The impact of disruptive events on built environment degree apprenticeship delivery – a case study of COVID-19

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Abstract

Purpose:
This study aims to understand the impact of the covid-19 pandemic disruptive event on delivery of the built environment degree apprentice programme in higher education in the UK and identify the key strategies to minimise the effect.

Design/methodology/approach
A qualitative approach was used to collect and analyse data from a sample set of built environment degree apprenticeship stakeholders. Semi-structured interviews was conducted with seventeen key stakeholders to collate emerging themes on their perceptions of the impacts of the pandemic and strategies to adopted to minimise it.

Findings:
The investigation reveals that the core impacts of covid-19 on the apprentices training programme are *lack of access to the site, furlough, limited access to off the job training, limited interaction with tutors and peers, too much time on the screen, limited pastoral care and lack of contact with a mentor*. The census from the research participants is that despite the development and gain with the various virtual platform used during pandemic physical meetings with their mentor remain pivotal to the built environment apprentices learning and training.

Practical implications:
The results provide relevant stakeholders and actors supporting degree apprentices training programmes (training providers and employers, among others) with the information needed to improve the delivery of Built Environment degree apprenticeship training programmes during a disruptive event covid-19. The study identifies various strategies to minimise the impact of disruptive events on the apprentices training, including technology, regular meeting with mentors online, and personal and pastoral care.

Originality: The study is the first to document the impact of the COVID-19 pandemic on degree apprenticeship programs in the built environment. It provides an in-depth understanding of how these programs have been affected and offers potential solutions to reduce or mitigate potential damage. The research will inform future policy decisions related to degree apprenticeship programs in the built environment.

Keywords: Degree apprenticeship, Covid-19, pandemic, Built environment, higher education

1. Introduction

The size of the available workforce to fill vacant job roles is decreasing due to the ageing population in many countries. To boost the supply of skilled workers, several programmes are being implemented across the globe. These include the Enhanced Construction Manpower Training Scheme of Hong Kong (Chung et al., 2019), degree apprentice courses in the UK (Saville et al., 2020), World Skills Programme South Africa (Construction Industry Development Board, 2017), European alliance for Apprentice in Europe (European Commission, 2013) and co-op degree courses in North America (Ingram et al., 2013). These programmes are designed to support work-based learning, which has been proven to bring a number of benefits such as improved academic performance, satisfaction and employability (Hegarty and Johnson, 2008; Doss et al., 2021). Apprenticeships also provide an effective platform for training young people for work in the construction sector, with the Enhanced Construction Manpower Training Scheme of Hong Kong (Ho, 2016) and CITB funded programmes in the UK (Abdel-Wahab, 2012) being two great examples. Apprenticeships offer young people the opportunity to earn an income (Daniel et al.2020) while also helping to tackle youth unemployment.

Covid-19 is proving to be one of the most disruptive global events to have occurred in recent times. The pandemic significantly impacted all sectors of human endeavour. The Educational sector, in particular, had to reinvent itself in many ways to cope with the challenges (Corbera et al., 2020). The Higher Education sector in the UK had traditionally delivered the programmes in various modes and formats. Recently, degree apprenticeships have become the preferred route for many professions in the UK as a result of Government incentives to support organisations through an Apprenticeship Levy since 2016 (Riley, 2016). Since then, several apprenticeship standards have been launched at various levels for different Occupational Profiles. The built environment sector that had traditionally implemented apprenticeships for the trades or operative level workforce became transformed, and currently, however, architects, engineers, surveyors and various project management specialists are being trained under various apprenticeship standards. These programmes rely very intensively on a tripartite arrangement between the apprentice, their employer and the training provider (FE or HE). The apprentice is the person employed in the training role by an organisation (the employer), and the training provider is the educational institution that the employer contracts to undertake the structured (off- the job) training element of the curriculum of study (Hughes and Saleva, 2019). Like any collaborative programme, however, risks are inherent, and various types of mitigation measures had been considered to ensure the success of the programmes. Typically, the programmes are subject to strict regulatory regimes, monitoring activities and other measures to assure qualitative delivery of the programme.

However, the impact of extensive disruptive events (such as the pandemic that was recently witnessed in the outbreak of Covid-19) has elicited newer and unforeseen impacts on the smooth delivery of the programmes. Literature evidence reveals that the challenges brought about by social distancing limit the opportunities for human interactions, and therefore, classroom style or face-to-face delivery became a challenge for many areas of human endeavour (Raaper and Brown, 2020; Twenge, 2019).

