# Information Technology in the World of the Educational Psychologist

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## Contents Page

**Abstract**

Purpose:

This thesis explores information technology (IT) use amongst educational psychologists (EPs) in the United Kingdom, specifically the IT used with and recommended to children and young people (CYP), the availability of devices, and how information is shared with service users. Factors that could influence IT use were also explored, including EPs' personal variables (age, demographics, disability), service variables, comfort levels with IT, and the impact of COVID-19. Bronfenbrenner's ecosystemic theoretical framework was used to conceptualize IT use amongst EPs.

Methods:

A mixed-methods research approach was used to analyse the data. Quantitative research surveys were administered and collected across two phases (before and after March 2020); 65 EPs completed the first survey and 37 completed the second. Qualitative data were also collected in two phases and involved in-depth interviews with three EP innovators to explore the enablers of IT usage and 10 further interviews to explore IT use after the COVID-19 lockdown.

Results:

The results indicate that EPs employ IT most frequently in their administrative tasks. Most EPs do not have access to IT-mediated assessments, whereas many frequently use IT to score assessments. Service factors were additionally found to influence IT usage, including senior leadership's openness to IT and the compatibility of IT with the EP service. Senior leadership impacts the frequency of IT use, availability of up-to-date devices, IT usage policies, availability of IT-mediated assessments, and time allocated to explore IT and develop competence. Planning by senior leadership was often related to comfort levels with IT. Since COVID-19, there has been a shift in the use of videoconferencing to communicate with service users and other EPs. EPs reported that videoconferencing was efficient for some meetings in terms of time spent travelling and flexibility for working parents. This research also found that remote working can negatively impact mental health; however, it is moderated by social networking and opportunities to gather virtually as a

team. Most EPs do not use any IT with CYP directly. EPs most often recommend IT to support CYP's literacy development, mental health, and augmentative and alternative communication. EPs frequently utilize laptops and smartphones in their practice for administrative tasks and communication. Availability of devices influences the frequency of usage; self-employed EPs frequently employ tablets, whereas EPs in other services reported not utilizing them.

Implications:

EPs must be supported to effectively utilize IT by being provided with the appropriate devices (and resources) and allocated time to learn and experiment with IT. Services must audit IT skills within teams and available resources. Additionally, services must develop IT use policies that enable an open exchange of ideas and new ways of working. CYP will utilize IT in their schooling and future work and will need to be supported to ensure that they have access. There are currently no resources or training for EPs on IT use. As such, it might be premature to explore how the availability of technology impacts IT use when very few EPs are using IT directly with CYP. This thesis seeks to begin the discourse on IT use in the hope that EPs and trainee EPs will continue to explore the role of IT and its potential for evolving practice.

## Impact Statement

The current study is one of the first in the United Kingdom to explore educational psychologists' (EPs') use of information technology (IT) in their practice with children and young people (CYP). The study took a mixed-methods approach to explore the factors that influence IT use. IT has been an often-overlooked aspect of EP practice; however, the impact of this topic became significant when restrictions to face-to-face work due to COVID-19 arose. This situation highlighted the need to advance EP practice, and this research is a starting point for EPs, policy makers, and senior leadership. The study highlighted that the availability of up-to-date IT and senior leadership attitudes and policy had the most significant impact on the usage of IT. Senior leadership who were identified as being supportive of IT use, in particular during COVID-19,

- Identified IT "experts" within the educational psychology service to guide and support other EPs. This included working groups or creating a specialist role for which time was allocated and protected for research and disseminating IT in practice.
- Provided opportunities to walk through new IT platforms as a team.
- Conducted an audit of EPs' training needs.
- Responded to EP requests for digital resources.
- Were open to opportunities and requests by EPs for different ways of working.

Teaching EPs about IT and its usage is important not only for evolving practice to ideally utilize the resources currently available but also for raising awareness about the ethical implications of using IT in practice. It is also important to empower EPs to evaluate the safety of programs they are employing in terms of information governance and data protection to ensure that service users' information is protected. This study has hopefully begun the discourse on IT use within the profession and supports EPs by providing a reference list of the tools that EPs are employing in their practice. There is also a need for more independent research on IT-mediated and virtual assessments in EP practice and how they can be better designed to meet EPs' needs whilst also considering CYP's views.

### *Information Technology in the World of the Educational Psychologist*

Humans are currently living in a digital age in which information technology (IT) has been integrated into almost every aspect of life. IT is defined as the use of physical devices (e.g., laptops, computers, smartphones, and tablets) to "create, process, store, secure and exchange all forms of electronic data" (Rouse, 2015). IT offers many advantages, such as improvements in productivity and efficiency by supporting individuals and increasing their output by reducing the time needed to conduct basic tasks (Albus, 2003). Technology skills are also necessary for work; those who are unable to remain abreast of or utilize new technologies are forcefully or voluntarily excluded from their jobs – a phenomenon known as *the digital divide* (Stewart, 2007).

IT is also a tool to support necessary and positive change (Serdyukov, 2017). The COVID-19 pandemic has impacted every aspect of society, including education, health care, employment, and communication, and IT has been a necessary tool in facilitating communication (Dwivedi et al., 2020). Many countries, including the United Kingdom, enacted nationwide lockdowns to reduce the spread of COVID-19. The virus has caused over 100,000 deaths in the United Kingdom and 2.5 million deaths globally (Worldometer, 2021).

In the United Kingdom, on March 18, 2020, schools, colleges, and early-years settings were ordered to close until June 1. All children and young people (CYP) returned to schools and colleges in September 2020; however, schools and other settings were again asked to close on January 4, 2021 (GOV.UK, 2021a), until March 8, 2021 (GOV.UK, 2021b). School closures have impacted CYP globally, with approximately 80% of students affected (Van Lancker & Parolin, 2020). With all these changes, research has already demonstrated that COVID-19 has impacted CYP's mental health and well-being, with increasing rates of anxiety, trauma, and grief (Golberstein et al., 2020; Prime et al., 2020; Salerno et al., 2020; Song et al., 2020).

Lockdowns have impacted CYP with disabilities significantly because they have not been able to access the face-to-face (FTF) support and provisions to which they would otherwise have been entitled (Brandenburg et al., 2020). CYP with education health and care plans (EHCPs) and those

with special educational needs (SENs) are more likely to be eligible for free school meals (GOV.UK, 2020). In the United Kingdom, it was found that when children were educated remotely, those who received free school meals in single-parent households and those whose parents had lower educational levels exhibited lower levels of home learning (Bayrakdar & Guveli, 2020). Research has already indicated that CYP from lower socioeconomic backgrounds suffer more, both academically and emotionally, during school breaks, and there are concerns that the implications of missing school will be worse for this group (Alexander et al., 2016; Cooper et al., 2016; Dooley et al., 2020).

IT is an integral part of managing day-to-day activities for the educational psychologist (EP). EPs globally have been affected by COVID-19, with a rapid shift to teleconsultations as the primary means of remaining in contact with schools, families, and CYP during lockdowns (Song et al., 2020). Since the COVID-19 pandemic, digital offerings for many industries have increased at a rate that would normally take 7 years, with many industries at least temporarily offering virtual services and remote working to meet the new demands placed upon them (LaBerge et al., 2020). The reasons for this rapid digitization include increases in remote working and changing needs and expectations of service users. Another important factor is that digitization was not a priority for senior leadership previously; however, it became a priority when it was the only solution for continuing to work (LaBerge et al., 2020).

Prior to COVID-19, EPs' IT usage could be broadly placed into the following categories: communication, accessing resources, supporting interventions, scoring and report writing, and offering professional development (Cummings, 2012). According to Florell (2014), the three most significant innovations that affect school psychologists (the U.S. equivalent to EPs in the United Kingdom) are tablets, cloud computing, and online communication between school psychologists (Florell, 2014). Technology developments arose as a critical theme in an analysis of interviews exploring current research and practice in school psychology amongst 46 school psychologists across Japan, Hong Kong, South Korea, Thailand, and Taiwan (Brown et al., 2016). Minor themes found within the central theme of technology development included Internet psychology and technology

addiction (referring to personal devices and online gaming), as well as the usage of technology in schools to support students' learning (the smallest subtheme; Brown et al., 2016).

Telepsychology has expanded at an exponential rate during COVID-19. Telepsychology includes the use of virtual communication to provide psychological services remotely (American Psychological Association [APA], 2013). The practice has similar effectiveness to FTF methods and is a feasible method to deliver services to a wide variety of individuals (Backhaus et al., 2012; McCord et al., 2020). Before COVID-19, psychologists might not have had a favourable view of telepsychology, reporting that a barrier to its usage is the loss of nonverbal cues. In 2017, 80% of 1,791 psychologists surveyed in the United States did not employ any form of telepsychology (Pierce et al., 2020). Within the psychological context, teletherapy has reduced barriers due to geographical distance by reducing the time needed to travel, thus increasing the reach of psychologists to individuals in remote areas, as well as those who are difficult to reach due to disabilities and mental health conditions (Elford et al., 2001; Pierce et al., 2020). As a result of the COVID-19 pandemic, psychologists around the world (including EPs) have had to expand their services to include telepsychology in response to restrictions on FTF work (Callahan, 2020). One clinic described how a training programme for clinical psychology doctoral students had 8 days to transition to fully online services (Scharff et al., 2020). During the lockdowns, many psychologists were left with the option of waiting until FTF assessments could be resumed or using telepsychology to complete assessments and collect information to provide advice and meet statutory duties (Stifel et al., 2020).

Technology has become increasingly incorporated into the competencies of EPs in countries such as Australia and the United States. However, in the United Kingdom, training EPs in technology was only mentioned once in the standards for the accreditation of doctoral programmes in educational psychology (British Psychological Society [BPS], 2017). The National Association for School Psychologists (NASP) in the United States specifically mentions technology in over 15 instances in its standards for school psychologists' graduation preparation (NASP, 2010). These include employing technological resources to support data collection, measurement and evaluation

of research outcomes, and interventions to support effective practice. Trainees should also demonstrate the skills to utilize technology resources to promote "academic outcomes, learning, social development and mental health" and "to enhance a child's cognitive and academic skills" (NASP, 2010). However, despite this, it was reported that the training school psychologists received in the United States concerning supporting individuals with Autism spectrum conditions and intellectual disabilities was "minimal at best and non-existent at worst" (Ayres et al., 2013).

IT is a tool to enhance individuals' cognition and communication and to "transcend the limitations of their minds" (Jonassen, 2009; Roco & Bainbridge, 2003). Assistive technology (AT) refers to technology developed to give disabled individuals more independence, improve their quality of life, and increase their access to work (House of Commons & Work and Pensions Committee, 2018). AT once meant clunky technology that was difficult to use and was designed for specific sensory impairments. However, now that advancements occur rapidly, AT is moving from a specialty to the mainstream. In other words, new technology already developed contains built-in accessibility features, such as screen readers on smartphones (WAIS, 2018). In the classroom, this means that technology can be utilized to support students with primary functional tasks (Scherer & Craddock, 2002). Research on AT that focuses on text readers has found that reading pens and text-to-speech software improve reading fluency and comprehension in students with specific learning difficulties (SPLDs; Lange et al., 2006; Schmitt et al., 2011; S. G. Wood et al., 2018). The implications of AT in learning allow the support provided to students to be customized and adapted to meet their specific needs, which allows adults to retreat instead of being present on a one-to-one basis, thus increasing students' self-efficacy (Ayres et al., 2013). This is particularly pertinent as the number of EHCPs continues to increase (Department of Education [DOE], 2018a) and the number of learning support assistants (LSAs) continues to fall (DOE, 2018b). Research on one-to-one support has also found significant negative correlations between the hours of LSA support a student receives and academic outcomes (Waddington & Reed, 2017).

AT is often discussed in governmental legislation and is a legally protected component in access to work and removing barriers in the workplace for adults with SPLDs; however, there is no such legislation for CYP. CYP with sensory impairments often have AT provided by the sensory teams or specialist teachers. However, a child with learning difficulties is often unable to access such resources (Becta, 2009). EPs are often the first-line practitioners after special educational needs coordinators (SENCOs), who become involved with children suspected of having SPLDs. If EPs do not have knowledge about AT support for a child's cognition, learning, and social-emotional development, then who will?

In the United Kingdom, IT is increasingly important, and it is now essential in the work that EPs conduct, both in the management of their daily lives and in their work with CYP; however, little is known about how IT is utilized. The topic of this thesis developed as I was observing classes where students were not able to access any written material without the support of other students or teachers. This can easily be rectified with access to a device (laptop or tablet) onto which worksheets can be uploaded. The student would then be able to use built-in text-to-speech software to access learning material without any support. This technology mediated solution is particularly salient to our work as EPs, and I have personally used IT myself to overcome challenges when I encountered obstacles in my learning. Additionally, my own experience before COVID-19 across two local authorities (LAs) and through discussions with colleagues revealed that IT is was not discussed amongst EPs. Discussions with colleagues often led to more questions and curiosity about what others were doing, which was the impetus of this study. This thesis aims to address the gap in the literature by exploring primarily how EPs are utilizing IT in their daily lives, as well as the enablers of and barriers to IT usage for EPs in the United Kingdom.

## *Literature Review*

### *Purpose and Aim of the Review*

A literature review was conducted utilizing Google Scholar and the University College London (UCL) Explore database. The key terms explored were *technology (including terms such as camera, smartphone, tablet, laptop), school psychologist,* and *educational psychologist* across both international and U.K. contexts. The literature was explored to gather information on the enablers of and barriers to IT usage in other contexts, including education, as there is currently no available literature exploring the enablers of and barriers to IT usage amongst EPs, which was then included in the context chapter and related to Bronfenbrenner's ecosystemic model.

### *The Usage of Information Technology Amongst Educational Psychologists*

There are currently different examples of sustained technology use, both in the United Kingdom and internationally, most of which come from the United States. Research in the United States has primarily focused on telepsychology, videoconferencing (VC) during consultations, training school psychologists, and best practice guidance. In the United Kingdom, video interaction guidance (VIG) is prevalent. Two additional applications of IT in the United Kingdom include online platforms for precision teaching and the usage of IT by an EP training provider to facilitate problem-based learning (PBL).

### *Telepsychology*

Telepsychology has rapidly increased due to COVID-19. Whilst there has been no published information on telepsychology use amongst U.K. EPs, there has been fairly recent guidance by the Division of Clinical Psychology (DCP) on the use of VC with CYP (DCP, 2020a, 2020b). Previously, many psychologists held negative views on telepsychology use due to fears about its impact on communication dynamics (Perrin et al., 2020). Within the psychological context, teletherapy has diminished geographical barriers by reducing the time needed to travel, thus increasing the reach of

psychologists to individuals in remote areas, including those who are difficult to reach due to disabilities and mental health conditions (Elford et al., 2001; Pierce et al., 2020).

VC refers to the use of devices (mobile phones, tablets, and computers) connected to the Internet to facilitate meetings between two or more individuals (Denstadli et al., 2012). Amongst school psychologists in the United States, VC has been employed to facilitate consultations. The decision to utilize VC has been based on distance, the severity of the case or problem (less likely for complex cases), and the consultee's ability and comfort level (Schultz et al., 2018). Research conducted by Fischer et al. (2016, 2017) demonstrated favourable comparisons between VC and FTF consultations on indices for problem identification utilizing analysis, records, and questionnaires. The comparisons were conducted by interviewing 60 school teachers; each teacher conducted one VC and one FTF consultation (Fischer et al., 2016, 2017). However, a limitation of this research is that the consultations' outcomes were not explored, and only quantitative measures were applied to measure acceptance of using VC.

Telepsychology has also been used for parenting interventions (Riegler et al., 2020). Fogler et al. (2020) adapted an existing three-session parenting intervention for parents of 20 children aged 5–11 who were newly diagnosed with attention deficit hyperactivity disorder. The sessions were delivered remotely in three groups due to COVID-19 restrictions. The study found no differences in the content delivered or parent satisfaction. They found an increase in parents' participation (those in two-parent households) in the sessions: 88% compared with the previous 45%. Qualitative feedback from parents revealed that they found the sessions convenient because they did not have to worry about commuting or childcare arrangements. The largest number of comments referred to challenges due to technical difficulties, such as connection issues. Parents additionally spoke about difficulties building rapport and being honest about sharing personal issues in what might have been an impersonal space (Fogler et al., 2020).

***Tele-assessment***

Administering, scoring, and interpreting cognitive assessments is one of the core competencies of EPs (Clark et al., 2017). Since COVID-19, EPs have been in a difficult position; delaying assessments would inevitably delay access to special education and associated provisions (Farmer et al., 2020a). However, concerns have been raised about conducting virtual assessments, as EPs have not received training that would allow them to claim competence in employing tele-assessment techniques. There are also concerns about norms of assessments, as they were not standardized to be utilized in this situation (COVID-19) or for remote delivery (Farmer et al., 2020a).

Stifel et al. (2020) conducted a systematic literature review on the use of tele-assessments with CYP. They found six studies that had explored the use of tele-assessments with CYP. For most of the assessments, the literature review found no significant differences between FTF assessments and those conducted virtually. However, processing speeds were higher when they were administered virtually. A limitation of the studies is that they utilized between-subjects designs, and they could not conclude whether CYP performed differently based on the type of assessment (Stifel et al., 2020). Research on the use of tele-assessments with adults found that, overall, conducting assessments virtually did not have a significant effect on scores compared to FTF assessments on verbal measures (Brearly et al., 2017). However, more research is needed to evaluate whether the generalizations made from tele-assessments with adults can be applied to CYP (Farmer et al., 2020a).

Hodge et al. (2019) conducted assessments of reading difficulties in 33 children aged 8–12 with learning and attention difficulties who were referred by their schools. They applied a within-subjects design. Assessments were performed via a telehealth platform by six psychologists and occurred at a designated centre with the necessary equipment available. An FTF psychologist was also present, and both the online and FTF psychologists scored the assessment simultaneously to avoid test–retest effects. The Wechsler Intelligence Scale for Children (WISC-V) assessment was administered, and, with permission from Pearson, digitized by scanning the materials. This

assessment included nonverbal subtests utilizing a split screen consisting of two cameras, one directed at the child and another to document the block-design activity. Children found the interactive touch screen intuitive and were motivated to perform the assessment; consequently, 91% of the children and psychologists reported enjoying the virtual format, and 6% reported that they did not enjoy the technology, although there had been issues with the Internet connection in this group. Furthermore, 84% of psychologists reported that virtual assessments did not impact children's performance, whereas 16% (*n* = 3) of psychologists believed that virtual assessments influenced children's performance, which included two instances in which it was believed that technology had a positive impact and one instance in which it had a negative impact. There were no significant differences in behavioural presentation between children assessed virtually compared with FTF. Hodge et al. (2019) concluded that tele-assessment is a feasible solution to conduct assessments remotely. However, the sample size was small and might not generalize to a larger population. The study also did not explore differences across the psychologists and their comfort levels and only looked at one group of children.

Wright (2020) additionally explored the equivalence of in-person and remote administration of the WISC-V assessment; 256 CYP aged 6–16 participated in the study. However, the sample did not include CYP with hearing, vision, or physical impairments, and participants were not screened for any learning difficulties to maintain generalizability. This was a case-control study. Participants were assigned to either traditional or remote assessment conditions. The authors did not clarify whether *traditional* meant paper-based tests (PBTs) or technology-based tests (TBTs); it would have been useful to compare all three forms of assessment. Data were collected between December 2019 and April 2020. In-person data collection was halted due to COVID-19. During remote administration, proctors (nonspecialists) were available on the participant side to support with technology as well as provide physical items (blocks, response booklets) and supervision. When they were not needed for a task, the proctors were instructed to sit at the back of the room to ensure that they did not impact the CYP's responses. For remote administration, stimulus materials were

presented via PDFs by Pearson that were made accessible to psychologists during COVID-19. Wright (2020) found low to moderate correlations for all subtests. A two-one-sided test was conducted to determine whether there were statistically significant differences between the traditional and remote scores on the WISC-V assessments. Apart from the letter–number sequencing subtest, all the confidence intervals for the two-one-sided tests were not significant. On the letter–number sequencing subtest, scores were significantly higher for in-person assessments (Wright, 2020). However, research has not yet concluded that the digital versions of assessments meet equivalency (Krach et al., 2020).

### *Technology-Based Tests*

Q-interactive, a platform developed by Pearson, has been the most promising addition to the cognitive assessment world. Q-interactive offers digitized versions of assessments frequently utilized in EP practice (Na & Burns, 2016). The digitized format takes advantage of the efficiency, accuracy, and accessibility that IT provides whilst maintaining the interaction and presence of a skilled examiner and examinee (Wahlstrom et al., 2016). Two iPads are used: one for the examiner and one for the test taker. These iPads are connected via Bluetooth, and once the information is downloaded onto the iPad, Wi-Fi is not needed to administer the assessment. With this format, an administration manual is no longer needed, as items are presented one after another, and they display instructions for start points, stop points, and reversals. Additionally, it prompts examiners to ask questions after a certain amount of time has passed. On multiple-choice responses, such as matrix reasoning, participants select their responses on the touch screen. Additional features include on-screen timers, voice-recording features for assessments that require verbal responses, and a note section that allows examiners to write behavioural observations via the iPad. All responses are also automatically scored at the end of the assessment (Clark et al., 2017). The advantages that Q-interactive provides include automating the assessment scoring process, reducing time needed for testing, and providing real-time feedback to clinicians (Wahlstorm et al., 2016). Clark et al. (2017) found that the Q-interactive platform eradicated computation, start-discontinue,

and reverse errors. Not recording a response was still common, even with Q-interactive, but Q-interactive flags when these errors occur (Clark et al., 2017). However, a significant limitation of this research is that it only considered the experiences of two trainees from a clinical psychology doctorate and the experiences of the authors. No information is presented about the statistical methods used. Nevertheless, it provides interesting insights and comparisons of the Q-interactive platform versus paper-based assessments

Pearson is one of the few platforms offering TBTs (Krach et al., 2020). One of Krach et al.'s (2020) main criticisms is that, at the time of writing, there had not been any independent research to explore the usage of assessments offered by Q-interactive or their equivalency to PBTs. The research often employed nonclinical samples and norms from PBTs. Krach et al. (2020) conducted an independent analysis of the Peabody Picture Vocabulary test, one of the assessments available on Q-interactive. The study included 117 students who had a mean age of 4.6 years. Approximately 50% received both PBTs and TBTs, 38% received TBTs only, and 5% received PBTs only. Data collected were evaluated following equivalency guidelines established by the APA (1999) for the usage of computer-based assessments. To follow the guidelines, three conditions needed to be met: equivalent rank order of scores, equivalent means, and equivalent score distributions (Krach et al., 2020). Equivalency standards were met for equivalent score distributions but not for equivalent rank order of scores. On three of 18 subtests, there were statistically significant differences between the tests; however, according to the technical guidelines by Pearson, these were not practically significant (Krach et al., 2020). When the equivalency standards are not met, CYP's scores might be over- or underreported, and the implications affect decision-making about the type of education funding and interventions they receive.

The solution for educational psychology is not to have a fully computerized assessment battery, as it is the observations and experiences of CYP during the assessment that provide valuable insights, in addition to the assessment results. Technology is useful for calculating, storing, and retrieving information (Jonassen, 2009). Many EPs also use online scoring, which is becoming

increasingly available for many cognitive assessments. These are more efficient, reducing the time taken to manually score the assessments and increasing accuracy (Jonassen, 2009). Computer scoring reduces computation errors by 37% and represents a situation in which technology can have a positive impact (Loe et al., 2007). However, it is also likely that the wrong numbers can be entered when using online scoring, as this is still susceptible to human error.

***Video Interaction Guidance***

VIG utilizes video recordings of an interaction followed by guided reflection to look for successful moments in the interaction (Kennedy, 2011). It was developed in the Netherlands to utilize with families to support better interactions and attachment between parents and their infants (Silhanova & Sancho, 2011). Subsequently, video clips of the interaction are reviewed with facilitators and discussed to identify what elements of the positive interactions were successful (Kennedy, 2011). The research published by EPs in the United Kingdom has focused on employing VIG in the following circumstances:

- As a tool to support the results of a dynamic assessment for teachers, children, and their parents (Landor et al., 2007)
- As an intervention to support LSAs with behaviour management (B. Hayes et al., 2018)
- To support parents in developing their skills and attunement with their children (Feltham-King, 2010; Taylor, 2016)
- As a way to gather children's voices and support them with increased understanding (Gibson, 2014; McKeating, 2018)
- As a method to support trainee EPs (TEPs) in developing consultation skills and peer supervision (Murray & Leadbetter, 2018).

However, almost all the literature on VIG, whether published or unpublished, is limited due to poor methodology, the number of participants included, and the lack of data on the intervention's impact. Notably, VIG is the most widely used intervention amongst technology

published in the literature, despite limited evidence supporting its usage. VIG is included in the BPS guidelines to support the development of specialist therapeutic competence for trainees (Dunsmuir & Leadbetter, 2010) and is incorporated into EP training programmes. One of the reasons VIG is viewed as an effective tool to support TEPs is that the complex cognitive demands placed on the trainees often cause them to forget the positive and successful instances in the interaction (Murray & Leadbetter, 2018). In this instance, the technology is assistive and serves to compensate for the additional cognitive load.

### *Usage of Information Technology as an Intervention With Children and Young People*

There has been limited research published that explores the outcomes of IT-mediated interventions by EPs in the United Kingdom and internationally. One of the few examples of EPs utilizing IT as part of an intervention is a web-based precision teaching programme developed in collaboration between UCL and Kent Educational Psychology Service (Sound Progress, 2017). This programme was designed to be utilized by LSAs with children as part of a precision teaching intervention. This intervention supports students by dividing learning tasks into smaller tasks in which progress can be tracked and recorded (Polson, 2021). Many EP services (EPSs) deliver training in precision teaching; however, implementation rates are reported to be as low as 20–25% (Killerby, 2015). Seven schools were involved in the trial by Sound Progress (2017); data were collected from 49 students who had not been making progress in their reading and who participated in the 8-week intervention. They found significant improvements in participants' decoding skills. However, their findings reveal higher implementation rates, with 49 of 58 children involved in the study completing 80% of the intervention and improvements in Test of Word Reading Efficiency assessment scores by five standardized points (Hayes et al., 2018). Staff reported that the children enjoyed the website. Facilitating factors for programme implementation included clear strategies, graphing, and data, which tracked and monitored students' progress. Barriers to implementation included difficulties with hardware, display problems, and other factors, such as absences and trouble identifying the correct starting point (Sound Progress, 2017). However, this research did not consider students'

perspectives. Staff feedback was gathered through a questionnaire that was not published. Nevertheless, it is a promising indicator of how universities and LAs can create research partnerships. These networks allow ideas and information to flow between researchers and practitioners in a dynamic exchange (Cummings, 2011).

In another intervention conducted in the United States, school psychologists evaluated the effects of utilizing text-to-speech technology as part of a listening-whilst-reading intervention on reading comprehension (Schmitt et al., 2011). Twenty-five students participated; they were in Grades 6, 7, and 8 and were already in a remedial reading programme. There was a control condition that included students who did not receive the intervention, as well as an experimental condition. Results revealed no significant differences across the conditions. A limitation of the study is that little was known about the students. It cannot be ruled out whether the students had preexisting language difficulties, which could have contributed to finding no significant difference (Schmitt et al., 2011).

### *Usage of Information Technology in Training Programmes*

Many training programmes employ IT to share student outcomes and programme information, facilitate supervision, store electronic portfolios, and share placement logs (Prus & Strein, 2011). In a review of 63 school psychology training providers in the United States, 32–35% of institutions utilized technology to deliver their programmes (Hendricker et al., 2017). Half of the course directors interviewed also reported delivering online training to students.

In response to a shortage of school psychologists in Colorado, a distance learning programme called *Giving Rural Areas Access to School Psychologists* was developed to train more school psychologists (Lahman et al., 2006). The curriculum was delivered through a technology-based approach, which utilized VC as well as activities delivered online and through listservs. The curriculum was spread over 2 years with an additional year for an internship. Lahman et al. (2006) interviewed eight graduates of the programme to gather their views about their experiences and evaluations. Many of the school psychologists enrolled in the programme because they needed to

work full time. All the school psychologists worked in rural communities, and their desire to join the programme was so they could stay in their communities. Many were unable to relocate due to family, work, and financial obligations. The programme allowed the school psychologists to work full time (five of the participants worked as school psychology assistants). Participants reported having positive experiences with material that was directly relevant to their practice in the field. They enjoyed the flexibility and the relationships they developed with the professionals in the course. However, the disadvantages were related to technology, connection issues, and the course's condensed nature, which was demanding when combined with working full time. Participants felt that remote learning affected the sense of community between staff and participants (Lahman et al., 2006).

Another application of technology in the EP field is a platform utilized by an EP training provider (Bozic & Williams, 2011). This case study evaluated the use of an online platform to facilitate training for TEPs in PBL at the University of Birmingham. PBL was initially utilized in medical schools across the United Kingdom and internationally. In this method, students are assigned a scenario – a problem case – and provided with guiding questions to explore. These are discussed in groups, and then students independently explore the learning objectives that are co-constructed. These are then shared with the group (Wood, 2003). PBL is utilized by EP programmes, such as the Institute of Education (IOE, 2019). The University of Birmingham offered PBL through a blended learning experience in which technology was included as an adjunct to FTF teaching to facilitate continued interaction between TEPs during their placements. The research was descriptive and offered a concise guide for introducing this method in other EP programmes. System usage statistics were employed, which allowed for the analysis of online activity by TEPs. Information was additionally collected through an anonymous questionnaire with open-ended questions. The researchers found that TEPs spent more time checking the forum than posting. The themes found through the survey's open-ended questions were that TEPs enjoyed the convenience of this form of learning and having time to reflect on what they wanted to say. It was reported that 70–80% of the

trainees had a positive experience. There was an increase in the number of postings for the second PBL (total posts = 56; average = 5.1 postings per TEP) compared with the first (total posts = 23; average = 1.9 per TEP). Their interpretation was that the type of task for PBL2 was different, as participants were asked to assume a more proactive role. However, the increased number of postings between PBL1 and PBL2 could indicate that TEPs' comfort with this new technology had increased. It was additionally reported that some TEPs would have preferred to use emails instead of the forum. This could indicate that the TEPs were more comfortable with and accustomed to utilizing emails rather than forums; furthermore, it could explain the increase in postings on the forum between the first and second PBLs. However, neither conclusion can be supported, as there is insufficient data over an extended time to determine whether the content or comfort levels had the greatest impact. Another limitation is that the research did not consider tutors' perspectives or experiences of utilizing the online PBL; throughout both PBL1 and PBL2, tutors only posted twice. More research must be conducted to determine whether EP practice is influenced by the training provider and staff's digital literacy. In research conducted by Hendricker et al. (2017), amongst the 50% of course directors who delivered online training to students, only 20% felt that they had received appropriate training themselves. This suggests that staff training in IT could be a broader issue that should be considered and might be a possible barrier for EPs.

***Conclusion***

Although the world is becoming more technological, there appears to be a gap between EPs who work in schools with CYP and IT usage. During COVID-19, IT has been utilized to continue to provide psychological services and to maintain communication and contact with service users during nationwide lockdowns. VC, in particular, has been an important facilitator for providing teletherapy and tele-assessments (Farmer et al., 2020a). However, although tele-assessments might be viable in the future, legal and ethical ramifications are associated with the decision to administer assessments remotely; research to date on tele-assessment features methodological flaws and small sample sizes (Farmer et al., 2020a). EPs are increasingly employing technology-assisted tests, such as Q-

interactive. However, concerns remain about equivalency for PBTs, which are at risk of being impacted by methodological errors (Clark et al., 2017; Loe et al., 2007). Additionally, universities are increasingly utilizing IT in training EPs, including training in consulting with VIG (Murray & Leadbetter, 2018), sharing course outlines, and delivering online learning opportunities (Hendricker et al., 2017). However, the research is limited regarding how IT is applied, what constitutes the evidence base for IT-mediated interventions, and how EPs are trained to practise in the digital age. The limited information and research available on EP IT usage could be a result of the barriers within the systems in which EPs operate, as well as how they are trained.

Research into current patterns of usage is important because IT is a cognitive tool (Jonassen, 2009) that offers increased reliability, efficiency, communication support, and equalization for those with additional needs. Cognitive assessments, which are viewed as a key task of EPs, are subject to human error and require a significant amount of cognitive skill to deliver. Research has found high error rates amongst trainees and professional psychologists in the administration of cognitive assessments (Clark et al., 2017), as well as the rate of errors in scoring these assessments (Russell, 2000). There is a potential role for IT to mediate the impacts of SPLDs, which could further confound assessments or pose additional challenges whilst eliminating errors (Clark et al., 2017; Russel, 2000).

## Conceptual Framework

This research is guided by Bronfenbrenner's (1998) ecological systems theory. This theory looks at complex processes and interactions between a person and their biopsychosocial environment through the dimensions of process, person, context, and time. Bronfenbrenner's model was developed around child development, whereby the child is influenced by different contexts they belong to, which take place within nested systems (Jaeger, 2016). The ecosystemic framework has also been used to explore children's IT use (Edwards et al., 2017; Johnson & Puplampu, 2008; Murphy & Beggs, 2003) and educators' IT use (Hatzigianni & Kalaitzidis, 2018; Rosen & Jaruszewicz, 2009). Edwards et al. (2017) explored the IT use of six children at home and school through an ecological lens. They mainly explored activity, time of day, and time spent using IT. They concluded that different settings impacted IT use based on the different goals of the setting. At school, the goal was mostly for children to learn through play, and based on this pedagogy, technology use in this setting was limited (Edwards et al., 2017). According to Murphy and Beggs (2003), the contextual environment influences internet use. Children who were given time to experiment with the Internet at home, had frequent access, and led their own learning learnt more than they did through teacher-directed learning in school (Murphy & Beggs, 2003).

The person, context, place, and time theory was chosen in this research, rather than earlier iterations of Bronfenbrenner's model. The earlier versions focused mostly on the context and did not look at biopsychosocial factors within the person that influenced their environment (Tudge et al., 2009). This was also a criticism by Bronfenbrenner of his earlier work (Bronfenbrenner & Morris, 1998). The quality of social networks is important, as such networks facilitate knowledge exchange. Christensen (2010) asserted that the model must consider how an individual interacts with their microsystem and macrosystem, for example, people who see opportunities compared with people who see obstacles. Although Christensen (2010) claimed that Bronfenbrenner's model does not take entrepreneurs into account. However entrepreneurship could be seen as a personal attribute, a force characteristic.

Although many studies claim to be guided by Bronfenbrenner's model, many do not commit fully to it, use it incorrectly, or only rely on the initial iterations of the theory (Tudge, 2016). Of 25 studies on child development that Tudge et al. (2009) explored, only four used the mature version of the theory. The problem is not necessarily the theory itself but the lack of studies that explore the core tenets of Bronfenbrenner's mature model and are rigorous in their methodologies and designs (Tudge et al., 2009). Tudge et al. (2009) further asserted that only examining interactions between personal variables and contexts across time is not enough to fully understand the interaction. Instead, longitudinal studies are necessary, which this study, by virtue of COVID-19, was able to do by exploring IT use across two points in time.

Hatzigianni and Kalaitzidis (2018) used Bronfenbrenner's ecological model, mainly focusing on microsystemic and mesosystemic factors (using the older iteration of the model) in early childhood educators' use of technology with their students. Data were collected through surveys of 203 early childhood educators and 28 interviews. The microsystemic factors explored mainly included personal attributes (although not categorized as such) of age, gender, qualifications, digital skills evaluations, confidence in using technology with children, and teaching pedagogy. The mesosystemic factors explored (although these are actually microsystemic factors) included devices used most frequently, the technology available, situations when technology was used most frequently, and training undertaken. The authors then explored the interactions between personal attributes and technology use (i.e., the mesosystem). They found associations between digital skills and hours of technology use with children. Teaching pedagogy was also found to influence digital skills and hours of technology use with children. Training to use technology was found to impact confidence in using IT with children (Hatzigianni & Kalaitzidis, 2018). Hatzigianni and Kalaitzidis (2018) acknowledged that more research was needed to explore the microsystemic factors of IT use. This research highlights the need for further exploration into the impact of technology on child development (one of the main concerns of early childhood educators) to address/challenge the beliefs that early childhood educators hold about IT use.

