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SECONDARY SCHOOL STUDENTS' PERCEPTIONS OF ONLINE LEARNING DURING COVID-19: EFFECTS ON MENTAL WELLBEING AND LEARNING DIFFICULTIES

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ABSTRACT

Establishing the scene. Learning requires full involvement and focus from students. The COVID-19 epidemic has led to a surge in online education, which could have an impact on students' ability to focus and pay attention, especially those who have unique learning challenges.

Aims. 1. Compared to classroom instruction, students' ratings of their online learning experience would be poorer across the board. 2. Individuals with certain learning disabilities may have a more pronounced decline in focus, engagement, perceived learning, and self-worth as a result of online learning as contrasted to classroom education. 3. A decline in student experience ratings as a result of online learning is linked to worse mental health.

Sample. Four hundred seven students from ages eleven to eighteen in a Welsh secondary school.

Methods. During the first UK national lockdown (March 2020–July 2020), students were asked to reflect on their learning experiences both in and out of the classroom.

End result. There was a statistically significant difference between online and classroom learning in terms of students' learning experiences (focus, engagement, capacity to learn, and self-worth). Among pupils who had identified learning disabilities, these distinctions stood out more. Mental health was also linked to how well one felt they could study and participate in both traditional classroom settings and online learning environments.

In summary. It seems like students' concentration, engagement, learning, and sense of self-worth have all taken a hit since online learning became the norm. A decline in mental health is linked to these reductions. Some kids with particular learning challenges seem to be more affected by the consequences.

I. INTRODUCTION

As with many aspects of everyday life, COVID-19 has had a severe impact on education worldwide (Onyema et al., 2020). On the 23rd of March 2020, the World Health Organization declared a global health emergency, resulting in schools across the United Kingdom physically closing (Toquero, 2020) and moving to online learning (Friedman, 2020). While schools remained open to those particularly vulnerable and the children of key workers, lessons were generally still delivered online as many teachers could not be present in schools. For those pupils in school, classes were often mixed, supervised by available staff, with students often completing work individually and not in class groups. Distance learning is likely to have consequences on the students' educational experience for many reasons, including home distractions, less effective supervision, and limited interaction with peers.

In this study, we examined perception of secondary school students' educational experience online compared to their usual classroom experience to understand the problems associated with online learning as experienced during the COVID-19 in the United Kingdom. The situation during the pandemic was unprecedented and hopefully not to be repeated. However, it provides an opportunity whereby schools may use online learning methods more frequently, perhaps as an adjunct to in-person teaching. In contrast to teaching that is planned and designed to be online, the online learning measured in this study was a temporary shift of instructional delivery to an alternate delivery mode due to the current situation. It involves the use of

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fully remote teaching solutions for instruction or education that would otherwise be delivered face-to-face. It is important to highlight that the online learning methods that were utilized by schools were unplanned, last-minute and with very little support or experience in this area from current schoolteachers which is not fully comparable as a planned process of online learning.

We focussed on pupils' learning experience, measuring perceptions of concentration, engagement, ability to learn, and self-worth from learning. We further examined if having specific learning difficulties was associated with greater perceived problems. We have also taken measures of pupils' current mental well-being to explore whether difficulties in concentration, engagement, and learning are associated with mental well-being.

Online versus classroom-based learning

In recent years, online technology has noticeably transformed learning and teaching environments (Ni, 2013). The debate over online learning's ability to replace the face-to-face education and teacher–student relationship remains unresolved (Schmid et al., 2014). Classroom activities are important beyond education and knowledge acquisition and help students acquire social skills that have implications for future personal and professional growth (Goodman et al., 2015). Interaction with teachers and other students is essential for developing positive self-esteem, self-confidence, and also improving students' ability to work collaboratively and productively with peers (de Souza Fleith, 2000).

A common concern surrounding online learning is the absence of face-to-face interaction (Bao, Selhorst, Moore, & Dilworth, 2018). Fraser and Goh (2003) noted that communication behaviours encouraged in a face-to-face classroom are not always supported or available within online teaching. The ability to ask questions, share opinions, or disagree with points is fundamental to learning (Chin & Osborne, 2008).

Research has often compared performance and learning outcomes due to online teaching versus classroom-based teaching (Akkoyunlu & Soylu, 2008; Ni, 2013). Kemp and Grieve (2014) compared undergraduate students' preferences and academic performance during the presentation of class material and written assessments online and within the classroom. Students rated face-to-face teaching much higher than online teaching and feedback suggested they felt more engaged during face-to-face teaching due to receiving immediate feedback. However, despite preference for in-class teaching, there were no significant differences in the students' academic performance between the two modes.

Multiple studies have explored online student engagement in higher education (Jeffrey, Milne, Suddaby, & Higgins, 2014), but few studies have explored online learning at school levels (Al-Salman, 2011). Friedman (2020) looked at students' online learning challenges amid the pandemic, using a quantitative survey design to determine distractions students face when studying online. South Korean high school students (ages 15–19 years) highlighted that their most significant challenge was staying awake and focused during online classes, followed by distractions such as watching online videos, rather than engaging in online lessons. Students also reported misunderstanding instructions and limited feedback. This research highlights vital challenges to students during online teaching from a student's perspective.