Various studies from across the world have reported the impact of Covid-19 on learning and teaching in higher education. For instance, Hill and Fitzgerald, (2020) from the Republic of Ireland examined the perception of regular postgraduate students of the impact of Covid-19 on their learning; Alsoud and Harasis, (2020) explore the impact of Covid-19 on E-learning in the context of Jordan Universities, Burns and et al. 2020 also investigated the impact of covid-19 on universities student wellbeing in the United Kingdom, Leaver et al. (2022) examine the impact of the Covid-19 on the future of nursing education in the USA. While this is commendable, these studies only focus on the traditional regular degree programmes. None of these studies investigated the impact of Covid-19 on the higher degree apprenticeship programme. Even, though the mode of delivery of the degree apprenticeship programme differs from the regular degree programmes (Gambin and Hogarth, 2016; Greig, 2019). Unlike the regular degree programmes, the degree apprenticeship programme has the worked-based learning element which will require the learner to go to work as part of the training. For instance, Jallow et al. (2020) reported that during the Covid-19 pandemic infrastructure project in the UK were impacted. This has a broader implication for built environment degree apprenticeship learners who require going to the site as part of their training requirement. More importantly, these factors demand a broader appreciation and understanding due to the complex and dynamic nature of the degree apprenticeship programme. Given this, the current study assesses the impacts of covid-19 on the degree apprenticeship programme to fill this knowledge gap.

The following key research questions were thus defined for this study:
RQ1 *What is the impact of disruptive events (covid-19) on Built Environment (BE) Degree Apprenticeship Delivery?*
RQ2 *What were the strategies adopted by the key stakeholders to manage the disruptive impact of covid-19 on the Built Environment Degree Apprenticeship programme?*

The study focuses on apprenticeship delivery due to its perceived vulnerability to the pandemic. Traditional programmes usually give training providers 100 percent opportunity to shape the learning experience of the student. However, the apprenticeship programme only gives part of the 20 percent to the training provider(Greig, 2019). As the remainder is in the hand of the employer situations like Covid-19 which had a significant impact on the industry disrupted this learning experience and, hence the aim of the research. The principal scientific significance of the current study on education and training in the built environment lies in its presentation of empirical evidence on the impact of the covid-19 pandemic on degree apprentice's programme in the built environment and strategies to minimise the effect, which has not been documented.

2. Literature review

2.1 Overview of Higher degree apprenticeship in the UK

Degree apprenticeships were introduced in 2015 as part of the reforms to the apprenticeships system in England**.** Apprenticeships are seen as a critical mechanism for the government to address the evidenced productivity gaps by encouraging employer investment in training and opening opportunities for skills development in critical industrial areas (Shipton *et al.*,

2016; Cerdin and Peretti, 2020). The degree apprenticeship was launched as an extension of the Higher Apprenticeship initiative; the Apprenticeship Levy and the move from frameworks to new standards were introduced. The reforms set out to put employers in control of designing the training they require to ensure an appropriately skilled workforce; therefore, degree apprenticeships were added to the mix of training products (Gambin and Hogarth, 2016; Baker, 2019). Degree apprenticeships combine full-time paid work and part-time university study to offer the apprentice the opportunity to gain a full Bachelor's or Master's degree (Level 6 or 7) whilst partaking in practical, on-the-job training (Baker, 2019).
Degree apprenticeships are created by partnerships between employers and universities or colleges (Providers). The learners must be employed for a minimum of 30 hours per week whilst they are studying part-time with 20% off the job training (OJT) under a tripped agreement (Gambin and Hogarth, 2016; Greig, 2019). The course of study will typically last between one and six years, depending on Level and sector. The qualification design is intended to ensure that learning fits flexibly around their work commitment through block release, distance, or blended learning (Cerdin and Peretti, 2020). The degree apprenticeship programme offers students the opportunity to gain a degree whilst working full-time in their chosen field. Unlike the traditional degree programme, apprentices are not required to attend classes every day and can complete the programme in three years(Daniel et al. 2020). This flexibility makes the apprenticeship programme attractive to many students, who may not be able to commit to a full-time university course. To participate in a degree apprenticeship, three parties must sign a tripartite agreement - the employer, the training provider and the learner(Baker, 2019). This is different from the traditional degree programme, which is usually a contract between just the student and university. However, it should be noted that the content delivered on each module and assessment will be the same for both apprentice and non-apprentice students. The degree apprenticeship programme is becoming increasingly popular, providing an excellent opportunity for those looking to gain qualifications and experience in their chosen field simultaneously.The UK Apprenticeship was initially intended as a tool for economic growth. However, the UK Government now sees degree apprenticeships as an essential tool for enhancing social mobility (Rowe *et al.*, 2017; Baker, 2019).