### *Proximal Processes*

Proximal processes are at the centre of Bronfenbrenner's model. Proximal processes describe the interaction between an individual and other people, objects, symbols, and their immediate external environment over time, resulting in a person's development (Tudge et al., 2009). The power that proximal processes have over development is mediated by personal characteristics, environmental contexts, and the time periods in which the interactions take place (Bronfenbrenner & Morris, 1998).

### *Personal Attributes*

Bronfenbrenner and Morris (1998) described personal attributes as being dispositions which initiate the proximal processes of a particular developmental domain (in this case IT use/skills) and sustain the process to continue. These are the social characteristics that either encourage or discourage reactions from other individuals that enable or act as barriers to the proximal processes taking place. These factors account for differences in the power and direction of the interaction between an individual and their context (Bronfenbrenner & Morris, 1998).

EPs influence, respond to, and react to the changes in their environment. Their phenomenological beliefs also influence their actions, such as what they believe about the system and their key role. Additionally, these are interpreted differently by each individual and result in distinct processes existing within the same setting (Darling, 2007).

### *Demand Characteristics*

Demand characteristics are factors that include biological characteristics of age, gender, and physical appearance. Research on the impact of gender on IT use has found women to be more anxious about IT use than men, which impacts their self-efficacy (EIGE, 2020). Gender differences were more apparent in intention to use new IT rather than actual use (Goswami & Dutta, 2016). This study focused on the characteristics of gender, age, and disability and mental health conditions.

AT is also discussed in governmental legislation. It is a legally protected component in access to work and removing barriers in the workplace for adults with disabilities under the Equality Act 2010 and is included in government schemes such as access to work, Disabled Students' Allowance, and the National Health Service (*Assistive Technology*, n.d.). Thus, it can be assumed that EPs who have disabilities and mental health conditions that might impact working could already be using IT to support them in their role.

***Resource Characteristics***

Resource characteristics are the bioecological resources that the individual possesses including ability, past experience, knowledge, and skill (Bronfenbrenner & Morris, 1998; Jaeger, 2016). Research has found that individuals with the lowest education levels and those with disabilities spend the most time on the Internet (van Deursen & van Dijk, 2014). Those with higher education levels and higher socioeconomic backgrounds reap the greatest rewards regarding accessibility of information and utilizing the Internet for personal development (Kalmus et al., 2011). However, those with the highest digital media skills have been the most self-reliant in acquiring new media and Internet literacy skills. Conversely, those who depend on support from friends and family have the lowest levels of Internet literacy skills (van Deursen et al., 2014).

The technology acceptance model (TAM) has been widely utilized to assess the factors that facilitate technology uptake (Granić & Marangunić, 2019). The TAM model focuses on the factors of perceived usefulness (the perception of how helpful new IT will be to an individual's efficacy in their work) and ease of use as mediators of technology uptake. Perceived usefulness and ease of use have been found to explain 40% of intention to use IT (Granić & Marangunić, 2019). Amongst school psychologists in the United States, Pierce et al. (2020) found that the TAM did not suit the usage of telepsychology amongst psychologists. Psychologists' beliefs about telepsychology and their perceptions of its ease of use had a stronger influence. Pierce et al. (2020) suggested that to

increase uptake, it would be important to focus on perceived norms of psychologists and that programmes should begin doing so in the training stage.

The resource characteristics explored in the study included comfort levels with IT, use of social media, access to learning/training opportunities, and use of IT with CYP and in EP practice.

***Force Characteristics***

Force characteristics are the social and emotional factors that affect behaviour and motivation (Jaeger, 2016). In this study, the force characteristics explored included innovativeness and views on the importance of IT in the EP role.

Innovation is an important factor in IT uptake. Technology is constantly changing and being refined as new, more efficient technology replaces older technology that quickly becomes obsolete (Kitchell, 1997). With this constant change, information about utilizing these technologies might not exist or might not be up to date with the latest developments. Thus, to effectively utilize new technology, experimentation must occur (Schunk & Pajares, 2010). Research on innovativeness reveals that more innovative individuals are often amongst the early adopters of new developments and innovations (Rogers, 2010).

Amongst teachers, innovativeness has been the strongest predictor of technology use in research (Van Braak, 2001). Innovativeness mediated the relationship between attitudes towards computers and the usage of technology. Factors involved in this determination include teachers' willingness to improve their teaching by utilizing technology and their perceived belief that technology is necessary to change education. Van Braak's (2001) findings are consistent with other research which has found that teachers' attitudes towards technology influence how they utilize IT in their classrooms (Hatzigianni & Kalaitzidis, 2018). However, when explored further, the attitudes towards computers had a more indirect relationship and were mediated by technological innovativeness. When the analysis controlled for teacher innovativeness, no effect was found for

attitudes towards computers. A causal relationship was also found between more positive attitudes towards technology and technological innovation (Van Braak, 2001).

### *Context*

According to Bronfenbrenner's ecological systems theory, an individual exists within an ecological environment in a nested system that includes the microsystem, mesosystem, exosystem, and macrosystem (Bronfenbrenner & Morris, 1998).

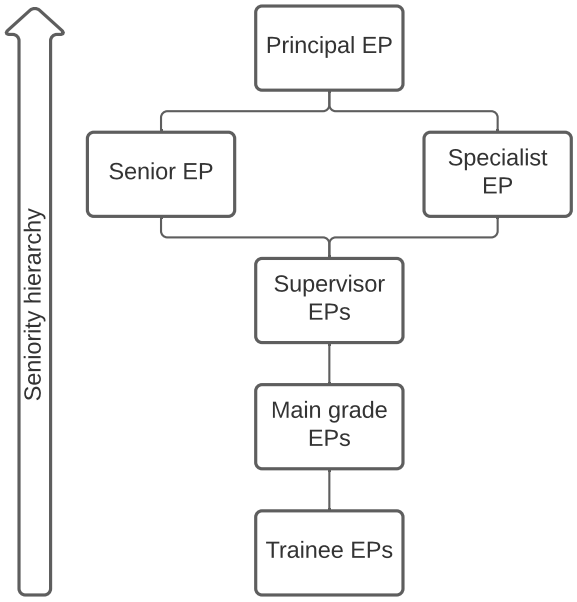
### *Microsystem*

The microsystem encompasses the environments of which a person is a member and aspects of the physical environments that invite exploration (Bronfenbrenner & Morris, 1998). This includes activities, roles, and interpersonal relationships. The personal characteristics are also implied within the microsystem to explain the power and direction of the proximal process with which an individual interacts over an extended period, in this case other colleagues, teachers, close friends, and SENCOs (Bronfenbrenner & Morris, 1998).

***Educational Psychologist Role.*** In the United Kingdom, EPs support and promote academic achievement as well as the emotional and social well-being of CYP from birth to age 25 (AEP, 2011). The EP role includes consultation, assessment, intervention, research, and training across different settings that support CYP at the individual, group, and systemic levels (Rumble & Thomas, 2017). In the United Kingdom, many EPs work in local authorities which operate within a hierarchical structure (shown in Figure 1) of seniority from TEPs to principal EPs (PEPs) who are at the top of the hierarchy and who influence the functioning of the educational psychology service (EPS; Prospects, 2021).

**Figure 1**

*Diagram Showing the Hierarchy of an Educational Psychology Service Within a Local Authority*




***Colleagues and Service Users.*** To develop IT skills, an individual must interact in reciprocal activities with another person (Bronfenbrenner & Morris, 1998). The acquisition of IT skills primarily occurs informally through friends, colleagues, or family rather than through formal instruction (van Deursen et al., 2014). In the International Computer and Information Literacy Study (ICILS, 2013), the environment was a key factor contributing to teachers' use of IT. IT was utilized more when teachers collaborated to discuss IT implementation, in addition to having access to technology (Fraillon et al., 2013).

**Availability and Access to Information Technology**. The quality of technology available and access to IT are important variables because technology needs to be available before users can develop the skills necessary to utilize it (Hargittai, 2010).

**Senior Leadership**. In the 1990s, IT usage became embedded in the world of work. Research from this period has found that the mindset and attitudes of managers and leadership influenced corporate innovativeness and technology adoption (Lefebvre & Lefebvre, 1992). Chief executive officer (CEO) factors that influenced technological innovativeness in the manufacturing industry at a

time when digitization was beginning to occur included age, educational background, familiarity with technology, tenure, and international work experience (Kitchell, 1997). It has been found that managers' characteristics influence technological adoption (Hottenstein & Dean, 1992); research has found that the mindset and attributes of CEOs are influential to corporate innovation and technology adoption (Lefebvre & Lefebvre, 1992). This could be a result of CEOs' influence on strategy and performance. Senior leadership's openness to technology adoption is influential in allowing employees to share information about IT usage with their managers and colleagues, thus facilitating an open information exchange (Hsu et al., 2019).

The microsystemic factors explored in this study included availability and access to IT, senior leadership views on IT, the EPS model, university training providers, IT training, and role.

***Mesosystem***

The mesosystem includes the interrelationships between different settings in which the individual is a participant. Hatziganni and Kalaitzidis (2018) surveyed 203 teachers and conducted focus groups to explore teachers' and leaders' views and technology usage in early childhood settings. They also explored the factors which influenced beliefs, attitudes, and teaching pedagogy. Training teachers to utilize technology with children has been found to be significantly correlated with utilizing technology in teachers' everyday practices ($r$ = 0.375) and also had a positive effect on their confidence in using technology (specifically tablets; $r$ = 0.375; Hatzigianni & Kalaitzidis, 2018). In the study, teachers rated themselves highly (73% rated themselves 7 on a scale of 1 to 10) on digital skills statements utilizing measures adapted from van Deursen et al. (2014). However, this was significantly different from their confidence in utilizing technology with young children, in which only 32% felt confident on the same scale. Confidence was influenced by personal beliefs, lack of training, and possible incompatibility with their teaching philosophy. Digital skills were significantly associated with the number of technologies used, as well as total time utilizing technology with

children ($r$ = 0.415). Two-tailed Pearson's correlation coefficient tests found moderate correlations between digital skills and hours of usage outside of work ($r$ = 0.395; Hatzigianni & Kalaitzidis, 2018).

### *Exosystem*

Events and decisions that occur in the exosystem directly influence the individual who is not part of this system (Jaeger, 2016; Sontag, 1996).

**Service Model**. The work that an EP undertakes is typically influenced by both within-service policy (e.g., whether a service is consultation focused) and external commissioners of EPSs, such as schools (Rumble & Thomas, 2017). In the educational psychology workforce survey (DOE, 2019) that was commissioned by the DOE, the researchers found that 85% of EPs work for local authorities in which they most often contribute to statutory EHC assessments (DOE, 2019). However, 93% of EPs reported they had more demands than they could meet due to increases in EHC assessment requests by local authorities. The increased demand means less capacity in many EPSs to focus on preventive work, including the ideal usage of IT to support CYP. Data were not available on the number of qualified EPs who work for private and local authority providers, although almost half of PEPs reported that some of their staff worked in private practice (DOE, 2019). Private providers offer an alternative because they offer greater flexibility, allowing EPs to perform more preventive tasks and work directly with EPS commissioners. This could also hypothetically mean that many of these services have the time and flexibility to offer intervention strategies or assessments that utilize IT.

**Government Legislation**. An important factor in the macrosystem involves legislation. In response to the stay-at-home orders which resulted in a nationwide lockdown on March 18, 2020, in the United Kingdom, IT use dramatically increased to connect people to their communities, educate children remotely, and facilitate virtual working (Dwivedi et al., 2020; GOV.UK, 2021a, 2021b; LaBerge et al., 2020). Previous research has found that IT adoption occurs because of an external pressure to change, despite how people feel about the change (Stewart, 2004, 2007).

### *Macrosystem*

The macrosystem encompasses the underlying beliefs of the system, such as culture, views, and pedagogy (Sontag, 1996; Tudge et al., 2009). Culture of work has been found to influence behaviour and thought processes around technology use in the workplace (Sang et al., 2010).

### *Time*

Time refers to the interactions between an individual and their environment within a specific period, across their life course (timing in a person's life; Jaeger, 2016). Changes that occur during historical time periods can impact an individual's development based on when they occur in their life course. The changes can either interrupt development or create new opportunities that enhance growth (Bronfenbrenner & Morris, 1998). This study will look at time by exploring the years an EP has been practicing and the EP's age to explore life course variables.

COVID-19 has caused a dramatic increase in digital offerings by many professions to accommodate for the new way of living caused by the restrictions in FTF interactions (LaBerge et al., 2020). The changes that resulted from the COVID-19 pandemic are historic. This study is longitudinal and will look at differences in IT use before and during COVID-19. Figure 2 shows a visual description Bronfenbrenner's process, person, context, and time model applied to EPs in the United Kingdom.

### *Research Questions*

1. How are EPs utilizing IT in their practice to support CYP?
    i. Did COVID-19 have an impact on IT use?
2. What factors influence EPs' usage of IT?

The factors explored include

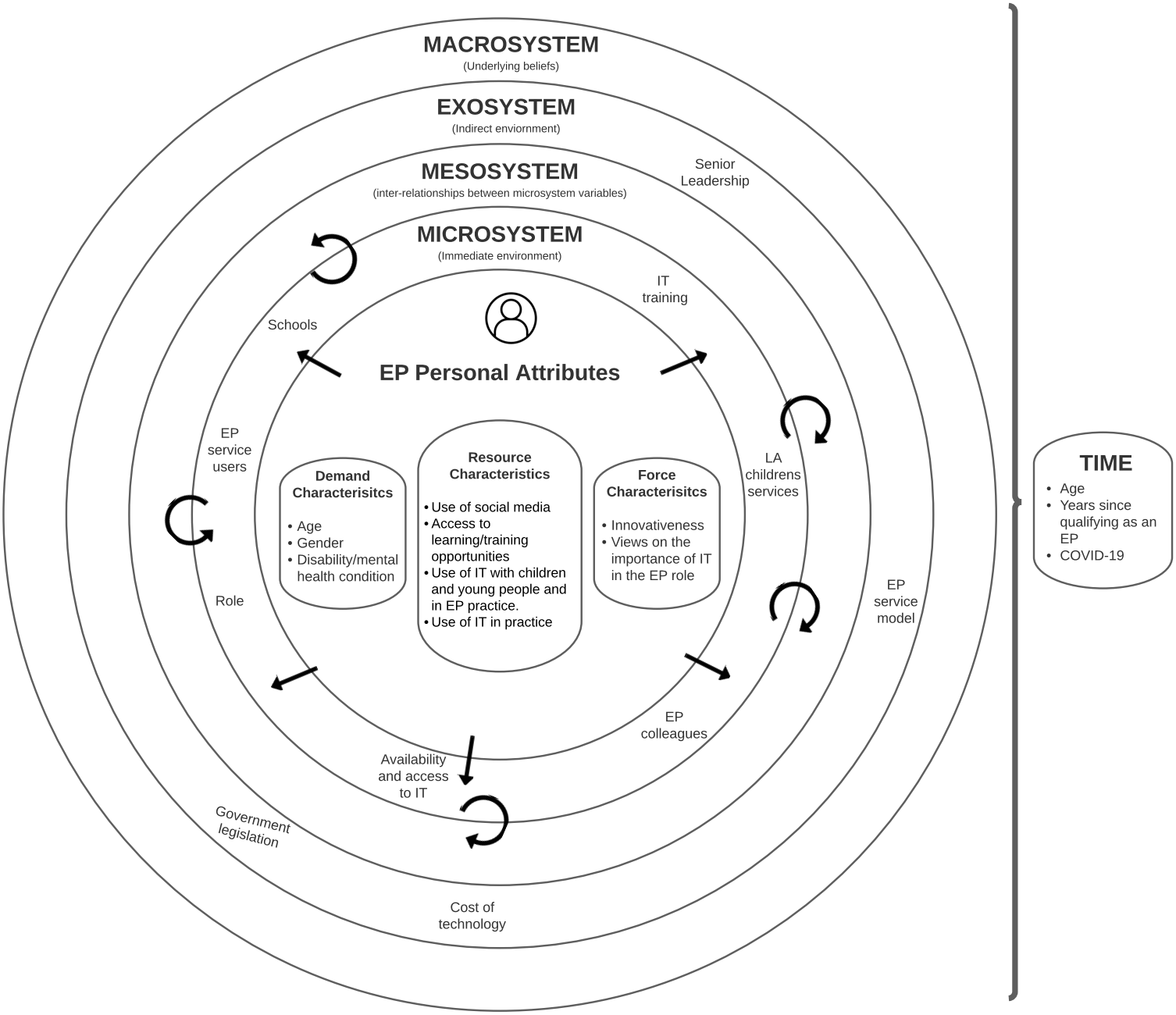
- Demographic variables (age, gender, and disability status)
- Personal variables (personal innovativeness in the domain of IT [PIIT], years since qualifying as an EP, perceived compatibility of IT with the EP role)

- Role and service variables (senior leadership team's [SLT's] openness to IT, compatibility of IT with service, and type of service)

3. What do EPs consider to be the enablers of and barriers to IT usage in their practice?

**Figure 2**

*Bronfenbrenner's Model Applied to Educational Psychologists in the United Kingdom*



## Methodology

### *Paradigm*

This research employs a pragmatic paradigm, as the emphasis is to explore the supporters of IT usage and innovativeness rather than being influenced by a particular philosophical stance. The pragmatic paradigm interprets reality as observable and measurable (positivist stance) and as a construct created when individuals experience and interact with their environment (constructivist stance; Alharahsheh & Pius, 2019; Brierley, 2017). Pragmatism centres the research on the methodology and research questions explored, as well as the positivist and constructivist stances (Brierley, 2017; Morgan, 2007).

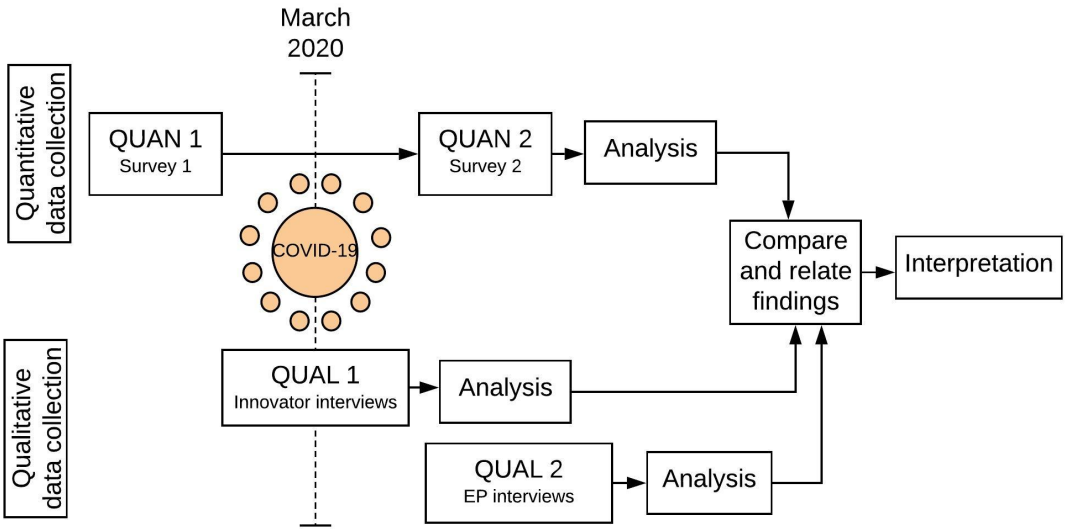
### *Research Design*

This study employed a mixed-methods research approach, which allowed for an in-depth exploration into EPs' technology use. A convergent-parallel mixed-methods design was utilized, as both quantitative and qualitative data were separately collected and then analysed and combined to explore similar research themes (Creswell, 2015).

Figure 3 presents the qualitative and quantitative research phases of the study and how they corresponded to COVID-19. A survey was used to question EPs (including TEPs) on their current technology usage, perceptions, and usage intentions, as well as to explore moderating factors that could influence these aspects, such as place of employment, to answer Research Questions 1 and 2. The design of the qualitative approach was emergent; during the study, the design was adapted to include an additional phase of both the quantitative and qualitative research sections. This considered the significant change in IT usage that resulted from remote working after the COVID-19 lockdown (Sallomi, 2020; Schoonenboom & Johnson, 2017). Consequently, the quantitative data were collected in two phases across different points in time.

**Figure 3**

*Diagram Presenting Research Design and Phases of Data Collection in Relation to COVID-19*




The themes were analysed separately for each of the data collection methods and then combined. NVivo was used to facilitate the thematic analysis (TA) process. The data are presented separately for enablers of and barriers to IT usage. Survey 2 and the interviews occurred after the work-from-home order was mandated in March 2020. Interviews transpired between February 2020 and October 2020; thus, they were impacted by the circumstances arising from COVID-19. For Research Question 3, factors related specifically to IT usage were explored. For example, the theme of mental health impact was tailored to remove the impacts of COVID-19 to explicitly investigate the impact of IT usage, such as its effects on team connectedness.

### *Quantitative Research Methodology*

#### *Participants*

TEPs and qualified EPs were the target population for the study. A convenience sampling approach was employed, and the surveys were circulated online, using the Qualtrics platform through EPnet, which is an email listserv that provides a forum for individuals working in educational psychology (Edpsy.org.uk, n.d.). In a survey conducted by Langford (2020), it was estimated that 2,800 individuals were registered on EPnet. The survey had 314 respondents, of whom 60% were

EPs, 20% were TEPs, and 10% were senior EPs. The largest proportion of EPs reported utilizing EPnet to observe the discussion and gather resources as well as information and advice (Langford, 2020). The rationale for utilizing EPnet and conducting an online survey was that many EPs communicate via emails. An online survey results in a larger sample and is both time- and cost-efficient.

According to the minimum sample size recommendations to detect "a moderate 0.80 Statistical power at the 5% significance level" (Onwuegbuzie & Collins, 2007, p. 288), it was hoped that 82 participants or more would be surveyed in the quantitative phase of the research. In the initial survey (Survey 1), 64 respondents (51 females, 12 males, and one nonbinary individual) participated, and 23% of EPs reported a disability or mental health condition (see Table 1). Data collection was halted in March 2020 due to the novel coronavirus outbreak, as the data collected would have likely been influenced by the changes that impacted the way EPs work (B. Johnson, 2020). In the second round of surveys, 37 participants contributed (35 females and two males), seven of whom had previously participated in the first round of surveys. Participating EPs had been practising for a mean of 14 years.

**Table 1**

*Disabilities Reported by Educational Psychologists in Survey 1*

| Disability or mental health condition | N |
|---|---|
| Mental health condition | 3 |
| Specific learning disability | 2 |
| Mobility difficulties | 2 |
| Autism spectrum condition | 2 |
| Long-term health condition | 3 |
| Attention deficit disorder/attention deficit hyperactivity disorder | 1 |

| | |
|---|---|
| Visual impairment | 1 |

*Note.* Educational psychologists were able to report more than one distality or mental health condition.

The total number of participants (*n* = 94) in Surveys 1 and 2 met the minimum sample size requirement of 85, which is considered a small but adequate sample. According to 2018 statistics from the 2019 EP workforce survey, there are 4,727 practising EPs in the United Kingdom (DOE, 2019). The sample required at a 95% confidence interval with a ±5% margin of error is 356 participants. The current sample is closer to the ±10% margin of error, with a recommended 95 participants. Table 2 presents the breakdown of gender and age for the surveys and includes data from the EP workforce survey. A chi-squared test was conducted to examine the relationship between age categories in the survey and the EP workforce survey. The relationship between these variables was significant: $\chi^2$ (2, $N$ = 4,820) = 48.26, $p < 0.001$. In the survey, the largest proportion of respondents were in the 25–34 age range, whereas the largest proportion of respondents in the EP workforce survey were in the 35–44 age range. Table 3 displays a breakdown of EPs employed in different services; the largest proportion were employed in LA settings.

**Table 2**

*Breakdown of Respondents From Both Surveys and the Educational Psychologist Workforce Survey by Gender and Age*

| Age | Educational psychologist workforce survey | | | Surveys 1 and 2 | | |
|---|---|---|---|---|---|---|
| | F (%) | M (%) | Total (N) | F (%) | M (%) | Total (N) |
| 25–34 | 13.2 | 8.3 | 576 | 50 | 31.6 | 32 |
| 35–44 | 29.9 | 18.6 | 1,302 | 7.1 | 26.6 | 22 |
| 45–54 | 26.1 | 21.5 | 1,188 | 7.1 | 31.6 | 26 |
| 55–64 | 20.6 | 25 | 1,017 | 7.1 | 8.9 | 8 |
| 65+ | 10.2 | 26.6 | 644 | 28.6 | 1.3 | 5 |
| Total | 3738 | 989 | 4,727 | 14 | 79 | 94 |

**Table 3**

*Frequency of Educational Psychologists Employed Categorized by Service*

| Type of service | N |
|---|---|
| Private for-profit | 6 |
| Private not-for-profit | 8 |
| Local authority | 66 |
| Self-employed | 15 |
| University/educational psychology training providers | 8 |

### *Survey Instruments*

Surveys 1 and 2 were sent to EPs via EPnet utilizing a convenience sampling approach. The Qualtrics platform was used to administer the surveys virtually (see Appendix A: Survey 1 and Appendix B: Survey 2)

**Background Variables.** Background variables measured included gender, age, employment, years qualified, and disability status. Additional background variables for EPS funding and type of work were extracted from the EP workforce survey (DOE, 2019). These background variables were chosen because they provide an overview of an EP's individual characteristics as well as the microsystem and mesosystem variables.

**Current Technology Usage and Availability of Information Technology.** Questions about device usage and access to work files were adapted from the Teachers' Use of Educational Technology survey (2010) to fit the context of EPs practising in the United Kingdom (NCES, 2010). Although the survey was designed in 2010, the variables utilized were chosen because they were presented in a user-friendly format and suited the research purpose. The variable of current technology usage explored availability and access to devices, Internet access, and EPs' engagement with their local network. Additional questions were devised from piloting the survey amongst TEPs and practising EPs.

Open-ended questions were developed to enquire about applications (apps), technology, or online programs EPs used in practice, for recommendations, and with students. Questions also asked about the usage of digitized assessments and online scoring. Responses were then quantified by collating the frequency of each assessment and then categorizing them. This is explained further in Chapter 5.

**Frequency of Information Technology Usage for Main Educational Psychologist Activities.** In Surveys 1 and 2, EPs were asked about the frequency of IT usage for the following activities: accessing resources, supporting interventions, assessments, report writing, offering professional development, administrative tasks, research, and observations. These tasks were identified as the main tasks in research previously conducted on EPs (Rumble & Thomas, 2017). EPs were asked to rate their responses on a 5-point Likert scale ranging from 1 (*never*) to 5 (*very frequently*).

**Frequency of Device Usage.** EPs were asked how frequently they used the following devices: laptop, stationary desktop, tablet, smartphone, digital camera, audio recorder, MP3 player or iPod, e-reader, and video camera. They were asked to rate their responses on a 4-point Likert scale (1 = *never* and 4 = *often*).

**Perceptions of Information Technology and Usage Intentions.** Scales for perceived usefulness, ease of use, usage intentions, and compatibility were adopted from Agarwal and Prasad (1998); however, they were originally designed by Moore and Benbasat (1991). These were measured on a 7-point Likert scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). Reliability for all the scales ranged from 0.71 to 0.88 (Agarwal & Prasad, 1998). These scales have been utilized often in the literature exploring TAM constructs (e.g., Weng et al., 2018).

**Personal Innovativeness in the Domain of Information Technology.** The PIIT scale was designed to measure innovation in response to the World Wide Web; however, it has been modified to explore IT usage (Agarwal & Prasad, 1998). PIIT consists of four statements measured on a 7-point Likert scale (from 1 = *strongly disagree* to 7 = *strongly agree*). PIIT has been used as a moderating variable and a personal characteristic to explore adaptations to new IT, such as virtual learning

environments (van Raaij & Schepers, 2008), and amongst teachers in early-years settings (Jeong & Kim, 2016) and secondary schools (De Smet et al., 2012).

Agarwal and Prasad (1998) defined the construct of PIIT as "the willingness of an individual to try out any new information technology". It is operationalized as a trait – a stable, unchanging characteristic of an individual. Agarwal and Prasad (1998) developed a questionnaire to measure PIIT utilizing preexisting measures to support the development of their measure. The scales for usage intent were based on measures created by Ajzen and Fishbein (1980). They found that PITT had a moderating effect on the three perceptions of IT use – ease of use, compatibility with existing work practice, and perceived usefulness. In their analysis, PIIT was only found to have a moderating effect for compatibility with usage intent as the dependent variable. Additionally, PIIT was significantly correlated with usage intentions. A limitation of the study is that it only explored the future usage of technology and did not determine whether any of the relationships existed for current technology use. They proposed that this tool and newly formed construct could be employed to identify early adopters and utilize them as "agents of change" (Agarwal & Prasad, 1998). It has since been utilized frequently in the literature to measure innovation and demonstrates acceptable internal consistency (Cronbach's alpha of 0.84).

***Data Analysis***

Data analysis methods involved nonparametric assessments, as the data did not meet the assumptions of skewness and kurtosis needed for a parametric assessment, such as a *t*-test (Laerd Statistics, 2015). Assessments to compare median scores in different groups included Mann-Whitney U assessments for two variables (e.g., gender) and the Kruskal-Wallis H test for more than two variables (e.g., age group categories). Spearman's rank-order correlation tests were also conducted to compare the relationship between two variables that were scale measures (e.g., years qualified); when the data were charted on a scatter graph, if they were nonlinear, then a Kruskal-Wallis H test was conducted (Laerd Statistics, 2015).

### *Qualitative Research Methodology*

The qualitative research component involved open-ended questions from the surveys that explored EPs' views on the enablers of and barriers to IT usage. Separate interviews triangulated the findings from the quantitative research sections and further explored EPs' views on the enablers of and barriers to IT usage.

### *Interview Participants*

Four EPs were interviewed for the innovator interviews; however, one interview was lost due to a technical error. The remaining three EPs had been practising from 5 to 24 years (two females and one male) and worked in main grade EP roles. In the second phase of the interviews, which explored IT usage during the COVID-19 lockdown, 10 EPs were interviewed (seven females and three males) who had been practising for a mean of 5 years.

### *Instruments*

Interviews 1 and 2 were semistructured and had guiding questions taken from the surveys (see Appendix C: Innovator Interviews and Appendix D: EP Interviews). Questions included asking EPs about their role and relevant experience, the impact of COVID-19, senior leadership, technology availability, training in technology, and thoughts about the development of IT usage in the future.

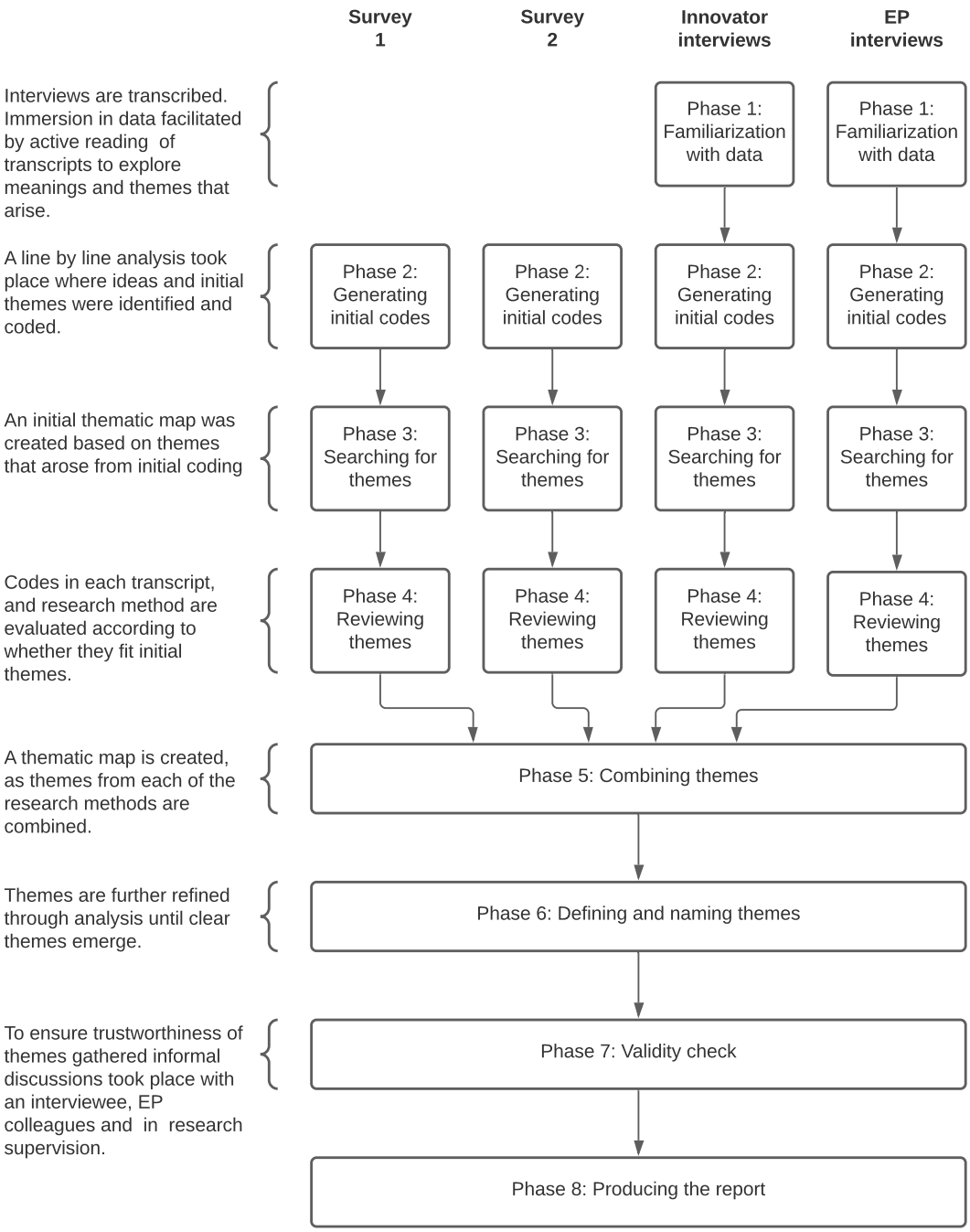
### *Analysis Approach*

A TA approach was employed to examine the transcribed interviews and open-ended questions from the surveys. This method was chosen because it offers the most flexibility and has been one of the most widely used analysis methods. TA is data driven, whereby meaning is generated from the themes that arise in the data related to the research questions (Patton, 2015). For the purposes of this research, an inductive approach to TA was utilized. NVivo (computer-assisted qualitative data analysis software) was used to support the data analysis process. To conduct the TA, the inductive approach was chosen, and the phases of analysis displayed in Figure 4 *Phases of Qualitative Analysis* were followed, as derived from Braun and Clarke (2006).

Once the themes were collected from the interviews, the open-ended questions from the surveys were also analysed. The combined themes were then analysed together to explore whether themes had emerged across the interviews and surveys.

**Figure 4**

*Phases of Qualitative Analysis*



### *Ethical Considerations*

Participant consent was requested after respondents had been presented with the information regarding the research across the surveys and interviews. If a participant did not consent to any of the items, then the survey ended. All information collected was kept confidential; introductions were not recorded. Consent was received prior to the start of the interviews. Additionally, consent was requested prior to recording – after the interview had started and introductions had ended. The interviews were audio recorded and stored in an encrypted file for the duration of the study. All ethical guidelines established by the UCL Ethics Committee were followed, and the project received ethical approval before data were collected (reference no. Z6364106/2019/12/73). For the purposes of confidentiality, EPs in the interviews are not named or pseudonymized due to the small number of EPs currently working in the field, which could potentially lead to identification by those familiar with the EPs. This is in accordance with general data protection regulation (GDPR) regulations concerning information about personal data that can indirectly identify an individual (GDPR.eu, 2021). Moreover, EPs mentioned concerns regarding their anonymity and the potential impact of their disclosures on their employment. As such, only quotes from the interviews are reported and presented, and the whole transcripts are not presented in the appendices.

### *Presentation of Results*

The results of the study are presented in two chapters based on the methodological approach. The quantitative results from Surveys 1 and 2, which correspond to Research Questions 1 and 2, are presented in Chapter 5. Qualitative results, which correspond to Research Question 3, are presented in Chapter 6. This synthesizes themes gathered from the open-ended survey questions that explored enablers of and barriers to IT usage, the innovator interviews, and EP interviews after COVID-19.

