

Mentors' views on challenges faced – and lessons learnt – while mentoring mathematics student teachers in FE during the Covid-19 lockdowns

Natheaniel Machino

University of East Anglia

Education systems globally went into a state of emergency when COVID-19 struck, and there was no choice but to go online in teaching and initial teacher education including mentoring. During this challenging period, education systems learnt much which could be beneficial thereafter. In this paper, I report findings of the analysis of ten questionnaire and seven follow up interview responses to two questions: *What are the challenges of mentoring mathematics student teachers during COVID? What have you learnt which you think could be carried post COVID?* Following thematic analysis, nine themes emerged but due to space limitations, four themes; teamwork, digital technology, mathematics needs physical demonstration, and recording lessons and meetings are discussed.

Keywords: Initial teacher education; mentoring; student teachers

Introduction

The COVID-19 pandemic affected education across the world and engendered unprecedented scenarios that required expeditious responses (Chirinda et al., 2021). Mentoring of student teachers was challenging but there were lessons learnt which could be beneficial during the post COVID era. In this paper, I report findings from the analysis of ten questionnaire and seven follow up interview responses to two questions: *What are the challenges of mentoring mathematics student teachers during COVID? What have you learnt which you think could be carried post COVID?* I am interested in the views of mentors of further education (FE) mathematics student teachers on mentoring challenges during COVID and lessons learnt. I describe the context of the study, the initial teacher education (ITE) in the Further Education and Skills sector (FE). I then discuss mentoring and e-mentoring of mathematics student teachers in the sector. This is followed by discussing the methodology of the study before a detailed report of the themes that emerged from the analysis.

Context

The FE sector in England (sometimes referred to as the post-16 sector, Lifelong Learning Sector, or Post-Compulsory Education and Training Sector) is extremely diverse; it includes FE colleges, sixth form colleges, adult and community learning providers, prisons, work-based learning providers, and private training companies (Lingfield, 2012a). Historically, FE was synonymous with vocational education and training; providing communities with courses that tended to be in practical, non-academic subjects. Many FE lecturers came from industries, such as construction and engineering, and were vital in providing the subject knowledge needed by colleges to enable them to offer a wide provision of courses (Burnell, 2017). The sector has undergone radical changes in recent years. FE colleges are now offering vocational courses and academic subjects at GCSE and A-Level. FE student teachers often

undergo ITE as part of a career change or add a part-time teaching role to an existing technical profession (Greatbatch & Tate, 2018). In contrast to entry into school teaching, around 90% of FE teachers are employed untrained and complete their ITE at the average age of 37 (Greatbatch & Tate, 2018). This means only around 10% of the teachers are trained at university. ITE in FE is mostly generic and focuses on the application of generalised pedagogies (Lucas et al., 2012). The subject specialism relies on trainees' ability to contextualise their learning to their own specialism with the support of subject mentors (Lucas et al., 2012), and this makes mentoring an integral part of ITE in FE. During the COVID 19 pandemic, like all activities in education (and in other sectors of the economy), mentoring moved online to what is referred to as electronic mentoring (thereafter called e-mentoring).

Methodology

This paper reports part of a study which seeks to gain insight into the role of mentoring in the mathematical and pedagogical knowledge development of mathematics student teachers in FE. The methodology of my study is qualitative, established on an interpretative research methodology that values the participant's views and reflections and looks for meanings within the participant's environment (Merriam & Tisdell, 2016). For the research reported in this paper, data were collected from mentors using an anonymous questionnaire and interviews. The questionnaire was distributed by the Education and Training Foundation (ETF) to 162 FE colleges in England, and ten responded and seven out of the ten were interviewed. I employed thematic analysis as the analytic tool, and some of the themes which emerged are discussed below.

Themes that emerged from the analysis

Teamwork

When responding to a question on challenges and lessons learnt during interview, Martin said,

Too often mentoring a trainee is an additional duty and without incentive for the mentor. Due to lack of time, the conversation between mentors and mentees was limited. Lockdown which forced online mentoring increased the time for mentoring as there was improved conversation and discussion due to more free time as team planning exercises saved individuals planning time.