The UK Education and Skills Funding Agency (ESFA) has prescribed procedures and processes for all services providers to administer apprenticeship courses (Baker, 2019). The system is designed to underpin accountability and transparency. The agency and Ofsted carry out regular audits, defaulting service providers risk having their licenses revoked.
The onerous admission, enrollment, and monitoring procedures laid down by the ESFA and Ofsted have resulted in a significant increase in the workload of university administrative and academic staff. The communication between the Universities and the monitoring agencies has substantial room for improvement (Rowe *et al.*, 2017).

The UK degree apprenticeship initiative signalled a radical departure from the traditional university degree model. The programme was introduced partly to address the increasing need for more industry-led practical vocational qualifications, as the industry is deemed to have better insight into employees who meet their business requirements (Henderson-Morrow, 2013). In addition, Richard (2012) advocated more significant employer involvement in degree apprenticeship curriculum development. The UK degree apprenticeship places the employer at the centre of UK skill strategy (Henderson-Morrow, 2013). Therefore, some of the critical features of the post-2015 reforms are that employers, professional bodies, and universities drive the degree apprenticeship initiative. The concept of apprenticeship training is not new. However, what is new is the tripartite partnership that underpins the degree apprenticeship model.

This non-traditional pathway of obtaining a university education offers further opportunities for those who wish to undertake a graduate or postgraduate course through a non-traditional pathway. However, for degree apprenticeship to be successful, there needs to be appropriate and adequate buy-in from apprenticeship students and their employers (Fuller and Unwin, 2001; Gambin and Hogarth, 2016; Bilginsoy, 2018; Daniel *et al.*, 2020). The degree apprentice programme in the UK is progressing. However, the global covid-19 pandemic has also impacted the programme in various ways.

2.2 The impact of Covid-19 on Learning and Teaching and Strategies to minimise the impact

The Coronavirus started in late 2019 in China. It kept evolving until it was announced by the World Health Organisation (WHO) in January 2020 as a global pandemic (World Health Organisation, 2020). It was pretty hard for the UK schools and universities to adapt to the new measures, so the decision was taken to switch to E-learning (Crawford et al., 2020). However, these changes affected the apprentices training programme. According to the Sutton Trust (2020) report, 36% of workers were furlough while 8% were made redundant. Additionally, it affected the apprentice's Off-the-Job learning and their End Point Assessment.

It is challenging to transfer to virtual pastoral care and set a seal on the complete delivery of learning outcomes to the apprentices for many reasons. According to Bao, 2020; Peters et al. 2020 lecturers cannot physically see and feel the Student's interaction and feelings. However, Online platforms such as Canvas, Blackboard, Microsoft Teams, Zoom, Skype, Cisco, Webex, and Go to Webinar were used to deliver teaching and learning activities (Pokhrel and Chhetri, 2021). Furthermore, using the chat box for questions or having one-to-one support sessions was adopted to minimise the impact (Rapanta et al., 2020).

In addition to the swap to E-Learning, alterations to working from home had to take place. Before Covid-19, there was seamless communication between staff and the apprentice; therefore, follow-up calls or an e-mail for the meeting were not required. During the pandemic, significantly more effort was required to keep effective communication going (Kniffin et al., 2021). According to Jallow et al. (2020), the Architecture and Construction Infrastructure design team had faced challenges in sharing the work and storing it remotely; the solution was to generate a server to synchronise the shared and stored work. Jallow et al. (2020) have reported the impact of Covid-19 on an infrastructure project in the UK. However, no study has explored the effects of the Covid-19 pandemic on the UK's built environment degree apprentice programme. This is, therefore, the focus of the current study.

3. Research Method

This study employed an interpretive approach and collected qualitative data (Bryman, 2016). The qualitative data were collected within real-life scenarios to understand the impact of covid-19 on the degree apprenticeship programme and how the key stakeholders in the sector mitigated it. The qualitative approach was adopted due to the paucity of knowledge on the impact of Covid-19 on the degree apprentice programme in the existing literature. According to (Creswell and Clark, 2010; Maxwell, 2004) qualitative research approach provides a platform for a researcher to explore an issue beyond what has been established in the literature. The qualitative interview technique adopted in this study enables the study

to demonstrate the impact of Covid-19 on the degree of built environment degree apprentice and the strategies adopted to mitigate it.