## Quantitative Results

The quantitative results are presented by IT usage variables explored in the study. These include frequency of utilizing IT for main EP activities, to score assessments, to administer assessments, to access devices, to share information across various platforms, and to use social media. Open-ended questions, which were converted to quantitative results, included assessments administered utilizing IT, assessments scored utilizing IT, apps used with CYP, and apps recommended to CYP.

For each of the measures regarding frequency of IT use, factors influencing IT usage were explored utilizing statistical analysis. The factors explored in the current research question included demographic variables (age, gender, and disability status), role, perceived compatibility of IT with the EP role and workplace, personal characteristics (years qualified, perceived compatibility with EP role, personal innovativeness), and service variables (type of service, perceived compatibility of IT with service, and senior leadership openness to IT usage). For gender, only males and females were compared out of respect for those who did not identify within the binary and to maintain confidentiality. Significant findings are highlighted in grey.

### *Frequency of Information Technology Usage for Main Educational Psychologist Activities*

In Surveys 1 and 2, EPs were asked about the frequency of IT usage for the following activities: accessing resources, supporting interventions, assessments, report writing, offering professional development, administrative tasks, research, and observations. These tasks were identified as the main tasks in research previously conducted with EPs (Rumble & Thomas, 2017). EPs were asked to rate their responses on a 5-point Likert scale ranging from 1 (*never*) to 5 (*very frequently*).

In Survey 1, most EPs stated that they utilized IT for report writing (97.1%), administrative tasks (92.15%), accessing resources (71.3 %), research (71.3%), and communicating with other professionals (69.6%). In Survey 2, EPs reported that they utilized IT most frequently for report

writing (94.4%, SD 0.68), administrative tasks (94.4%), communicating with parents (75%), and accessing resources (75%). To explore the differences in frequency of IT usage for main activities between Surveys 1 and 2, the Mann-Whitney U test was conducted, as the data were ordinal and did not meet the assumptions of skewness and kurtosis for a *t*-test. Table 4 presents the median frequency of IT usage for main activities across Surveys 1 and 2. The medians were statistically significantly different for communicating with parents ($U$ = 1835.5, $z$ = 5.148, $p$ = 0.000) and for offering professional development ($U$ = 1418, $z$ = 2.036, $p$ = 0.042). EPs reported using IT to communicate with parents and offer professional development more frequently in Survey 2. There were no significant differences for other areas of IT usage.

**Table 4**

*Frequency of Information Technology Usage for Main Educational Psychologist Activities in Surveys 1 and 2*

| **Frequency of utilizing information technology for main activities** | **Survey 1** | | **Survey 2** | | **Total** | |
|---|---|---|---|---|---|---|
| | **Mdn** | **N** | **Mdn** | **N** | **Mdn** | **N** |
| Communicating with parents | 3 | 64 | 5 | 36 | 4 | 100 |
| Communicating with other professionals | 5 | 64 | 5 | 36 | 5 | 100 |
| Accessing resources | 5 | 64 | 5 | 35 | 5 | 99 |
| Supporting interventions | 3 | 64 | 4 | 36 | 4 | 100 |
| Scoring assessments | 4 | 64 | 4 | 36 | 4 | 100 |
| Writing reports | 5 | 64 | 5 | 36 | 5 | 100 |
| Offering professional development | 4 | 64 | 5 | 36 | 4 | 100 |
| Performing administrative tasks | 5 | 64 | 5 | 36 | 5 | 100 |
| Performing research | 5 | 63 | 5 | 36 | 5 | 99 |
| Observations | 1 | 64 | 1 | 36 | 1 | 100 |

### *Factors Influencing Frequency of Information Technology Usage for Main Educational Psychologist Activities*

To explore factors influencing IT use, median scores for frequency of IT usage for main EP activities (accessing resources, supporting interventions, scoring assessments, writing reports, offering professional development, performing administrative tasks, performing research, and observing) were generated for ease of analysis to determine whether there was an influence of different variables on overall IT usage. Overall, the median IT score was 4.5.

#### *Demographic Variables.*

***Gender.*** A Mann-Whitney U test was conducted to determine whether there were differences in total IT usage between males and females. Distributions of total IT usage were similar. The median score was not statistically significantly different for females (*Mdn* = 4.5) and males (*Mdn* = 4.75, *U* = 580, *z* = 0.397, *p* = 0.691).

***Disability or Mental Health Condition.*** A Mann-Whitney U test was conducted to determine whether there were differences in total IT usage for individuals who identified as having a disability or mental health condition and those who did not. Distributions of total IT usage were similar. The median scores were not significantly different between those who did not identify a disability (*Mdn* = 4.75) and those who identified as having a disability or mental health condition (*Mdn* = 4.5, *U* = 614.5, *z* = -0.905, *p* = 0.366).

***Age.*** A Kruskal-Wallis H test was conducted to determine whether there were differences in total IT usage between five age categories: 25–34, 35–44, 45–54, 55–64, and 65+. Median IT usage scores were not significantly different between age group categories: $\chi^2$ (4) = 6.217, *p* = 0.183.

***Role***. Separate Mann-Whitney U tests were performed to determine whether there were differences in total IT usage for EPs across six role categories: PEPs, senior EPs, specialist EPs, supervisor EPs, main grade EPs, and TEPs. Tests for each of the roles were conducted separately, and the medians were compared with those of EPs in other roles; for example, the median score of PEPs (*Mdn* = 4.0) was compared with those of EPs in other roles (*Mdn* = 4.5). Median total IT usage scores were not significantly different for any of the EP roles (all *p* > 0.05).

***Compatibility and Personal Characteristics.***

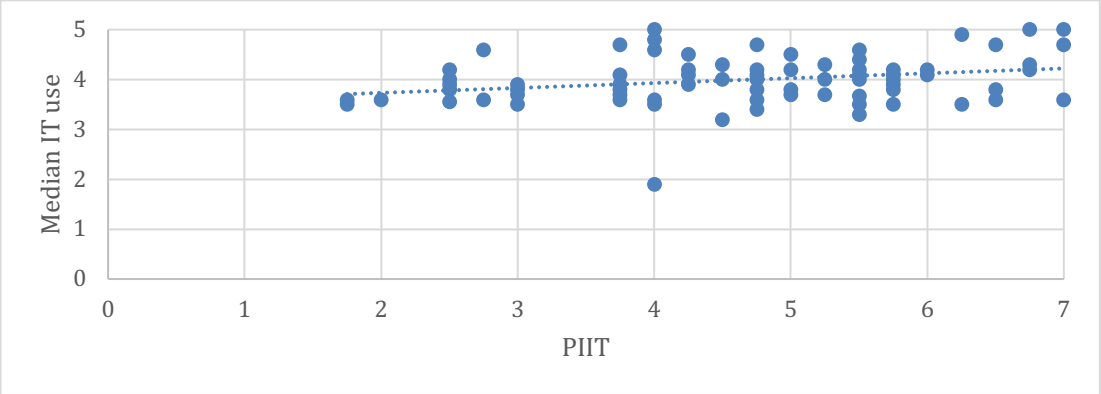
***Years Qualified.*** A Spearman's rank-order correlation test was conducted to assess the relationship between years qualified and total IT usage ($N$ = 76). The relationship was not significant: $r(76) = -0.024$, $p = 0.840$.

***Extent to Which Educational Psychologists Felt Information Technology Was Compatible With Their Role.*** A Kruskal-Wallis H test was conducted to determine whether there were differences in total IT usage and the extent to which EPs felt that IT was compatible with their role, measured on a 7-point Likert scale (from 1 = *strongly disagree* to 7 = *strongly agree*). Median IT usage scores were not significantly different between the categories: $\chi^2$ (5) = 4.045, $p$ = 0.543.

***Personal Innovativeness in the Domain of Information Technology.*** A Spearman's rank-order correlation test was conducted to assess the relationship between PIIT and total IT usage ($N$ = 92). There was a significant although weak positive correlation between PIIT and total IT usage ($r_s$ = 0.032, $N$ = 92, $p$ = 0.006). This means that as the frequency of IT usage increases, the PIIT score increases as well, which is illustrated in Figure 5.

**Figure 5**

*Relationship Between Personal Innovativeness in the Domain of Information Technology and Median Information Technology Usage*



***Service.***

***Type of Service.*** Separate Mann-Whitney U tests were conducted to determine whether there were differences in total IT usage for EPs across five service categories: private for-profit, private not-for-profit, LA, self-employed, and university or EP training provider. Tests for each of the roles were conducted separately, and the medians were compared with those of EPs working in other services. Median total IT usage scores were not significantly different for EPs working in the five service categories (all $p > 0.05$).

***Compatibility of Information Technology With Service.*** A Spearman's rank-order correlation test was conducted to assess the relationship between the compatibility of IT with service (measured on a 7-point Likert scale ranging from 1 = *strongly disagree* to 7 = *strongly agree*) and total IT usage. The relationship was not significant ($r_s = 0.177$, $p = 0.091$).

***Senior Leadership's Openness to Information Technology Usage.*** A Spearman's rank-order correlation test was conducted to assess the relationship between senior leadership's openness to IT usage (measured on a 7-point Likert scale ranging from 1 = *strongly disagree* to 7 = *strongly agree*) and total IT usage. The relationship was not significant ($r_s = 5.579$, $p = 0.349$).

***Usage of Information Technology for Scoring Assessments***

In Surveys 1 and 2, EPs were asked how often they utilized online or computer-based scoring for assessments. In Survey 1, the largest proportion of EPs reported that they utilized computer or online scoring very frequently and somewhat frequently (29.7%), whereas in Survey 2, the largest proportion of EPs reported that they utilized IT for scoring assessments very frequently (37.8%). The Mann-Whitney U test was conducted to compare the median frequency of utilizing IT to score assessments across Survey 1 (*Mdn* = 4) and Survey 2 (*Mdn* = 4). The difference was not statistically significant ($U = 1158$, $z = 0.045$, $p = 0.964$).

In Survey 1, EPs were asked, in an open-ended question, for which cognitive assessments they employed computer scoring. In Survey 2, the most common assessments were presented individually. Participants were asked to choose any that applied, as well as another option to

describe any other assessments they utilized that were not listed. Table 5 displays which assessments EPs stated that they utilized, including the frequency, across the two surveys. The assessments were organized into assessment categories, including cognitive assessments, diagnostic assessments, achievement tests, and checklists or questionnaires. In Survey 1, the largest proportion of EPs reported that they utilized virtual scoring for cognitive assessments, whereas in Survey 2, this was checklists or questionnaires. A Mann-Whitney U test was conducted to explore whether there were differences in the usage of IT for scoring each of the assessment categories. The medians were only significantly different for the category of checklists or questionnaires in Survey 1 (*Mdn* = 0) and Survey 2 (*Mdn* = 1, U = 1548, *z* = 2.863, *p* = 0.004). In Survey 2, EPs more often reported that they utilized checklists or questionnaires than they had previously.

**Table 5**

*Frequency of Online or Computer-Based Scoring for Assessments Organized by Category*

| Category | S1 | S2 | Assessment | S1 | S2 |
|---|---|---|---|---|---|
| Cognitive assessment | 50 | 33 | British Abilities Scale 3 (BAS3) | 40 | 28 |
| | | | Wechsler Intelligence Scale for Children Fifth Edition (WISC-V) | 8 | 5 |
| | | | Wechsler Adult Intelligence Scale (WAIS) | 1 | 0 |
| | | | Children's Memory Scale | 1 | 0 |
| | | | NEPSY | 1 | 0 |
| Diagnostic assessment | 4 | 1 | Phonological Assessment Battery 2 | 2 | 0 |
| | | | Clinical Evaluation of Language Fundamentals | 1 | 0 |
| | | | Thrive Online Scoring Tools | 1 | 0 |
| | | | Dyslexia Portfolio | 0 | 1 |

| | | | | | |
|---|---|---|---|---|---|
| Achievement test | 9 | 5 | Wide Range Achievement Test | 1 | 0 |
| | | | Wechsler Individual Achievement Test (WIAT-III) | 5 | 5 |
| | | | York Assessment of Reading for Comprehension | 3 | 0 |
| Checklist or questionnaire | 31 | 34 | Sensory Profile | 11 | 2 |
| | | | Boxall Profile Online Scores | 3 | 1 |
| | | | Child Communication Checklist | 3 | 5 |
| | | | Strengths and Difficulties Questionnaire | 3 | 12 |
| | | | Vineland Adaptive Behaviour Scales | 3 | 4 |
| | | | Behaviour Rating Inventory of Executive Function | 2 | 3 |
| | | | Child Behaviour Checklist | 1 | 0 |
| | | | Cognitive Abilities Profile | 1 | 0 |
| | | | Communication Checklist – Self Report | 1 | 0 |
| | | | Performance Assessment of Self-Care Skills | 1 | 0 |
| | | | Conners | 1 | 0 |
| | | | Teacher Report Form | 1 | 0 |
| | | | Adaptive Behaviour Assessment System Third Edition | 0 | 1 |
| | | | 5 -15r - Nordic Questionnaire for Evaluation of Development and Behaviour in Children and Adolescents | 0 | 2 |
| | | | Revised Child Anxiety and Depression Scale | 0 | 2 |
| | | | Behaviour Assessment System for Children Third Edition (BASC-3) | 0 | 2 |

### *Factors Influencing Information Technology Usage*

#### *Demographic Variables.*

***Gender.*** A Mann-Whitney U test was conducted to determine whether there were differences in frequency of utilizing IT to score assessments for males and females. The median scores were not significantly different when comparing males and females ($U$ = 457, $z$ = -0.655, $p$ = 0.512).

***Disability.*** A Mann-Whitney U test was conducted to determine whether there were differences in frequency of utilizing IT to score assessments for individuals who identified as having a disability or mental health condition and those who did not. The median scores were not significantly different between those who did not identify a disability and those who identified as having a disability or mental health condition ($U$ = 649, $z$ = -0.262, $p$ = 0.794).

***Age.*** A Kruskal-Wallis H test was conducted to determine whether there were differences in frequency of utilizing IT to score assessments for five age categories: 25–34, 35–44, 45–54, 55–64, and 65+. Median frequency of utilizing IT to score assessments was not significantly different between age group categories: $\chi^2$ (4) = 4.840, $p$ = 0.304.

***Role.*** Separate Mann-Whitney U tests were conducted to determine whether there were differences in frequency of utilizing IT to score assessments for EPs across six role categories: PEPs, senior EPs, specialist EPs, supervisor EPs, main grade EPs, and TEPs. Median frequency of utilizing IT to score assessments was significant for specialist EPs (*Mdn* = 5) compared with EPs in other roles (*Mdn* = 4, $U$ = 426.5, $z$ = -1.995, $p$ = 0.046). Median frequency of utilizing IT to score assessments was not significantly different for PEPs, senior EPs, TEPs, supervisor EPs, and main grade EPs (all $p$ > 0.05).

#### *Personal Characteristics.*

***Years Qualified***. A Spearman's rank-order correlation test was conducted to assess the relationship between years qualified and frequency of utilizing IT to score assessments. The relationship was not significant ($r_s$ = 0.040, $N$ = 76, $p$ = 0.733).

***Perceived Compatibility of Information Technology With the Educational Psychologist Role.*** A Spearman's rank-order correlation test was conducted to determine the relationship between EPs' perceived compatibility of IT with their role and frequency of utilizing IT to score assessments. The relationship was not significant ($r_s$ = 0.067, $N$ = 91, $p$ = 0.530).

***Personal Innovativeness in the Domain of Information Technology.*** A Spearman's rank-order correlation test was conducted to determine the relationship between PIIT and frequency of utilizing IT to score assessments. The relationship was not significant (*rs* = 0.032, $N$ = 92, $p$ = 0.763).

***Service.***

***Type of Service.*** Separate Mann-Whitney U tests were conducted to determine whether there were differences in the frequency of utilizing IT to score assessments for service type: private for-profit, private not-for-profit, self-employed, LA, and university or EP training provider. The median scores were not significant for private for-profit, private not-for-profit, LA, self-employed, and university or EP training provider settings (all $p > 0.05$).

***Compatibility of Information Technology With Service.*** A Spearman's rank-order correlation test was conducted to determine the relationship between the perceived compatibility of IT with EPs' service and the frequency of utilizing IT to score assessments. The relationship was not significant ($r_s$ = 0.060, $N$ = 92, $p$ = 0.568).

***Senior Leadership's Openness to Information Technology Usage.*** A Spearman's rank-order correlation test was conducted to determine the relationship between perceived senior leadership's openness to IT usage and the frequency of utilizing IT to score assessments. The relationship was not significant ($r_s$ = 0.0.119, $N$ = 92, $p$ = 0.259).

***Availability of Devices and Frequency of Utilizing Information Technology to Score Assessments.*** Separate Kruskal-Wallis H tests were conducted to determine whether there were differences in the frequency of utilizing IT to score assessments and the availability of tablets, laptops, and smartphones for the responses of not available, provided by work, and personally owned. There were no differences across the devices (all $p < 0.05$).

### *How Educational Psychologists Use Information Technology With Children and Young People*

In the surveys, EPs were asked via an open-ended question about the type of IT utilized with CYP. These responses were analysed in NVivo and then coded to obtain a quantitative response. The codes were then organized into categories of use. Most often, EPs stated that they did not utilize IT with CYP (*n* = 61). The most frequent usages of IT with CYP were for the categories of mental health (*n* = 17), assessment and intervention (*n* = 12), and augmentative and alternative communication (*n* = 8). Table 6 displays the 11 categories of programs identified in Surveys 1 and 2, as well as a description of the category and number of references. EPs often referred to generic programs, such as mindfulness apps or, more specifically, the Take Ten app (see Appendix E for programs organized by category).

A Mann-Whitney U test was completed for the median number of categories that EPs recommended to CYP for Survey 1 (*Mdn* = 0) and Survey 2 (*Mdn* = 0). The medians were not significantly different (*U* = 1090.5, *z* = -0.549, *p* = 0.583).

**Table 6**

*Categories of Information Technology (IT) That Educational Psychologists Utilized With Children and Young People (CYP) With Combined Examples From Surveys 1 and 2*

| Category | Description | N |
|---|---|---|
| None | | 61 |
| Mental health | Programs or apps utilized to support CYP's mental health, such as mindfulness apps | 17 |
| Assessment and intervention | IT utilized as part of assessment and intervention, such as touch-typing programs | 12 |
| Augmentative and alternative communication | IT utilized to support CYP with communication difficulties to express their views, such as talking mats | 8 |
| Software platforms | Programs or operating systems utilized by EPs with CYP, such as PowerPoint for gathering views or making questionnaires interactive | 9 |
| Documenting work | IT utilized by EPs in individual work with CYP to document what has been done, such as photos of work | 6 |

| | | |
|---|---|---|
| Devices | Reference to utilizing specific devices, such as a touch screen laptop, with CYP | 5 |
| Communication | Virtual communication programs utilized to interact with CYP, such as videoconferencing | 5 |
| Visual stories and information presentation | Programs utilized to present information to CYP in a more accessible, interactive, or visual format, such as YouTube videos or social stories | 5 |
| Accessibility | IT utilized by EPs to support CYP in overcoming barriers that result from their specific area of need, such as voice to text for CYP with literacy difficulties | 4 |
| Applications for autism spectrum disorder | Programs utilized that are specifically targeted at supporting CYP who have difficulties associated with a diagnosis of autism spectrum disorder, such as Brain in Hand | 2 |
| Sensory needs | App usage to support CYP with sensory needs, such as a voice meter to monitor noise levels | 2 |

***Demographic Variables.***

***Gender.*** A Mann-Whitney U test was conducted to determine whether there were differences in IT utilized with CYP. The distribution of IT recommended for CYP usage was similar. The median score was not significantly different for females and males ($U$ = 585, $z$ = 0.408, $p$ = 0.683).

***Disability or Mental Health Condition.*** A Mann-Whitney U test was conducted to determine whether there were differences in the IT utilized with CYP who identified as having a disability or mental health condition and those who did not. The median scores were not significantly different between those who did not identify a disability or mental health condition and those who did ($U$ = 678, $z$ = -0.068, $p$ = 0.946).

***Age.*** A Spearman's rank-order correlation test was conducted to determine the relationship between age and IT utilized with CYP. The relationship was not significant ($r_s$ = -0.195, $N$ = 94, $p$ = 0.059).

***Role.*** Separate Mann-Whitney U tests were conducted to determine whether there were differences in the IT utilized with CYP by EPs across six role categories: PEPs, senior EPs, specialist

EPs, supervisor EPs, main grade EPs, and TEPs. There were no differences in IT usage found between the IT utilized with CYP by EPs in any role (all $p > 0.05$).

***Compatibility and Personal Characteristics.***

***Years Practising.*** A Spearman's rank-order correlation test was performed to determine the relationship between EPs' years practising and IT utilized with CYP. The relationship was not significant ($r_s = -0.033$, $N = 76$, $p = -0.776$).

***Extent to Which Educational Psychologists Felt That Information Technology Was Compatible With Their Role***. A Spearman's rank-order correlation test was conducted to determine the relationship between perceived compatibility with the EPs' role and IT utilized with CYP. The relationship was not significant ($r_s = -0.022$, $N = 91$, $p = 0.838$).

***Personal Innovativeness in the Domain of Information Technology.*** A Spearman's rank-order correlation test was conducted to assess the relationship between PIIT and IT utilized with CYP. The relationship was not significant ($r_s = 0.047$, $N = 92$, $p = 0.658$).

***Educational Psychologists' Confidence in Evaluating Applications That Schools Use.*** A Spearman's rank-order correlation test was conducted to assess the relationship between EPs' confidence in evaluating applications that schools use and the IT utilized with CYP. The relationship was not significant ($r_s = 0.161$, $N = 93$, $p = 0.124$).

***Educational Psychologists' Comfort Levels With Recommending Information Technology to Children and Young People.*** A Spearman's rank-order correlation test was conducted to assess the relationship between EPs' comfort levels with recommending IT to CYP and the IT utilized with CYP. There was a positive significant correlation ($r_s = 0.267$, $N = 92$, $p = 0.010$).

***Service.***

***Type of Service.*** Separate Mann-Whitney U tests were conducted to determine whether there were differences in the IT utilized with CYP by EPs across five service categories: private for-profit, private not-for-profit, LA, self-employed, and university or EP training provider. The median

score for IT utilized with CYP was only significantly different for university or EP training providers (*Mdn* = 1.5) compared with EPs in other roles (*Mdn* = 0, *U* = 211.5, *z* = -2.118, *p* = 0.034).

***Compatibility of Information Technology With Service.*** A Spearman's rank-order correlation test was performed to determine the relationship between the perceived compatibility of IT with EPs' service and the IT utilized with CYP. The relationship was not significant ($r_s$ = -0.161, *N* = 93, *p* = 0.123).

***Senior Leadership's Openness to Information Technology Usage.*** A Spearman's rank-order correlation test was conducted to determine the relationship between perceived senior leadership's openness to IT usage and IT utilized with CYP. The relationship was not significant ($r_s$ = -0.035, *N* = 93, *p* = 0.742).

### *Availability of Devices and Frequency of Utilizing Information Technology With Children and Young People*

Separate Kruskal-Wallis H tests were conducted to determine whether there were differences in the IT utilized with CYP and the availability of tablets, laptops, and smartphones for the following responses: not available, provided by work, and personally owned. There were no differences across the devices (all $p < 0.05$).

### *How Educational Psychologists Are Recommending Information Technology to Children and Young People*

In the surveys, EPs were asked via an open-ended question about the type of IT they recommended to CYP. These responses were analysed in NVivo and then coded to obtain a quantitative response. The codes were then organized into categories of usage, which can be seen in Table 7.

Recommendations fell into two categories: a generic recommendation, such as speech-to-text software, or a specific recommendation, such as Dragon Dictate (see Appendix F for programs organized by category). EPs stated that they most often recommended programs and applications to

support CYP's literacy development (*n* = 56), accessibility (*n* = 51), and emotional and mental health (*n* = 44). Twenty-one EPs reported that they did not recommend any IT to CYP.

**Table 7**

*Categories of Information Technology (IT) Recommended to Children and Young People (CYP) Across Surveys 1 (S1) and 2 (S2)*

| Category | Description | S1 | S2 |
|---|---|---|---|
| Literacy interventions | The recommendation of specific interventions and applications to support CYP's literacy development, such as Nessy | 15 | 17 |
| Accessibility | The recommendation of specific programs and applications to support CYP with additional needs to access the learning curriculum and reduce barriers that are a result of their additional need, such as speech-to-text software | 17 | 15 |
| Emotional and mental health | The recommendation of programs and applications to support CYP's emotional and mental health, such as Kooth | 23 | 2 |
| Numeracy | The recommendation of specific interventions and applications to support CYP's numeracy development, such as Times Tables Rock Stars | 8 | 5 |
| Devices | The recommendation of specific devices to support CYP. This often focuses on devices such as laptops and iPads for dictation or for an alternative method of recording information. | 7 | 7 |
| Touch typing | The recommendation of programs to support CYP's development of touch-typing skills, such as BBC Dance Mat | 7 | 3 |
| Augmentative and alternative communication | IT utilized to support CYP with communication difficulties to express their views, such as Proloquo2Go | 5 | 2 |
| References to information | The recommendation of specific websites for further information and reference, such as the app wheel | 4 | 1 |
| Visual stories and information presentation | The recommendation of programs to present information in a more accessible, interactive, or visual format, such as mind-mapping applications | 7 | 0 |
| Assessment and intervention | The recommendation of programs and applications as part of a continuous assessment or intervention process, such as a literacy toolbox | 5 | 1 |

| | | | |
|---|---|---|---|
| General learning | The recommendation of programs and applications to support children's learning across a wide range of areas and skills, such as games for improving working memory; BBC Bitesize is one such application | 6 | 0 |
| Sensory needs | The recommendation of programs and applications to support CYP with sensory needs, such as Dexteria | 2 | 0 |
| Apps for supporting CYP with autism | The recommendation of programs and applications specifically targeted at supporting CYP who have difficulties associated with a diagnosis of an autism spectrum condition, such as Brain in Hand | 3 | 1 |
| Time tracking | The recommendation of programs and applications to support CYP in developing and understanding time awareness | 1 | 0 |
| Word processing software | The recommendation of word processing software most often as an alternative form of recording information | 1 | 1 |

EPs additionally commented that they recommended general types of apps rather than specific apps (n = 2). Two EPs reported that other professionals, including learning advisory teachers and schools, had more specific knowledge about IT that supports CYP. Individual EPs reported only recommending apps that they had personally tried or recommending apps specific to each CYP's needs. Two EPs reported the need to stay up to date with the literature, as the recommended IT changes continuously.

For each of the IT categories, a Mann-Whitney U test was conducted to explore whether there were differences in IT recommended across Surveys 1 and 2. Statistically significant differences between Surveys 1 and 2 were found for literacy interventions ($U = 1426$, $z = 2.229$, $p = 0.026$), numeracy ($U = 821$, $z = -3.310$, $p = 0.001$), and visual stories and information presentation ($U = 1044$, $z = -2.031$, $p = 0.042$).

IT recommended to CYP was quantified into frequency of usage for each category of IT recommended: none, one category, two categories, three categories, and four or more categories. A Mann-Whitney U test was conducted to explore whether there were differences in IT recommended

across Surveys 1 and 2. This was not significant ($U$ = 962.5, $z$ = -0.241, $p$ = 0.810). The median number of categories of IT recommended across both Surveys 1 and 2 was two.

### *Factors Influencing Information Technology Usage*

#### *Demographic Variables.*

***Gender.*** A Mann-Whitney U test was conducted to determine whether there were differences in IT recommended to CYP by males and females. The median score was not significantly different for females and males ($U$ = 406.5, $z$ = -1.231, $p$ = 0.218).

***Disability or Mental Health Condition.*** A Mann-Whitney U test was conducted to determine whether there were differences in IT recommended to CYP who identified as having a disability or mental health condition and those who did not. The median score was not significantly different between those who did not identify a disability or mental health condition and those did ($U$ = 720.5, $z$ = 0.454, $p$ = 0.650).

***Age.*** A Spearman's rank-order correlation test was conducted to determine the relationship between age and IT recommended to CYP. The relationship was not significant ($r_s$ = -0.001, $N$ = 93, $p$ = 0.996).

Role**.** Separate Mann-Whitney U tests were conducted to determine whether there were differences in IT recommended to CYP by EPs across six role categories: PEPs, senior EPs, specialist EPs, supervisor EPs, main grade EPs, and TEPs. Median IT usage was significantly different for senior EPs (*Mdn* = 0) compared with EPs in other roles (*Mdn* = 0, $U$ = 807.5, $z$ = 2.807, $p$ = 0.005). However, most EPs did not utilize any IT with CYP (senior EPs = 71.4%, EPs in other roles = 63.7%). The median of IT recommended to CYP was not significantly different for EPs in other roles (all $p$ > 0.05).

#### *Compatibility and Personal Characteristics.*

***Years Practising.*** A Spearman's rank-order correlation test was conducted to determine the relationship between the EPs' years of practising and IT recommended to CYP. The relationship was not significant ($r_s$ = -0.095, $N$ = 77, $p$ = 0.411).

***Extent to Which Educational Psychologists Felt Information Technology Was Compatible With Their Role.*** A Spearman's rank-order correlation test was conducted to determine the relationship between the extent to which EPs felt IT was compatible with their role and IT recommended to CYP. The relationship was not significant ($r_s$ = -0.012, $N$ = 92, $p$ = 0.906).

***Personal Innovativeness in the Domain of Information Technology.*** A Spearman's rank-order correlation test was conducted to assess the relationship between PIIT and IT recommended to CYP ($N$ = 93). There was a weak positive correlation between PIIT and IT recommended to CYP ($r_s$ = 0.222, $n$ = 93, $p$ = 0.032).

***Educational Psychologists' Confidence in Evaluating Apps That Schools Use.*** A Spearman's rank-order correlation test was conducted to assess the relationship between EPs' confidence in evaluating apps that schools use and IT recommended to CYP. There was a weak positive correlation between confidence in evaluating apps that schools use and the IT recommended to CYP ($r_s$ = 0.249, $N$ = 92, $p$ = 0.010).

***Educational Psychologists' Comfort Levels With Recommending Information Technology to Children and Young People.*** A Spearman's rank-order correlation test was conducted to assess the relationship between EPs' comfort levels with recommending IT to CYP and IT recommended to CYP. There was a positive significant correlation ($r_s$ = 0.256, $N$ = 92, $p$ = 0.0.017).

***Service.***

***Type of Service.*** Separate Mann-Whitney U tests were conducted to determine whether there were differences in IT recommended to CYP by EPs across five service categories: private for-profit, private not-for-profit, LA, self-employed, and university or EP training provider. The median of IT categories recommended was not significant across types of service (all $p$ > 0.05).

***Compatibility of Information Technology With Service.*** A Spearman's rank-order correlation test was conducted to determine the relationship between the perceived compatibility of IT with EPs' service and the IT recommended to CYP. The relationship was not significant ($r_s$ = -0.046, $N$ = 92, $p$ = 0.664).

***Senior Leadership's Openness to Information Technology Usage.*** A Spearman's rank-order correlation test was performed to determine the relationship between the perceived openness of senior leadership to IT usage and IT recommended to CYP. There was a weak negative relationship found between senior leadership's openness and IT recommended to CYP ($r_s$ = -0.239, $N$ = 32, $p$ = 0.022). EPs who strongly agreed that senior leadership were open recommended a median of one category of app, whereas EPs who disagreed recommended four categories of IT to CYP (see Table 8).

**Table 8**

*Median Information Technology Recommended Categorized by Senior Leadership's Openness to Information Technology*

| Senior leadership openness | N | Mdn |
|---|---|---|
| Disagree | 1 | 4 |
| Somewhat disagree | 1 | 4 |
| Neither agree nor disagree | 20 | 2 |
| Somewhat agree | 8 | 2 |
| Agree | 27 | 2 |
| Strongly agree | 35 | 1 |

***Availability of Devices and Information Technology Recommended to Children and Young People***

Separate Kruskal-Wallis H tests were conducted to determine whether there were differences in IT recommended to CYP and the availability of tablets, laptops, and smartphones for the following responses: not available, provided by work, and personally owned. Differences were only found for availability of laptops: $\chi^2$ (2) = 6.155, $p$ = 0.046. Median scores were 0 for all three categories of availability, indicating that even when laptops were available, most EPs did not recommend IT to CYP.

### *Administering Assessments Using Information Technology*

EPs were asked how often they utilized IT to administer assessments in Surveys 1 and 2. Table 9 presents the frequencies of administering assessments utilizing IT across the surveys.

**Table 9**

*Assessments Administered Across Surveys 1 (S1) and 2 (S2)*

| Assessment | S1 | S2 |
|---|---|---|
| Wechsler Intelligence Scale for Children (WISC-V) | 7 | 1 |
| Automated Working Memory Assessment | 1 | 0 |
| NEPSY (NEPSY-II) | 1 | 0 |
| Wechsler Adult Intelligence Scale (WAIS-IV) | 1 | 0 |
| Wechsler Individual Achievement Test (WIAT-III) | 2 | 1 |
| Wide Range Achievement Test (WRAT-4) | 1 | 0 |
| British Ability Scales (BAS3) | 0 | 1 |

### *Factors Influencing Information Technology Usage*

#### *Demographic Variables.*

***Gender.*** A Mann-Whitney U test was conducted to determine whether there were differences in frequency of IT-mediated cognitive assessments administered for males and females. The median scores were not significantly different when comparing males and females ($U = 560$, $z = 0.294$, $p = 0.769$).

***Disability.*** A Mann-Whitney U test was conducted to determine whether there were differences in frequency of IT-mediated cognitive assessments administered for individuals who identified as having a disability or mental health condition and those who did not. The median scores were not significantly different between those who did not identify a disability or mental health condition and those did ($U = 781.5$, $z = 1.433$, $p = 0.152$).

***Age.*** A Spearman's rank-order correlation test was conducted to determine the relationship between age and frequency of IT-mediated administration of cognitive assessments. The median scores were not significantly different across age categories ($r_s$ = 0.136, $N$ = 92, $p$ = 0.195).

***Role.*** Separate Mann-Whitney U tests were conducted to determine whether there were differences in frequency of IT-mediated administration of cognitive assessments for EPs across six role categories: PEPs, senior EPs, specialist EPs, supervisor EPs, main grade EPs, and TEPs. The median frequency of IT-mediated administration of cognitive assessments was not significantly different for EPs in the six role categories (all $p > 0.05$).

***Personal Characteristics.***

***Years Qualified.*** A Spearman's rank-order correlation test was conducted to assess the relationship between EPs' years qualified and the frequency of utilizing IT to administer assessments. The relationship was not significant ($r_s$ = 0.122, $N$ = 76, $p$ = 0.293).

***Perceived Compatibility of Information Technology With the Educational Psychologist Role.*** A Spearman's rank-order correlation test was conducted to determine the relationship between the frequency of IT-mediated administration of cognitive assessments and EPs' perceived compatibility of IT with the EP role (measured on a 7-point Likert scale ranging from 1 = *strongly disagree* to 7 = *strongly agree*). There was a weak significant negative relationship ($r_s$ = -0.221, $N$ = 91, $p$ = 0.035) between the frequency of IT-mediated assessments and EPs' perceived compatibility. However, the median score for perceived compatibility across the Likert scale was 1, which means most EPs reported that they never used IT to administer cognitive assessments.

***Personal Innovativeness in the Domain of Information Technology.*** A Spearman's rank-order correlation test was conducted to determine the relationship between PIIT and the frequency of IT-mediated administration of cognitive assessments. The relationship was not significant ($r_s$ = 0.203, $N$ = 92, $p$ = 0.052).

***Service.***

***Type of Service.*** Separate Mann-Whitney U tests were conducted to determine whether there were differences in the frequency of utilizing IT-mediated assessments for service type: private for-profit, private not-for-profit, self-employed, LA, and university or EP training provider. The median frequency of utilizing IT-mediated assessments was significant for EPs working in private for-profit services (*Mdn* = 4) compared with EPs in other roles (*Mdn* = 1, *U* = 123, *z* = -2.691, *p* = 0.007). EPs in other services typically reported that they never used IT to administer assessments (74.4%), whereas responses from EPs in private for-profit services were more varied, with EPs reporting that they never, often, and very often used IT to administer assessments (all 33.3%). For all other services, the relationships were not significant (all $p > 0.05$).

