider. The school-based internal mentors were selected by the placement host as per standard protocol for teaching placements within this specialist field. Each training ToD used the remote camera technology to facilitate remove supervision across a four-week teaching placement, completing a minimum of three remote observations in this manner. All the teaching sessions were either small group or individualised 1:1 teaching, as is typical in the role of a ToD. The sessions were centred on pre/post-tutoring of the curriculum or language development tailored to the deaf learners' needs. Naturally, video recordings which include children in school settings do raise ethical challenges. In order to overcome those challenges parents and schools were provided with a full and detailed explanation of the equipment, the need for the project and reassurances as to how the recordings would be used and stored.

Data collection

A qualitative approach was used in order to gather the data and understand the experience of learners and supervisors undertaking this new approach. Participants were interviewed by the authors of this paper in order to appreciate their individual experience (Kvale, 1996). Semi-structured questions were inductive in nature and sought to understand the experiences of the participants within the three stages of supervision identified by Acheson and Gall (1997, 2003). The researchers were mindful that participants came from different backgrounds and were placed in a variety of settings. This brought with it a need to be open to participant views and the need to retain a focus on the participant telling their experience. The interviews were digitally recorded and transcribed verbatim by one of the authors of this paper.

Data analysis

Data analysis took the form of thematic content analysis whereby themes were identified and coded as they surfaced (Burnard, Gill, Stewart, Treasure, & Chadwick, 2008). As themes were found in individual transcripts, researchers used open-coding to note the newly identified themes alongside the text. This open-coding was used to form the initial coding framework. The themes from all the individual transcripts were then considered together and overlapping or similar categories were grouped to form the final coding framework. Both researchers analysed the data independently before comparing notes, discussing and agreeing themes.

Findings

Student and supervisor/mentor participants discussed a range of viewpoints which are listed in key themes in Tables 1 and 2. The findings have been grouped into the three stages of

Table 1. Findings.

Stage	Themes	Student reflections
Pre-observation	Preparation and set up	• Importance of prior practice • Straightforward to use • Information that cannot be captured must be sent to supervisor beforehand • Value of clear instructions provided from HEI • Anxiety of keeping equipment safe • More information about the supervisor/about their background would help student feel more secure
	Adjustments to the process of supervision	• Student and supervisor agreed times and days for structured support • Telephone discussion before the first supervision helped alleviate concern
Lesson	Children's reactions	• Unobtrusive: most children not affected • Children reacted positively to the technology • Some children initially distracted but also would be by a physical supervisor • Passing the marker aided turn-taking (important for groups of deaf children)
	Technical	• Straightforward and easy to use • Excellent visual and audio quality (for speech or sign language) • Ability to adjust, e.g. neck microphone adjusted to use as pass microphone • Positioning is key – consideration of group, room, type of activity
	Impact on lesson	• Concern that the tutor might not gauge the mood of the lesson/may 'miss' small things • Less anxiety as no physical observer present
	Nature of relationship	• Relationship to supervisor feels remote • No changes to the relationship if you have had prior contact • Felt similar amount of support to physical supervisor via alternative methods
Post-observation	Technical/process	• Uploading to cloud is time-consuming • Excellent visual and audio quality (for speech or sign language • Waiting between video upload and feedback causes anxiety
	Quality of feedback	• Feedback was very detailed • Changes nature of feedback qualitatively
	Future opportunities	• Possible hybrid system: physical supervisor/swivl • Better for second placement – you are less vulnerable, more experienced and have more understanding • More structure from HEI, e.g. timetable for feedback

supervision as described by Acheson and Gall (1997, 2003): pre-observation, the lesson, post-observation.

Pre-observation

Student participants spoke unanimously of the straightforward, easy to use system. Comments suggested that they felt supported by the provision of detailed and clear user instructions. The course provider created and tested the instructions ensuring they were specific to the needs of the participants. Student participants valued testing and familiarising themselves with the equipment before formal assessment. However, students had to consider how to position the equipment to ensure capture of learners. In doing so, consideration of whether this was a group teaching session or 1:1 was particularly relevant. Students talked of being awareness that they were responsible for sending information to the supervisor before the remote observation as they were aware that lesson plans and resources may not be captured.