3.1 Material and Procedure

The research instrument was developed based on the information gathered from a preliminary literature review and the information collected from the key stakeholders involved in delivering the degree of the apprentice's programme. The interview instrument was open-ended but semi-structured to keep the research participant focused. The open-ended nature of the questions allows the research participant to present their opinion on the research questions explored. According to (Bryman, 2012) the benefits of open-ended questions include: (i) interviewees respond to questions based on "their terms" and (ii) the class of questions helps investigate new knowledge areas. The interview instrument consists of three key sections. The first section asks questions about the background of the research participant. The second section explores the impact of the covid-19, and the last section seeks to know the strategies adopted by the stakeholders to minimise the effect. The interview was the same for each stakeholder, but the tone of the question varies from one stakeholder to another. For example, the apprentices were asked how the pandemic has impacted their learning; whilst the employers were asked to discuss how they felt the pandemic had affected their apprentices.

3.2 Data Collection

The participants involved in the delivery of the apprenticeship programme were purposively selected to participate in the study. Purposive sampling was adopted to ensure that only those who have adequate knowledge to answer the research question were involved in the study (Campbell *et al.*, 2020). In addition to the criteria outlined above, the sstudy also required that the respondents had a certain level of experience in their field. For students, they had to have been on the apprenticeship programme during the pandemic; for academics, they had to have been involved in delivering apprenticeship programmes; and for employers, they had to have apprentices training with them during the pandemic. Lastly, skill coaches had to be engaged in mentoring apprentices during the pandemic. By requiring this level of experience from our respondents, we were able to ensure that we had a wide range of perspectives and insights for the study.The selected stakeholders include the apprentice, the training provider (academic staff and skill coaches) and the employer. In addition, a semi-structured interview was used to aggregate the evidence used in answering the research questions. In all, 17 key stakeholders were interviewed. This comprises eight apprentices (AP), four employers (EM), three skill coaches (SC) and two academic staff (AS) that teaches on the apprentice programme. The apprentices are students studying for a level 6 bachelor's degree in the built environment courses at a UK University in England. The apprentices were at various stages in their study. Table 1 shows the distribution of the research participant. It is worth mentioning that before the pandemic, the apprentices attended the University one day a week.

However, during the pandemic, sessions were delivered online via the University Virtual Learning Environment. The university specifically employed skills coaches to support the apprentice's skills development throughout their training. They act as mentors for the apprentice provided by the university. The Case Study University is a major apprentices training provider, and it gives degree apprentice training across all its faculties in the UK. One single University was used for this study as the project team could not have access to other Universities to collect data. This was largely due to the disruption and instability that the covid-19 pandemic brought on learning and teaching in higher education in the UK. The University was used a critical case(Yin, 2009) as they were one of the Universities who was actively delivering the degree apprenticeship programme during the covid-19 pandemic.The faculty

ethics committee approved the data collection instrument before it was administered. Formal consent was received from each research participant before the interview. All the interview was conducted remotely due to covid-19 restriction and was recorded via MS Team. The interview was designed to last for 60 minutes. However, not all the interviews went as planned. The average duration of the interview was 40 minutes.

3.3 Data Analysis

The recorded interviews were transcribed verbatim. The transcribed interviews were analysed using inductive analysis (Bryman and Burgess, 1994; Miles and Huberman, 1994). The core issues that emerged across the 17 interviews were first coded manually and categorised into themes and sub-themes. This was achieved by reading the transcribed interview; the emerging factors were first coded, the factors were then grouped and categorised into themes. The research team then reviewed the emerging themes for final refinement and classification of the themes. This serves as internal validation of the emerging theme and sub-themes (Silverman, 2013). The agreed themes and the associated factors are presented and discussed in the result and discussion section.

Insert Table: I here

4. Result and Discussion

4.1 Impact of Covid-19 on Built Environment apprenticeship

This section answers research question one, and it presents the theme that emerged on the impact of the covid-19 on BE degree apprentices during the pandemic. The two broad themes are (1) impact on BE apprentice learning and teaching and (2) impact on the BE apprentice work experience. The figure below shows the themes and sub-themes that emerged from the interviews.

Insert Figure 1 here

4.2 Impact of Covid-19 on BE apprentices learning and teaching.

The results from the interviews of the apprentices generated some key themes that can be deduced as impacts of Covid-19. These include limited interaction and engagement, too much screen time; technology and connection issues; disrupted pastoral care; limited opportunity for on-the-job training; and learning in isolation. These are further explained as follows.