***Compatibility of Information Technology With Service.*** A Spearman's rank-order correlation test was conducted to determine the relationship between the perceived compatibility of IT with EPs' service and the frequency of IT-mediated administration of cognitive assessments. A significant weak negative relationship was found ($r_s = -0.238$, $N = 92$, $p = 0.022$). However, the median scores were all 1, indicating that most EPs did not use IT to administer assessments.

***Senior Leadership's Openness to Information Technology Usage.*** A Spearman's rank-order correlation test was conducted to determine the relationship between the perceived openness of senior leadership to IT and the frequency of IT-mediated administration of cognitive assessments. The relationship was not significant ($r_s = 0.103$, $N = 92$, $p = 0.330$).

### *Availability of Devices and Frequency of Utilizing Information Technology-Mediated Assessments*

Separate Kruskal-Wallis H tests were conducted to determine whether there were differences in the frequency of IT-mediated assessments and the availability of tablets, laptops, and smartphones for the following responses: not available, provided by work, and personally owned. There was only a difference in the frequency of IT-mediated assessments administered for tablets: $\chi^2(2) = 7.387$, $p = 0.025$. Median scores were 1 for all three categories of availability, indicating that even when laptops were available, most EPs rarely utilized them.

### *Social Media*

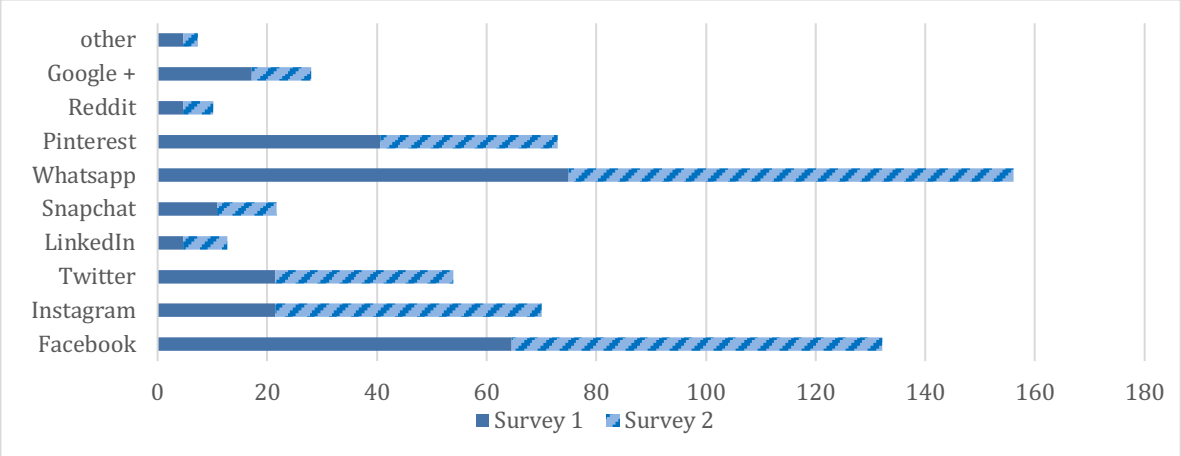
EPs were asked whether they used social media in their personal or professional lives. In Survey 1, 84.4% of participants reported that they used social media, whereas 94.6% of EPs reported having used social media in Survey 2. A Mann-Whitney U test was conducted to compare social media usage across Surveys 1 and 2; results were not statistically significant ($U$ = 1063, $z$ = -1.522, $p$ = 0.128).

### *Personal or Recreational Use of Social Media*

EPs reported Facebook (65.6%) and WhatsApp (75%) to be the most frequently used social media platforms in Survey 1. In Survey 2, this pattern of usage was similar, with EPs more frequently utilizing Facebook (67.6%) and WhatsApp (81.1%; see Figure 6). A Mann-Whitney U test was conducted to compare the means for frequency of utilizing each social media platform recreationally between Surveys 1 and 2. None of the usages of social media platforms were significantly different across Surveys 1 and 2 (all $p > 0.05$).

**Figure 6**

*Recreational Use of Social Media in Surveys 1 and 2*



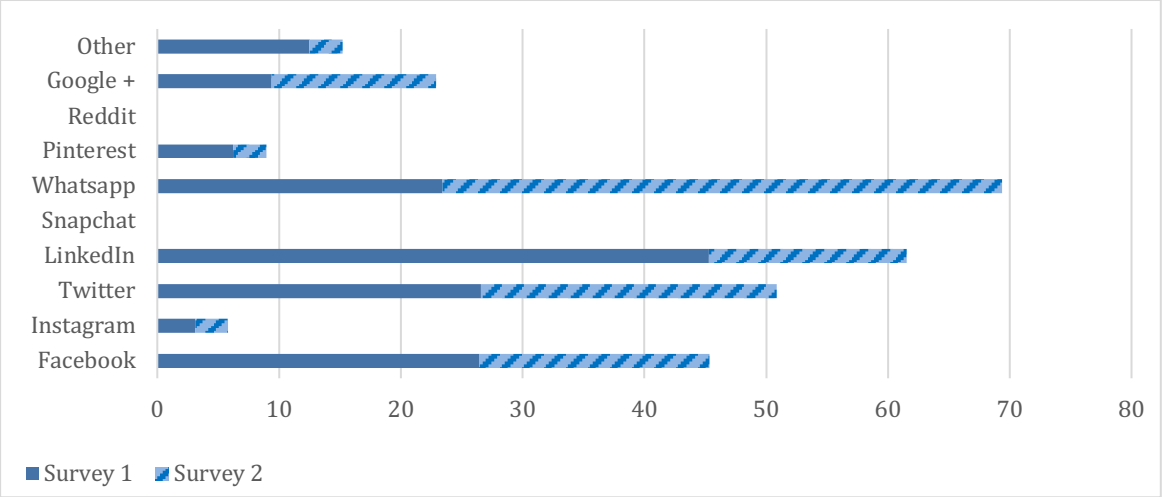

### *Professional Use of Social Media*

LinkedIn (44.6%), Twitter (26.2%), and WhatsApp (23.1%) were reported to be the most frequently utilized social media platforms in Survey 1. In Survey 2, WhatsApp (45.9%), Twitter (24.3%), and Facebook (18.9%) were reported to be the most frequently utilized social media

platforms (see figure 7). A Mann-Whitney U test was conducted to compare the means for each social media platform used professionally between Survey 1 and Survey 2. WhatsApp usage was found to be statistically significantly different across Surveys 1 (23.1%) and 2 (45.4%; $U$ = 917.5.5, $z$ = -2.331, $p$ = 0.020), with an increase in usage. LinkedIn was additionally found to be statistically significantly different, with a decrease in usage from Survey 1 (44.6%) to Survey 2 (16.2%; $U$ = 1544, $z$ = 2.890, $p$ = 0.003).

**Figure 7**

*Professional Social Media Use Across Surveys 1 and 2*




### *Availability of Devices*

EPs were asked what devices they used in their everyday roles. The devices included laptops, stationary desktops, tablets, smartphones, digital cameras, audio recorders, MP3 players, e-readers, and video cameras. For each of the devices, EPs were asked whether the devices were available to them and whether they were provided by work or personally owned. EPs were also provided with an "other" option. Additionally, EPs were asked how frequently they used the devices. The largest proportion of EPs in Survey 1 provided themselves with smartphones (44.4%), laptops (22.2%), and tablets (21.7%). In Survey 2, the largest proportion of EPs provided themselves with smartphones (29.7%), stationary desktops (27%), and tablets (24.3%). The largest proportion of employers in Survey 1 provided EPs with laptops (74.6%), smartphones (42.9%), and stationary desktops (34.5%).

In Survey 2, these patterns were similarly consistent, whereby EPs were provided laptops (75.7%), smartphones (70.3%), and tablets (29.7%).

Other devices mentioned included microphones, headsets, scanners, webcams, and HP iPAQs. One EP mentioned that they utilized devices owned by schools to work around GDPR concerns. Additionally, some EPs reported that they were only provided iPads if they had received specific training to utilize them.

A Kruskal-Wallis H test was conducted to determine whether there were differences in the availability of devices in Surveys 1 and 2 (Table 10). The difference in availability of devices was not statistically significantly different between Surveys 1 and 2 (all $p > 0.05$).

**Table 10**

*Availability of Devices in Surveys 1 and 2*

| **Device** | **Survey 1** | | **Survey 2** | |
|---|---|---|---|---|
| | ***Mdn*** | ***N*** | ***Mdn*** | ***N*** |
| Laptop | 2 | 63 | 2 | 30 |
| Stationary desktop | 1 | 58 | 2 | 30 |
| Tablet | 2 | 60 | 2 | 30 |
| Smartphone | 2 | 63 | 2 | 30 |
| Digital camera | 1 | 58 | 1 | 30 |
| Audio recorder | 1 | 56 | 1 | 30 |
| MP3 player or iPod | 1 | 56 | 1 | 30 |
| E-reader | 1 | 56 | 1 | 30 |
| Video camera | 1 | 59 | 1 | 30 |

*Note.* 1 = Not available, 2 = Provided by work, 3 = Personally owned

In Survey 2, 33.3% (*n* = 10) of EPs reported receiving new technology after COVID-19. This included smartphones (*n* = 4), headphones (*n* = 3), laptops (*n* = 2), laptop–tablet hybrids (*n* = 2), tablets (*n* = 1), monitors (*n* = 1), and phones (*n* = 1).

### *Availability of Devices and Frequency of Device Usage*

A Kruskal-Wallis H test was conducted to determine whether there were differences in the frequency of utilizing devices based on their availability. The median frequency of device usage was significant for laptops, $\chi^2$ (3) = 16.197, *p* = 0.001; stationary desktops, $\chi^2$ (3) = 60.877, *p* = 0.000; tablets, $\chi^2$ (3) = 36.013, *p* = 0.000; digital cameras, $\chi^2$ (3) = 56.134, *p* = 0.000; audio recorders, $\chi^2$ (3) = 34.595, *p* = 0.000; MP3 players or iPods, $\chi^2$ (3) = 20.293, *p* = 0.000; e-readers, $\chi^2$ (2) = 9.500, *p* = 0.009; and video cameras, $\chi^2$ (2) = 38.363, *p* = 0.000. Table 11 illustrates that for all devices except e-readers, EPs were more likely to report that they utilized devices more often if the devices were provided by work or personally owned, whereas all devices other than laptops were never utilized and were not available. However, the relationship was not significant for smartphones: $\chi^2$ (3) = 1.866, *p* = 0.601.

**Table 11**

*Availability of Devices and Median Frequency of Device Usage*

| **Devices** | **N** | **Availability of devices** | | |
|---|---|---|---|---|
| | | **Not available (*Mdn*)** | **Provided by work (*Mdn*)** | **Personally owned (*Mdn*)** |
| Laptop | 94 | 2.5 | 4 | 4 |
| Stationary desktop | 83 | 1 | 3 | 4 |
| Tablet | 80 | 1 | 3 | 2 |
| Smartphone | 88 | 1 | 4 | 4 |
| Digital camera | 76 | 1 | 2 | 2 |
| Audio recorder | 74 | 1 | 2 | 2 |

| | | | | |
|---|---|---|---|---|
| MP3 player or iPod | 70 | 1 | 1 | 1.5 |
| E-reader | 69 | 1 | 1 | 1 |
| Video camera | 74 | 1 | 2 | 3 |

*Note*. 1 = Never, 2 = Rarely, 3 = Sometimes, 4 = Often

### *Frequency of Device Usage*

In Survey 1, EPs reported that they used laptops (94.7%), smartphones (68.6%), tablets (32.6%), and stationary desktops (30.4%) often. In Survey 2, this was largely similar, with EPs reporting the usage of laptops (89.2%), smartphones (67.6%), stationary desktops (24.3%), and tablets (16.2%). A separate Mann-Whitney U test was conducted to determine whether there were differences in the frequency of usage for devices in Surveys 1 and 2 (see Table 12). None were found to be statistically significant (all $p > 0.05$).

**Table 12**

*Median Frequency of Device Usage in Surveys 1 and 2*

| **Device** | **Survey 1** | | **Survey 2** | |
|---|---|---|---|---|
| | ***Mdn*** | ***N*** | ***Mdn*** | ***N*** |
| Laptop | 4 | 57 | 4 | 30 |
| Stationary desktop | 2 | 46 | 2 | 30 |
| Tablet | 2 | 43 | 2 | 30 |
| Smartphone | 4 | 51 | 4 | 30 |
| Digital camera | 1 | 39 | 1 | 30 |
| Audio recorder | 1 | 37 | 1 | 30 |
| MP3 player or iPod | 1 | 33 | 1 | 30 |

| | | | | |
|---|---|---|---|---|
| E-reader | 1 | 32 | 1 | 30 |
| Video camera | 1 | 37 | 1 | 30 |

*Note.* 1 = Never, 2 = Rarely, 3 = Sometimes, 4 = Often

### *Factors Influencing Information Technology Usage*

#### *Demographic Variables.*

***Gender.*** Separate Mann-Whitney U tests were conducted to determine whether there were differences in the frequency of device usage for males and females. The median frequency of device usage for audio recorders was significantly different for females (*Mdn* = 1) and males (*Mdn* = 2, *U* = 147, *z* = -3.848, *p* = 0.000). Medians for the frequency of usage for other devices were not significant when comparing males and females (all $p > 0.05$).

***Disability.*** A Mann-Whitney U test was conducted to determine whether there were differences in frequency of device usage for individuals who identified as having a disability or mental health condition and those who did not. The median scores were only significantly different between those who identified as having a disability or mental health condition (*Mdn* = 1) and those who did not (*Mdn* = 1, *U* = 350, *z* = 2.910, *p* = 0.004) for e-readers.

***Age.*** A Spearman's rank-order correlation test was performed to determine the relationship between age and device usage. There was a weak significant relationship for stationary desktop usage ($r_s = 0.255$, $N = 76$, $p = 0.041$). Median IT usage for stationary desktops was highest for EPs over the age of 55, who they reported using stationary desktops often (see Table 13). For all other devices, the relationship between age and device usage was not significant (all $p > 0.05$).

**Table 13**

*Median Device Usage Categorized by Age*

| Device | Age | | | | |
|---|---|---|---|---|---|
| | 25–34 | 35–44 | 45–54 | 55–64 | 65+ |
| Laptop | 4 | 4 | 4 | 4 | 4 |
| Stationary desktop | 2 | 1 | 1 | 4 | 4 |
| Tablet | 2.5 | 2 | 1 | 3.5 | 2 |
| Smartphone | 4 | 4 | 4 | 4 | 4 |
| Digital camera | 1 | 1 | 1 | 2 | 1 |
| Audio recorder | 1 | 1 | 1 | 2 | 2 |
| MP3 player or iPod | 1 | 1 | 1 | 1 | 1 |
| E-reader | 1 | 1 | 1 | 1 | 1 |
| Video camera | 1 | 1.5 | 1 | 1.5 | 1.5 |

*Note.* 1 = Never, 2 = Rarely, 3 = Sometimes, 4 = Often

***Role.*** *Separate Mann-Whitney U tests were conducted to determine whether there were differences in the frequency of device usage for EPs across six role categories: PEPs, senior EPs, specialist EPs, supervisor EPs, main grade EPs, and TEPs. The median frequency of device usage for tablets was significantly different for main grade EPs (Mdn = 1) compared with EPs in other roles (Mdn = 3, U = 888.5, z = 2.617, p = 0.009). The greatest proportion of EPs in other roles reported that they utilized tablets often (n = 14) and never (n = 11), whereas the greatest proportion of main grade EPs reported that they never utilized tablets. The median frequency of device usage for tablets was also significantly different for PEPs (Mdn = 4) compared with EPs in other roles (Mdn = 2, U = 54, z = -2.659, p = 0.008). For all other devices and roles, the relationships were not significant (all p > 0.05).*

***Personal Characteristics.***

***Years Qualified.*** A Spearman's rank-order correlation test was performed to determine the relationship between EPs' years qualified and frequency of device usage. There was a weak positive relationship between smartphone usage and age ($r_s$ = 0.280, $p$ = 0.016). EPs who reported that they

used smartphones often had been practising for a median of 16 years, whereas EPs who reported rarely utilizing smartphones had been practising for a median of 4 years (see Table 14). For all other devices, the relationship was not significant for years qualified (all $p > 0.05$).

**Table 14**

*Frequency of Smartphone Usage and Median Years Qualified*

| Frequency of smartphone usage | N | Years qualified (*Mdn*) |
|---|---|---|
| Never | 2 | 4 |
| Rarely | 4 | 11 |
| Sometimes | 16 | 6 |
| Often | 51 | 16 |

*Note.* 1 = Strongly disagree, 2 = Disagree, 3 = Somewhat disagree, 4 = Neutral, 5 = Somewhat agree, 6 = Agree, 7 = Strongly agree

### *Perceived Compatibility of Information Technology With the Educational Psychologist Role.*

***Role.*** A Spearman's rank-order correlation test was conducted to determine the relationship between EPs' perceived compatibility of IT with the EP role and frequency of device usage. Perceived compatibility was significant for stationary desktop usage ($r_s = 0.271$, $p = 0.013$). EPs who reported that they used devices sometimes and often were more likely to report that they agreed that IT was compatible with the EP role, whereas EPs who rarely and never utilized stationary desktops reported that they somewhat agreed that IT was compatible with the EP role (see Table 15). For all other devices, no relationships were significant (all $p > 0.05$).

**Table 15**

*Frequency of Smartphone Usage and Median Perceived Compatibility With the Educational Psychologist Role*

| Frequency of smartphone usage | N | Perceived compatibility (*Mdn*) |
|---|---|---|
| Never | 40 | 5 |
| Rarely | 10 | 5 |
| Sometimes | 10 | 6.5 |
| Often | 23 | 6 |

*Note.* 1 = Strongly disagree, 2 = Disagree, 3 = Somewhat disagree, 4 = Neutral, 5 = Somewhat agree, 6 = Agree, 7 = Strongly agree

***Personal Innovativeness in the Domain of Information Technology.*** A Spearman's rank-order correlation test was conducted to determine the relationship between PIIT and frequency of device usage. PIIT was not significant ($p > 0.05$).

***Service.***

***Type of Service.*** Separate Mann-Whitney U tests were performed to determine whether there were differences in frequency of device usage for the following types of service: private for-profit, private not-for-profit, self-employed, LA, and university or EP training provider.

For EPs in private for-profit service, frequency of device usage was significant for stationary desktops. EPs in private for-profit service (*Mdn* = 4) utilized stationary desktops more often than EPs employed in other services (*Mdn* = 1.5, *U* = 84, *z* = -2.302, *p* = 0.04).

For EPs in LA services, frequency of device usage was significant for stationary desktops and digital cameras. EPs in LA services reported never utilizing stationary desktops (*Mdn* = 1), whereas EPs in other services reported using them often (*Mdn* = 4, *U* = 986.5, *z* = 3.247, *p* = 0.001). EPs in LA services reported never utilizing digital cameras (*Mdn* = 1), whereas EPs in other services reported rarely using them (*Mdn* = 2, *U* = 715, *z* = 2.446, *p* = 0.014).

For EPs who were self-employed, frequency of device usage was significant for tablets and digital cameras. EPs who were self-employed reported utilizing tablets often (*Mdn* = 4), whereas EPs

in other services reported rarely using them (*Mdn* = 2, *U* = 239, *z* = -2.085, *p* = 0.037). EPs who were self-employed reported never utilizing digital cameras (*Mdn* = 1), whereas EPs in other services reported rarely using them (*Mdn* = 2, *U* = 217.5, *z* = -2.429, *p* = 0.015).

The relationship of frequency of devices utilized for the remaining devices and services was not significant (all $p > 0.05$).

***Compatibility of Information Technology With Service.*** A Spearman's rank-order correlation test was conducted to determine the relationship between the perceived compatibility of IT with EPs' service and frequency of device usage. A significant weak positive relationship was found for the frequency of tablet usage and compatibility of IT with service ($r_s = 0.289$, $N = 80$, $p = 0.009$; see Table 16).

**Table 16**

*Frequency of Tablet Usage and Median Perceived Compatibility With the Educational Psychologist Role*

| Frequency of tablet usage | N | Role compatibility (*Mdn*) |
|---|---|---|
| Never | 36 | 6 |
| Rarely | 11 | 6 |
| Sometimes | 13 | 7 |
| Often | 7 | 20 |

*Note.* 1 = Strongly disagree, 2 = Disagree, 3 = Somewhat disagree, 4 = Neutral, 5 = Somewhat agree, 6 = Agree, 7 = Strongly agree

***Senior Leadership's Openness to Information Technology Usage.*** A Spearman's rank-order correlation test was conducted to determine the relationship between the perceived openness of senior leadership to IT and frequency of device usage. The relationship was not significant (all $p > 0.05$).

***Information Sharing***

In Survey 1, EPs very often shared information via FTF meetings (92.1%) and emails (61.9%) and often via telephone (39.7%). In Survey 2, EPs very often shared information via email (54.1%), FTF meetings (54.1%), and telephone (43.2%) and often via post (32.4%).

Other forms of communicating in Survey 2 included eight references to utilizing VC platforms, whereas in Survey 1, other forms of sharing information included more FTF methods, such as the school office, SENCOs, and printed information (see Table 17).

**Table 17**

*Other Forms of Sharing Information Described in Surveys 1 and 2*

| **Survey 1** | ***N*** | **Survey 2** | ***N*** |
|---|---|---|---|
| WhatsApp | 1 | YouTube webinars | 2 |
| Special educational needs coordinators | 2 | Videoconferencing | 8 |
| School office | 1 | Zoom | 2 |
| Printed information | 1 | WhatsApp video chat | 1 |
| Parent forum meetings | 1 | Skype | 1 |
| Local offer website | 2 | Microsoft Teams | 3 |
| Company website | 1 | Google meetings | 1 |
| Advice sheets | 1 | Newsletter | 1 |
| | | Local offer website | 2 |
| | | Electronic resources | 2 |

A Mann-Whitney U test was completed for each form of information sharing to compare the median frequency of usage for Surveys 1 and 2 (see Table 18). The frequencies of sharing information via the platforms in Surveys 1 and 2 were significantly different for telephone ($U$ = 1500.5, $z$ = 2.559, $p$ = 0.010), FTF meetings ($U$ = 172.5, $z$ = -8.274, $p$ = 0.000), post ($U$ = 663, $z$ = -

3.666, $p$ = 0.000), service websites ($U$ = 1596, $z$ = 3.201, $p$ = 0.001), and other forms of sharing information ($U$ = 92.28, $z$ = 2.514, $p$ = 0.012). There were increases in the usage of telephones, service websites, and other forms of sharing information. There were decreases in sharing information via FTF meetings and letters sent by post.

**Table 18**

*Median Frequency of Information Sharing for Surveys 1 and 2*

| Forms of information sharing | Survey 1 | | Survey 2 | |
|---|---|---|---|---|
| | N | Mdn | N | Mdn |
| Email | 64 | 5 | 37 | 5 |
| Telephone | 64 | 4 | 37 | 5 |
| Face-to-face meetings | 64 | 5 | 37 | 1 |
| Letters sent by post | 64 | 3 | 37 | 2 |
| Blogs | 64 | 1 | 37 | 1 |
| Service website | 64 | 2 | 37 | 3 |
| Social media | 64 | 1 | 37 | 1 |
| Text message | 64 | 1 | 37 | 2 |
| Other | 64 | 1 | 37 | 1 |

*Note.* 1 = Strongly disagree, 2 = Disagree, 3 = Somewhat disagree, 4 = Neutral, 5 = Somewhat agree, 6 = Agree, 7 = Strongly agree

### *Factors Influencing Information Technology Usage*

#### *Demographic Variables.*

***Gender.*** Separate Mann-Whitney U tests were conducted to determine whether there were differences in the frequency of information sharing for males and females. Medians for the frequency of sharing information were not significant for any of the forms of information sharing (all $p > 0.05$).

***Disability.*** A Mann-Whitney U test was conducted to determine whether there were differences in the frequency of information sharing for individuals who identified as having a disability or mental health condition and those who did not. The median for the frequency of sharing information was not significant for any of the forms of information sharing (all $p > 0.05$).

***Age.*** A Spearman's rank-order correlation test was performed to determine the relationship between age and frequency of information sharing. The relationship between age and frequency of sharing information was significant for sharing information via email ($r_s = 0.246$, $p = 0.017$, $N = 93$) and text message ($r_s = 0.372$, $p = 0.000$, $N = 93$; see Table 19). EPs who were in the 65+ age range reported sharing information via text message often, compared with EPs under 64, who rarely and never shared information via this format. Overall, EPs often shared information via email; however, EPs over 45 were more likely to report doing so very often. The relationships between other forms of information sharing and age were not significant (all $p > 0.05$).

**Table 19**

*Median Frequency of Information Sharing Categorized by Age*

| Forms of information sharing | 25–34 | | 35–44 | | 45–54 | | 55–64 | | 65+ | |
|---|---|---|---|---|---|---|---|---|---|---|
| | N | Mdn | N | Mdn | N | Mdn | N | Mdn | N | Mdn |
| Email | 31 | 4 | 22 | 4.5 | 27 | 5 | 8 | 5 | 5 | 5 |
| Telephone | 31 | 4 | 22 | 4 | 27 | 4 | 8 | 5 | 5 | 4 |

| Forms of information sharing | 25–34 | | 35–44 | | 45–54 | | 55–64 | | 65+ | |
|---|---|---|---|---|---|---|---|---|---|---|
| | N | Mdn | N | Mdn | N | Mdn | N | Mdn | N | |
| Face-to-face meetings | 31 | 5 | 22 | 5 | 27 | 5 | 8 | 5 | 5 | 5 |
| Letters sent by post | 31 | 4 | 22 | 3.5 | 27 | 3 | 8 | 4 | 5 | 3 |
| Blogs | 31 | 1 | 22 | 1 | 27 | 1 | 8 | 1 | 5 | 1 |
| Service website | 31 | 2 | 22 | 2 | 27 | 3 | 8 | 1.5 | 5 | 1 |
| Social media | 31 | 1 | 22 | 1 | 27 | 1 | 8 | 1 | 5 | 1 |
| Text message | 31 | 1 | 22 | 1 | 27 | 2 | 8 | 1 | 5 | 4 |
| Other | 32 | 2 | 22 | 2 | 27 | 2 | 8 | 2 | 5 | 2 |

*Note. 1 = Never, 2 = Rarely, 3 = Not often, 4 = Often, 5 = Very often*

**Role.** Separate Mann-Whitney U tests were conducted to determine whether there were differences in frequency of information sharing for EPs across six role categories: PEPs, senior EPs, specialist EPs, supervisor EPs, main grade EPs, and TEPs. The relationship between frequency of information sharing and role was only significant for main grade EPs for blogs ($U = 939$, $z = -2.228$, $p = 0.026$) and for other forms of information sharing ($U = 913$, $z = -2.227$, $p = 0.023$). However, most EPs reported that they never shared information via blogs (main grade EPs = 85.7%, EPs in other roles = 96.2%) and did not utilize other forms of information sharing (main grade EPs = 95.2%, EPs in other roles = 78.8%). For the other forms of information sharing, there were no significant differences between the roles (all $p > 0.05$).

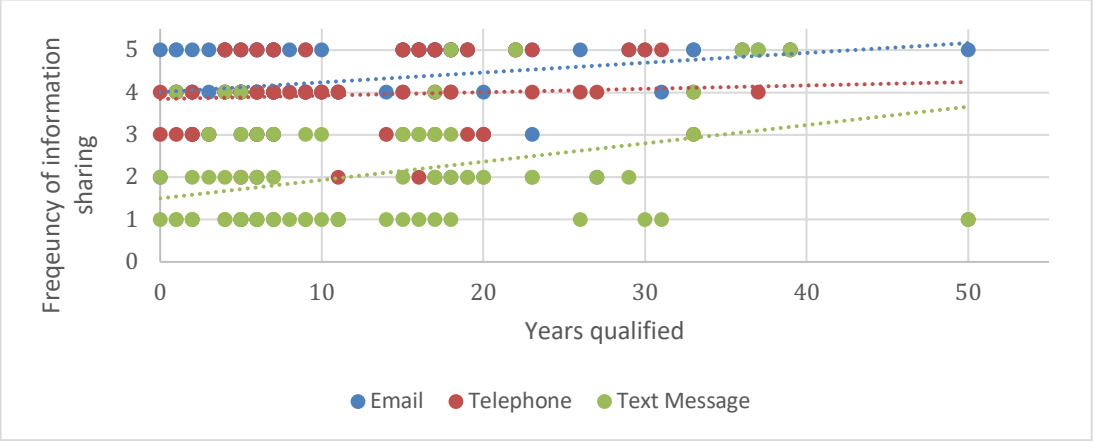
***Personal Characteristics.***

***Years Qualified.*** A Spearman's rank-order correlation test was conducted to determine the relationship between years qualified and frequency of information sharing. There was a weak positive relationship between years qualified and frequency of sharing information via text message

($r_s$ = 0.317, $N$ = 77, $p$ = 0.005) and email ($r_s$ = 0.231, $N$ = 77, $p$ = 0.043); additionally, there was a moderate relationship between age and sharing information via telephone ($r_s$ = 0.0249, $N$ = 77, $p$ = 0.029; see Figure 8). The relationships between age and other forms of sharing information were not significant (all $p$ > 0.05).

**Figure 8**

*Relationship Between Age and Frequency of Sharing Information via Text Message, Telephone, and Email*

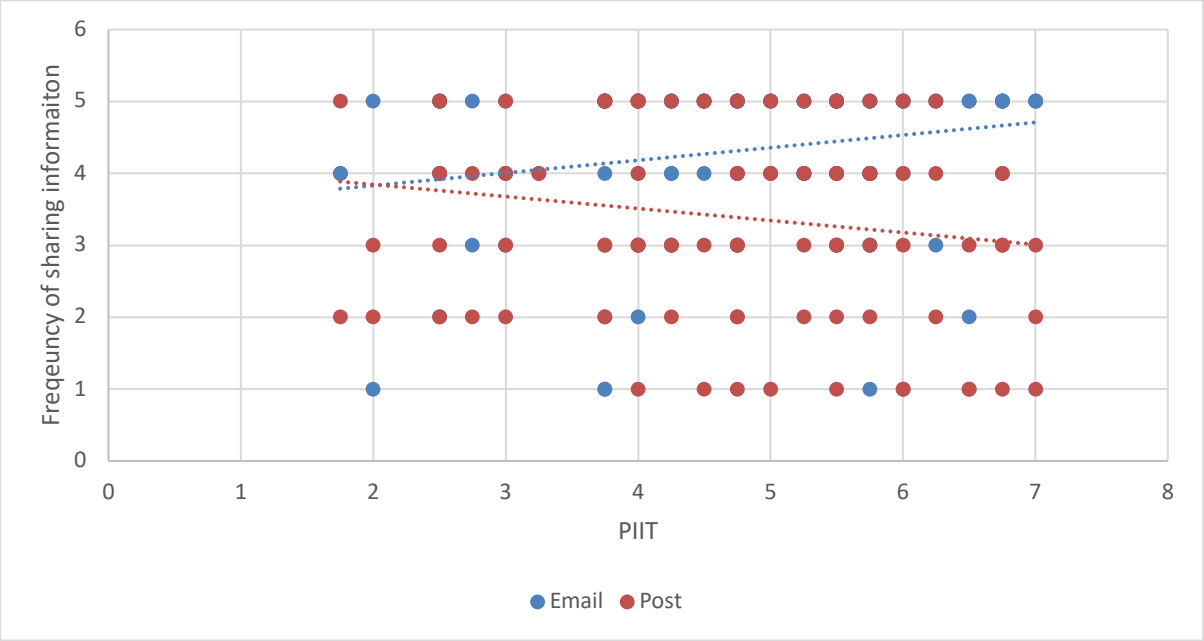



***Perceived Compatibility of Information Technology With the Educational Psychologist Role.*** A Spearman's rank-order correlation test was conducted to determine the relationship between EPs' perceived compatibility of IT with the EP role and frequency of sharing information. The relationship was not significant for any of the forms of information sharing (all $p$ > 0.05).

***Personal Innovativeness in the Domain of Information Technology.*** A Spearman's rank-order correlation test was conducted to determine the relationship between PIIT and frequency of sharing information. There was a weak negative relationship for sharing information via post ($r_s$ = -2.13, $N$ = 93, $p$ = 0.041) and a weak positive relationship for sharing information via email ($r_s$ = 0.279, $N$ = 93, $p$ = 0.007; see Figure 9). As PIIT increased, EPs were less likely to send information by post and more likely to share information via email. For all other forms of sharing information, the relationship was not significant (all $p$ > 0.05).

**Figure 9**

*Relationship Between Personal Innovativeness in the Domain of Information Technology and Frequency of Sharing Information via Text, Email, and Post*




***Service.***

***Type of Service.*** Separate Mann-Whitney U tests were conducted to determine whether there were differences in the frequency of sharing information for the following types of service: private for-profit, private not-for-profit, self-employed, LA, and university or EP training provider.

For EPs in private for-profit services, the frequency of sharing information was significant for telephones ($U$ = 109.5, $z$ = -2.512, $p$ = 0.012), social media ($U$ = 120, $z$ = -2.963, $p$ = 0.003), and text message ($U$ = 133, $z$ = -2.1632, $p$ = 0.031). EPs in private for-profit services more often utilized telephones (private for-profit *Mdn* = 5, other *Mdn* = 4), social media (private for-profit *Mdn* = 3.50, other *Mdn* = 1), and text message (private for-profit *Mdn* = 5, other *Mdn* = 1) compared with EPs in other services.

For EPs in private not-for-profit services, the frequency of sharing information was significant for email ($U$ = 582, $z$ = 2.382, $p$ = 0.017) and other forms of information sharing ($U$ = 543, $z$ = 2.552, $p$ = 0.012). For EPs in other services, 65.5% reported sharing information via email very often, whereas 40% of EPs reported sharing information often.

For EPs who were self-employed, the frequency of sharing information was significant for letters sent by post ($U$ = 812, $z$ = 2.413, $p$ = 0.016). EPs who were self-employed did not often share information by letters (*Mdn* = 2), whereas EPs in other services did so often (*Mdn* = 4).

The relationships between frequency of sharing information for other forms of information sharing and service were not significant (all $p > 0.05$).

***Compatibility of Information Technology With Service.*** A Spearman's rank-order correlation test was conducted to determine the relationship between the EPs' perceived compatibility of IT with their service and frequency of sharing information. A significant weak positive relationship was found for sharing information via email ($r_s$ = 0.274, $N$ = 93, $p$ = 0.008) and text message ($r_s$ = 0.239, $N$ = 93, $p$ = 0.021; see table 20). EPs who agreed that IT was compatible with their services shared information more often via text message compared with EPs who did not agree that IT was compatible (except for EPs who strongly disagreed). EPs who strongly agreed that IT was compatible with their services rarely shared information via text message, whereas those who agreed did so rarely. The relationship between frequency of sharing information for other forms of information sharing and compatibility of IT with service were not significant (all $p > 0.05$).

**Table 20**

*Median Frequency of Information Sharing via Text Message and Email Categorized by Compatibility of Information Technology With Service*

| Frequency of sharing information | Strongly disagree | | Disagree | | Somewhat disagree | | Neither agree nor disagree | | Somewhat agree | | Agree | | Strongly agree | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | N | Mdn | N | Mdn | N | Mdn | N | Mdn | N | Mdn | N | Mdn | N | Mdn |
| Email | 1 | 5 | 2 | 4.5 | 6 | 4 | 10 | 4 | 9 | 4 | 29 | 5 | 36 | 5 |
| Text message | 1 | 2 | 2 | 3 | 6 | 1 | 10 | 1 | 9 | 1 | 29 | 2 | 36 | 2 |

*Note. 1 = Never, 2 = Rarely, 3 = Not often, 4 = Often, 5 = Very often*

***Senior Leadership's Openness to Information Technology Usage.*** A Spearman's rank-order correlation test was conducted to determine the relationship between the perceived openness of senior leadership to IT and frequency of sharing information. The relationships were not significant (all $p > 0.05$).