Table 2. Supervisor/mentor reflections.

Stage	Themes	Supervisor/mentor reflections
Pre-observation	Preparation	• Importance of discussion before first observation via initial phone call • Necessity of clear information from student (e.g. lesson plans, timetable)
Lesson	Adjustments to nature of supervision	• Viewing of the physical teaching file can be problematic • More reliance on School-Based Internal Mentors such as for the teaching file • Not seeing everything of the session – more onus on the supervisor to ask the right questions post-observation • No picture of what is happening outside the sessions • More flexibility for the supervisor: is able to observe a greater range of sessions as can complete at time that suits them
Post-observation	Technical	• Occasional buffering • Good quality sound and visuals
	Nature of feedback	• Same as in person • Opportunity for feedback to be more detailed • Questioned potential for grade disagreement between internal mentor and external supervisor • Opportunity for student to 'lead' in critique
	Reflection/improvements to skills	• Opportunity for students to use as a self evaluation/learning tool • Provided evidence for students to enable them to go back and watch again • Some School-Based Internal Mentors used as a form of support alongside the student
	Future opportunities	• More regular contact with the internal supervisor at the start – wants HEI to instruct a start and finish call • Would like guidance from HEI re students who are finding placement difficult • More guidance on areas that demand more support from internal mentor • Guidelines on how School-Based Internal Mentors and external supervisors work together in this approach • Questioned application outside of the learners' normal place of work – particularly with getting parental permissions. • Hybrid approach • Need to understand how to manage a failing student

The lesson

Students, external supervisors and school-based mentors commented that the unobtrusive nature of the technology meant that children were largely unaffected and held a positive view of the situation. Some children who were distracted would, it was noted, have been distracted by a live physical supervisor in a traditional supervision route. The technology brought about some general benefit to the teaching environment such as an emphasised need for turn taking within group teaching sessions.

Some student comments indicated that this mechanism of supervision feels remote at the 'lesson' stage and discussed concerns that supervisors might miss small things, holding the belief that this could impact negatively on them. Similarly, some external supervisor comments indicated less opportunity to take an active part in the process of supporting the learner. However, an alternative view (from student participants) was that there were no changes to the relationship if prior contact had been appropriately established. Considerations of a perceived change of role of school-based mentors and external supervisors were highlighted within the comments and will be explored further within the discussion of the paper:

> as a learning experience she didn't get the same kind of general mentoring that you would get from an external tutor going in … it seemed that it was more of an assessment process – it

depends on how you see the role of external tutor doesn't it? (Participant 8, School Based Mentor)

All student participants commented on technical difficulties they had experienced with the time taken to upload the digital files to the cloud service. It was later identified that this could have been significantly ameliorated by adjusting the camera resolution. As the resolution was set high on the systems, student participants commented that the quality of audio and visual recording was excellent. This is pertinent as equipment used to record both the voices of deaf children and visual signed languages needs to be of sufficient quality to ensure audibility and visibility. Students discussed their personal adaptations of the equipment use such as passing the microphone (marker) as opposed to wearing the neck microphone.

Some comments were indicative of the anxiety that students feel prior to the placement and comments revealed a fear of an unknown person remotely watching them teach. Other student comments suggested that the remote situation supported a more natural teaching situation during the observation:

> I think in terms of having the observations, especially when you have got one-to-one sessions, I think it is less intense than having somebody there, which probably makes your session more natural. (Participant 4, Student)

Supervisors acknowledged student fears but explained how approaches which seek to dispel this fear can be productive:

> One key is that initial phone call. I think because the student, as they do when you walk into their lesson, has to feel safe with you watching them … they have to feel professionally safe and have an idea that if you are going to produce any criticisms that they will be constructive. (Participant 5, Supervisor)