Limited interaction and engagement

While the impact of Covid-19 on learning and teaching may be perceived as unfavourable, it is rather a blessing in disguise for some students. One significant negative impact of Covid-19, as identified by most interviewees, is limited interaction and engagement. The interviewees stated that the introduction of remote learning, an alternative means of teaching and learning during the pandemic, has been helpful; however, there is a lack of personal interaction between lecturers and students. Some of the students express concern about limited interaction with their module tutor. Similarly, employers feel that teacher-student interaction demands are not met. A comment from one of the employers is captured below:

*They are no longer in the same room with their classmates and the tutor, so there might be, for example, less keen on asking questions, or they are missing out on interesting conversations with a tutor or the other people in the class because, again, they might not want to put themselves forward to talk or ask questions necessarily***[E03].**

Existing educational literature has consistently acknowledged the significance of students interactions with their teachers and classmates (Bernard et al., 2009; Moore 1989). According to the findings by Wut and Xu (2021), online classrooms, however, impose limitations on offering comments, asking new questions, and requesting an explanation on complex issues.

Too much time on screen

Another negative impact of the Covid-19 lockdown is linked to too much time on screen. With the aids of internet technology, laptops, tablets, and smartphones have become an essential element of modern life since they are utilised for various functions such as communication, leisure time entertainment, social networking, navigation, and workplace applications. In essence, the Covid-19 lockdown has increased the number of hours individuals spend on the screens, and the students are not exceptions. Online teaching poses a risk of exposure to increased screen time for the learners (Wargadinata et al., 2020). Besides online lectures, apprenticeship students are now spending more hours using social media technologies to combine tasks from the university and their place of work which they have to do at home, on various screens. However, given the benefits of technology that enables the students to get their work done, several adverse effects are - as one of the interviewees expressed:

*When you sit at the screen all day, it is not suitable for anyone to be honest with you. It is not suitable for the lecturers as well as for the students in that sense. It has both physical and psychological effects on my body***[AP01].**

According to Akulwar-Tajane et al. (2020), the psychological effects of screen usage on young people continue to be a topic of discussion in society. Concerns about the harmful effects of screen time on psychosocial functioning, health, and behaviour remain prevalent and are often expressed in academic, governmental, and media circles. The finding in our study is in line with some evidence in the literature, which routinely shows negative correlations between screen time and well-being (Twenge and Campbell, 2018; Twenge, 2019).

Technology and connection issue

While some students spend too much time on the screen, others do not have equal access to technological tools and the internet. According to the interview findings, some respondents said that the availability of computers and Wi-Fi for economically and financially constrained students, or those in geographical regions with weak internet connections, is a major disadvantage in adopting online learning during the lockdown. This finding is in line with the claim by Wargadinata et al. (2020) on the impact of lack of computers and internet on student's learning during the lockdown.

Disrupted pastoral care

Students have benefitted immensely from pastoral caregiving by tutors. However, the process of pastoral support has been disrupted during the Covid-19 lockdown and might affect student learning and well-being. One of the employers interviewed opined that:

*Students' academic performance is likely to suffer due to fewer contact hours for learners and a lack of physical interaction with teachers when experiencing challenges with learning and understanding. This is because some of the students feel the impact of lack of pastoral care***[E04].**
A study on pastoral care during the epidemic shows that presence and in-person encounters are still essential parts of being and that recent experience has emphasised the necessity of embodied assistance for individuals in need (Swift, 2020). However, although the physical presence and distant engagement might result in meaningful pastoral care (Swift, 2020), one of the areas in which teachers are least confident in providing online help to students is pastoral care (Lundie and Law, 2020).

Limited opportunity for on the job training
impact of the Covid-19 lockdown that is peculiar to apprenticeship education as identified by one of the skill coaches interviewed is *'limited opportunity for on the job 'training'***[SC01].** This is critical because the essence of the apprenticeship model of work-based learning is to incorporate 'day 'release' education in universities, rather than both theoretical and practical instruction being delivered in the workplace (Higgs, 2021). Due to the lockdown, most businesses began operating online and implemented a work-from-home policy, providing the facility to their employees to work from home. However, working from home is challenging for apprentices as they do not feel the organisational climate at home. In addition, because of the practical nature of the built environment, apprentices would learn better during practical sections in the workplace. One skill coach representative expressed, 'many students feel this period has been a waste of time through lost *workplace 'exposure'***[SC03].**

Learning in isolation
With universities closed because of the new coronavirus lockdown, self-study is more critical than ever. In this downtime, some students can cover most of their syllabus without the added headache of dressing up and travelling to the university campus. Some of the interviewees claimed that they gain more time to do personal study and school work as explained by an interviewee:

Well, you might be slightly surprised by this, but my grades and personal study have improved while working at home. This is one thing I have benefitted from the lockdown because I do not have to travel distance to attend lectures, unlike before **[AP08].**
The naturally driven learners are mainly unaffected in their learning since they require little supervision and direction, but the susceptible group who are weak in learning would have challenges (Pokhrel and Chhetri, 2021). For instance, one of the students interviewed revealed that the absence of peer learning might negatively impact student performance. Other interviewees also reiterated *'the feeling of learning in' isolation* **[AP07]** as a significant impact of Covid-19 lockdown on their study. One of the interviewees put it this way;

The lockdown makes you feel isolated when you are doing the study; you are on your own.