### *Service Information Technology Evaluations*

EPs were asked to evaluate the IT in their service for material availability, access to assessments, access to online scoring, access to up-to-date technology, availability of computer stations, and the working conditions of their computers. These items were scored on a 5-point Likert scale (1 = *strongly disagree* to 5 = *strongly agree*). Most EPs somewhat agreed that their IT services were in good condition (see Table 21). However, EPs reported that they somewhat disagreed with the statement that technology-mediated assessments were readily available.

**Table 21**

*Service Information Technology Evaluation Statements*

| Service evaluation statements | Agreement (Mdn) |
|---|---|
| I can readily obtain answers to technology-related questions. | 4 |
| We have adequate access to up-to-date technology resources. | 3 |
| Materials (e.g., software or printer supplies) are readily available. | 4 |
| Computer stations are readily available to work on. | 4 |
| We have access to up-to-date technology (e.g., computers or tablets). | 4 |
| Online or computer-based scoring for assessments is readily available. | 4 |
| We have access to technology-mediated assessments. | 2 |

*Note. 1 = Strongly disagree, 2 = Somewhat disagree, 3 = Neither agree nor disagree, 4 = Somewhat agree, 5 = Strongly agree*

***Type of Service.*** Separate Mann-Whitney U tests were conducted to determine whether there were differences in IT evaluations for the following types of service: private for-profit, private not-for-profit, self-employed, LA, and university or EP training provider.

Median scores were significant for private for-profit services for the statement, "We have access to up-to-date technology resources" ($U$ = 132.5, $z$ = -2.0259, $p$ = 0.039). EPs in private for-profit services more strongly agreed with the statements (*Mdn* = 4.50) compared with EPs in other services (*Mdn* = 3).

Median scores were significant for private not-for-profit for the statement, "I can readily obtain answers to technology-related questions" ($U$ = 587.5, $z$ = 2.216, $p$ = 0.027). They were also significant for the statement, "We have access to up-to-date technology" ($U$ = 657, $z$ = 3.075, $p$ = 0.002). EPs in other services had higher agreement with both statements (*Mdn* = 4) than EPs in private not-for-profit services.

Median scores were significant for LA services for the statement, "Materials are readily available" ($U$ = 1338.5, $z$ = 3.524, $p$ = 0.000). Overall, EPs agreed that they had materials available; however, EPs in other services agreed more strongly (*Mdn* = 5) compared with EPs in LAs (*Mdn* = 4).

Median scores were significant for university or EP training providers for the statement, "We have access to technology-mediated assessments" ($U$ = 457, $z$ = 1.966, $p$ = 0.049). The median score was lower for EPs employed with university training providers (*Mdn* = 1) compared with EPs in other services (*Mdn* = 2).

### *Compatibility of Information Technology With Service*

A Spearman's rank-order correlation test was conducted to determine the relationship between the perceived compatibility of IT with EPs' service and frequency of utilizing IT to score assessments. There were moderate positive significant relationships between compatibility of IT with service and the following statements:

| | |
|---|---|
| I can readily obtain answers to technology-related questions. | $r_s$ = 0.390, N = 93, p = 0.000 |

| | |
|---|---|
| We have adequate access to up-to-date technology resources. | $r_s$ = 0.398, N = 93, p = 0.000 |
| Computer stations are readily available to work on. | $r_s$ = 0.369, N = 93, p = 0.000 |
| We have access to up-to-date technology (e.g., computers or tablets). | $r_s$ = 0.403, N = 93, p = 0.000 |
| Online or computer-based scoring for assessments is readily available. | $r_s$ = 0.387, N = 93, p = 0.000 |
| We have access to technology-mediated assessments. | $r_s$ = 0.434, N = 93, p = 0.000 |

EPs who strongly agreed that IT was compatible with their services were more likely to agree that they had access to IT support, up-to-date technology resources, computer stations that were readily available, computer-based scoring, and technology-mediated assessments.

***Senior Leadership's Openness to Information Technology Usage***

A Spearman's rank-order correlation test was conducted to determine the relationship between the perceived openness of senior leadership to IT usage and IT evaluation statements. A weak significant positive relationship was found for the statement, "We have access to up-to-date technology (e.g., computers or tablets)" ($r_s$ = 0.233, $N$ = 93, $p$ = 0.024). EPs who strongly agreed that their senior leadership were open to IT usage were more likely to agree that they had access to up-to-date technology.

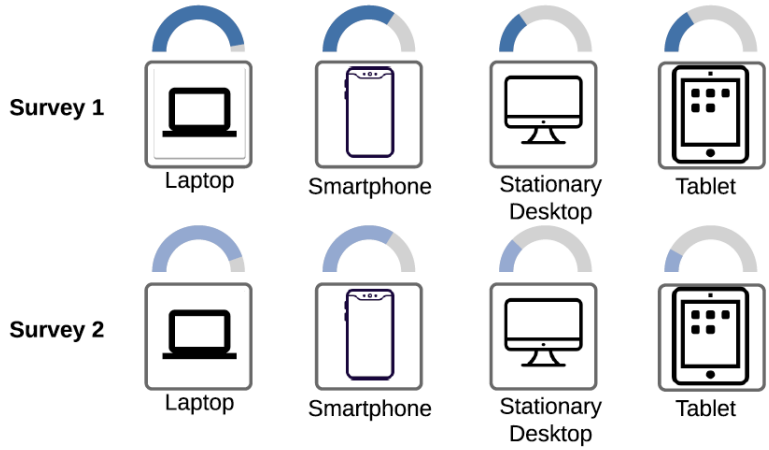
***Summary of Quantitative Results***

***RQ1: How are EPs utilizing IT in their practice to support CYP?***

Overall, Eps used IT very frequently for their main administrative tasks including report writing, accessing resources, research, and communication with other professionals and parents. EPs also used IT frequently for scoring assessments. There was also a shift in the type of assessments scored in the second survey, where EPs scored questionnaires more often and cognitive assessments (which required FTF work) less often. Most EPs reported that they never used IT for administering assessments and did not have them available.

**Figure 10**

*Availability of Devices*




EPs were most often provided with laptops and smartphones (shown in Figure 9) and less frequently with stationary desktops and tablets. EPs reported that they most often provided themselves with smartphones. Availability of devices was found to influence frequency of use.

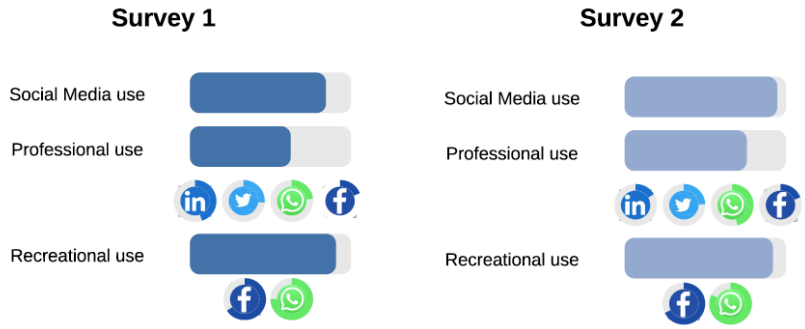
When IT usage with CYP was explored, more than half of EPs stated that they did not utilize any IT with CYP. This was due to both not knowing what IT was available and a feeling that it was unnecessary. The minority of EPs that did use apps with CYP most often used mindfulness apps (in the category of mental health). They also utilized apps for assessment and intervention, which included utilizing certain apps to explore children's needs dynamically. Another area of IT that EPs utilized and recommended to CYP was augmentative and alternative communication applications to support communication with CYP and to gather their views. EPs most often recommended apps to support literacy, accessibility, and mental health.

Most EPs recommended one type of app category. EPs often recommended generic types of apps rather than specific apps due to not knowing what was available or the evidence behind apps to recommend (e.g., speech-to-text software) or a specific recommendation, such as Dragon Dictate (see Appendix F for programs organized by category). EPs stated that they most often recommended programs and applications to support CYP's literacy development (e.g., literacy games), accessibility (speech to text or communication), and emotional and mental health (most often mindfulness apps).

Although there was no difference the quantity of IT recommended in Survey 2, there were differences in the type of app recommended. There were increases in the recommendations of apps that would support literacy development, including games and programs such as Nessy. There were reductions in the recommendations of apps to support mental health and increases in the use of IT to present information (e.g., YouTube videos).

**Figure 11**

*Social Media Use*




Social media usage amongst EPs in the United Kingdom was reported to be high and above the U.K. 2021 statistic of 77.9% (ONS, 2020). The majority of EPs utilized social media for recreational purposes both before and after COVID-19 (see Figure 10). Facebook and WhatsApp were the most utilized recreationally, whereas WhatsApp, LinkedIn, and Twitter were the most frequently utilized professionally.

EPs most often shared information with service users through FTF meetings, via emails, and over the phone. COVID-19 resulted in a 38% reduction in FTF meetings, and EPs most frequently reported that they never shared information via this format. There was also an increase in sharing information by service websites, telephones, and videoconferencing.

***RQ2: What factors influence EPs' usage of IT?***

The demographic variables of gender and disability did not have a major impact on IT use. EPs over the age of 55 were the most likely to report that they used stationary desktops often.

Higher levels of PIIT influenced total IT use and the sharing of information by email.

EPs who had been qualified for a longer period were more likely to report using smartphones often, compared with EPs who had been practicing for a shorter period, who reported doing so rarely.

EPs who reported that their senior leadership were open to IT were more likely to report that they had access to up-to-date technology. EPs who more strongly agreed with the statement that IT was compatible with their services shared information more often by text message; they also more strongly agreed with statements about access to computer stations, IT support, up-to-date technology resources, computer-based scoring, and technology-mediated assessments.

EPs employed in private for-profit services were the most likely to report that they used IT-mediated assessments and stationary desktops and more strongly agreed with the statement that they had access to up-to-date technology. EPs employed in local authorities were the most likely to report that they never used stationary desktops. EPs who were self-employed used tablets the most frequently. EPs employed in private for-profit services were also more likely to share information with service users via text message, telephone, and social media.

## Qualitative Results

In both the surveys (Survey 1 = 65, Survey 2 = 37) and interviews (Interview 1 = 3, Interview 2 = 10), EPs were asked in an open-ended question what they considered to be the enablers of and barriers to IT usage in their practice. For the barriers, themes for Interviews 1 and 2 were combined (*n* = 13), as the primary purpose of Interview 1 was an in-depth exploration of the enablers of IT usage. Enablers of and barriers to IT usage are presented separately.

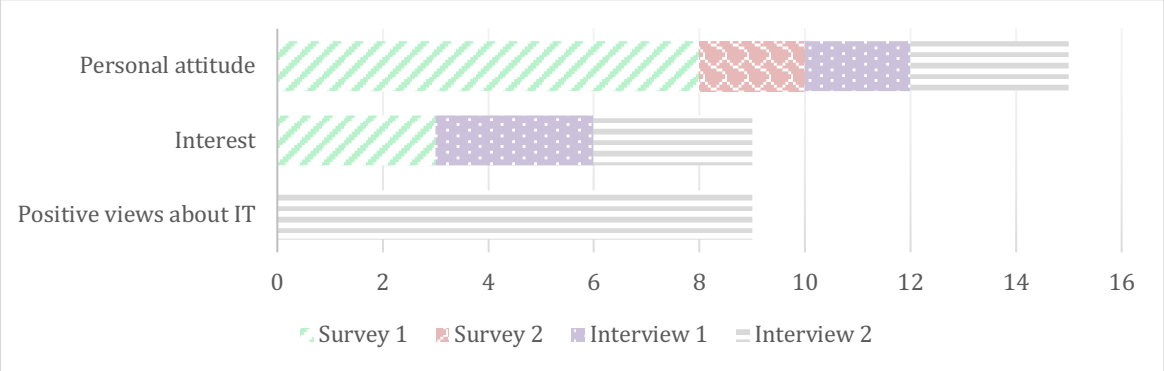
### *Enablers of Information Technology Usage*

#### *Personal Characteristics*

The theme of personal characteristics was found across Surveys 1 (*n* = 9) and 2 (*n* = 2) as well as Interviews 1 (*n* = 3) and 2 (*n* = 10). The subthemes found included interest, views, and attitude toward IT (see Figure 12).

**Figure 12**

*Subthemes for Personal Characteristics for Each of the Data Collection Formats*




The subtheme for attitude across Interview 2 and Surveys 1 and 2 included motivation, enthusiasm, and willingness to try. In Survey 1, this subtheme included being inquisitive and open to teach oneself new skills. EPs were motivated to learn more about IT to meet their specific needs, such as exploring the best devices or utilizing a video editing program.

The subtheme of interest in Survey 1 and Interview 1 included an interest in keeping up to date and aware of relevant IT. One participant reported an interest in IT focused on their

undergraduate and postgraduate thesis. The EPs in Interview 1 also reported a general research interest, specifically in IT research, disseminating research, and sharing their expertise. In Survey 2, the subtheme of interest encompassed an interest in exploring available IT and utilizing the free trial of online or virtual assessments provided by Pearson in March and April 2020.

Positive views on IT identified in Interview 2 included positive views on digital assessments and a change in EP views after COVID-19. After COVID-19, EPs realized that IT was "even more central" to their functioning and practice, reporting that the experience and exposure of needing to utilize IT would encourage EPs to utilize IT more in the future.

> *'Before COVID, we weren't using any of this kind of technology. And now that we're used to this, we're like, oh, my gosh, why were we so dependent on people doing things in person beforehand?'*

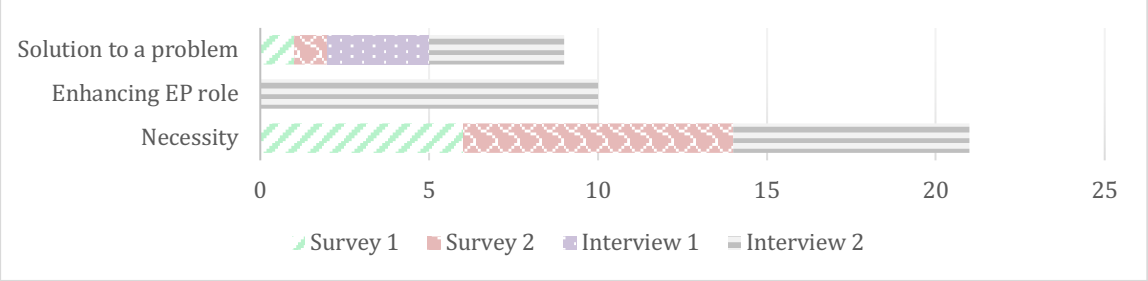
Changing views on COVID-19 also included a changing view on virtual assessments. EPs explained that initially, they were reluctant to use virtual assessments. One EP shared that they were concerned about building rapport and engaging CYP remotely. However, they reported that they were "pleasantly surprised" and felt that CYP could engage and perform to the "full extent of their abilities virtually". Another EP found the experience "better, once it works", as everything in the assessment manuals is in one place, saving time from having to "dip from one manual to another".

### *Relevance to Educational Psychologists' Role*

The theme of relevance to the EP role encompasses the necessity of utilizing IT, the opportunity to discover and learn, and the ability to find a solution to a problem (see Figure 13). This theme was found in Surveys 1 ($n$ = 7) and 2 ($n$ = 9) as well as Interviews 1 ($n$ = 3) and 2 ($n$ = 10).

**Figure 13**

*Subthemes for Reasons to Utilize Information Technology for Each of the Data Collection Formats*



The subtheme of the necessity of utilizing IT for the EP role in Interview 1 included the usage of IT for VIG and reports, the evidence base supporting IT usage, and the knowledge of IT being the future. EPs in Interview 2 ($n$ = 7) also mentioned that IT is the future of employment ($n$ = 2) and the EP role ($n$ = 3).

EPs in Interviews 1 and 2 reported the need to update and evolve practice, as the profession was behind in IT compared with other professions ($n$ = 5). This need was mentioned in Interviews 1 and 2, as EPs reported that IT was essential to perform the role now ($n$ = 3) and that working virtually allowed EPs to meet CYP "on their territory" ($n$ = 3).

EPs in Interview 2 and Survey 2 reported that the current situation due to COVID-19 was another enabler for IT usage, as it was the "only way out of the problem". This subtheme of IT as a solution to a problem also included increasing access to EPs and offering EPs with disabilities a solution to work around their difficulties, as mentioned in the interviews ($n$ = 1) and Survey 1 ($n$ = 2). In Interview 1 ($N$ = 3), EPs reported that their examples of innovative IT practice were often the result of utilizing IT to efficiently solve a problem, such as physical distance or a need that arose from commissioners.

> If we look at adults, adults are all using technology all the time in their jobs. It's artificial, to be sitting around writing by pen all the time. To equip children for the future, they need to be skilled up in ICT. But if they've got barriers to learning also, I think ICT is going to be an answer to that as well in a lot of cases.'

EPs in Interview 2 spoke about IT enhancing the EP role; this included EPs who were excited about future opportunities after being exposed to the possibilities of utilizing IT and the overall IT upskilling amongst EPs and commissioners. EPs also mentioned the enforced usage of IT and remote working caused by COVID-19 as an instigator to increase the scope of practice and creativity in the EP role.

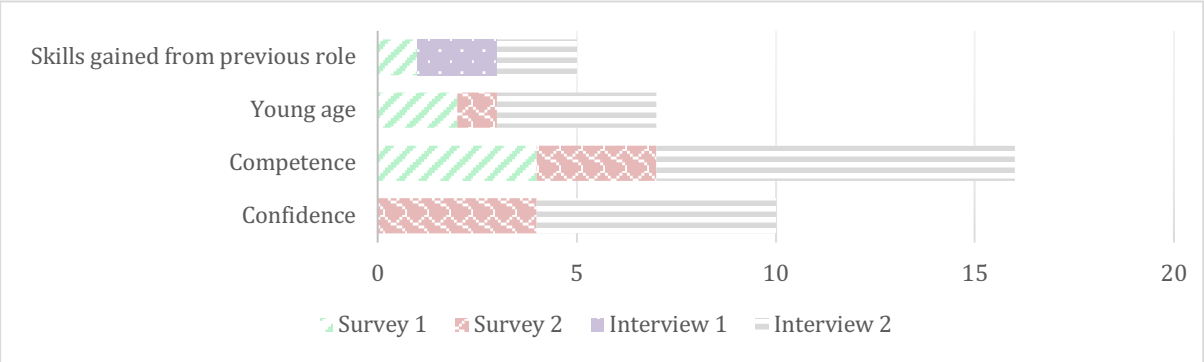
> 'I think the pandemic and public health restrictions have, in some ways, given us the opportunity to really test the limits of technology and how it can be used in our profession and discover some new and innovative ways of working. I am certain that I've been able to deliver services to a much wider range of schools. So, I think that it's important for all EPs and people involved in educational psychology research to be aware that it very much does have a place. And it can present a lot more opportunities when you do start exploring it then you would have realised.'

***Competence and Confidence***

The theme of competence and confidence consists of the following subthemes: confidence to utilize IT, competence in IT, age (younger EPs were perceived as being more confident and competent), and skills gained from a previous role (see Figure 14). This theme was found across Surveys 1 ($n$ = 7) and 2 ($n$ = 7) as well as Interviews 1 ($n$ = 2) and 2 ($n$ = 10).

**Figure 14**

*Subthemes for Competence and Confidence for Each of the Data Collection Formats*




The majority of EPs in Interview 2 (*n* = 6) spoke about confidence in utilizing IT as an essential factor in willingness to experiment, even when learning a new IT skill was initially difficult. The EPs also reported that they were personally confident in utilizing IT.

Confidence was also related to the subtheme of competence. In Interview 2, EPs spoke about initially being hesitant and finding the process of working virtually to be difficult (*n* = 3); however, they were able to adjust and, consequently, increase their skill level (*n* = 6). Across Interviews 1 (*n* = 4) and 2 (*n* = 3), competence included personal knowledge, experience utilizing IT, and skill level within the subtheme. The subtheme of skills gained from previous roles was found in Survey 1 (*n* = 1) as well as Interviews 1 (*n* = 3) and 2 (*n* = 2). Exposure to IT in previous roles supported EPs in their current role by supporting competence and IT usage confidence.

In Surveys 1 and 2 and Interview 2, EPs reported age, and especially being younger, as an enabler of IT usageIn the interviews, EPs elaborated that age was an enabler simply due to the exposure that younger EPs and trainees had gained from having “grown up with IT”. It was reported that younger EPs felt “safer with some of the newer ideas in terms of assessing children and

observing children online". It was also reported that TEPs were particularly helpful in supporting their services in terms of adapting and evolving their practice after the changes to virtual working due to COVID-19.

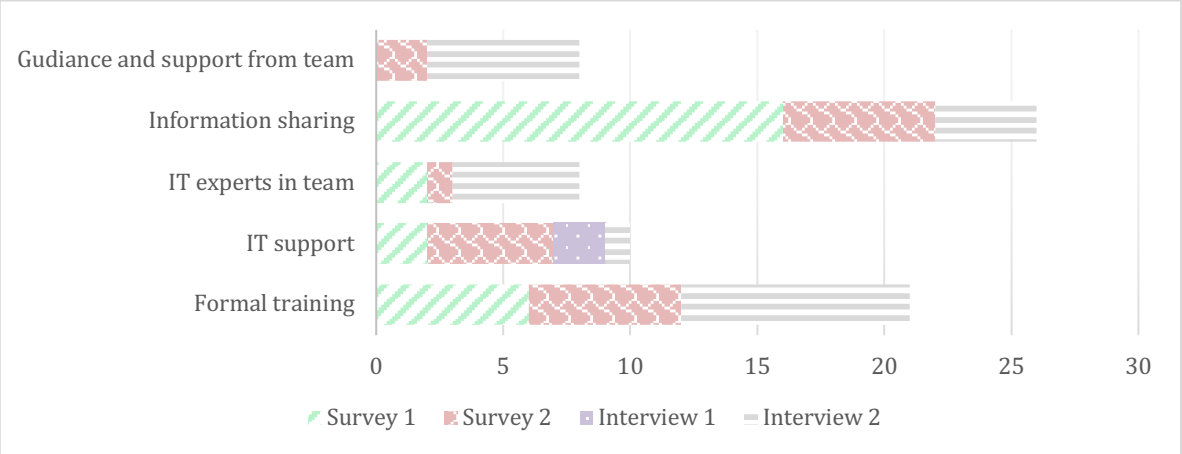
> *"The trainees were already well set-up for using Zoom and teams and so forth as part of their university teachings. So actually, they really led the way in terms of helping and showing us how to use the tools. And I suppose in terms of commissioning activities, like training, were able to become the real trailblazers within the service of building confidence and showing what could be achieved.'*

### *Access to Information Technology Support*

The theme of access to IT support included formal sources, such as training and IT support, and informal sources, such as IT experts on teams, access to guidance and support, and information sharing (see Figure 15).

**Figure 15**

*Subthemes for Access to Information Technology Support for Each of the Data Collection Methods*




The subtheme of access to support was found across Surveys 1 (*n* = 6) and 2 (*n* = 20) as well as Interviews 1 (*n* = 2) and 2 (*n* = 10). In Surveys 1 and 2, the subthemes for training included continuing professional development (CPD) and general references to training. The subthemes were consistent in Interview 2 and included additional training that occurred due to the move to virtual working (*n* = 3). EPs in Interview 2 also spoke about how their university training provider supported

them to make the most of IT (*n* = 5); this included skills in video editing (*n* = 1), lectures (*n* = 2), and universities moving toward greater usage of IT (*n* = 3).

The subtheme of access to IT support mainly encompassed support from IT teams within an EPS in Interview 1 and Surveys 1 and 2.

IT experts were EPs in services who were more confident and experienced in utilizing IT. In the interviews, EPs who were considered experts in their services (*n* = 4) were provided opportunities to support their teams during COVID-19 by offering training and guidance to their SLT. An EP in Interview 1 reported that their SLT had supported them to focus on their interest in utilizing IT by allowing them to "try new approaches and experiment".

Information sharing in Interview 2 and Surveys 1 and 2 encompassed sharing helpful practices and resources from colleagues, SENCOs, teachers, and specialists. Additionally, it included communication between teams and service users. In Interview 2, EPs also mentioned the facilitation of information sharing through virtual webinars, YouTube, EPnet, conferences, and personal networks.

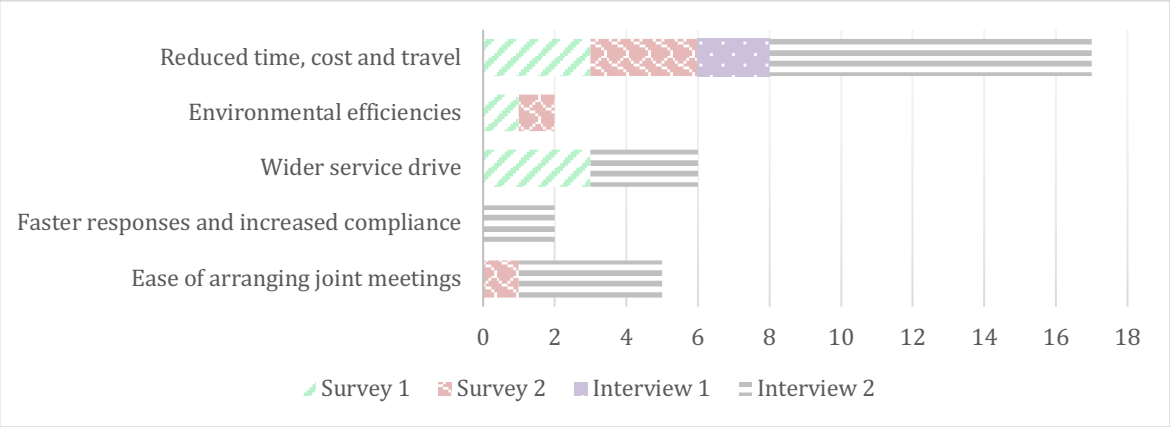
Guidance and support were mainly informal, with teams gathering to learn from each other and walk through new programs. Learning together to utilize IT was reported by EPs ($n$ = 3) in Interview 2 when they were learning how to work virtually during COVID-19. In Interview 1, the subtheme of guidance and support was facilitated by access to IT professionals and knowing people in the extended circle who were knowledgeable about IT.

***Efficiency***

The theme of efficiency that IT offered was found in Surveys 1 (*n* = 7) and 2 (*n* = 5) as well as Interviews 1 (*n* = 2) and 2 (*n* = 10). This theme encompassed efficiencies due to the reduced time needed, costs, and travel time (see Figure 16).

**Figure 16**

*Subthemes for Efficiency for Each of the Data Collection Formats*




EPs in Interview 2 elaborated further on this theme, reporting that virtual working allowed them to realize that it was more efficient to have virtual conferences, thus saving time by not driving from school to school for meetings. EPs reported that in some cases, "it will probably be seen as more acceptable" for some work to continue virtually. EPs in Interview 2 also reported that as a result of virtual working, they could respond more quickly to EHC requests and meet statutory deadlines. The increased efficiencies that IT offered were reported to be the focus of broader service drives to encourage "smart working" to reduce cost and time as well as manage reduced office space.

> *'The local authority is endeavouring to change the way of working completely. In fact, they may have taken advantage of COVID to cut down on central costs – in other words, office costs – and spend a little bit more on equipment, which I think they are planning to do.'*

EPs in Interview 2 and Survey 2 reported that it was easier to arrange joint meetings with other professionals and be "present at other people's meetings in a way that wasn't feasible before because of the problems of all the time it takes to travel between places".

***Time***

The theme of time as an enabler was found in Surveys 1 and 2. EPs were not specific about what this meant; however, an EP in Survey 1 mentioned having time to explore the literature. An EP

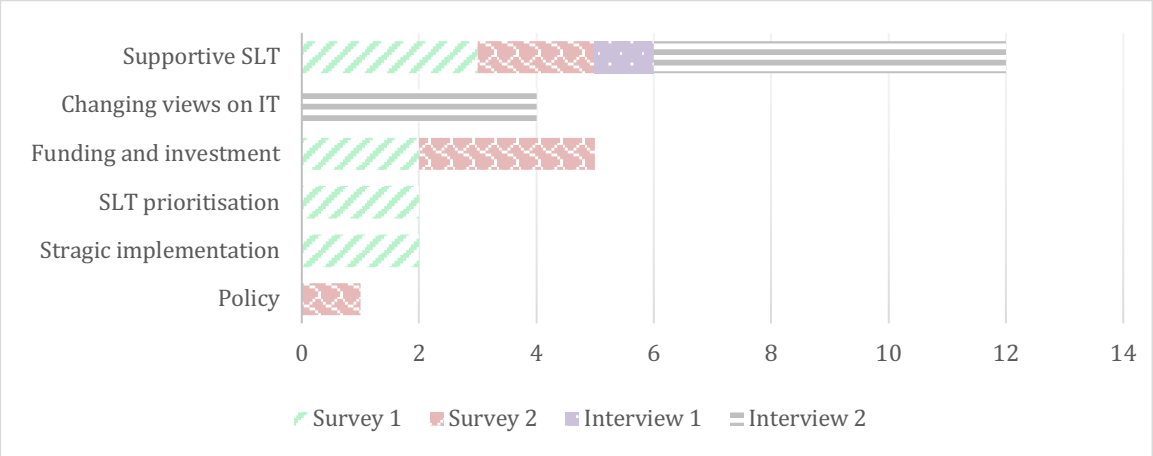
in Survey 2 reported “time to evaluate the apps that are available”, and an EP in Interview 2 reported more “flexibility in timing”.

### *Senior Leadership*

Senior leadership was mentioned as an enabler across Surveys 1 ($n$ = 9) and 2 ($n$ = 4) as well as Interviews 1 ($n$ = 1) and 2 ($n$ = 7). Subthemes included SLT support, SLT prioritization, changing views on IT, strategic implementation, funding and investment, and policy (see Figure 17).

**Figure 17**

*Subthemes of Senior Leadership Team for Each of the Data Collection Formats*




Having a supportive SLT was the predominant subtheme across the surveys and interviews and included factors unrelated to IT, such as a generally supportive service. An EP in Interview 1 reported that their SLT had supported them to focus on their interest in utilizing IT by allowing them to “try new approaches and experiment”. In Survey 2, a member of an SLT reported that their interest in IT and willingness to “develop the use of remote working and online assessment for the service” was an enabler for the usage of IT in their service. EPs in Surveys 1 and 2 also reported SLT’s investment and funding as an IT usage enabler.

EPs in Survey 2 reported the subthemes of changing SLT views on IT as an enabler for IT usage, which was produced by COVID-19. EPs reported that initially, requests for digital materials and strategies were “put on the back burner”; however, the “attitude of leadership changed quite

rapidly" to be progressive and embracing of IT. Another subtheme identified in Interview 2 included the SLT actively promoting the usage of IT by performing the following actions:

- Nominating IT experts within the EPS to guide and support other EPs and introduce them to various platforms
- Offering specializations in virtual working and assessments
- Providing opportunities to walk through new platforms together
- Providing training by IT experts within the team that is specific to IT within the EP role
- Setting up working groups
- Responding to EP requests for digital resources
- Being open to opportunities and requests brought by EPs for different ways of working

***Infrastructure***

EPs in Interviews 1 (*n* = 6) and 2 (*n* = 2) spoke about infrastructure as an enabler for IT usage. This encompassed having infrastructure for remote working, access to Wi-Fi, and schools and workplaces becoming better equipped with IT.

***Access to Resources***

Access to resources was found as a theme in Surveys 1 (*n* = 15) and 2 (*n* = 14) and Interview 2 (*n* = 2). For Survey 1, this primarily focused on general IT and laptops, whereas Survey 2 included tablets and smartphones. In Survey 2, further subthemes included access to online assessments (*n* = 4) and access to apps and software. In Survey 1 (*n* = 1) and Interview 2 (*n* = 1), EPs reported having files saved electronically and virtual files as enablers. An EP in Survey 2 also reported their preexisting work set-up at home as an enabler during COVID-19.

***Improved Connectivity***

The theme of improved connectivity was found across Survey 2 ($n$ = 9), in which EPs specifically mentioned Microsoft Teams. In Survey 2 ($n$ = 4), EPs reported that virtual conferencing, virtual team meetings, and informal virtual gatherings with colleagues supported team morale ($n$ = 4). EPs in Interview 2 also reported that virtual tools enabled EPs to stay connected ($n$ = 2). EPs in Interview 2 additionally reported advantages to virtual working, such as connecting with hard-to-reach young people ($n$ = 3) and increasing service user access to EPs ($n$ = 5).

> *'I think the good thing about the virtual work is that it's quite democratic; it opens up access. It's much easier to engage with an EP, where you don't have to worry about travel time, meetings, or meeting rooms. So, I think there's definitely an opportunity for us to think far more about how we engage with, in particular, children and their families, as opposed to just thinking about being in a school setting to complete our work. I think that's an exciting thing for us to embrace.'*

***Educational Psychologist Service Type***

The theme of EPS type was found in Interviews 1 ($n$ = 1) and 2 ($n$ = 2). In Interview 1, an EP reported being located at a university and having access to support as enablers. The EPs in Interview 2 reported working in an LA service to be an enabler. One participant reported that this was due to the LA's unfamiliarity with EP needs and being more responsive to their IT requests. Another EP stated that working in an LA during COVID-19 was an enabler due to the flexibility that this type of service offered EPs in fulfilling their statutory role by "trialling" other activities that could meet those duties.

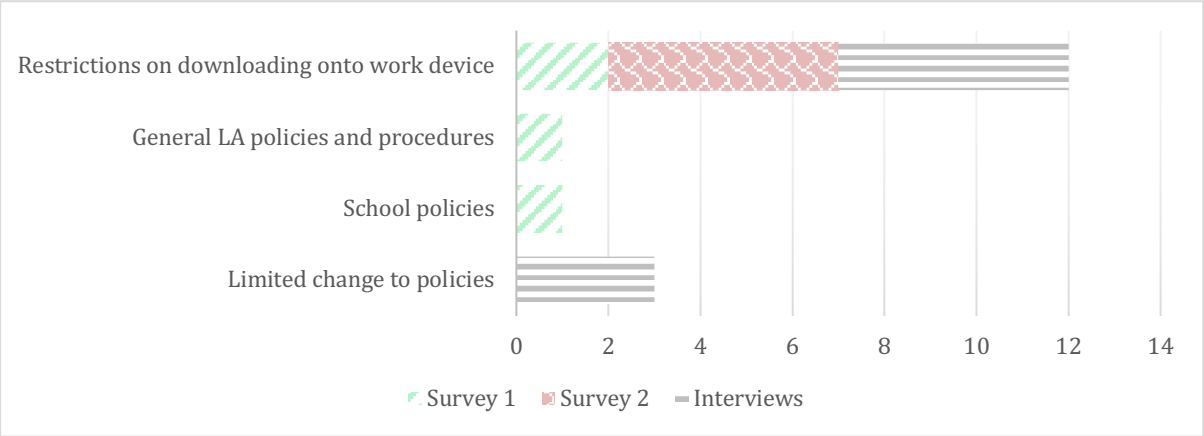
***Barriers to Information Technology Usage***

***Policies and Procedures***

Policies and procedures were mentioned as barriers in the interviews ($n$ = 3) as well as Surveys 1 ($n$ = 5) and 2 ($n$ = 8). Figure 18 shows that the most significant barrier was IT policies for downloading and utilizing IT on work devices.