Martin attributed teamwork to increased time for mentoring. There was an increase in team planning because teachers were supposed to teach online but the knowledge of teaching online was scarce, so sharing ideas was the only option available. Savory and Glasson (2009) observe that formal mentoring meetings are difficult to arrange if the mentor and mentee are not given time to carry out the meetings. Often mentors are allocated full timetables with mentoring not given any time. I note that literature mentions lack of time for mentoring and this study goes a step further to mention that online working created time for mentoring. Post-COVID, teachers could continue the teamwork as it saves time and teachers have the opportunity of sharing ideas.

Digital technology

The main challenge during teaching online (thereafter, e-teaching) was teacher attitude toward the use of technology. Don agreed that technology was important in e-

mentoring and e-teaching during the pandemic. He talked about the expansion of technology in teaching and learning but admitted he was not keen on it:

Some people have loved online training and teaching. Others, like me, are not so keen on online. I'm a bit of old fashioned. I am more of a pencil and paper person, but yeah, everything that's online encouraged students to learn because they are so much in technology.

The issue of teacher attitude is also raised by Mulenga and Marbán (2020) who claim that student teachers' learning to teach mathematics online is affected by their attitude towards the use of technology, which they claim is generally negative. While the need to use technology increased due to the pandemic, it was learnt that technology should not be used blindly. According to M16 (mentors who responded to the questionnaire are given code names), technology might not be very helpful in teaching and learning as it could make lessons more 'robotic' where people interact with the computer which does not have the human touch. M16 suggested some limitation on the use of technology. M16's cautiousness implies that he or she is not convinced of the benefits of technology, and this is a challenge. Don, M19 and M16 agreed that mentoring student teachers on the use of digital technology would be beneficial but they were very cautious on its use.

Some mentors and student teachers had limited technological literacy, and this made e-teaching challenging. Martin said he observed that some mentors struggled with technology. Technological access is not limited to physical access as intellectual access was also a challenge. Some student teachers and some mentors may not have the technological literacy on how to use of technology in teaching mathematics (Mulenga & Marbán, 2020). A benefit brought by COVID triggered e-teaching and e-mentoring, which cannot be challenged is that teachers upskilled themselves in technological literacy in a very short space of time. Don said,

For me personally, my eyes were opened to the number of resources that are online that are available, I wasn't aware of. Yeah, I now use Microsoft Forms. I use Nearpod. I learned all that by myself and I'd never seen them before. I sort of continue to use them in the classroom because we're, you know, we're not at home and teaching from home. We are in the classroom doesn't mean that we can't use the online resources as such.

In agreement with Don, Howard (2021) says his ability to use video-conferencing software has developed immensely alongside confidence and competency. Overall, teachers upskilled themselves in the use of technology, and they are more comfortable in its use in lessons after the pandemic.

Mentors and student teachers had some concern that students rarely switched their cameras on and contribute during e-teaching, but there are also claims that students engaged better with technology. It is a tale of two stories; students did not engage during e-teaching and students engaged better with the technology during e-teaching and face-to-face teaching. It might be said that students did not engage while being taught online but when using the technology themselves, they worked well. Contradictions in research results about e-teaching and e-mentoring are not uncommon; for example, the observation that students did not have sufficient technological knowledge and skills (Mailizar et al, 2020) contradicts Chirinda et al. (2021) who claim that learners are remarkably familiar with the technology.

In an effort to make online lessons more interesting and engaging, mentors and student teachers had to look on the internet for ideas and resources. M21 wrote, "It's very important to be able to use all resources available to us in the classroom including computer-based resources and real-life examples which can be shown

through the internet.” M20 who was more enthusiastic wrote, “Good, there is some good stuff out there. We are using Dr Frost and BKSB [internet platforms] with success. Success means that students like it, and it encourages engagement and participation”. Darragh (2021) reports a study on online mathematics instructional programmes (OMIP) used in New Zealand primary schools which emphasises the use of digital technology platforms like Mathletics, Studyladder, MathsBuddy and Sumdog. The OMIP, like all other online platforms, has advantages of time saving and giving instant feedback and constantly assesses student to ensure progress; “It promotes understanding in a personalised [and differentiated] way, engages and motivates students to practise skills” (Darragh, 2021, p. 271). As a lesson learnt, the resources learnt could be beneficial in engaging students during the post COVID era..