4.3 Impact of Covid-19 on BE apprentice work experience

This subsection discussed the sub-themes that emerged on the impact of Covid-19 on the BE apprentices work experience. The sub-themes are (*1) lack of contact with mentor, (2) lack of access to site (3) Furlough.*

Lack of physical contact with the mentor at work

The study reveals that during the Covid-19, apprentices could not have meaningful contact with their mentor at work. Some of the research participants stated that:

"I have not been able to see him directly and go out with him. Also, no one to one with them over a desk, for example, looking at a plan" **[E01].** Another employer stated**:** *So, the way we have managed the apprentice, we have been quite flexible with allowing people to work from home. This means we have limited contact with them* **[E03].**

This is due to the restriction the government put in place during the lockdown. Although the construction sector was not in total lockdown during the Covid-19 pandemic in the UK, social distancing and other Covid-19 restrictions still apply (Department Business, Energy, and Industrial Strategy, 2021). This means not all construction workers will be required to travel to the office work; the majority may work from home. According to Jallow, Renukappa and Suresh, (2020), construction workers in the UK could not go to -site during the total pandemic lockdown. Therefore, it was challenging to manage, inspect or supervise on-site work from home. The apprentices' mentors' limited or no access to the site would significantly impact their apprenticeship training programme. Mentoring is a crucial element of the apprenticeship training programme as it provides the apprentices with an opportunity for hands-on learning from employees who are well experienced. However, traditional mentoring has been disrupted during the pandemic due to social distancing and other restrictions (Abdelhamid et al., 2020). One of the apprentices stated: *You lose a level of mentoring throughout all this. You lose because they were all working from home even still* **[AP01**].

Additionally, the lack of opportunity for mentoring was mentioned by AP02, AP03 and AP05, among others**.** The study found that virtual platforms such as MS Team and Zoom were used to organise meetings between mentors and Mentees **(E01, E02 and E03).** According to Abdelhamid et al., 2020, if mentors and mentees fully exploit the virtual platforms, they will enhance their relationships and support the mentee to learn adequately. However, virtual mentoring cannot replace face-to-face and day-by-day mentoring, especially in the built environment degree apprenticeship

Lack of access to the site

Another related factor to the lack of physical contact with the mentor is the absence of site visits by the apprentices to see the actual process on site. This was echoed by all the apprentices that participated in the study. This concern raised by the built environment degree apprenticeship is not surprising because of the practical nature of the built environment programmes. The general expectation of the apprentices is to be fully engaged with related practical activities four days a week at the workplace and one day for academic work at the university. According to Daniel et al. 2020, the UK apprenticeship is designed for a one-day release or a block delivery. However, the covid-19 pandemic has altered this model recently, disappointing the apprentices with study mainly working from home. Some of the apprentices stated:
"Day-to-day, I managed pretty well from home. It ends in what you can do to get out and see certain people and visit sites. However, these are the things I have not been able to do. This is because I am working from home rather than in the office" **[AP05].**
*"Since September, I have been mainly doing administrative office work. I have never been on site or any quantitative work or anything like that***" [AP04].**

The limited access to the site by the apprentices means they would not attain the required skill. The statement with AP04 aligns with Doherty and Cullinane (2020) finding where the study found that during the pandemic, 16% of apprentices were redeployed to work in other business areas within the organisation is not relevant to their apprenticeship. While some apprentices, such as those in the IT sector, may work effectively from home without visiting the office or site, the built environment apprentice technical programmes may not suffice. Because the apprentices' programme is a continuum, the gap created by the pandemic's learning and skill development should be an argument for the critical stakeholders in the sector.

Furlough

The study reveals that during the pandemic, most of the apprentices were furlough by the employers. This was due to their inability to perform their duties regular due to the pandemic. However, this does not stop their study at the university, as some of the participants reported. Some of the research participants stated that: *Having joined our company and then just a few months later, she has to be put on furlough. It was challenging for her* **[E02]. ***He was furlough during the pandemic, but he still kept in touch with his studies. He is the only person furlough during the apprenticeship* **[E03].** Many workers were furlough during the pandemic in the United Kingdom, so it is not only the apprenticeship programmes that were affected. The UK government introduced the furlough scheme, which allows the employer to retain the employee and pay the employer through money made available by the government while away from work.