**Figure 18**

*Subthemes for Policies and Procedures for Each of the Data Collection Formats*



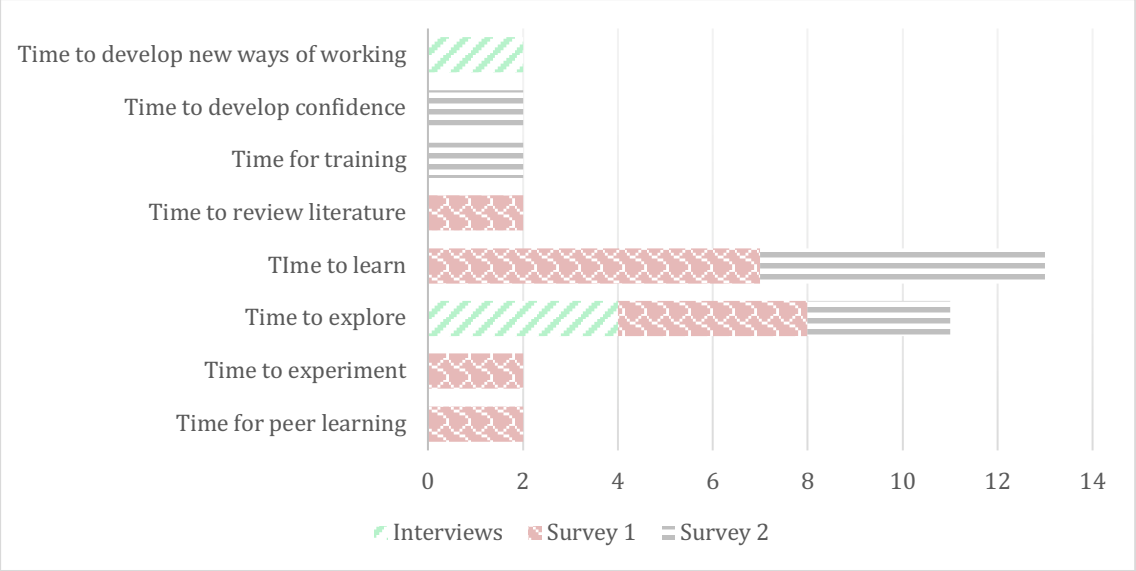

In the interviews, EPs reported that these policies limited the IT available and that their services might not utilize the most effective systems. Policies could also impact the type of work an EP can do, as they can prevent EPs from utilizing IT in instances in which it could support the role. This might result from LAs not understanding the "unique demands and requirements for online working" compared with other LA roles, such as social workers. EPs in the interviews reported that there had been limited changes to policies during COVID-19.

***Time***

Time was reported to be a barrier in Surveys 1 (*n* = 30) and 2 (*n* = 18) as well as in interviews (*n* = 5). Figure 19 indicates that the largest number of participants in Surveys 1 and 2 reported that time to learn was the most significant time barrier to IT usage. In the interviews, the most significant barrier was the time to explore. EPs in the interviews reported that due to "very high workloads", there was not enough time or capacity to explore new IT and adapt to the new ways of working in response to COVID-19.

**Figure 19**

*Subthemes for Time for Each of the Data Collection Formats*




### *Age*

The largest proportion of EPs mentioned age in the interviews ($n$ = 7) as a barrier to IT usage, as did one participant in Survey 2. The interviewees mentioned that older EPs were more uncomfortable and resistant to new IT ($n$ = 2). Two EPs associated age with seniority in their services. One EP mentioned that there had been tension on their team when senior EPs wanted to return to schools to do "face-to-face work in March [or] April", which was at the peak of the COVID-19 crisis in England, whereas younger EPs felt more confident delivering some of the services online.

Differences in school IT experiences were also discussed in the interviews; one EP mentioned that when they did GCSE IT, it was with "a typewriter", whereas another EP reported that the skills that they were taught in GCSE IT supported their competence.

Age was also described as one of the reasons some EPs retired early when technology began to be more prevalent in the EP role. However, confidence and capacity to change were stated as possible reasons for this.

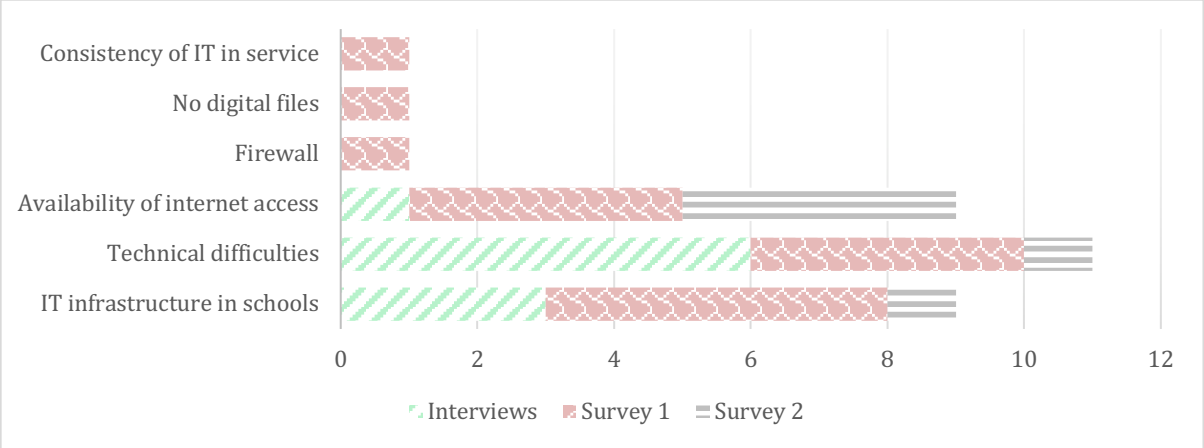
One EP in the interviews reported that age was not a factor that influenced IT usage; comfort levels had more influence.

### *Information Technology Infrastructure*

IT infrastructure was mentioned as a barrier in Surveys 1 ($n$ = 15) and 2 ($n$ = 6) and the interviews ($n$ = 7). IT infrastructure in schools was the largest subtheme identified in Survey 1; specifically mentioned was access to Wi-Fi in schools. In the interviews, this also included restrictions on utilizing specific programs in schools (see Figure 20).

**Figure 20**

*Subthemes for Information Technology Infrastructure for Each of the Data Collection Formats*




The subtheme of technical difficulties was also common across all surveys and interviews. In Survey 1, this included service systems being inadequate, whereas in Survey 2, the consistency of IT in the service was mentioned.

In the interviews, EPs mentioned that technical difficulties impacted work completed; if IT was not reliable, then technical difficulties caused significant distress when working at home during COVID-19.

> 'Some of the strongest emotions I have felt at work during the pandemic has been really strong feelings of frustration and anger because IT isn't working, which isn't something that I had before.'

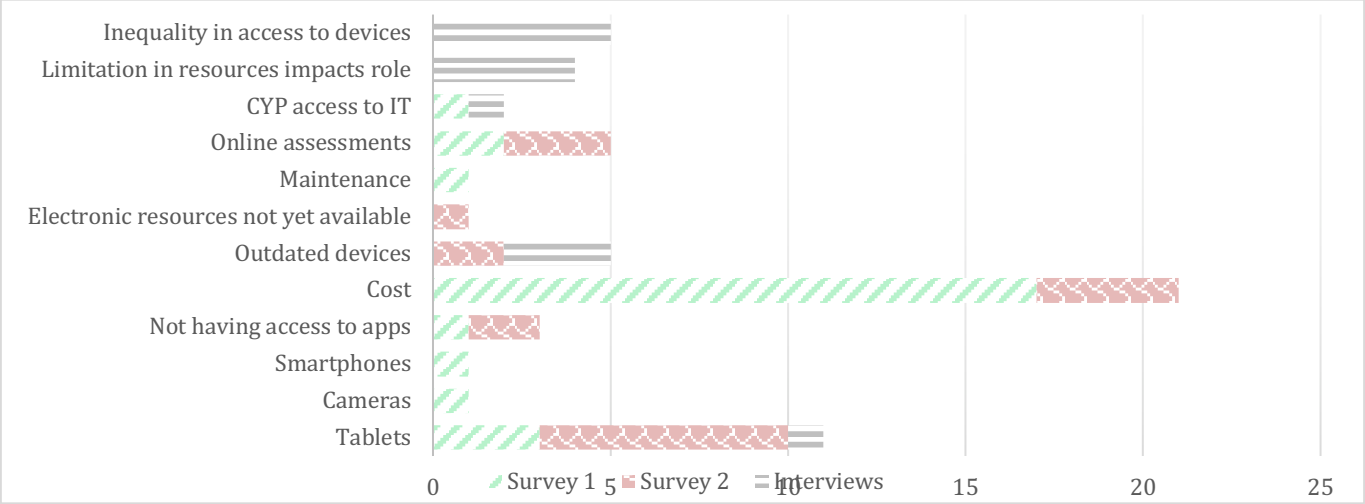
EPs in the interviews also reported that due to technical difficulties, "there was a lot more phone calls and emails" to set up meetings and troubleshoot when issues arose. EPs in the interviews also spoke about IT systems not being compatible, particularly when remotely accessing a server with specific programs, such as video access during VC.

### *Availability and Access to Resources*

Access to resources was mentioned as a barrier in Surveys 1 ($n$ = 48) and 2 ($n$ = 30) as well as the interviews ($n$ = 7). This theme included references to access to apps, software, resources, and devices (included in the central theme of access to resources). Figure 21 presents additional subthemes.

**Figure 21**

*Subthemes for Availability and Access to Resources for Each of the Data Collection Formats*




In all three forms of data collection, EPs further specified that they did not have access to tablets, which would be helpful for assessments, especially with Q-interactive. EPs in Survey 2 reported that they did not want to buy digital versions of assessments when they already owned the physical versions.

One of the participants in the interviews reported that limitations in resources impacted the EPs' role, as they found it "hard to recommend apps to schools" and reported that greater access to IT resources would likely make them more comfortable.

In the interviews, EPs also mentioned that lack of appropriate equipment at home was a barrier that resulted in inequality in access to devices, as some EPs were better equipped than others.

> 'And some people didn't even have a work phone, which I think was probably the worst thing about the lockdown situation. There's a clear divide between the EPs that got a work phone and those that didn't get a work phone.'

***Concerns About Data Protection and General Data Protection Regulation***

Concerns about data protection and GDPR were mentioned by participants in Surveys 1 ($n$ = 5) and 2 ($n$ = 3) as well as in the interviews ($n$ = 8). EPs in the interviews elaborated further, reporting that their concerns increased after the new GDPR legislation was introduced. Another broader concern shared was uncertainty about evaluating apps and how they meet GDPR requirements.

During COVID-19, there were also concerns about working with CYP virtually; these were shared by both EPSs and individual EPs due to safeguarding concerns and ensuring that children were old enough and able to provide consent to work virtually. Some EPSs decided not to undertake virtual work with CYP due to concerns about ethics and safeguarding.

One EP reported that concerns had been raised when a service user recorded a session without the EP's consent. One EP additionally mentioned that there was an increase in spam phone calls. Another was concerned about the surveillance of private data by large companies and the need to include this in training EPs and in discussions with CYP.

***Lack of Reference***

EPs in Survey 1 ($n$ = 5) and the interviews ($n$ = 3) reported a lack of reference for utilizing IT in the EP role. In Surveys 1 and 2, EPs reported that they would "welcome a source" and were "not aware of how other EPs are using technology in their work".

Another EP in the interviews also spoke about needing to know what made programs effective rather than only the specific app they should recommend.

***Reliability of Virtual Assessments***

EPs in Surveys 1 ($n$ = 4) and 2 ($n$ = 2) and the interviews ($n$ = 4) reported concerns about the reliability of virtual assessments. In the interviews, EPs elaborated further by discussing concerns about the standardization process. They were unsure whether the assessments had been standardized for usage via virtual platforms such as Zoom. Some services do not have "a clear position" on utilizing virtual assessments. EPs in the interviews also reported that virtual

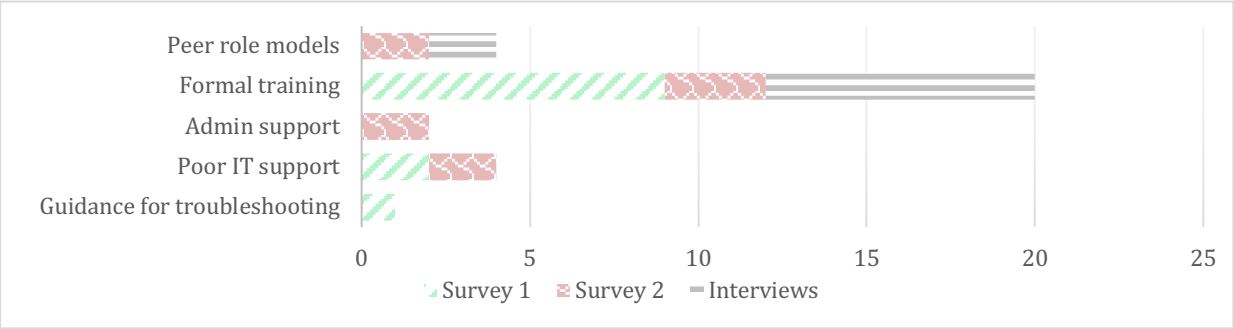
assessments are not “a replacement for face-to-face assessment” and as such cannot offer a valid assessment.

### *Information Technology Support*

EPs in Surveys 1 ($n$ = 14) and 2 ($n$ = 11) and the interviews ($n$ = 9) mentioned lack of IT support as a barrier. Subthemes identified included IT support in a service, guidance for troubleshooting, administrative support, access to formal training, and peer role models (see Figure 22).

**Figure 22**

*Subthemes for Information Technology Support for Each of the Data Collection Formats*




EPs in the interviews reported that they did not receive any training after the change to virtual working due to COVID-19, and there was an “expectation that you should just know” about utilizing IT. In the pre-COVID-19 survey, EPs reported that a lack of training and CPD was a barrier.

> ‘When I think about the spread of expertise in IT, training would really be helpful so that at least everyone's got a certain basic level of competence and confidence using IT.’

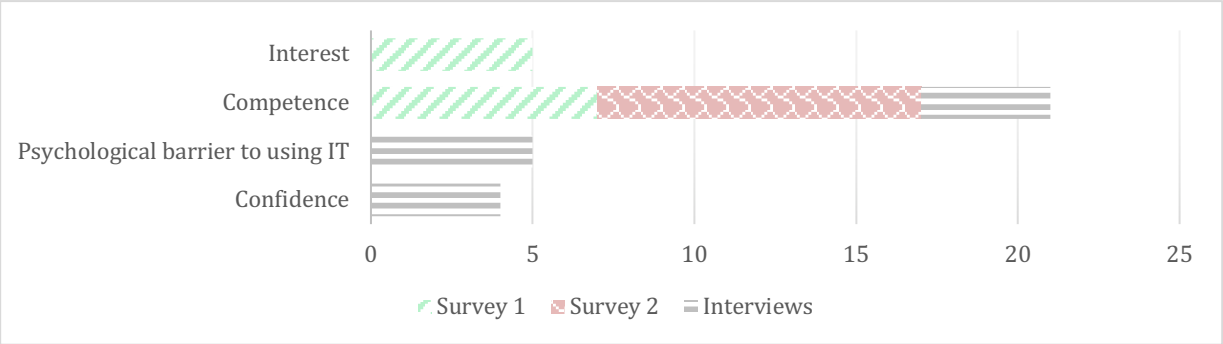
Informal IT support included support from competent colleagues in an EPS. The lack of colleagues who are more competent in IT within a service to act as role models for appropriate practice was considered to be a barrier, as EPs in those services continued to utilize “non-technological ways of doing things”.

### *Information Technology Competence and Confidence*

The theme of competence and confidence was found in Surveys 1 (*n* = 12) and 2 (*n* = 10) as well as in the interviews (*n* = 11). Subthemes included interest, competence, confidence, and a psychological barrier to utilizing IT (see Figure 23).

**Figure 23**

*Subthemes for Information Technology Competence and Confidence for Each of the Data Collection Formats*



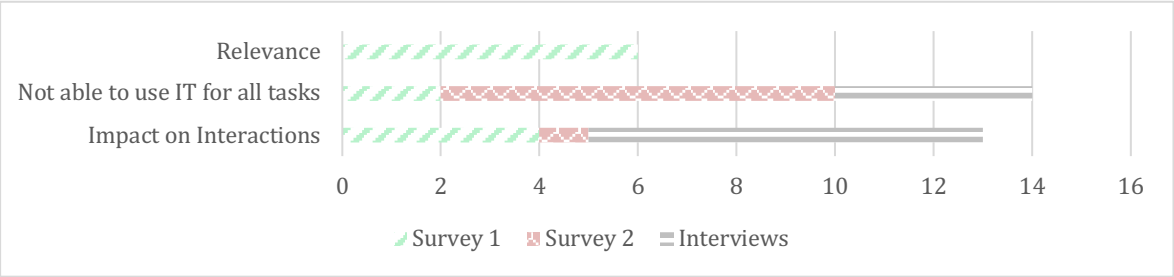

In the interviews, EPs reported that lack of confidence in utilizing IT might be due to a psychological barrier to learning to utilize IT and the impact of learning in a stressful situation induced by COVID-19. EPs additionally reported that confidence also impacted their abilities to deliver services remotely. Furthermore, some EPs reported that they had not yet seen the importance of IT or a broader role in supporting people with disabilities to "have a much better quality of life", focusing instead on the negative impact of social media or video games.

### *Impact of Information Technology on the Educational Psychologist's Role*

The theme of IT having a negative impact on the EP role was found across Surveys 1 (*n* = 14) and 2 (*n* = 9) and the interviews (*n* = 9). Subthemes identified included relevance, impact on interactions, and inability to utilize IT for all tasks (see Figure 24).

**Figure 24**

*Subthemes for Impact of Information Technology on the Educational Psychologist's Role for Each of the Data Collection Formats*




EPs reported that they could not utilize IT in all tasks. In Survey 1, this included the view that IT was "not a substitute for human interaction" and the preference for paper and pencil for diary management and observations. In Survey 2, an EP reported that tasks such as online training did not have the same impact as FTF interactions. In the interviews, many EPs reported that observations were one of the tasks that could not be replicated virtually and in which it was "always better" to "assess the child in person, if possible" because the opposite could result in a situation where the "context is missing".

EPs across Surveys 1 and 2 and the interviews reported that IT impacted interactions. In Survey 1, this was mentioned mainly in terms of IT being a physical barrier that impacted

> 'It can be harder to build rapport. I always enjoy the little walk between a classroom and where the assessment or individualised work is going to take place to find out what the child had done that morning or if they understood what was happening in their lesson or introduce myself. You don't get that little walk to build that rapport, particularly with children who are shy. It also gives them a chance to get comfortable.'

consultation skills and could be perceived as threatening. In Survey 2, EPs reported feeling that virtual interactions did not have the same impact as FTF interactions. EPs also reported that IT was a barrier to building rapport and made it more difficult. This was also mentioned in the interviews.

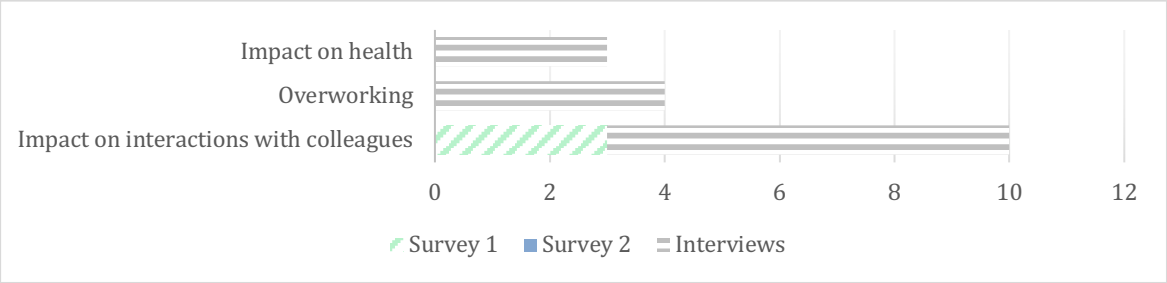
### *Impact on Mental Health and Well-Being*

The impact of IT on mental health and well-being was mentioned in Survey 1 (*n* = 3) and the interviews (*n* = 10). For this question, the specific impact of IT and remote working was the focus

rather than the direct impact of COVID-19. Subthemes identified included overworking, the negative impact of IT and remote working on mental health, and an impact on physical health (see Figure 25).

**Figure 25**

*Subthemes for Impact of Information Technology on Mental Health and Well-Being for Each of the Data Collection Formats*




EPs in both Survey 1 and the interviews reported that remote working negatively impacted mental health and well-being. In the surveys, an EP reported that remote working "limits opportunities" and meant that EPs did not "see each other". In the interviews, which occurred after the restrictions and introduction of remote working, the majority ($n$ = 6) of EPs reported that they missed the FTF interpersonal interactions with their colleagues, which positively impacted team morale. In the interviews, EPs spoke about the shift in interactions with their colleagues, in which they felt that their interactions were more "task focused" and "heavily structured", losing the "water-cooler moments" where they had "a bit of a chance to just unwind and reflect with someone in an informal way". EPs reported that remote working appeared to have a more significant impact on older EPs who "feel a greater sense of loss" and isolation as a result of unfamiliarity with utilizing IT to communicate informally.

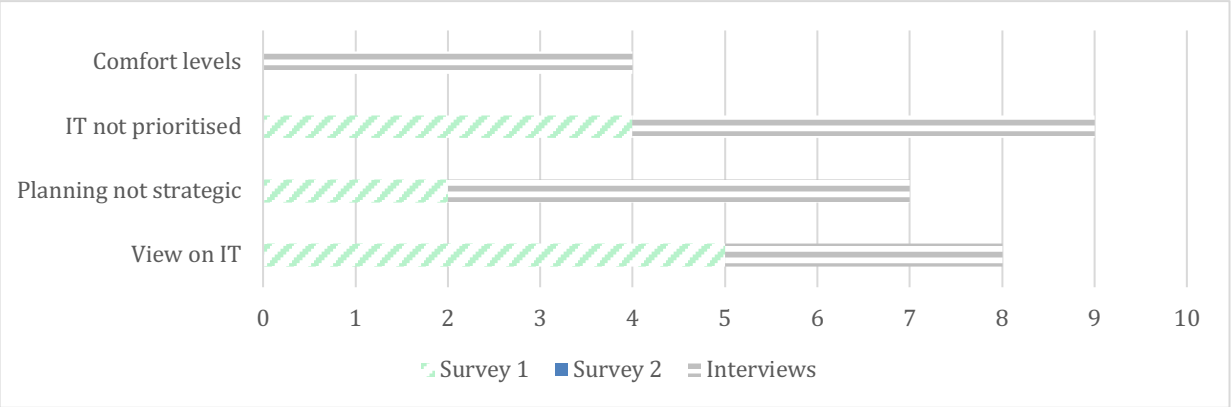
In the interviews, EPs also reported that they had been working for longer hours and taking fewer breaks and that their well-being was not "monitored enough". The health impacts that EPs spoke about were mainly the result of musculoskeletal problems caused by an increase in IT usage and a reduction in physical exercise due to working from home.

***Senior Leadership***

In Survey 1 ($n$ = 11) and the interviews ($n$ = 9), EPs reported that senior leadership was a barrier to utilizing IT in their practice (see Figure 26).

**Figure 26**

*Subthemes for Senior Leadership for Each of the Data Collection Formats*




EPs felt that this was due to IT not being prioritized and the focus instead being on fulfilling statutory duties that were essential for the services to survive and not "go bankrupt". Senior leadership views added another barrier when, according to EPs, they were "inflexible", "rigid", and "sceptical".

Another subtheme identified in Survey 1 and the interviews was that IT planning was not strategic and "set up in a way" in which barriers were reduced. EPs reported in the interviews that services often took a reactionary stance of "scraping by" and "managing the bare minimum". IT was seen as an "add-on" driven by being "cost-effective" instead of functional.

> 'I guess it feels a bit like the conversation we have with the schools about how we need to get around being firefighting and reactive. Get away from that to moving to a proactive, systemic, thought-out approach in advance'.

SLTs' discomfort with IT was reported as a subtheme in the interviews. EPs reported that this made it "difficult to make changes". Some EPs reported that their senior leadership were "less confident in IT" but recognized there was a need for it, particularly during COVID-19, when they relied on "other people to explore and enact it". Some EPs reported that senior leadership's discomfort with IT was possibly age related, as senior leadership were often more experienced EPs

who “value the face-to-face use of consultation” and who might not see IT as “playing a major part in our role”, only employing it when it was “useful or needed”.

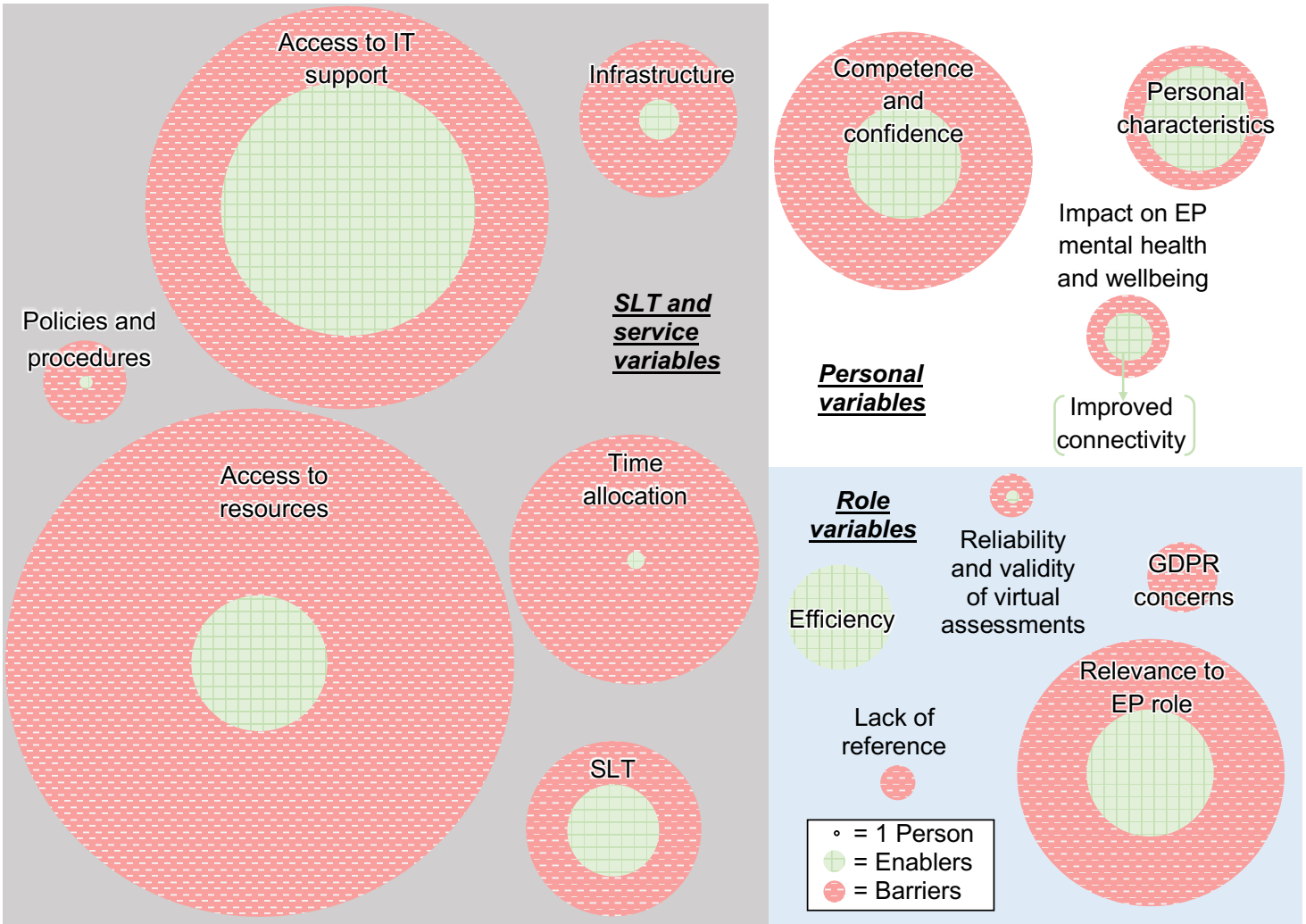
**Summary of Qualitative Results**

***RQ3: What do EPs consider to be the enablers of and barriers to IT usage in their practice?***

Figure 27 summarizes the enablers of and barriers to IT usage, according to the number of references to specific themes across the surveys and interviews. Superordinate themes found are shown in the three main sections of the diagram, which includes SLT and service variables, personal variables, and role-related variables.

**Figure 27**

*Summary of enablers and barriers of IT use organized into superordinate themes*



SLTs and service variables constitute the largest number of references by EPs across the surveys and interviews. These variables are largely outside of EPs' control. SLTs and their views on IT largely influence EPs' access to resources (including tablets, up-to-date devices, and remote and IT-mediated assessments) and IT support. SLTs are also directly responsible for policies that either help or hinder IT use, strategic prioritization of IT in training, and allocating time for EPs to focus on IT in their practice. The service model and goals of the EPS are also influential, as are the demands that need to be met. Many EPs felt that they did not have enough time to focus on IT because they were inundated with EHCP requests. The infrastructure of the EPS also influences the work an EP can do. Infrastructure refers to not only the IT systems (e.g., Wi-Fi) within the workplace but also the IT systems at home and in school.

Personal variables encompass how IT impacts individuals and how the individuals themselves influence their IT use. Personal characteristics encompass motivation, enthusiasm, and willingness to try, which facilitate later IT competence. Competence and confidence in using IT was the largest theme of the personal variables superordinate theme. In the interviews, age was hypothesized as a factor that influenced competence and confidence. TEPs were noted as being particularly helpful in helping their services adapt to virtual working during COVID-19. Some senior leaders' discomfort with IT was also attributed to age, which could in some cases be a barrier to IT use within the service (unless SLTs were open to IT experts on their teams). Virtual connectivity and remote working mostly due to COVID-19 had an impact on EPs' mental health and well-being due to overworking, not taking enough breaks, and missing FTF contact with colleagues. However, it also appears that virtual connectivity (most often through Microsoft Teams) was a mediator. Service variables could also be at play, as it was reported that regular virtual team meetings, which were more common at the beginning of the pandemic, were viewed as supportive. Some EPs were also more enthusiastic in seeking more opportunities for virtual connectivity with colleagues, whereas EPs who were less comfortable with IT might have felt more isolated.

Role variables encompass the themes that are related to EPs' day-to-day working and pedagogical beliefs about the role of IT. Many EPs felt that IT was not relevant for all tasks and could never be a replacement for FTF work. However, where IT had an advantage was in the efficiency that it offered to EP work, its ability to increase access to EPs and to meet young people on their territory. There was also an understanding that IT is the present and will play a significant role in the further education and employment of the CYP that EPs support. COVID-19 has been an instigator for this realization. However, there is a lack of references about good practice involving the use of IT with CYP. There are also concerns about data protection and GDPR and the reliability and validity of remote assessments that hinder further uptake of IT in EP practice beyond administrative tasks.

## Discussion

Technology is now part of every aspect of life. COVID-19 has solidified the role of IT, which has resulted in a change in the ways EPs work, communicate, and network. Although research has been conducted in the United States on school psychologists' usage of IT (Florell, 2014, 2015; Hayes, 2018), no such studies have been conducted in the United Kingdom. This exploratory mixed-methods research study sought to investigate IT usage amongst EPs in the United Kingdom and the factors (including COVID-19) that influenced them. The study also hoped to encourage discourse on IT use within the profession and support EPs by providing a reference list of the tools that EPs employ in their practice.

The first research question sought to understand how EPs were using IT in the United Kingdom. The findings were largely that they used IT for administrative tasks and scoring assessments. After COVID-19, there was a shift in the use of videoconferencing to reach service users and to connect with other EPs within an EPS. The second research question sought to explore the factors influencing IT use amongst EPs. The research findings indicated that the largest factors influencing IT use were the service variables, which include the EPS model, senior leadership openness to IT, and compatibility of IT with an EPS. Although the individual EP variables did not directly influence the environment, they were very much influenced by the exosystemic variables (the variables that directly influence the individual EP who is not part of this system), mainly senior leadership – which either positively or negatively impacted the resources an EP had access to, IT support, and policies and procedures within an EPS. Individual EPs were only able to influence their environment if they had senior leadership who were open in their views towards IT use. The EPs must comply with the external barriers to and enablers of IT use and do not influence the system; instead, they must contend with them. It could also be that EPs who struggle with not being able to influence the ecological environment in which they exist then enter another environment (i.e. moving away from local authorities) more suited to them where they have more influence over the processes that exist within it. EPs who were self-employed or who worked in private for-profit settings had greater access to up-to-date technology and resources such as tablets. The themes

found regarding the enablers of and barriers to IT use (the third research question) from the interviews were largely consistent with the quantitative findings on factors that influenced IT use. The key findings from the study indicate that for EP practice to evolve, changes need to be top down and need to come from senior leadership within EPSs and the EP training providers.

This section first summarizes the main findings from the research questions through the lens of Bronfenbrenner's (1998) ecological systems theory, as described previously in the conceptual framework section (see p. 26). It then discusses the implications of the research, and finally, it explores the strengths and limitations of the study.

### *Chronosystem*

#### *Impact of COVID-19*

The need to utilize IT and adapt was reported as a catalyst for IT usage, especially during COVID-19. COVID-19 resulted in a rapid upskilling of EPs and service users, even amongst EPs who previously considered themselves less competent in utilizing IT. Technology use is influenced by an intention or need for usage and digital competence (including self-efficacy), as well as technological support (Wang et al., 2013). EPs reported that COVID-19 created an opportunity for them to advance their IT usage and adapt their service provision, where they had previously "lagged behind other professions". COVID-19 caused an increase in communication with parents and a decrease in offering professional development.

EPs in the interviews reported that building rapport with service users was more difficult when delivering training. Similar findings were reported by parents who attended a parenting intervention delivered virtually; parents reported that it was more difficult to build rapport and trusting relationships online when meeting as a group (Fogler et al., 2020). On the other hand, many EPs reported that virtual working created a more equal and engaging medium for hard-to-reach young people. EPs additionally reported that virtual working was more time efficient and made it easier and more accessible for families to connect with EPs. Psychologists in other professions have

similarly reported that therapy delivered virtually has reduced the impact of geographical distance (particularly in more remote areas) and increased access for individuals with disabilities and mental health conditions (Elford et al., 2001; Pierce et al., 2020). Virtual working was considered particularly helpful for some meetings, such as planning meetings; many EPs reported that they would like for these to continue virtually. This could also be due to factors such as complexity, as videoconferencing was found to be more useful for less complex cases (Fischer et al., 2016, 2017). Virtual meetings were more accessible for working parents to attend, as they did not need to take time off work or make childcare arrangements. This is consistent with Fogler et al.'s (2020) finding that training delivered virtually was more accessible to parents and resulted in an increase in both parents attending training.

There was an increase in professional use of communication tools, largely WhatsApp (which doubled) and Microsoft Teams, during COVID-19 compared with before COVID-19. This result is also interesting, as previously, EPs might have already been feeling isolated due to working from home because of work arrangements or not having sufficient stationary desktops in offices. There has been a decrease in LinkedIn usage, which could indicate that EPs were less interested in job opportunities during the COVID-19 lockdowns. However, despite the high usage of social media, most EPs reported that they never utilized social media or blogs to share information with their service users. Before COVID-19, EPs most often shared information with service users through FTF meetings and emails. However, after the March 2020 COVID-19 restrictions on FTF working, only half of EPs reported having FTF meetings. They increased the frequency with which they utilized phones, service websites, and other forms of communication, which primarily involved videoconferencing (LaBerge et al., 2020; Song et al., 2020). The increase in videoconferencing was also seen amongst other psychology professions (Pierce et al., 2020; Stifel et al., 2020).

### *Age (Life Course Variables)*

Differences in experiences with IT result from life course variables; EPs who had been practicing for longer periods did not have the same exposure as EPs who were starting in their profession. In

the interviews, comfort levels and confidence with IT were linked to age: Older EPs were less comfortable than younger EPs who grew up with IT embedded in their daily lives. Eight of 10 EPs in Interview 2 reported age as a barrier to IT usage; however, age was mentioned by only one participant in the surveys. An important point mentioned was that older EPs had not had the same foundational training as younger EPs had, where the core IT competencies learnt during school were still supportive to them now. During COVID-19, it was reported that TEPs were critical players in supporting their services as they adapted to virtual working. It is important to note that specific training in the use of IT to support EPs in their practice or for interventions was rarely reported by EPs in their EP training. However, one programme was reported to have provided students with laptops, which they were expected to use to maintain contact virtually with supervisors and throughout the course. Older EPs' experiences were different from those of digital natives, who were born into a world where technology usage was prevalent (Wang et al., 2013). EPs who were in the 55–64 age range utilized stationary desktops more often than did those in any other age range; as such, it could be that EPs who were older had more of a challenge adapting to working from home due to a set-up that they were not familiar with. However, statistical analyses on total IT usage, IT recommended to CYP, and IT utilized with CYP did not find any significant differences between EPs across age and years since qualifying. This is consistent with previous research, which also found no significant relationship between age and total IT usage (Hayes, 2018).