Some supervisor comments indicated concerns as to whether they were exposed to the full picture of the student's practice in the placement or if, in fact, this was akin to looking through a narrow window. The general ambience and incidental comments *in situ* were not reflected in the assessment process:

> Sometimes you see a lot more in a school don't you? You can glean what is happening and how the student is getting on, [remotely] there is less of that opportunity for casual conversation and just seeing a fuller picture. (Participant 6, Supervisor)

It was, however, acknowledged that this perceived need from the external supervisor was particularly pertinent to students on a first placement or in supervision situations where the learner is challenged to meet the competencies. All participants mentioned the possible benefits of a 'hybrid' system where learners are assessed by a combination of physical and remote supervision.

Post-supervision

Student comments indicated anxiety between waiting for the video to upload and it being watched/receiving feedback. This indicates the need for these fears to be alleviated for students as they embark on remote supervision. Students and external supervisors discussed the need to timetable agreed times and days for feedback and support and saw this as an essential requirement ensuring that remote supervision worked smoothly:

> The feedback was very good … We had a system in place where we spoke every Thursday which was very handy. I knew it was coming every week, I was prepared for it. (Participant 1, Student)

Students indicated potential benefits for improvement of their skills and also to support the development of them as reflective practitioners. The comments suggested that this real-time record of their practice gives learners a chance to see their work afresh, without relying on memory, and in a way that allows them to stop, rewind and watch again.

> I thought that was a really positive part of using Swivl. You could stop the video and think 'well I have just done that there, I didn't know that I did that' and you jot something down, and then you could pick the video back up again and keep going with this. So I thought it was a lot easier to track through your session and be more specific in your reflections. (Participant 2, Student)

Further comments from Participant 2 demonstrate the opportunity for empowerment of the training teacher within the active role that they are taking:

> My reflections are definitely more thorough and you actually get to notice things about your delivery … I noticed in one of my sessions I didn't give enough thinking time and speaking time for the child and I jumped in too quickly. I think without this medium I would not have known that, other than [the supervisor] telling me. It has made me really think how I work with children … (Participant 2, Student)

External supervisors also commented on the opportunities for reflection and self assessment, noting both an increased opportunity for students to have critically appraised the session before the feedback session. Additionally, opportunities were noted in clearly demonstrating the validity of the feedback offered by external supervisors:

> I think in one of the reflections she said 'oh I can see it now, I can see what you mean' … I said 'you need to give the deaf child time to process and think about his response, don't be afraid of silence' … she changed the way she taught, which was great and without the Swivl she might not have seen that. (Participant 7, Supervisor)

In addition to students noticing their own points for reflection, potential uses in providing evidence of teaching ability and competence were also noted. Beyond the focus on self, the student participants also reflected on the use of the equipment to understand more about the children they were working with, finding value in listening again to the language use of the children.

> it might be a particular word or something that a child is always stumbling over, or a particular sound that they don't produce that you might not have picked up on in a session but once you watch it back you would. (Participant 2, Student)

It was noted, however, that detailed watching of oneself for purposes of reflection is time consuming, a point which considered in more depth within the discussion.

Discussion

Three broad areas are worthy of further discussion from the results and can be summarised as: role of the HEI in supporting technology use, role definition and opportunity for reflection and skill development.

Role of the HEI in ensuring technology is ready for use

Participant comments highlighted the importance of prior information and guidance in preparing students to undertake assessment by this method. Clear instructions, specific to the needs of the user, were discussed by participants alongside the importance of practicing using the technology beforehand. However, the impact of the introduction of remote

supervision on other parts of the placement had not been considered prior to the trial. For example, both student and supervisor participants discussed their uncertainly around how to go about the sharing of evidence within the placement file. In progression of the project it would be necessary to undertake a detailed consideration of each step of the supervision process and what the impact of this technology may be. The findings of this pilot study impact on the progression of remote supervision arrangements within the HEI. In moving forward, the HEI may consider the use of electronic portfolios or a managed learning environment (Carter, 2005) to provide the external supervisor with access to ongoing documentation (e.g. lesson plans, pupil profiles).