According to the available data, between April 2020 and May 2021, about 11.5 million jobs from various employers were furloughed in the UK (Statista, 2021). The construction industry is among the sectors severely hit by the pandemic. According to Marshall, 2021, during the pandemic's first wave, the construction claimed 3.7 billion pounds from the Coronavirus Job Retention Scheme for furloughed employees. At the same time, it is true to say that the furlough scheme helps to minimise the economic impact of the pandemic on the apprentices. However, it is unable to close the skill and learning gap. Some of the apprentices stated that: *When it comes to the professional competence side of things, it is not ideal, not being able to see your line manage **[AP01].*** The study also reveals that the apprentices **[E02, AP02, AP01]** were able to make good use of the furlough time to concentrate on their academic work, and as a result, they scored higher grades.

4.4 Minimising the impact of Covid-19 on built environment degree apprenticeship programme

This section answers research question two, and it presents the theme that emerged on the strategies adopted to minimise the impact of the pandemic on the built environment degree apprentice. The two broad themes are (1) strategies adopted by the learning provider and (2) the strategies adopted by the employers. Figure 2 below shows the themes and sub-themes that emerged from the interviews.

Insert figure 2 here

4.5 The approach adopted by the Employers to minimise the impact of Covid-19 on BE Apprentice

Regular meeting with mentors online

With government restrictions in the UK during the pandemic, built environment degree apprentices cannot go to work and see their mentors. The study found that various online and digital platforms were used to engage with the mentor at work to reduce the impact of the pandemic on learning and training at the workplace. Some of the research employers stated,"*We just need to make sure that we check on them regularly using online meetings. I have been scheduling catch-ups with all of the apprentices* **[E01].** This approach was also adopted by **E01** and **E02** too. According to (Jallow, Renukappa and Suresh, 2020), the primary method assumes in the UK to minimise the impact of working from home on the employees was to use various digital platforms to organise meetings and communication with the workers. However, the approach comes with its challenges as some activities cannot be performed holistically online. The census from the research participants is that despite the development and gain with the various virtual platform used during pandemic apprentices, physical meetings with their mentor remain pivotal to the built environment apprentices learning and training.

Care for personal and work-life of the apprentice

One of the most reported impacts of the covid-19 lockdown is the poor mental health experienced due to the limited contact with other people and other family pressure arising from the lockdown. Alsharef et al. (2021) observed from their study that focused on construction workers that workers could not report to work because of the unavailability of childcare and caring for their sick family members, which negatively affected their mental health. This shows the importance of adopting personal care for the apprentices adopted by the employer to minimise the impact of the covid-19 pandemic on their personal and family life. Some employers stated that they adopted various measures to care for the built environment apprentices working with them. For example, **E02** noted that:*"But yes, it is nice that this kind of interaction not only related to work or things which go forward to enhance your knowledge, skills and behaviour through those things, we see her as a colleague, which almost like a friend to know how she is going from where you can give her a guide and sort of "* **[E02].** Building personal relationships in the development of an employee within an organisation cannot be overemphasised, especially the apprentices who are an employee on training. According to **E03,** they organise team-building activities unrelated to work through various online platforms to care for their apprentices.

4.6 The approach adopted by the training provider to minimise the impact of Covid-19 on BE Apprentice

In response to the anticipated spread of COVID-19, universities across the world unexpectedly discontinued face-to-face instruction in favour of technology-mediated teaching. As a result, using technology in students' learning processes from many disciplines became vital, and it was the only method to educate, interact, and cooperate (Vladova et al., 2021). This study revealed that the university employed informative online platforms such as CANVAS, Microsoft Teams, Zoom, Skype, and Cisco to deliver teaching and learning activities. In addition, students also expressed the benefit of the WhatsApp app and Microsoft Teams for interactive and learning purposes during the pandemic. Some research participants stated that: *'most of the time, we may contact our course mates over WhatsApp regardless of time differences, physical distance, or office working hours. Microsoft Teams also enriches the student learning experience and makes it relatively easy for lecturers to contact learners at their convenience, which helps decrease feedback delays'* **[AP03].**