### *Personal Variables*

#### *Demand Characteristics*

The study found that demand characteristics including gender and disability status did not impact overall IT use. Differences according to gender might have also been missed, as the majority of EPs in the field are females. Although in the interviews, age was found to influence comfort levels with IT, it was more so the life course variables (included in the chronosystem) related to exposure to IT and educational experiences that had an impact.

***Resource Characteristics***

Resource characteristics are the social, emotional, and mental resources that an individual possesses. Resource characteristics were found to impact IT use and included experience gained from previous roles, educational experiences, and interest in the use of IT. Physical resources at home and in the workplace also impacted EPs' IT use. Additionally, EPs reported discrepancies in IT available within EPSs during COVID-19, which created inequalities; for example, EPs who had requested smartphones previously and those who already had work-from-home set-ups had an advantage over EPs who did not have these available to them. However, EPs who already had resources available might have also been better off due to other factors found to influence IT use including socioeconomic background, IT literacy, and self-reliance (van Deursen et al., 2014).

IT use as result of remote working was found to deplete EPs' emotional resources by causing stress and overworking, further compounded by technical difficulties. EPs reported that they struggled with overworking and scheduling breaks between meetings, which detracted from their reflection time, time to rest, and ability to detach from work. Research has found that individuals with work–life conflicts had higher levels of work-related stress, blurred boundaries, and difficulties detaching from their work (Golden & Veiga, 2008). Personality factors have been found to influence the impact of working from home on well-being; individuals who ruminated often, had lower levels of social support, and were less open to new experiences were more negatively affected by working from home (Anderson et al., 2015; Oakman et al., 2020). Furthermore, factors such as self-discipline, motivation, and time management have been found to influence work-from-home performance (Charalampous et al., 2018; Richardson & McKenna, 2014).

***Force Characteristics***

Attitude, motivation, and views about IT were key influencers for IT usage. EPs are autonomous professionals, which could explain the variability in IT usage across EPs and services. EPs are given a specific task (e.g., explore a child's learning needs); however, it is up to them to decide what assessments and procedures to use to fulfil the task. EPs also need to be confident enough with IT to

undertake the challenge of learning how to do something new with IT. Willingness to try new approaches was found to be a facilitator for later competence, particularly amongst innovators who were more open to teaching themselves new skills. This is also consistent with research that found that individuals with the highest Internet literacy skills were more self-reliant, whereas those who depended on others were less confident with IT (van Deursen et al., 2014). Innovators also identified a gap where IT had the potential to solve a problem and had an interest in disseminating research and supporting service users. PIIT was correlated with the frequency of utilizing IT for the EP role: Individuals with high levels of PIIT also utilized IT more often in their role and sent emails more frequently. Amongst teachers, innovativeness was found to mediate IT use, which was also influenced by teachers' beliefs about the importance of IT (Hatzigianni & Kalaitzidis, 2018; Van Braak, 2001).

### *Microsystem*

#### *Availability and Access to Technology*

EPs reported that the largest barrier to IT usage was availability of up-to-date devices and infrastructure, such as Wi-Fi. Access to appropriate IT resources was considered to impact EPs' comfort levels with both utilizing and recommending IT. Not having resources was considered a barrier, as EPs could not experiment with or explore what was available, especially during COVID-19. Availability of IT and frequency of device use were also found to be correlated, which supports the idea that technology first needs to be available for it to be used effectively in practice (Hargittai, 2010).

There were differences in the frequency of devices utilized based on the type of EPSs. Laptops were the devices most frequently utilized by EPs and were most often provided by employers. Approximately 20% of EPs utilized tablets; however, most EPs reported never using them—frequency of device use was found to be correlated with availability. EPs reported utilizing laptops and smartphones most frequently, and they most often provided themselves with smartphones. The

use of personal devices raises ethical concerns with regard to data protection. It has been found that 17% of adults who use smartphones in the United Kingdom do not have security, and 32% were unsure if they had security on their phones (ONS, 2020). According to the American Psychological Association guidelines on telepsychology, it is considered a competence of the psychologist to ensure that they are continuously kept up to date about the latest developments in their technology use and safe practice by consulting with more skilled colleagues and technology experts (APA, 2013). Using personal devices also makes it more difficult for organizations to monitor and apply security controls to ensure that devices used are protected against data loss and are compliant with GDPR guidelines (NCSC, 2020).

### *Infrastructure*

Infrastructure was both an enabler of and barrier to IT use. IT infrastructure refers to the actual devices (e.g., computers, tablets), the communication technology, and the individuals employed to maintain and manage the databases and IT systems (IT support; Chung et al., 2003). Infrastructure is important as it allows an organization to provide services efficiently. The system of an organization might not be effective when there is a breakdown in communication between the IT support team and the organization. In the current study, EPs reported that infrastructure was a barrier when EPs were unable to access necessary websites due to firewalls, technical difficulties (related to software and IT systems), and connectivity. EPs were also impacted by poor infrastructure in schools and at home, which affected the work that they were able to do.

### *Information Technology Support*

In the interviews, formal IT support provided by IT teams was reported to be a buffer for stress caused by IT difficulties. Training on IT delivered from other services, such as from an LA, were reported to be unhelpful, as they did not cover the specialist areas that EPs needed to know. This is consistent with research indicating that generic training in IT was found not to be relevant or helpful, particularly amongst older adults, and did not help with troubleshooting (Damodaran & Burrows, 2017).

Informal forms of IT support included “IT experts” within teams or sharing of information with colleagues about the resources that they were using. Technology adoption is most frequently disseminated through word of mouth, often by “local experts” (Stewart, 2007). In the past, these were known as early adopters. These experts often share information by being proactive, such as volunteering information and sharing resources, or reactive, such as sharing information after they have been asked (Stewart, 2007). Training delivered by “expert” EPs provided specialist IT knowledge applicable to the role. This is consistent with research that has found that allowing users to request the type of help needed ensured that training specifically met the users’ needs, particularly for individuals who struggled with IT (Damodaran & Burrows, 2017). This also aligns with research findings that IT skills were normally acquired informally through colleagues, friends, and family rather than through formal training (van Deursen et al., 2014). Amongst teachers, IT was found to be utilized more often when there were opportunities to collaborate and discuss IT use in practice, in addition to having the technology available to experiment with (Fraillon et al., 2013).

Remote working specifically resulted in a lack of connection with colleagues, as well as isolation. This is consistent with recent research by the British Psychological Society (BPS), which found the rapid move to remote working to be particularly stressful for psychologists, as it also blurred boundaries between their work and home life (BPS, 2020). Low levels of social support from colleagues has been found to be correlated with higher levels of stress (Vander Elst et al., 2017). In a systematic review by Oakman et al. (2020), there were inconsistent findings about the impact of working remotely on mental health and well-being. Moderators found to influence mental health included the home environment, social connections outside of work, and level of support received from an organization (Oakman et al., 2020).

***Senior Leadership***

Senior leadership and leaders’ personal attributes impacted IT use amongst the EPs within their service. SLTs were also responsible for allocating training and CPD for their services. Another theme that emerged from the surveys and interviews was time. EPs often reported that they did not have

time to explore the literature or to experiment. EPs often work according to a time-allocation model, where they have time dedicated to specific schools and tasks. EPs who worked in services that had supportive SLTs were permitted time and opportunities to guide their team in utilizing IT and to influence service policies, especially during COVID-19. EPs reported that supportive SLTs allocated time for EPs to explore their IT interests. SLTs are also responsible for allocating funding, with the budget provided by the external children's services

### *Mesosystem*

#### *Senior Leadership*

Senior leadership's openness to IT use was associated with stronger agreement by EPs about access to up-to-date technology. Across the surveys and interviews, a key theme that emerged from both qualitative and quantitative analyses was that service-level factors had the most significant impact on IT usage. SLTs within EPSs and their views and attitudes towards IT were gateways for EPs' IT usage, availability of up-to-date technology, and access to computer stations. SLTs additionally had an impact on IT policies, procedures, and responses to COVID-19. EPs reported that planning for IT by SLTs was often reactive rather than proactive. When inappropriate systems were in place, they impacted the work that EPs were able to do.

In previous research, Luftman et al. (1999) found that enablers for effective infrastructure included senior leadership support for IT use, prospective planning, IT personnel, and an understanding of the organization's needs. The flexibility of the infrastructure system is also an integral factor in responding to new demands (e.g., COVID-19), devices, skills, and software. This also needs to be in alignment with senior leadership strategy (Chung et al., 2003). Findings from the current study are consistent with this, as EPs in services with more open senior leadership had better access to devices and might have already had the appropriate infrastructure in place (e.g., having digital files). There could also be a potential role for EPs' to have more integrated relationships with their IT teams.

### *Educational Psychologist Role*

EPs' seniority and role within their services were associated with frequency of using IT-mediated assessments and IT. Senior EPs were more likely to report using IT-mediated assessments; PEPs and senior EPs were also more likely to utilize tablets. The increased use could be due to factors such as increased disposable income that comes from more senior posts. However, more open senior leadership will likely also influence their service policy, as mentioned by an SLT in the interviews.

### *Type of Service*

EPs in private for-profit services and those who were self-employed reported that they more frequently utilized stationary desktops and tablets. EPs in private for-profit services were also more likely to agree that they had access to up-to-date technology and IT-mediated assessments. As such, there appeared to be discrepancies in access to IT-mediated assessments and devices, such as tablets and stationary desktops, based on the type of service. The limited use of stationary desktops in LAs is likely due to availability. EPs in LAs are often co-located with other LA children's services teams. In the interviews, a few EPs reported that they had to work from home when there was not enough space to work in the office (where stationary desktops are located). Another possible reason for the discrepancy could be related to financial and bureaucratic constraints. LAs are large organizations and therefore have more bureaucratic procedures for device use than a single EPS that operates within a private for-profit or self-employed context, which also translates to more financial flexibility.

There are also service-level differences in communication: 50% of EPs in private for-profit services very often utilized blogs to share information with service users, whereas only 22% of EPs employed in other services reported that they did so. This pattern was similar for sharing information via text message. This could indicate that due to differences in time allocation or other reasons, EPs in private for-profit services are more accessible to their service users.

### Exosystem

#### *Local Authority Systems*

The findings of this study indicate that although PEPs influence their own service policy, there is also a wider influence of the local authority (LA) systems that allocate EPs' funding and investment. There are also service-level policies on IT use that might not account for the type of work that EPs are doing. This was apparent when EPs reported that generic LA training was not relevant to their role. In the interviews, EPs also reported that there were wider service drives from LAs to encourage remote work due to financial and space constraints. EPs working in LAs must also fulfil statutory duties by providing psychological advice for EHCPs within specific periods, and 93% of EPs surveyed in 2019 reported that they had more demands than they could meet (DOE, 2019, 2015). This then limits the time that EPs within local authorities can spend and could explain why private for-profit and self-employed EPs had greater use of IT.

### Availability of Virtual/Information Technology-Mediated Assessments

Three-quarters of EPs in this study reported that they never utilized IT to administer assessments. The most frequent assessments administered using IT were the WISC-V, WAIS-V, and WIAT-III (all part of Pearson's Q-interactive platform). A few EPs across the surveys and interviews reported concerns about the reliability of virtual assessments and standardization. EPs also reported that IT-mediated assessments might not be reliable or user friendly (although a minority reported that their initial concerns about IT-mediated assessments were reduced by using and becoming familiar with them). Concerns about IT-mediated assessments have been reported in other studies due to the lack of competitors offering IT-mediated assessments, which limits choice, and the shortage of published independent research (Brearly et al., 2017; Farmer et al., 2020b; Stifel et al., 2020; Wright, 2020). This could also be an instance where better communication can be effective, if there is greater consultation between assessment providers and EPs in the United Kingdom. Assessments can then be made more user friendly, with greater ecological applications in the field.

Many EPs reported that they did not have access to tablets, yet assessments created by Pearson require two tablets to administer, which is unattainable for an EP working within a local authority setting.

### *Technology Cost*

Cost of devices was reported as a significant barrier to IT use by many EPs. Technology is always being updated due to technology obsolescence—when devices and software become out of date and need to be replaced by new, more advanced products (PCMag, 2021). As such, costs of updating technology and devices will need to be considered by SLTs in their planning.

## Macrosystem

Beliefs about inclusion underlie the EP role. This is also influenced by legislation on supporting the inclusion of CYP in education and in society as they become adults (DOE, 2015; Farrell, 2006). In line with these goals, IT has the potential to support by enhancing the EP role and was recognized by EPs in the interviews as being an enabler of IT usage. EPs reported that IT helped with increasing efficiency, making EPs more accessible to service users, and reaching groups that were previously difficult to engage.

IT is no longer the future of work; it is the present, and CYP will be utilizing computers and technology in their future career roles and education. CYP require support and guidance on how IT can support their digital inclusion and access to the virtual world. AT supports disabled individuals to have more independence, to improve their quality of life, and to increase their access to work (House of Commons & Work and Pensions Committee, 2018). IT for everyone is a tool to enhance human cognition and communication and to “transcend the limitations of their minds” (Jonassen, 2009). One of the reasons VIG is viewed as an effective tool to support TEPs is that due to the complex cognitive demands placed on the trainees, the positive and successful instances of the interaction are often forgotten (Murray & Leadbetter, 2018). In this instance, the technology is being

"assistive" and serving to compensate for the additional cognitive load. A study on adults' usage of the Internet in the United Kingdom found that amongst those with disabilities, 67% reported that utilizing the Internet lessened feelings of isolation (ONS, 2019). Amongst young people aged 16–24 who were self-reported Internet nonusers, 60% were disabled and had the same levels of non-usage as those aged 75 and over. This was due to a lack of interest, security and privacy concerns, and a lack of digital literacy (ONS, 2019). Another study found that individuals who attended special schools (12%) or were in residential care (19%) felt that they were not digitally included; one of the greatest contributors to this feeling was a lack of access to devices (Johansson et al., 2021). This is something to consider, especially regarding young people over the age of 16 with whom EPs work. As part of the Preparing for Adulthood framework, EHCPs should include advice on supporting a young person's employment, independent living, good health, and friendships, relationships, and community (Preparing For Adulthood, 2017). In all four areas, AT and IT can support young people's inclusion in society and increase their self-efficacy.

New technology devices are being produced with accessibility features such as screen readers already built in (WAIS, 2018). In the classroom, this means that technology can be utilized to support students with primary functional tasks—if a student has a specific literacy difficulty, then technology can be used to support them with reading materials presented in a history lesson, which would allow them to have the same experience as their peers and increase their access to learning (Scherer & Craddock, 2002). For example, research has found reading pens and text-to-speech software to be effective in improving reading fluency and reading comprehension in students with SPLDs compared with students who did not receive the intervention (Lange et al., 2006; Schmitt et al., 2018; S. G. Wood et al., 2018). The implications of AT in learning would allow for support given to students to be customized and adapted to meet their specific needs. This would allow adults to step back instead of being present on a one-to-one basis and increase students self-efficacy (Ayres et al., 2013). This is particularly pertinent as the number of EHCPs continues to increase (DOE, 2018a) and the number of LSAs continues to decrease (DOE, 2018b).

Inequalities in access to IT and communication with service users across different types of EPSs creates an ethical conundrum. If private for-profit EPs have better access to technology and assessments and can theoretically provide more resources on digital inclusion for CYP, then this creates a disparity for CYP who access EPs through local authorities, as they will not benefit from the same resources and guidance.

***Implications and Future Directions***

The upskilling of staff and schools in IT has created new opportunities for the scope of EP work. Many EPs reported that they would like meetings, such as planning meetings, to continue virtually. This is consistent with research in the United States, which has found that virtual consultation was most effective for less complex cases (Schultz et al., 2018). COVID-19 has also created new opportunities for EPs. There has been a drastic increase in the number of social networking opportunities for EPs to connect and discuss critical aspects of EP practice, for example, webinars on "Developing EP Services to Challenge Racism and Promote Equality" by the Educational Psychologists' "Race" and Culture Forum.

Previously, the digital divide was primarily focused on Internet access; however, it also encompasses technical competence (the ability to utilize devices) and information literacy (the ability to utilize information to meet a need; Scheerder et al., 2017). There is a need to ensure that all EPs are supported to make the most of what IT can offer, yet there are also not enough resources or research on appropriate IT usage for EPs. Digital fluency is key to target, as improving fluency increases an individual's self-efficacy (Ktoridou & Eteokleous-Grigoriou, 2011). This is important, as IT is continually changing, and EPs need to have the self-efficacy to continue to learn and adapt. EPs have also reported a fear of utilizing new technology due to GDPR concerns as well as familiarity and comfort with IT. Research has found that creating opportunities by running drop-in sessions and embedding IT in training for employees reduced fear and facilitated competence and self-efficacy (Damodaran & Burrows, 2017). EPs must also be provided with equipment, such as tablets, to

ensure that they have experience with trialling apps and software that can support CYP before they make recommendations.

EPs' autonomy over their work practices (guided by service policies, legislation, and availability of IT) and what assessments they use has also served to widen the gap in IT literacy with regard to the EP role. EPs who are more competent in IT have found ways to remain connected to their colleagues and share information about IT use with their professional networks. In contrast, EPs who struggle with IT could become more isolated and left behind. In this study, services that were successful at taking advantage of IT and adapting quickly to working virtually had encouraged EPs who are considered "experts" on their teams to support their practice, conducted audits about what training was needed, created regular opportunities for team meetings (which also allowed for experimentation), and were open to procuring assessments/IT that would be helpful, such as Zoom for training when it was initially restricted. Thus, without intervention by EPSs and training providers, the gap between individual EPs and their use of IT in practice could widen.

Supporting EPs working virtually is crucial if EPs are to continue working from home in the future, as EPs in the interviews reported that they might be doing so more often. There must be more oversight to ensure EPs are not overworking and that they feel supported and connected to their team. Psychologists who work from home face more pressures due to managing distractions and competing demands (Burgoyne & Cohn, 2020). Supervisors need to have oversight of their employees to ensure that they have appropriate workloads and that there is regular and open communication, as well as check-ins about how employees are managing their work–life boundaries. Supervisors have been found to be influential in reducing the impact of social isolation, which corresponds with job satisfaction and performance (Golden, 2012; Mulki & Jaramillo, 2011). There is also a need to ensure that there is regular FTF communication and opportunities for days in the office to ensure that co-workers remain connected. Services also need to consider home-related costs of technology and ensure that IT is up to date (Oakman et al., 2020). This also includes

providing EPs with ergonomic equipment that supports their physical well-being (Charalampous et al., 2018).

Research has found significantly high error rates amongst trainees and professional psychologists in the administration and scoring of cognitive assessments, which are considered a primary function of the EP (Clark et al., 2017; Russell, 2000). There is also a potential role for IT-mediated assessments to support EPs with disabilities, which could pose additional challenges. In addition to ensuring accuracy in assessment administration and scoring, more research must be conducted to explore the reliability of assessments utilized by EPs to explore the role of IT-mediated assessments, as well as how the assessments can be improved to increase their utility and ease of use in the field. This also ensures that EPs can "demonstrate effective reporting and recording skills across a range of settings and activities", as mentioned in the educational psychology standards (BPS, 2019). Another limitation of the research on IT-mediated assessments and tele-assessments is that the research does not consider CYP's views and preferences.

***Educational Psychologist Implications***

The research findings indicate that EPSs and training programs will need to audit the assessments and resources they have, to determine whether newer, fully online resources and assessments can replace them. For example, virtual survey administration provides a more efficient, timely, and accessible format and reduces scoring errors.

The literature review highlighted that schools have needed to embrace technology change more quickly, and there is a risk that EPs will be providing obsolete services if they do not adapt. For EPs to develop their services, they need an audit of EP IT literacy and practice using IT. An audit can also help identify IT experts within EPSs who are already experimenting with utilizing new IT. The audit can also identify future training areas and practices that will be most helpful to an EPS. Time must be allocated to EPs for learning about and developing IT in their practice, led by IT experts within EPSs. EPs will also need to be provided with IT resources if they will be making recommendations so that

they can experiment and develop competency. Training will also need to cover the practical elements of GDPR so that EPs can feel confident with navigating applications. At present, fear of GDPR breaches has discouraged experimentation.

TEPs are also an untapped resource as they are best placed to develop the role of IT in EP practice. In the interviews, EPs reported that TEPs were instrumental in helping their services adapt quickly to virtual working. TEPs also have potential time to allocate towards the specialization of IT use in EP practice through their research projects and possible assignments. There will need to be at least a few lectures on the use of IT in practice; however, that will also depend on research in the field that is currently lacking.

Before COVID-19, EPs had worked from home occasionally for tasks such as report writing. During the first survey, before COVID-19, an EP had expressed that a barrier to IT was that it encourages isolation from their teams. Since COVID-19, EPs have continued to work from home, interacting with their teams remotely and attending FTF visits in schools when they were able to. Thus, it could be that isolation amongst EPs had been endemic before COVID-19. Many EPs who were interviewed missed the informal catch-up with their team members, which boosted morale and provided opportune moments for knowledge exchanges. Many EPs have adapted to using virtual tools such as WhatsApp and Microsoft Teams to communicate; however, some EPs are unable to utilize or adapt to these tools as quickly. Thus, it cannot be assumed that EPs alone can make the most of IT in their practice, which further supports the need to audit EP IT literacy and provide support to members of EP teams who might be struggling to adapt. IT usage will need to be supported by SLTs who are open to IT and allocating time to "expert EPs" or working groups to advance practice within their services and support their colleagues to advance their skills.

### *Strengths and Limitations of This Study*

Survey respondents were recruited utilizing a convenience sampling approach through EPnet. Additionally, with convenience sampling approaches, there is a risk that the data in the study are not

representative of the whole population (Coughlan et al., 2009). When comparing the age ranges for the survey with that of the EP workforce survey (DOE, 2019), there was a significant difference; EPs in the survey were, on average, younger (25–34) compared with EPs in the workforce survey (45–64). One of the limitations of the second survey was that there was a relatively small sample size of 37 participants, seven of whom had already participated in the first survey. This was a stressful time for EPs, and many reported that they were avoiding the EPnet forum, as they were overloaded with information. However, this study utilized a mixed-methods design, which allowed for triangulation of data and further insights into EPs' usage of IT during COVID-19 through the interviews, which were overall consistent with the themes found in the surveys.

The survey also used a significant number of Likert-scale questions, where EPs were asked to rate their frequency of IT use or the extent to which they agreed with various statements. This method was chosen because it would allow for data collection from a large sample size, which would enable statistical analysis (Nemoto & Beglar, 2014). Many of the instruments used in the quantitative analysis were chosen from already available scales that had already established validity and reliability, such as the PIIT measure, or were tested through piloting and gathering feedback.

Many of the questions also relied on EPs to recall the frequency of using IT in their role, which could have caused the results of the study to be impacted by recall bias, whereby responses might have overinflated or underinflated the frequency of using IT in their role (Althubaiti, 2016). Other biases that might have impacted the data include selection bias, whereby EPs chose to participate in the study if it was salient for them or if they already had an interest in IT. However, some EPs who were interviewed reported that they had participated due to wanting to know more about IT and what other EPs were doing. Social desirability could have also impacted the results (Althubaiti, 2016). The EPs who were interviewed were concerned about the impact of what they were saying with regard to their service. Additionally, an interesting finding was that only one EP in the surveys reported that age was a barrier to IT use, whereas most EPs reported that it could be a possible barrier relating to experience with IT and comfort levels.

The quantitative analysis of the study used both exploratory and confirmatory data analysis, utilizing factors that were derived from other studies on IT usage. However, research that performs multiple hypothesis tests is at risk of increased rates of Type 1 errors—increasing the likelihood of finding a statistically significant difference when there is not one (Sedgwick, 2014). In light of this, nonparametric tests were utilized in the quantitative analysis. Results from the quantitative analysis were also triangulated with information from the qualitative interview findings, which contributed to the certainty that conclusions derived from the data are valid (Messick, 1994). Additionally, the quantitative analysis of gender might have also been impacted by the gender imbalance in the EP profession, as approximately 80% of EPs are female.

PIIT is reported to be a stable trait construct of the individual; however, during the interviews, some EPs reported that they had previously been more uncomfortable with IT, but during COVID-19, they had to challenge that fear and as a result became more open. This indicates that PIIT might not necessarily be a stable construct. Traditional measures to explore innovativeness often lack consistency, and it is difficult to determine the reliability and validity of the construct because it can only be measured after innovation has occurred (Flynn & Goldsmith, 1993). There were also increases in the rate of digitization of services, which arose because of prioritization and demands from service users (LaBerge et al., 2020). It would have been interesting to explore whether the innovators in the study had higher levels of PIIT measures; however, this was not possible because information was collected separately. Nevertheless, the interviews corroborated findings on PIIT, including self-reliance in developing new skills and an openness to IT use.

***Conclusion***

At present this study is one of the first to provide data on EPs' usage of IT, and it is a fairly new field of research. Until COVID-19, the discourse on IT usage within the profession stipulated that it was optional and not a necessity to think about in supporting CYP. However, IT usage in the profession has now become essential due to the circumstances brought by COVID-19, which means that EPs are now working remotely, and many faced limitations of entering schools during the March

2020 lockdown. The world has already changed, and the time has come for EPs and the systems around them to catch up and learn how to ideally utilize what IT can offer to CYP to enhance EPs' practice and moderate IT's negative effects. This study has begun the discourse on IT usage within the profession and supports EPs by providing a reference list of the tools that EPs utilize in their practice.

EPs are required to provide advice that supports CYP's special educational needs, health care needs, and outcomes. If technology can reduce CYP's isolation, which impacts their social involvement, or if AT can assist CYP in overcoming school- and work-related access to learning and employment, then the profession is doing a disservice by not providing advice on IT use. Furthermore, the landscape of learning is changing. Although there have been changes to EP practice, mainly through virtual conferencing and the absence of FTF contact with other EPs, this thesis found that there was no significant change in the use of IT in practice with CYP and the quantity of IT recommended. There was an increase in the use of questionnaires compared with cognitive assessments scored virtually; however, there was no difference in the total number. COVID-19 has only exaggerated the findings of EPs' IT literacy concerning the use of IT in their role supporting CYP.

Teaching EPs about IT and its usage is important not only for evolving practice to ideally utilize the resources currently available but also for raising awareness about the ethical implications of utilizing IT in practice, as well as empowering EPs to evaluate the safety of programs they are using in terms of information governance and GDPR. To utilize the current technology that is available, EPs must be up to date, primarily because the technology already exists to support the CYP with whom they work. However, it is vital to utilize IT wisely to ensure that service users' information is protected and in line with recent GDPR changes.

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**Appendices**


## Ethics

My name is Liane Al-Baba and I am inviting you to take in part in my research project 'IT in the world of the EP'. I am a Trainee Educational psychologist at the UCL IOE and am being supervised by Maria Kambouri and Tom Connor (EP supervisor).

This survey will explore what technology you use, how you use social media and the programs you use. It will take approximately 20 minutes to fill out and would appreciate your patience to do so. The hopes of this project will be to extend our current knowledge and understanding of the applications for IT in the way that EPs currently work.

**Data Protection Privacy Notice**

The data controller for this project will be University College London (UCL). The UCL Data Protection Office provides oversight of UCL activities involving the processing of personal data, and can be contacted at **data-protection@ucl.ac.uk.** UCL's Data Protection Officer can also be contacted at data-protection@ucl.ac.uk. Further information on how UCL uses participant information can be found here: **www.ucl.ac.uk/legal-services/privacy/participants-health-and-care-research-privacy-notice.**

Further information about UCL's privacy policies can be found here: **https://www.ucl.ac.uk/legal-services/privacy**

If you have any further questions before you decide whether to take part, you can reach me at rmjlalb@ucl.ac.uk.

**Consent** (The survey will only continue if you consent to all of the following)

- ☐ I confirm that I have read and understood this information sheet,
- ☐ I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason.
- ☐ I agree for information I provide to be collected. I know that all data will be kept under the terms of the General Data Protection Regulation (GDPR).
- ☐ I agree that small direct quotes may be used in reports (these will be anonymised).

**EP demographics**

Which gender do you identify as?

- ○ Male
- ○ Female
- ○ [ ] Other (please describe)
- ○ Prefer not to say

What is your age?

- ○ Under 25
- ○ 25 - 34
- ○ 35 - 44
- ○ 45 - 54
- ○ 55 - 64
- ○ 65 +
- ○ Prefer not to say

Where are you located?

[ ]

Which university did you/ are you currently training at?

What is your current role within your service/ organization? (please select all that apply)

- [ ] Principal Educational Psychologist
- [ ] Senior Educational Psychologist
- [ ] Specialist Educational Psychologist
- [ ] Educational Psychologist
- [ ] Trainee Educational Psychologist
- [ ] Newly Qualified Educational Psychologist
- [ ] Supervisor (Placement)
- [ ] Supervisor (research)
- [ ] Supervisor (university based)
- [ ] University/ Training Provider senior leadership (course director, head of year)
- [ ] University based researcher
- [ ] Other (please describe)

What year did you qualify to become an Educational Psychologist?

Which university do you work at?

How long have you been in your current role?

- ○ Less than one year
- ○ More than one year, fewer than five years
- ○ More than five years, fewer than ten years
- ○ More than ten years

**Disability**

Do you consider yourself to have a disability or a mental health condition? ( Please select all that apply)

- [ ] No disability
- [ ] Mental Health Condition (e.g. depression, anxiety disorder)
- [ ] Specific learning disability (e.g. dyslexia, dyspraxia)
- [ ] Mobility difficulties
- [ ] Long-term health condition
- [ ] Autistic Spectrum Condition
- [ ] ADD/ ADHD
- [ ] Prefer not to say
- [ ] Other (please describe)

**Type of Work**

How are your Educational Psychology Services currently commissioned? (Please select all that apply)

- [ ] By the Children's and Young People's Trust and/or sub groups of the trust
- [ ] By the Health and Well Being Board or sub group of the Board
- [ ] Clusters or partnerships of schools
- [ ] Local Authority Maintained Schools (primary, secondary, special)
- [ ] Academies, Trust or Free (primary, secondary, special)
- [ ] By the local authority Children's Services senior management team
- [ ] Parents
- [ ] Another local authority
- [ ] Social enterprise

- [ ] Unsure
- [ ] Other

If you stated other, please provide details here

How do you fund your Educational Psychology Service? (please select all that apply)

- [ ] Core Council budget (i.e. Revenue Support Grant)
- [ ] Central expenditure element of Dedicated Schools Grant (DSG)
- [ ] _____ Another Grant (please name the Grant)
- [ ] Income generation stream i.e. traded services (e.g. payment by schools)
- [ ] _____ Another agency (s) (please name the agency / agencies)
- [ ] Another organization / local authority
- [ ] Other

If you stated other, please provide details here

Where are you employed? (select all that apply)

- [ ] Private-for-profit (company, business or individual, for wages, salary or commissions)
- [ ] Private-not-for-profit (tax-exempt, or charitable organization)
- [ ] Local Authority
- [ ] Self-employed
- [ ] University or EP training provider

What is the service model of your local authority?

- ○ Fully Traded
- ○ Partially traded
- ○ Untraded

In which settings are you currently working? (please select all that apply)

- [ ] Educational Psychology Service
- [ ] Multi-agency / Integrated Service / Team
- [ ] Children Looked After
- [ ] Child Protection
- [ ] Disability and Fostering
- [ ] Adoption
- [ ] Local Authority Maintained Primary and Secondary Schools
- [ ] Local Authority Maintained Specialist Provisions
- [ ] Academies, Trust or Free Schools (primary, secondary)
- [ ] Academies, Trust or Free Schools Specialist Provisions
- [ ] Early Years Settings
- [ ] Further Education (e.g. FE college, sixth form college)
- [ ] Child and adolescent
- [ ] Independent and non maintained provision
- [ ] Other

What other settings are you currently working in (please state)

If you use any other social media platforms please describe:

**Current Use of IT**

To what extent has the following prepared you to make the most of IT in your EP practice

| | Not at all | Minor Extent | Moderate Extent | Major Extent |
|---|---|---|---|---|
| Undergraduate Program | ○ | ○ | ○ | ○ |
| Educational Psychology Training Program | ○ | ○ | ○ | ○ |
| Training provided by staff responsible for technology support at your place of work | ○ | ○ | ○ | ○ |
| Independent Learning | ○ | ○ | ○ | ○ |
| Workshops or courses | ○ | ○ | ○ | ○ |
| Asking other EPs | ○ | ○ | ○ | ○ |

Has anything else supported you to make the most of IT in your EP practice?

How frequently do you use any online or computer based scoring for assessments?

- ○ Never
- ○ Rarely
- ○ Sometimes
- ○ Often
- ○ All of the time

Which assessments do you use the online/computer based scoring for?

What phone apps/ devices/ online programs or any other IT have you recommended to support children and young people (e.g. recommendations in your reports or to schools)?

What phone apps/ devices/ online programs or any other IT do you use on a regular basis with the children/ young people you support?

What apps/ devices/ online programs do you use for everyday admin tasks (e.g. Google calendar)

What apps/devices/ programs do you use most often to support you in your role as an EP (e.g. taking photos of student's responses on an assessment to score later)

How comfortable do you feel recommending IT/apps/software to children or young people?

| | Extremely comfortable | Somewhat comfortable | Neutral | Somewhat uncomfortable | Extremely uncomfortable |
|---|---|---|---|---|---|
| At present | ○ | ○ | ○ | ○ | ○ |
| Where you would like to be | ○ | ○ | ○ | ○ | ○ |

How often do you use devices (e.g. laptops, computers, smartphones, tablets) to administer cognitive assessments? (E.g q-interactive)

- ○ Very Often
- ○ Often
- ○ Not Often
- ○ Rarely
- ○ Never

What cognitive assessments do you use devices (e.g. laptops, computers, smartphones, tablets) to administer?

How often do you get asked about using IT to support students by SENCOs?

- ○ Very often
- ○ Often
- ○ Not often
- ○ Rarely
- ○ Never

How often do you get asked about using IT by parents?

- ○ Very Often
- ○ Often
- ○ Not often
- ○ Rarely
- ○ Never

How often do you get asked about using IT by students?

- ○ Very often
- ○ Often
- ○ Not often
- ○ Rarely
- ○ Never

How do you share information with your service users?

| | Very often | Often | Not Often | Rarely | Never |
|---|---|---|---|---|---|
| Email | ○ | ○ | ○ | ○ | ○ |
| Telephone | ○ | ○ | ○ | ○ | ○ |
| Face-to-face meetings | ○ | ○ | ○ | ○ | ○ |
| Letters sent by post | ○ | ○ | ○ | ○ | ○ |
| Blogs | ○ | ○ | ○ | ○ | ○ |
| Service website | ○ | ○ | ○ | ○ | ○ |
| Social Media | ○ | ○ | ○ | ○ | ○ |
| Text Message | ○ | ○ | ○ | ○ | ○ |

Is there any other way you share information with your service users?

**Service IT use**

How do you access your work files? ( Please select all that apply)

- ☐ Remote access to server
- ☐ Work desktop computer
- ☐ Work laptop
- ☐ Personal laptop with remote access to server
- ☐ Personal laptop
- ☐ Tablet
- ☐ Smartphone
- ☐ _____ Other (please describe)

At your service how much do you agree with the following statements:

| | Strongly agree | Somewhat agree | Neither agree nor disagree | Somewhat disagree | Strongly disagree |
|---|---|---|---|---|---|
| Most of our computers are kept in good working condition | ○ | ○ | ○ | ○ | ○ |
| I can readily obtain answers to technology-related questions | ○ | ○ | ○ | ○ | ○ |
| We have adequate access to up-to-date technology resources | ○ | ○ | ○ | ○ | ○ |
| Materials (e.g., software, printer supplies) are readily available. | ○ | ○ | ○ | ○ | ○ |
| Computer stations are readily available to work on. | ○ | ○ | ○ | ○ | ○ |
| We have access to up to date technology (e.g. computer/ tablet) | ○ | ○ | ○ | ○ | ○ |
| Online/computer based scoring for assessments is readily available | ○ | ○ | ○ | ○ | ○ |
| We have access to technology mediated assessments | ○ | ○ | ○ | ○ | ○ |

What technology devices do you use in your everyday practice?

| | Availability | | | Frequency of use if applicable | | | |
|---|---|---|---|---|---|---|---|
| | Not Available | Provided by Work | Personally Owned | Never | Rarely | Sometimes | Often |
| Laptop | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Stationary Desktop | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Tablet | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Smart phone | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Digital Camera | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Audio recorder | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

| | Availability | | | Frequency of use if applicable | | | |
|---|---|---|---|---|---|---|---|
| | Not Available | Provided by Work | Personally Owned | Never | Rarely | Sometimes | Often |
| MP3 Player/IPod | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| E-reader | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Video Camera | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

What other devices do you use in your practice and how frequently do you use them?