Martin said he observed that some mentors struggle with technology; therefore, mentors and student teachers should work collaboratively on technological knowledge development. Technology has brought about collaboration between mentors and mentees. Darren said, “Most young people might know the technology so mentors should learn from mentees as well.” Shields et al.’s (2021) observe that student teachers and mentors overall experience of co-teaching during the pandemic was beneficial as mentors and student teachers learned to use technologies they might not have used before and “teacher candidates were more proficient with the technology tools and taught their classroom mentor teachers how to utilize technology effectively” (p. 87). Ersin and Atay (2021) quote a student teacher saying:

From time to time though, she had problems uploading some materials. I helped her with that. I showed her how to do it. It was a good collaboration. I think she also learned something from me because she said, I have things to learn from my young colleagues (p. 208).

Mentors learnt from student teachers, and this improved the mentor/mentee relationship as the hierarchical structure of this relationship was challenged. As a lesson learnt, collaboration and learning from each other, which could continue into the post COVID era, might be seen as change of dynamics in mentor – mentee relationship and moving from an expert-neophyte model to a collaboration model, where the mentor and the mentee learn together (Athanasos & Achinstein, 2003).

Mathematics needs physical demonstration.

The problem of lack of physical demonstration seems to be worse in e-mentoring mathematics student teachers. Unlike subjects like history and literature where teachers and students could sit around the table and discuss, mathematics needs physical demonstration. M18 described, “Being unable to have direct contact with the mentee and observe proper lessons,” as one of the challenges of e-mentoring. M16 wrote, “There are certain topics for mathematics that were harder to teach [online] than others (compass work for example). This made observing lessons and getting a true reflection of the teacher’s ability problematic.” M20 added by writing, “It is also very hard to teach maths properly online, you need to be there to see what they are doing so you can counteract misconceptions and correct errors.” It could be argued that teaching online; for example, how to draw an angle of 60° using ruler and compass, is difficult. Observing a student teacher teaching such a lesson and giving feedback is equally (if not more) challenging. Irfan et al. (2020) studied lecturers who teach in Mathematics Education study programmes in Indonesia and observe one of the obstacles faced during teaching mathematics online as the limitations of writing mathematical symbols and the limited basic capabilities of the learning management

systems and multimedia software to support online learning. This challenging experience has taught mentors and mentees to develop their technological knowledge rapidly; for example, Don said that he learnt about many resources he was not aware of which he would be using during face-to-face teaching.

While it could not be disputed that mathematics teaching needs physical demonstration, it can be argued that the challenge made teachers aware of online resources and software which could be beneficial during the post COVID era.

Recording lessons and meetings

While mentoring mathematics (and other subjects) student teachers online during lockdown has been challenging, M20 wrote: “We have learnt all sorts of things, like that classes [lessons] can be recorded, or you can join in with online classes, both of which can be used for mentoring and reflection.” Student teachers might teach a lesson while being observed by the mentor and record the lesson. During mentoring meetings, the mentor and the student teacher might use the video to discuss the lesson. The practice of recording lessons has been in use in mathematics education research some time, but it seems there is no literature on recording lessons for mentoring purposes. As a lesson learnt from the COVID era, there is need for a shift, from mentors being physically present in the classroom to observing and assessing student teachers’ teaching competence using video-recorded lessons. Lessons and mentor meeting could continue to be recorded for reviewing and reflection.

Discussion and conclusion

In this paper, I have reported the analysis of ten questionnaire and seven follow up interview responses from mentors of mathematics student teachers in FE answering two questions; *What are the challenges of mentoring mathematics student teachers during COVID? What have you learnt which you think could be carried post COVID?* Thematic analysis was employed as the analytic tool. Data shows that teamwork during the pandemic freed time for mentoring and other professional activities. Teacher attitude and technological literacy affected e-mentoring, but teachers improved their technology during the pandemic. Student engagement during online lessons was observed to be low but students engaged well with technology when using the technology themselves. Technology improved the relation between mentors and mentees as mentors learn from mentees as well. E-teaching and e-mentoring were observed to be challenging as teaching mathematics needs physical demonstration. Lessons and meetings could also be recorded and reviewed later. There were many challenges during e-teaching and e-mentoring but there were also lessons learnt which could be beneficial during the post pandemic era.

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