Pastoral support by Skill coach

One of the ways online learning platforms can be made effective is for the academic staff to transform their pedagogical methods in ensuring pastoral care are provided to support virtual platforms (Rasiah et al., 2020). Some students are likely to be more competent or prepared to reach out to skill coaches and use the resources provided. Hence, pastoral service providers must devise systems for routinely engaging with all students, allowing individuals who may otherwise fall through the gaps to benefit from accessible interaction and assistance (Raaper and Brown, 2020). This was evident in this study as one skill coach representative expressed that:

"As learning and skills coaches, we meet our students four times per year (quarterly reviews). We were almost available to answer their enquiries 7days/ week during the pandemic, even during our bank holidays and annual leaves. I am convinced with the quote,'put yourself in other people's shoes' If I am in their place, I would wish to have someone resolve my concerns and answer my enquires as soon as possible, or someone listens to me, whether personal or not". This can be considered pastoral care (the major part of our job when it comes to students) **[SC02].**

Another skill coach noted by expressing personal experience: *"during the meeting, I ensure by directly or indirectly questioning the student's progress. If the line manager cannot attend, I provide the apprentices with their feedback in the skills review form to guide and support them"* **[SC03].**

One to one session with the student

Having one to one discussions or feedback with apprentices is another approach adopted by the university to ensure continuous learning during the pandemic. A past study found that the majority of the students found one-to-one tutor feedback helpful during Covid-19 (Srivastava et al., 2021). This study found that the skill coaches provided one-to-one sessions for the apprentices. One of the skill coaches noted that:

One of the main ways apprentices have benefitted from skills coaches during the pandemic is our offer of increased levels of support. I have told all my students that I am on hand anytime to go through anything apprenticeship related and more. One of the most significant difficulties for them has been the uncertainty of everything. We have been able to pacify them by answering questions, advising of assessment extensions (and extensions to the APC), help them gain access to online lectures and signposted them to online help, particularly to COVID-19 guidance on our website, as well as helping to interpret government guidance **[SC01].**

The one-to-one session also helps in providing mental health support to the apprentices. Some skill coaches stated that students facing anxiety, feeling exhausted or pressured from work or personal things in their lives must arrange a meeting to speak *about their personal issues and seek advice. Some feel anxieties from loads of work they have, especially students in their last two years and higher apprenticeship* **[SC03].**

5. Conclusion

This study aims to understand the impact of the covid-19 pandemic disruptive event on the delivery of the built environment degree apprentice programme in higher education in the UK and identify the key strategies to minimise the effect. The study found that the covid-19

significantly impacts delivering the UK's built environment degree apprenticeship programme.

The investigation reveals that the core impacts of Covid-19 on the apprentices' training programme are *lack of access to the site, furlough, limited access to off the job training, limited interaction with tutors and peers, too much time on the screen, limited pastoral care and lack of contact with a mentor.* The study categorised the identified impact of covid-19 on the delivery of the built environment degree programme into *school-level learning impacts* and *workplace level learning impacts.* The study found that mentoring is a crucial element of the apprenticeship training programme. It provides the apprentices with an opportunity for hands-on learning from employees who are well experienced. However, traditional mentoring has been disrupted during the pandemic due to social distancing and other restrictions.

The study identifies various strategies adopted at the *school level* and at the *workplace level* to minimise the impact of disruptive events on the apprentices training, including *technology, regular meeting with mentors online,* and *personal and pastoral care.* The census from the research participants is that despite the development and gain with the various virtual platform used during pandemic apprentices, physical meetings with their mentors remain pivotal to the built environment apprentices' learning and training.

The principal scientific significance of the current study on education and training in the built environment lies in its presentation of empirical evidence on the impact of the covid-19 pandemic on degree apprentice's programme in the built environment and strategies to minimise the effect, which has not been documented. First, the results provide relevant stakeholders and actors supporting degree apprentices training programmes (training providers(Universities), employers(main contractors, etc), and regulatory agencies among others) with the information needed to improve the delivery of Built Environment degree apprenticeship training programmes during a disruptive event Covid-19. Second, the identified strategies for minimising the impact of covid-19 on the delivery of the built environment degree apprentice programme provide a focal point for all stakeholders to improve the delivery in this uncertain time.

Although the study is based on a single case conducted in a UK higher education, it could be adopted and serve as a lens to direct future improvements to apprentice training programmes during a disruptive event such as covid-19 in other countries. Degree apprenticeship is now receiving more attention in different parts of the world due to the increasing need to fill the skill shortage gap in the construction sector. This means the evidence presented in this study could provide insight on how to manage the programme during a disruptive event such as a pandemic. This study is limited to a single case study as such the findings cannot be generalised. Future study could use multiple case study and do cross case study analysis to gain more insight into the phenomenon. Future study could also explore the impact of other disruptive events on learning and teaching.

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