There is increasing research on online learning due to the current pandemic, with most research canvassing teachers' or parents' perspectives. Garbe, Ogurlu, Logan, and Cook (2020) collected data from parents who had a child who had moved from face-to-face teaching to learning online in spring 2020. Using thematic analysis, researchers identified several critical themes (e.g., a lack of learning motivation). Parents believed that pupils' lack of motivation during online learning was due to a lack of a teacher's presence. Further to this, they thought children were uncomfortable

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using computer screens, recording themselves and generally preferred face-to-face learning.

Specific learning difficulties

Specific learning difficulties are defined by the Individuals with Disabilities Education Improvement Act of 2004 as a disorder in one or more of the basic psychological processes involved in physical or sensory needs that manifests itself in difficulty to listen, think, speak, or complete mathematical calculations (Yell, Shriner, & Katsiyannis, 2006).

There is limited information on whether the online learning effects outlined above are greater in pupils with specific learning difficulties (Erickson, Trerise, VanLooy, Lee, & Bruyere, ` 2009). Online experiences may be increasingly difficult among those with specific learning difficulties.

For pupils with dyslexia, particular study skills are identified as problematic. Woodfine, Nunes, and Wright (2008) sought to address difficulties in learning dyslexia in synchronous e-learning environments among higher education students. Through problem-solving and qualitative interviews, they found text-based synchronous learning activities isolated and demotivated students with dyslexia. Students with dyslexia fell behind other students, often being slower to read a text and needing more time to complete tasks.

Mental well-being

Schools are an essential source of health and mental health support (Hoffman & Miller, 2020). Early evidence indicates that adolescent mental health and well-being are suffering during the pandemic with increased rates of anxiety and lower quality of life (RavensSieberer et al., 2021). However, there is limited research on how the shift to online learning has affected pupils' mental health. Traditional classroom-based education and health are closely linked (Bradley & Greene, 2013). Research has often shown school engagement affects mental well-being (Bond et al., 2007; Hakanen & Schaufeli, 2012). School engagement is influenced by factors involving reading, writing skills and the school context, such as participation in lessons and support (Jennings, 2003). We aim to determine whether the ability to concentrate and engage in the online learning environment would be predictive of current mental well-being.

Research objectives

Student engagement and concentration are critical for successful learning (Appleton, Christenson, & Furlong, 2008); hence, understanding changes in these factors due to moving education online is important. This study explores students' perceptions of the online and classroom-based teaching experience during COVID-19. By comparing the two learning contexts, conclusions can be made about students' ability to engage, concentrate, learn, and experience self-worth. To our knowledge, this study provides the first explicit comparison of the perceptions of online learning with classroom learning in secondary school children and how this is associated with mental well-being and particularly specific learning difficulties. We examined whether there are differences in concentration, motivation, and engagement from a pupil's perspective during online and classroom-based teaching and address whether this difference has a more substantial impact on children with specific learning difficulties.

II. METHOD

Participants

All 462 pupils at a secondary education school in Wales were invited to participate in the survey. The school is an all-girls secondary school with co-education in Years 12 and 13 (age 16–18). A total of 407 pupils completed the survey (17 males, 390 females). Participants were aged between 11 and 18 years, of which (34 pupils in Year 7, 68 pupils in Year 8, 56 pupils in Year 9, 59 pupils in Year 10, 63 pupils in Year 11, 69 pupils in Year 12 and 53 pupils in Year 13, five pupils selected prefer not to say. Of the sample, we had data on the number of pupils with specific learning difficulties due to dyslexia (n = 23), dyspraxia (n = 3), autism spectrum disorder

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(ASD) (n = 3), attention deficit hyperactivity disorder (n = 1), hearing impairment (n = 2), visual impairment (n = 1), working memory problems (n = 29), and processing speed problems (n = 51). The identification of specific learning difficulties was reliant on the school's existing data. Specific learning difficulties were pupils identified by the school as having an identified need, either by identification through formal testing by an Educational Psychologist or specialist teacher assessor with a current Specific Learning Difficulties Assessment Practising Certificate, or by having a Statement of Special Educational Needs. Due to the complexity of the conditions and comorbidity, a specific learning difficulty such as dyslexia will potentially also have processing speed problems or working memory problems; conversely, those with issues with processing speed problems or working memory problems may have dyslexia without formal diagnosis.

The population of the school determined the sample sizes. Overall, the sample size (n = 407) produced a powerful test (>99%) of the main hypotheses that online learning would produce more negative ratings on our dependent variables even for small effect size (d = .20; α = .05 – see Cohen, 1988). The small sample sizes constrained our secondary hypotheses relating to specific learning difficulties, and only those groups with a sample size > 25 were analysed. For the smallest group (working memory group, n = 29) against a much larger control group and using standard estimates for a 'medium' effect size (d = .50; α = .05) gives a power of 73.5%, which rises to 91.5% for the processing speed problem group (n = 51).