Role definition

Comments from both student and supervisor participants suggest a perceived impact on roles within the process of placement supervision. For example, some external supervisor comments suggested that they felt less 'hands on' with the process although student participants did not bear reference to this. This is perhaps a predictable eventuality of the project as the preferences that the supervisors were bringing to the experience had not been considered. Zahorik (1998) found that supervisors had preferred types yet prior to this study the HEI had not considered how the supervisor's approach and the remote situation may mesh together. Previous work carried out by the HEI with ToDs training to mentor newly qualified teachers has evidenced (through EDAC Psychometric Testing) the high preferences to work as a supportive team player. Evidence from role preferences suggests that supervisors wanted to take a more direct role than this method of supervision allowed.

In contrast, positive student comments considered the enhanced opportunity to reflect on their practice to improve skills and this suggested an opportunity for students to feel more empowered to address their own training needs and take positive action. The traditional supervision arrangement may be seen as unequal in many respects; when the supervisor is physically present they view a transitory event which the student themselves does not have the opportunity to view with an outsider's perspective. Whilst the need for reflective practice is keenly discussed as part of a training teacher's skill set we have little evidence that the medium of traditional observation and supervision lends itself to this and there is potential for this to foster a passive learning experience, with the student taking note of what is fed back to them from the supervisor. Previous research by Tang and Chow (2007) noted the need for student-teachers to be well placed to develop their own judgements on their performance in the feedback session in order to develop higher order processes of analysis of their teaching. In the remote situation described in this study, the trainee is able to view exactly what the supervisor has seen and is well placed to sit this with an objective framework. The trainee is also placed in a more appropriate position to challenge the view of the supervisor or evidence reasons for decisions taken 'in action' as they are no longer dependant on memory. We are unable to predict how this might change future behaviours of the training ToDs but could suggest that the impact of critical self-appraisal afforded by the set up of remote supervision in this project may support ToDs in their skills of articulating the specialist nature of their role and how their actions are informed by good practice and sound pedagogy with deaf learners. As the role of a ToD is often unknown (or misinterpreted) to those outside the field this has the potential to support the trainees in their roles.

Beyond the changes to the relationship between student and supervisor the comments also suggested the potential for remote supervision to lead to changes in task distribution during the placement. Both external supervisors and school-based internal mentors discussed some tasks which were traditionally performed by the external supervisor (e.g. monitoring of an evidence-based teaching file) which, in the remote supervision, were carried out by the school-based supervisor.

Impact on reflection and ability to support development of skills

The theory of reflective practice has been discussed extensively within the literature (Schön, 1983, 1987), being seen as an essential tool in practicum to support teacher competence (Harland & Myhill, 1997; Osterman & Kottkamp, 2004; York-Barr, Sommers, Ghere, & Montie, 2006). However, teaching learners the skill of critical reflection has been recognised as an area of a significant challenge (Mackay & Tymon, 2012). As long ago as 1904 Dewey suggested that overemphasis on practice had the potential for student-teachers to follow cooperation teacher techniques without their own question or reflective inquiry. Whilst the ability to self-reflect was listed within the placement core-competencies it could be suggested that the traditional system of supervisor observation and feedback does not necessarily lend itself to this as the assessment and feedback, by design, is as seen by the eyes of the supervisor. A significant finding from the participant comments related to the opportunities that this form of assessment may hold on the learner's ability to reflect on the development of their skills. The comments suggest that the provision of this alternative method leant itself to enabling learners to self-evaluate and appraise their own performance, a key element in becoming a reflective practitioner. The comments from participants suggested that the use of the remote camera brought about qualitative changes to the nature and provision of the feedback, with learners watching their own learning and self-assessing before discussion the supervisor observations. It might therefore be considered that the opportunity to self-assess enhances learners reflective practice skills. The opportunity to self-evaluate in line with a clear assessment criteria may enable a transparency which empowers the learner:

> demystifying assessment through direct involvement helps to empower students without undermining the authority of the tutor or the educational establishment. (Fallows & Chandramohan, 2001)

This supporting the development of reflective skills is important for ToDs perhaps more so than teachers in mainstream education. ToD's working environments can be isolated when visiting deaf children peripatetically. Where a ToD is based in a school they will often be the only member of staff qualified to work with deaf children. Whereas, a mainstream teacher can approach a number of expert teachers to observe and support their development a ToD is more limited in who they might be able to approach. Part of the initial qualification must seek to address this, i.e. that we are training the student to become the 'expert' where there may be no others locally. Skills of self-reflection and critical appraisal will be a key to maintaining and developing skills.