**Compatibility**

To what extent do you believe that using IT is compatible with all aspects of your role?

- ○ Strongly agree
- ○ Agree
- ○ Somewhat agree
- ○ Neutral
- ○ Somewhat disagree
- ○ Disagree
- ○ Strongly disagree

To what extent do you think that using IT fits well with the way you like to work?

- ○ Strongly agree
- ○ Agree
- ○ Somewhat agree
- ○ Neutral
- ○ Somewhat disagree
- ○ Disagree
- ○ Strongly disagree

To what extent do you think that using IT fits into you work style?

- ○ Strongly agree
- ○ Agree
- ○ Somewhat agree
- ○ Neutral
- ○ Somewhat disagree
- ○ Disagree
- ○ Strongly disagree

**Perceived Usefulness of IT to work as an EP**

How important do you think it is for educational psychologists to be aware of new technological innovations that would be beneficial to their practice?

- ○ Extremely important
- ○ Very important
- ○ Moderately important
- ○ Slightly important
- ○ Not at all important

Do you think that learning about new IT is considered to be a high priority to educational psychologists?

- ○ Strongly agree
- ○ Somewhat agree
- ○ Neither agree nor disagree

- Somewhat disagree
- Strongly disagree

How important is it for you to learn about how IT/apps can be used to support children and young people?

- Extremely important
- Very important
- Moderately important
- Slightly important
- Not at all important

How interested would you be in CPD opportunities related to IT?

- Extremely interested
- Very interested
- Moderately interested
- Slightly interested
- Not interested at all

What would you like this CPD to involve?

Why do you think learning about IT is important?

**Compatibility with service and leadership**

How much do you agree with the following statements:

I believe using IT as part of my practice is compatible with my service

- Strongly agree
- Agree
- Somewhat agree
- Neither agree nor disagree
- Somewhat disagree
- Disagree
- Strongly disagree

Senior leadership are encouraging of using IT more often in practice

- Strongly agree
- Agree
- Somewhat agree
- Neither agree nor disagree
- Somewhat disagree
- Disagree
- Strongly disagree

Senior Leadership are open to EPs using IT in their practice

- Strongly agree
- Agree
- Somewhat agree
- Neither agree nor disagree
- Somewhat disagree
- Disagree
- Strongly disagree

**PITT**

If I heard about a new information technology or app, I would look for ways to experiment with it.

- Strongly agree
- Agree
- Somewhat agree
- Neutral
- Somewhat disagree
- Disagree
- Strongly disagree

Among my peers, I am usually the first to try out new information technologies.

- Strongly agree
- Agree
- Somewhat agree
- Neutral
- Somewhat disagree
- Disagree
- Strongly disagree

In general, I am hesitant to try out new information technologies.

- Strongly agree
- Agree
- Somewhat agree
- Neutral
- Somewhat disagree
- Disagree
- Strongly disagree

I like to experiment with new information technologies.

- Strongly agree
- Agree
- Somewhat agree
- Neutral
- Somewhat disagree
- Disagree
- Strongly disagree

**Confidence**

How confident do you feel about evaluating the apps that schools are using?

- Extremely confident
- Somewhat confident
- Neutral
- Not confident
- Not confident at all

How confident do you feel about your understanding of how children and young people are using the internet and social media?

- Extremely confident
- Somewhat confident
- Neutral
- Not confident
- Not confident at all

**Enablers and Barriers open questions**

What do you consider to be the barriers to using IT in your practice as an EP?

What do you consider to be the enablers of IT use in your practice as an EP?

**Interviews**

Would you be interested in being interviewed in the future about your views on IT and the EP role? (this will not be guaranteed and you will also have the choice to withdraw if you are contacted in the future)

- Yes
- No

Would you be able to provide an email to get in contact with you?

Institute of Education

**Ethics**

My name is Liane Al-Baba and I am inviting you to take in part in my research project 'IT in the world of the EP'. I am a Trainee Educational psychologist at the UCL IOE and am being supervised by Maria Kambouri and Tom Connor (EP supervisor).

This survey will explore what technology you use, how you use social media and the programs you use. It will take approximately 30 minutes to fill out and I would appreciate your patience to do so. The hopes of this project will be to extend our current knowledge and understanding of the applications for IT in the way that EPs currently work.

Data Protection Privacy Notice

The data controller for this project will be University College London (UCL). The UCL Data Protection Office provides oversight of UCL activities involving the processing of personal data, and can be contacted at data-protection@ucl.ac.uk. UCL's Data Protection Officer can also be contacted at data-protection@ucl.ac.uk ].

Further information on how UCL uses participant information can be found here: www.ucl.ac.uk/legal-services/privacy/participants-health-and-care-research-privacy-notice.

Further information about UCL's privacy policies can be found here: https://www.ucl.ac.uk/legal-services/privacy

If you have any further questions before you decide whether to take part, you can reach me at rmjlalb@ucl.ac.uk.

Consent (The survey will only continue if you consent by clicking on all of the following)

- ☐ I confirm that I have read and understood this information sheet,
- ☐ I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason.
- ☐ I agree for information I provide to be collected. I know that all data will be kept under the terms of the General Data Protection Regulation (GDPR).
- ☐ I agree that small direct quotes may be used in reports (these will be anonymised).

Have you completed this survey in the past?

- ○ Yes
- ○ No

**EP demographics**

Which gender do you identify as?

- ○ Male
- ○ Female
- ○ [ ] Other (please describe)
- ○ Prefer not to say

What is your age?

- ○ Under 25
- ○ 25 - 34
- ○ 35 - 44
- ○ 45 - 54
- ○ 55 - 64
- ○ 65 +
- ○ Prefer not to say

Choose one option that best describes your ethnic group or background

White

- English/Welsh/Scottish/Northern Irish/British
- Irish
- Gypsy or Irish Traveller
- [ ] Any other White background, please describe

Black/ African/Caribbean/Black British

- African
- Caribbean
- [ ] Any other Black/African/Caribbean background, please describe

Asian/Asian British

- Indian
- Pakistani
- Bangladeshi
- Chinese
- Any other Asian background, please describe

Mixed/Multiple ethnic groups

- White and Black Caribbean
- White and Asian
- White and Black African
- [ ] Any other Mixed/Multiple ethnic background, please describe

Other ethnic group

- Arab
- [ ] Any other ethnic group, please describe

- Prefer not to say

Where are you located?

Which university did you/ are you currently training at?

What is your current role within your service/ organization? (please select all that apply)

- [ ] Principal Educational Psychologist
- [ ] Senior Educational Psychologist
- [ ] Specialist Educational Psychologist
- [ ] Educational Psychologist
- [ ] Trainee Educational Psychologist
- [ ] Newly Qualified Educational Psychologist
- [ ] Supervisor (Placement)
- [ ] Supervisor (research)
- [ ] Supervisor (university based)
- [ ] University/ Training Provider senior leadership (course director, head of year)
- [ ] University based researcher
- [ ] Other (please describe)

What year did you qualify to become an Educational Psychologist?

Which university do you work at?

How long have you been in your current role?

- Less than one year
- More than one year, fewer than five years
- More than five years, fewer than ten years
- More than ten years

**Disability**

Do you consider yourself to have a disability or a mental health condition? ( Please select all that apply)

- [ ] No disability
- [ ] Mental Health Condition (e.g. depression, anxiety disorder)
- [ ] Specific learning disability (e.g. dyslexia, dyspraxia)
- [ ] Mobility difficulties
- [ ] Long-term health condition
- [ ] Autistic Spectrum Condition
- [ ] ADD/ ADHD
- [ ] Prefer not to say
- [ ] [ ] Other (please describe)

**Type of Work**

How are your Educational Psychology Services currently commissioned? (Please select all that apply)

- [ ] By the Children's and Young People's Trust and/or sub groups of the trust
- [ ] By the Health and Well Being Board or sub group of the Board
- [ ] Clusters or partnerships of schools
- [ ] Local Authority Maintained Schools (primary, secondary, special)
- [ ] Academies, Trust or Free (primary, secondary, special)
- [ ] By the local authority Children's Services senior management team
- [ ] Parents
- [ ] Another local authority
- [ ] Social enterprise
- [ ] Unsure
- [ ] Other

If you stated other, please provide details here

How do you fund your Educational Psychology Service? (please select all that apply)

- [ ] Core Council budget (i.e. Revenue Support Grant)
- [ ] Central expenditure element of Dedicated Schools Grant (DSG)
- [ ] [ ] Another Grant (please name the Grant)
- [ ] Income generation stream i.e. traded services (e.g. payment by schools)
- [ ] [ ] Another agency (s) (please name the agency / agencies)
- [ ] Another organization / local authority
- [ ] Other

If you stated other, please provide details here

Where are you employed? (select all that apply)

- [ ] Private-for-profit (company, business or individual, for wages, salary or commissions)
- [ ] Private-not-for-profit (tax-exempt, or charitable organization)
- [ ] Local Authority
- [ ] Self-employed
- [ ] University or EP training provider

What is the service model of your local authority?

- ○ Fully Traded
- ○ Partially traded
- ○ Untraded

In which settings are you currently working? (please select all that apply)

- [ ] Educational Psychology Service
- [ ] Multi-agency / Integrated Service / Team
- [ ] Children Looked After
- [ ] Child Protection
- [ ] Disability and Fostering
- [ ] Adoption
- [ ] Local Authority Maintained Primary and Secondary Schools
- [ ] Local Authority Maintained Specialist Provisions
- [ ] Academies, Trust or Free Schools (primary, secondary)
- [ ] Academies, Trust or Free Schools Specialist Provisions
- [ ] Early Years Settings
- [ ] Further Education (e.g. FE college, sixth form college)
- [ ] Child and Adolescent Mental Health Service (CAMHS)
- [ ] Independent and non maintained provision
- [ ] Other

What other settings are you currently working in (please state)

What are the main tasks that you undertook in your typical working week **before** COVID-19 ?

- [ ] Consultations
- [ ] Meetings
- [ ] Preparing and delivering training
- [ ] Supervision of trainees
- [ ] Supervision of colleagues
- [ ] Supervision of schools staff
- [ ] EHCP assessments
- [ ] Individual work with pupils
- [ ] [ ] Therapeutic work - please specify
- [ ] Report writing
- [ ] Observation
- [ ] ELSA supervision
- [ ] ELSA training
- [ ] Attending local authority panels
- [ ] Planning meetings
- [ ] [ ] Admin tasks e.g. emails - please specify

What are the main tasks that you undertook in your typical working week **before** COVID-19 ?

- [ ] Consultations
- [ ] Meetings
- [ ] Preparing and delivering training
- [ ] Supervision of trainees
- [ ] Supervision of colleagues
- [ ] Supervision of schools staff
- [ ] EHCP assessments
- [ ] Individual work with pupils
- [ ] [ ] Therapeutic work - please specify
- [ ] Report writing
- [ ] Observation
- [ ] ELSA supervision
- [ ] ELSA training
- [ ] Attending local authority panels
- [ ] Planning meetings
- [ ] [ ] Admin tasks e.g. emails - please specify

Are there any other tasks that you undertook in your typical working week **before** COVID-19 ?

What are the main tasks that you are undertaking **now** in your typical working week, and how do they differ to what you did in the past (e.g. virtual feedback meetings, telephone consultations)?

**Service IT use**

**In the survey Information Technology (IT) is defined as the use of physical devices (e.g. laptops, computers, smartphones, tablets) to "create, process, store, secure and exchange all forms of electronic data" (Rouse, 2015).**

Please rank how frequently you used IT for the following activities **Before** Covid 19:

| | Very frequently | Somewhat Frequently | Occasionally | Somewhat infrequently | Never |
|---|---|---|---|---|---|
| Communicating with parents | O | O | O | O | O |
| Communicating with other professionals | O | O | O | O | O |
| Accessing resources | O | O | O | O | O |
| Supporting interventions | O | O | O | O | O |
| Scoring Assessments | O | O | O | O | O |

| | Very frequently | Somewhat Frequently | Occasionally | Somewhat infrequently | Never |
|---|---|---|---|---|---|
| Report writing | O | O | O | O | O |
| Offering professional development | O | O | O | O | O |
| Administrative tasks | O | O | O | O | O |
| Research | O | O | O | O | O |
| Observations | O | O | O | O | O |

Please rank how frequently you **currently** use IT for the following activities:

| | Very frequently | Somewhat Frequently | Occasionally | Somewhat infrequently | Never |
|---|---|---|---|---|---|
| Communicating with parents | O | O | O | O | O |
| Communicating with other professionals | O | O | O | O | O |
| Accessing resources | O | O | O | O | O |
| Supporting interventions | O | O | O | O | O |
| Scoring Assessments | O | O | O | O | O |

| | Very frequently | Somewhat Frequently | Occasionally | Somewhat infrequently | Never |
|---|---|---|---|---|---|
| Report writing | O | O | O | O | O |
| Offering professional development | O | O | O | O | O |
| Administrative tasks | O | O | O | O | O |
| Research | O | O | O | O | O |
| Observations | O | O | O | O | O |

Do you use IT in any other activities for your role?

**Social Media**

Do you use any social media platforms in your work or personal life?

- O Yes
- O No

If yes which ones do you use? ( Please select all that apply)

| | Professional Use | Recreational use |
|---|---|---|
| Facebook | ☐ | ☐ |
| Instagram | ☐ | ☐ |
| Twitter | ☐ | ☐ |

| | Professional Use | Recreational use |
|---|---|---|
| LinkedIn | ☐ | ☐ |
| Snapchat | ☐ | ☐ |
| Whatsapp | ☐ | ☐ |
| Pinterest | ☐ | ☐ |
| Reddit | ☐ | ☐ |
| Google+ | ☐ | ☐ |
| listserv (i.e. electronic mailing list e.g. EPnet) | ☐ | ☐ |
| Other (please describe) | ☐ | ☐ |

**Service IT use**

How did you access your work files **before** Covid? ( Please select all that apply)

- ☐ Remote access to server
- ☐ Work desktop computer
- ☐ Work laptop
- ☐ Personal laptop with remote access to server
- ☐ Personal laptop
- ☐ Tablet
- ☐ Smartphone
- ☐ Other (please describe)

How do you **currently** access your work files? ( Please select all that apply)

- ☐ Remote access to server
- ☐ Work desktop computer
- ☐ Work laptop
- ☐ Personal laptop with remote access to server
- ☐ Personal laptop
- ☐ Tablet
- ☐ Smartphone
- ☐ Other (please describe)

At your service how much do you agree with the following statements:

| | Strongly agree | Somewhat agree | Neither agree nor disagree | Somewhat disagree | Strongly disagree |
|---|---|---|---|---|---|
| Most of our computers are kept in good working condition | ○ | ○ | ○ | ○ | ○ |
| I can readily obtain answers to technology-related questions | ○ | ○ | ○ | ○ | ○ |
| We have adequate access to up-to-date technology resources | ○ | ○ | ○ | ○ | ○ |
| Materials (e.g., software, printer supplies) are readily available. | ○ | ○ | ○ | ○ | ○ |

| | Strongly agree | Somewhat agree | Neither agree nor disagree | Somewhat disagree | Strongly disagree |
|---|---|---|---|---|---|
| Computer stations are readily available to work on. | ○ | ○ | ○ | ○ | ○ |
| We have access to up to date technology (e.g. computer/ tablet) | ○ | ○ | ○ | ○ | ○ |
| Online/computer based scoring for assessments is readily available | ○ | ○ | ○ | ○ | ○ |
| We have access to technology mediated assessments | ○ | ○ | ○ | ○ | ○ |

What technology devices do you use in your everyday practice?

| | Availability | | | Frequency of use | | | |
|---|---|---|---|---|---|---|---|
| | Not Available | Provided by Work | Personally Owned | Never | Rarely | Sometimes | Often |
| Laptop | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Stationary Desktop | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Tablet | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Smart phone | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Digital Camera | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| | Not Available | Provided by Work | Personally Owned | Never | Rarely | Sometimes | Often |
| Audio recorder | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

| | Availability | | | Frequency of use | | | |
|---|---|---|---|---|---|---|---|
| | Not Available | Provided by Work | Personally Owned | Never | Rarely | Sometimes | Often |
| MP3 Player/IPod | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| E-reader | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Video Camera | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

What other devices do you use in your practice and how frequently do you use them?

Have you received any new technology since COVID-19?

- ○ Yes
- ○ No

What new technology have you received ?

**Current Use of IT**

To what extent has the following prepared you to make the most of IT in your EP practice

| | Not at all | Minor Extent | Moderate Extent | Major Extent |
|---|---|---|---|---|
| Undergraduate Program | ○ | ○ | ○ | ○ |
| Educational Psychology Training Program | ○ | ○ | ○ | ○ |
| Training provided by staff responsible for technology support at your place of work | ○ | ○ | ○ | ○ |
| Independent Learning | ○ | ○ | ○ | ○ |
| Workshops or courses | ○ | ○ | ○ | ○ |
| Asking other EPs | ○ | ○ | ○ | ○ |

Has anything else supported you to make the most of IT in your EP practice?

How frequently do you use any online or computer based scoring for assessments?

- ○ Never
- ○ Rarely
- ○ Sometimes
- ○ Often
- ○ All of the time

Which assessments do you use the online/computer based scoring for? (Please select all that apply)

- ☐ British Abilities Scale 3 (BAS3)
- ☐ Wechsler Individual Achievement Test - Third UK Edition (WIAT-III)
- ☐ Wechsler Intelligence Scale for Children Fifth Edition (WISC - V)
- ☐ Child Communication Checklist (CCC)
- ☐ Strengths and Difficulties Questionnaire (SDQ)
- ☐ Vineland Adaptive Behavior Scales
- ☐ [ ] Other please describe

How frequently do you use devices (e.g. laptops, computers, smartphones, tablets) to administer cognitive assessments?

- ○ Never
- ○ Rarely
- ○ Sometimes

- Often
- All of the time

What cognitive assessments do you use devices (e.g. laptops, computers, smartphones, tablets) to administer?

What phone apps/ devices/ online programs or any other IT have you recommended to support children and young people (e.g. clicker, speech to text )?

What phone apps/ devices/ online programs or any other IT do you use on a regular basis with the children/ young people you support? (e.g. powerpoint, talking mats)

What apps/ devices/ online programs do you use for everyday admin tasks (e.g. Google calendar)

What apps/ devices/ programs do you use most often to support you in your role as an EP (e.g. taking photos of student's responses on an assessment to score later, video recording for VIG)

How comfortable do you feel recommending IT/apps/software to children or young people?

| | Extremely comfortable | Somewhat comfortable | Neutral | Somewhat uncomfortable | Extremely uncomfortable |
|---|---|---|---|---|---|
| At present | | | | | |
| Where you would like to be | | | | | |

How often do you use devices (e.g. laptops, computers, smartphones, tablets) to administer cognitive assessments? (E.g q-interactive)

| | Very Often | Often | Not Often | Rarely | Never |
|---|---|---|---|---|---|
| At Present | | | | | |
| Before Covid-19 | | | | | |

How often do you get asked about using IT to support students by SENCOs?

| | Very Often | Often | Not Often | Rarely | Never |
|---|---|---|---|---|---|
| At Present | | | | | |
| Before Covid-19 | | | | | |

How often do you get asked about using IT by parents?

| | Very Often | Often | Not Often | Rarely | Never |
|---|---|---|---|---|---|
| At Present | | | | | |
| Before Covid-19 | | | | | |

How often do you get asked about using IT by CYP?

| | Very Often | Often | Not Often | Rarely | Never |
|---|---|---|---|---|---|
| At Present | O | O | O | O | O |
| Before Covid-19 | O | O | O | O | O |

How do you share information with your service users **at present**?

| | Very often | Often | Not Often | Rarely | Never |
|---|---|---|---|---|---|
| Email | O | O | O | O | O |
| Telephone | O | O | O | O | O |
| Face-to-face meetings | O | O | O | O | O |
| Letters sent by post | O | O | O | O | O |
| | Very often | Often | Not Often | Rarely | Never |
| Blogs | O | O | O | O | O |
| Service website | O | O | O | O | O |
| Social Media | O | O | O | O | O |
| Text Message | O | O | O | O | O |

Is there any other way you are currently sharing information with your service users?

How do you share information with your service users **before Covid-19**?

| | Very often | Often | Not Often | Rarely | Never |
|---|---|---|---|---|---|
| Email | O | O | O | O | O |
| Telephone | O | O | O | O | O |
| Face-to-face meetings | O | O | O | O | O |
| Letters sent by post | O | O | O | O | O |
| | Very often | Often | Not Often | Rarely | Never |
| Blogs | O | O | O | O | O |
| Service website | O | O | O | O | O |
| Social Media | O | O | O | O | O |
| Text Message | O | O | O | O | O |

Is there any other way you used to share information with your service users?

**Compatibility**

To what extent do you believe that using IT is compatible with all aspects of your role?

| | Strongly Agree | Agree | Somewhat Agree | Neutral | Somewhat Disagree | Disagree | Strongly Disagree |
|---|---|---|---|---|---|---|---|
| At present | O | O | O | O | O | O | O |
| Before Covid-19 | O | O | O | O | O | O | O |

To what extent do you think that using IT fits well with the way you like to work?

| | Strongly Agree | Agree | Somewhat Agree | Neutral | Somewhat Disagree | Disagree | Strongly Disagree |
|---|---|---|---|---|---|---|---|
| At present | O | O | O | O | O | O | O |
| Before Covid-19 | O | O | O | O | O | O | O |

To what extent do you think that using IT fits into you work style?

| | Strongly Agree | Agreee | Somewhat Agree | Neutral | Somewhat Disagree | Disagree | Strongly Disagree |
|---|---|---|---|---|---|---|---|
| At present | O | O | O | O | O | O | O |
| Before Covid-19 | O | O | O | O | O | O | O |

**Perceived Usefulness of IT to work as an EP**

How important do you think it is for educational psychologists to be aware of new technological innovations that would be beneficial to their practice?

| | Extremely Important | Very Important | Moderately Important | Slightly Important | Not at all important |
|---|---|---|---|---|---|
| At present | O | O | O | O | O |
| Before Covid-19 | O | O | O | O | O |

Do you think that learning about new IT is considered to be a high priority to educational psychologists?

| | Strongly Agree | Somewhat Agree | Neither Agree nor Disagree | Somewhat Disagree | Strongly Disagree |
|---|---|---|---|---|---|
| At present | ○ | ○ | ○ | ○ | ○ |
| Before Covid-19 | ○ | ○ | ○ | ○ | ○ |

Do you think that learning about new IT is considered to be a high priority to educational psychologists?

| | Strongly Agree | Somewhat Agree | Neither Agree nor disagree | Somewhat Disagree | Strongly Disagree |
|---|---|---|---|---|---|
| At present | ○ | ○ | ○ | ○ | ○ |
| Before Covid-19 | ○ | ○ | ○ | ○ | ○ |

How important is it for you to learn about how IT/apps can be used to support children and young people?

| | Extremely Important | Very Important | Moderately Important | Slightly Important | Not as all Important |
|---|---|---|---|---|---|
| At Present | ○ | ○ | ○ | ○ | ○ |
| Before Covid-19 | ○ | ○ | ○ | ○ | ○ |

How interested would you be in CPD opportunities related to IT?

- ○ Extremely interested
- ○ Very interested
- ○ Moderately interested
- ○ Slightly interested
- ○ Not interested at all

What would you like this CPD to involve?

Why do you think learning about IT is important?

**Compatibility with service and leadership**

How much do you agree with the following statements:

I believe using IT as part of my practice is compatible with my service

| | Strongly Agree | Agree | Somewhat Agree | Neither agree nor Disagree | Somewhat Disagree | Disagree | Strongly Disagree |
|---|---|---|---|---|---|---|---|
| At present | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Before Covid-19 | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

Senior leadership are encouraging of using IT more often in practice

| | Strongly Agree | Agree | Somewhat Agree | Neither agree nor Disagree | Somewhat Disagree | Disagree | Strongly Disagree |
|---|---|---|---|---|---|---|---|
| At Present | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Before Covid-19 | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

Senior Leadership are open to EPs using IT in their practice

| | Strongly Agree | Agree | Somewhat Agree | Neither agree nor disagree | Somewhat Disagree | Dsiagree | Strongly Disagree |
|---|---|---|---|---|---|---|---|
| At Present | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Before Covid-19 | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

**PITT**

If I heard about a new information technology or app, I would look for ways to experiment with it.

- ○ Strongly agree
- ○ Agree
- ○ Somewhat agree
- ○ Neutral
- ○ Somewhat disagree
- ○ Disagree
- ○ Strongly disagree

Among my peers, I am usually the first to try out new information technologies.

- ○ Strongly agree
- ○ Agree
- ○ Somewhat agree
- ○ Neutral
- ○ Somewhat disagree
- ○ Disagree
- ○ Strongly disagree

In general, I am hesitant to try out new information technologies.

- ○ Strongly agree
- ○ Agree
- ○ Somewhat agree
- ○ Neutral
- ○ Somewhat disagree
- ○ Disagree
- ○ Strongly disagree

I like to experiment with new information technologies.

- ○ Strongly agree
- ○ Agree
- ○ Somewhat agree
- ○ Neutral
- ○ Somewhat disagree
- ○ Disagree
- ○ Strongly disagree

**Confidence**

How confident do you feel about evaluating the apps that schools are using?

- ○ Extremely confident
- ○ Somewhat confident
- ○ Neutral
- ○ Not confident
- ○ Not confident at all

How confident do you feel about your understanding of how children and young people are using the internet and social media?

- ○ Extremely confident
- ○ Somewhat confident
- ○ Neutral
- ○ Not confident
- ○ Not confident at all

**Enablers and Barriers open questions**

What do you consider to be the barriers to using IT in your practice as an EP?

What do you consider to be the enablers of IT use in your practice as an EP?

How have your views and experiences with IT changed since the Covid-19 pandemic and the current new ways of working?

**Interviews**

Would you be interested in being interviewed in the future about your views on IT and the EP role? (this will not be guaranteed and you will also have the choice to withdraw if you are contacted in the future)

- Yes
- No

Would you be able to provide an email to get in contact with you?

***Appendix C: Innovator Interviews***

Thanks for coming in today to talk to me. It's good of you to give up your morning/afternoon.

Interview Introduction

Length – 30 – 45 minutes

Primary goal: To explore how EPs are using IT in their practice and in their work with their service users.

Verbal Consent

Are you happy to take part in the interview and are you happy for me to record?

- ☐ Verbal Consent was given
- ☐ Verbal consent was NOT given

Background Information

- ☐ Explanation about their project and how it came about
- ☐ What were the facilitators? (service, interest, need etc..)

- ☐ Can you tell me a little bit about your role?
  - □ Service model
  - □ Type of work
  - □ Commissioners
  - □ Years practicing as an EP
  - □ Training provider

Technology use

- ☐ What technology do you have available to you at work?
- ☐ How do you use technology at work?
- ☐ e.g Assessments, admin, individual work, scoring
- ☐ How comfortable are you with technology?

Training in technology

- ☐ What kind of training if any have you received in technology that is applicable to you at work?
- ☐ How did your university course prepare you to make the most out of IT/technology that supports you?

Workplace

- ☐ How supportive are senior leadership at your service towards technology?

Interest

- ☐ How important do you think it is now becoming for EPs to know more about IT?
- ☐ What do you think are the barriers to using IT in your role?

***Appendix D: EP Interviews***

Introduction

Hello, thank you for meeting with me today.

- ☐ Check participants have read consent form. Only begin recording once they have verbally consented again.
- ☐ Explain about the purpose of the interview: To explore the changes in IT use that have taken place due to COVID

Background

- ☐ Ask the EP to describe their role, and relevant experience

Changes in IT use

- ☐ What impact has COVI19 had on your day-to-day role/ experiences as an EP
- ☐ Have you started doing things now that you haven't before?
- ☐ Is anything changing?
- ☐ Is there anything that you are no longer doing now?
- ☐ Type of work you are doing.
- ☐ Service users? (parents, teachers, SENCOs)
- ☐ Technology use?
- ☐ Interest?

Senior leadership

- ☐ Describe your service leaderships approach to technology?
- ☐ Do you think that anything has changed?
- ☐ Any changes to service policies or processes in relation to the use of technology?

Technology availability

- ☐ What technology do you have available? (at home/ provided by work)
- ☐ Any new technology provided?
- ☐ How do you use IT at work?
- ☐ Day to day?
- ☐ Facilitating work in schools?
- ☐ With CYP?
- ☐ any changes?
- ☐ How comfortable are you with IT?
    - What IT are using/ most comfortable with?

Training in technology

- ☐ What kind of training/CPD  if any have you received in technology that is applicable to you at work?
    - External? Provided by service? CPD?
- ☐ How did your university course prepare you to make the most out of IT/technology that supports you?

Barriers

- ☐ What do you think might be the barriers to the use of IT in the role of the EP?

Future

- ☐ In the future when we are no longer subject to these restrictions how do you see the role of IT in our professions developing?
- ☐ What do you think EPs would be doing with IT in 5 years that they are not doing now?

***Appendix E: How EPs are using IT with CYP***

| Category | Program/app/software | N |
|---|---|---|
| Mental health | Mood tracking | 2 |
| | *iMood* | *1* |
| | *Daylio* | *1* |
| | Mindfulness, meditation apps | 11 |
| | *Take ten* | *1* |
| | *Pesky Gnats* | *1* |
| | *Head Space* | *4* |
| | *Calm* | *1* |
| | *Breathe* | *1* |
| | Kooth | 1 |
| | 2 dweck site. | 1 |
| | Apps for delaying self-harm | 1 |
| | Apps for anxiety | 1 |
| Assessment and intervention | VIG | 3 |
| | Touch typing | 1 |
| | *BBC dance mat* | *1* |
| | SAM | 1 |
| | Q-interactive | 1 |
| | Literacy toolbox | 1 |
| | Dynamic Assessment | 4 |
| | *Osmo* | *2* |

| | | |
|---|---|---|
| | *Memory games* | *1* |
| | *ipad games for dynamic assessment* | *1* |
| | Behaviour observation app | 1 |
| Augmentative and Alternative Communication | Talking mats | *7* |
| | Pictello | *1* |
| Software platforms | Powerpoint (e.g. making questionnaires interactive, gathering CYP views) | 6 |
| | Microsoft forms | 1 |
| | Movie maker | 1 |
| Documenting work | Scanner apps | 2 |
| | photos of work done with a child | 2 |
| | Mind mapping | 1 |
| | Audio recorder | 1 |
| Devices | laptops (e.g looking at photos together, co-writing reports with post-16s) | 4 |
| | ipad | 1 |
| Communication | WhatsApp | 2 |
| | Video conferencing | 3 |
| | *Zoom* | *1* |
| | *Skype* | *1* |
| | *Microsoft teams* | *1* |
| Visual stories and information presentation | Videos | 4 |

| | | |
|---|---|---|
| | Youtube | 3 |
| | Social stories | 1 |
| Accessibility | Voice recognition | 1 |
| | Clicker | 1 |
| | Accelewrite | 1 |
| | Acceleread | 1 |
| Apps for ASD | Brain In hand | 1 |
| Sensory Processing | Voice meter | 1 |
| | Dexteria | 1 |

***Appendix F: How EPs are recommending IT to support CYP***

| Category | Program/app/software | N |
|---|---|---|
| Literacy interventions | Clicker | 21 |
| | Colour Semantics app | 1 |
| | Literacy apps | 4 |
| | Nessy | 7 |
| | Oxford reading tree free ebook library | 1 |
| | Speedy Readers | 1 |
| | Lexia | 2 |
| | Word Shark | 4 |
| | Reading apps | 2 |
| | Rapid Phonics | 1 |
| | Teach your monster to read | 1 |
| | Cambugs | 2 |
| | ARROW | 1 |
| | Head sprout | 1 |
| | Spelling apps | 5 |
| | Spelling shed | 2 |
| | Squeebles | 1 |
| Accessibility | Word Q Speak Q | 1 |
| | Word speech recognition | 1 |
| | Voice recognition | 1 |
| | Text to speech function | 5 |

| | | |
|---|---|---|
| | Speech to text function | 15 |
| | Read & Write Gold | 1 |
| | Dragon Dictate | 8 |
| | Dictation | 3 |
| | Acceleread | 3 |
| | Accelerwrite | 3 |
| | Text-to-speech - iPad | 1 |
| | Assistive Technologies | 3 |
| | Audiobooks | 1 |
| | Audio recorders | 3 |
| | Electronic spell checkers | 1 |
| | DocsPlus | 1 |
| Emotional and Mental Health | Mood Tracking | 1 |
| | iMood | 1 |
| | Kooth | 3 |
| | LA specific mental health offer | 1 |
| | MindEd Big White Wall | 1 |
| | Stay Alive | 1 |
| | Zones of Regulation | 1 |
| | Mind | 2 |
| | MindEd | 1 |
| | Anxiety Apps | 1 |
| | Take Ten | 1 |

| | | |
|---|---|---|
| | Delaying self harm apps | 1 |
| | Calm Harm | 1 |
| | Mindfulness, meditation apps | 30 |
| | Headspace | 7 |
| | mindspace | 1 |
| | Plum Village Mindfulness | 1 |
| | Smiling minds | 2 |
| | Insight timer | 1 |
| | Breathe | 1 |
| | Calm | 5 |
| | Breathball | 1 |
| Numeracy | Number Train | 1 |
| | Number Shark | 2 |
| | Number Plane | 1 |
| | Sumdog | 1 |
| | my maths | 1 |
| | Times tables rock stars | 4 |
| | Intellimathics | 1 |
| | The Flying Carpet | 1 |
| | Hegarty Maths | 1 |
| | Dynamo maths | 1 |
| Devices | Access to a device to dictate | 2 |
| | Dictaphones | 1 |

| | | |
|---|---|---|
| | Access to a device to type | 1 |
| | Accessiblity settings on devices | 2 |
| | C-pen | 4 |
| | Speech to text function on ipad | 1 |
| | Fitbit | 1 |
| | Kindle | 1 |
| | Laptop | 2 |
| | e-readers | 1 |
| | Ipad | 2 |
| | Alternative methods for recording | 2 |
| Touch Typing | BBC dance mat | 5 |
| | English type | 1 |
| Augmentative and Alternative Communication | PECS Apps | 1 |
| | Proloquo2Go | 3 |
| | Boardmarker | 2 |
| | Snap Core | 1 |
| | Widgit Online | 1 |
| References to information | Websites for precision teaching graphs | 1 |
| | websites for visual aids | 1 |
| | More references to websites | 1 |
| | Information and advice websites for teachers, parents, and CYP | 1 |
| | Emotional literacy websites - apps with downloadable resources | 1 |

| | | |
|---|---|---|
| | Carol Dweck website | 1 |
| | App Wheel | 2 |
| Visual stories and information presentation | Comic life | 1 |
| | Ask Lara (animated series) | 1 |
| | Pictello | 1 |
| | Social Stories | 2 |
| | Social skills videos | 1 |
| | Mind mapping apps | 2 |
| Assessment and intervention | Dyslexia Quest | 1 |
| | Boxall Profile | 2 |
| | Literacy toolbox | 2 |
| | Strength cards | 1 |
| | VIA character strengths survey | 1 |
| General learning | Top Marks | 1 |
| | Memory games | 1 |
| | Educational software | 1 |
| | Games for improving working memory | 1 |
| | BBC bitesize | 1 |
| | Lego builders | 1 |
| Sensory Needs | Voice Meter | 1 |
| | Dexteria | 1 |
| | Fireworks | 1 |

| | | |
|---|---|---|
| Apps for supporting CYP with autism | Brain in hand | 1 |
| Time tracking | Alarms | 1 |
| | Time tracking apps | 2 |
| Word processing software | - | 2 |