III. RESULTS

Comparison of classroom versus online learning

Data are presented in Table 2. In line with our first hypothesis, each scale score was significantly lower for studying online than in the classroom (all ps < .001). The effect sizes were 'large' (Cohen, 1988) for the Concentration, Engagement, and Ability to Learn scales and 'medium' for the Self-Worth scale.

Distractions during classroom versus online learning

Information on the percentage of reported pupils' distractions for online and classroombased learning are presented in Table 3. Overall, a higher percentage of pupils reported 'no distraction' (19.6%) in classroom learning than online learning (9.6%). Distraction by devices such as phones or computers was reported more during online learning (51.4%) than in classroom learning (14.4%). Similarly, distraction by family (37.9%) and pets (30.7%) were rated as frequent distractions for online learning. A high proportion of

Table 1. Descriptive statistics of the Classroom versus Online Study Questionnaire (COSQ)

			Classroom		Online			Effect size (Cohen's *d*)
	N	Possible range	Mean	*SD*	Mean	*SD*	*p*-value	[95% CI]
Concentration	379	(6–24)	19.3	2.8	16.2	3.7	<.001	0.94 [0.81, 1.08]
Engagement	384	(6–24)	18.2	3.8	14.9	4.1	<.001	0.82 [0.70, 0.94]
Ability to learn	377	(12–48)	37.2	5.5	32.5	5.9	<.001	0.83 [0.72, 0.95]
Self-worth from learning	383	(7–28)	20.3	4.3	17.7	4.6	<.001	0.58 [0.50, 0.67]

Table 2. Number of reported distractions for online and classroom learning (%)

	Classroom		Online	
Distraction	Number	Per cent	Number	Per cent
N	382		385	
Not distracted	75	19.6	37	9.6
Friends	144	37.7	62	16.1
Family	0	0.0	146	37.9
Noise outside	134	35.1	187	48.6
Distracting thoughts	226	59.2	208	54.0
Pets	0	0.0	118	30.7
Devices	55	14.4	198	51.4
Other	27	7.1	33	8.6

students rated 'distracting thoughts' as interfering with their concentration during both online learning (54.0%) and in the classroom (59.2%).

IV. DISCUSSION

Online versus classroom-based Learning

The results support our primary hypothesis that pupils' self-reported concentration, engagement, and ability to learn were

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significantly lower during online learning. These effects are 'large' by conventional standards (Cohen, 1988). Students' perceived selfworth from learning was also reduced by online learning with a medium effect size. The results support earlier arguments that online education is challenging for pupils and can impact learning (Friedman, 2020) and complements research from parental perspectives on a lack of pupils' engagement and self-worth when online learning (Garbe et al., 2020). Pupils reported greater difficulty in the ability to concentrate during online lessons. Pupils reported more distractions by noise and devices during online learning, supporting Friedman's (2020) research. It may be advisable for schools and parents/carers to find suitable solutions to improve monitoring of devices, such as mobile phones, game consoles, and other devices during online lessons to minimize distractions.

Table 3. Correlations between changes in COSQ scores and mental well-being (SWEMWBS)

Sub scales	*n*	Classroom	Online	Difference between classroom and online scores
Concentration	362	.42**	.46**	−.14*
Engagement	370	.38**	.42**	−.07
Ability to learn	370	.53**	.58**	−.10*
Self-Worth from learning	369	.58**	.61**	−.07

Student engagement with teachers is critical to learning (Furrer, Skinner, & Pitzer, 2014). Pupils develop perceptions about their ability to learn through student-centred teaching, which involves reflection, interaction, and discussion (Barr & Tagg, 1995), which also links to personal development and academic performance (Pascarella & Terenzini, 2005). Future research should evaluate how online learning leads to less engagement and poorer perceptions of ability to learn, and what can be done to ameliorate this. The period being studied was during the global COVID-19 pandemic (March–July 2020). Educators were forced to deliver content in an unfamiliar context, direct to learners' homes, via the unfamiliar means of online virtual learning platforms, previously only used for supplementary work, such as homework. As teachers adapted to delivering online, as learners became au fait with the technology, and as the providers of the online learning platforms improved functionality, the engagement and concentration of students may have improved. Further studies are needed to test these possibilities. Many schools may well choose to utilize online learning practices in future; however, this is likely to be without further school closures but through online methods that schools consider for the future.

V. CONCLUSION

According to the research, students' mental health suffers when they learn online since their learning experiences (focus, engagement, capacity to learn, and self-worth from learning) are much worse than when they learn in a traditional classroom setting. Anyone already struggling with working memory issues will find the situation worsened. In order to mitigate the negative effects of online education on students' mental health, more research is required in this field.

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