The alternative supervision route may also provide opportunities for peer observation as part of a formative process. Goldberg et al. (2010) indicated that peer reviews were help to be meaningful and valuable for the majority of teachers surveyed, forcing them to reflect on their teaching skills and methods. Barnard et al. (2011) echoed similar gains but noted

time constraints in doing so. For teachers learning in this specialist field the potential for such gains via peer review may outweigh perceived time constraints. There is emerging evidence which shows that where a participatory approach to assessment of placement learning is established (Cooper & Ord, 2014) students are well placed to see themselves as active partners in the assessment process and this has been found to genuinely engage students and supervisors who found it developmentally valuable for students to *own their own work, speak for it and value it through the 'grading' process* (Cooper & Ord, 2014)

Beyond teacher education, there is increasing prominence within the tertiary sector for learners to develop their reflective skills (Francis & Cowan, 2008) and acknowledgement of the importance of self assessment in professional programmes within tertiary institutions (Boud & Falchikov, 2006; Bourke, 2014). Considering the highly specialised work of a ToD it may be suggested that this deep self-evaluation and appraisal should be a core skill meaning that opportunities to develop such skills need to be catered for both within the design and implementation of the pedagogical process. The use of technology, in this study, appears to have the potential to support this.

Considering that these sessions were captured for future reference, students may well have perceived this to be a greater challenge, considering the permanence of data stored on video. A study which focused on the use of data capture suggested that *Students may have perceived a greater challenge to prepare more and perform well* (Ford et al., 2012). Further consideration would be required to understand whether this challenge does, in fact, improve performance and whether any such improvement is retained for sessions once learners are not required to evidence such detailed and focused reflection.

Conclusion

There is much more to be understood about how this type of technology fits within the current system of work-based learning and practical assessment. Participant comments suggest considerable impact on skill development for training ToDs but this is set alongside a need to review the whole system in order to enable further implementation. This might include consideration of which learners are able to utilise such technology and any potential variations such as the 'hybrid' idea mentioned by participants. A whole system review might also focus on role definition and clearly define competencies which have the potential to be impacted on by virtue of the use of this technology (i.e. a more specific focus on reflective practice). Systems currently in use may need adapting to enhance the opportunities provided by the new technology, for example, standard paper-based teaching portfolios may change to an e-portfolio which would be more readily available to remote supervisors.

A key finding of the project showed the value that student participants placed on the opportunities that the technology held in supporting them as reflective practitioners. This is a useful finding as established work evidences reflection as a difficult-to-teach skill (Francis, 1995; Mackay & Tymon, 2013). However, further understanding is required to understand the value, depth and accuracy of the reflection gained through this remote method and whether this has the opportunity to promote higher order reflection (Larrivee, 2008) that we may wish to encourage within specialist teachers. If these higher order reflective skills are, in fact, promoted or enhanced by this technology then this supports the notion that technology supports and enhances pedagogy.

Limitations

A limitation of this study is that low numbers of participants do not enable findings to be generalised across the cohort of learners. However, as a pilot the study introduces what might be possible and potential challenges of seeking to address supervision of vocational learning in this way. There is potential for biased results as it was not possible to randomly assign this technology to learners due to potential impact on the ability of the learners to meet the assessment criteria. Future directions will seek to expand the use of the remote supervision tool across the whole cohort enabling larger numbers to take part. If this were to be the case a paper analysis of reflective comments within the student evaluations would be incorporated.

Disclosure statement

Funding

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