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The Student Perspective on In-school Personal Electronic Devices and Online Safety: A Qualitative Study

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Abstract: In Ireland, the decision to introduce personal electronic devices (tablet computers) is made at the school level. This research examines the student voice regarding the benefits, drawbacks and potential of this technology in schools. As schools embrace more internet-connected technologies, the question of how schools deal with the topic of online safety becomes more pertinent. Students also discuss how their school teaches the importance of online safety. Qualitative focus group interviews were undertaken with students from lower and upper secondary levels based on a theoretical sample (to capture schools of differing ICT orientation) of ten schools across the Republic of Ireland. A key finding is that personal electronic devices provide teachers another means through which to actively engage students - provided other conditions (such as internet infrastructure, home connectivity, and effective professional development for teachers) are met. This study highlights how students can provide a valuable contribution to decision making by school management and policy makers in this area. This paper suggests that the performance of this new technology should be continually evaluated, especially during a time of rapid technological advancements.

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The student perspective on in-school personal electronic devices and online safety: A qualitative study

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Abstract

In Ireland, the decision to introduce personal electronic devices (tablet computers) is made at the school level. This research examines the student voice regarding the benefits, drawbacks and potential of this technology in schools. As schools embrace more internet-connected technologies, the question of how schools deal with the topic of online safety becomes more pertinent. Students also discuss how their school teaches the importance of online safety. Qualitative focus group interviews were undertaken with students from lower and upper secondary levels based on a theoretical sample (to capture schools of differing ICT orientation) of ten schools across the Republic of Ireland. A key finding is that personal electronic devices provide teachers another means through which to actively engage students - provided other conditions (such as internet infrastructure, home connectivity, and effective professional development for teachers) are met. This study highlights how students can provide a valuable contribution to decision making by school management and policy makers in this area. This paper suggests that the performance of this new technology should be continually evaluated, especially during a time of rapid technological advancements.

1 Introduction

Personal electronic devices have become a more common feature of classrooms in recent years. As part of Ireland's National Digital Strategy, every post-primary school in the Republic of Ireland has received a 100Mbps broadband connection (DCENR, 2013). During this period there has been an increase in the presence of internet-connected devices (namely tablet computers) in schools, a decision which is made at the school level. This paper discusses how students feel about recent trends in the use of electronic devices as part of their education. Respondents discuss the implications (both actual and potential) for teaching and learning, with particular consideration for how this new technology interacts with current teaching methods. Given the presence of more internet-connected technology in schools, understanding how schools deal with online safety and cyber security has become increasingly important. This paper also presents the student perspective with regard to their perceived level of online safety and discovers what schools are doing to inform students about the importance of online safety.

The paper is structured as follows: Section 2 discusses research, both academic and non-technical, regarding the use of ICT equipment and online safety. Section 3 outlines the methodology and data collection process. Findings are discussed in Sections 4 - 5, while Section 6 features some concluding remarks.

2   Literature review

The European Commission Digital Agenda (DAE) aims to "foster innovation, economic growth and progress" through digital technologies across the European Union (EU) by 2020 (European Commission, 2015). However, a recent OECD report observes that while new technologies for teaching and learning exist, schools tend to lag behind other institutions in adopting them (OECD, 2015). Country-specific studies of ICT use in education typically feature small-scale studies which combine a number of qualitative methods, such as teacher interviews, lesson plan development and classroom observation (Sweeney-Burt, 2014). Other studies draw on large-scale survey data to explore the relationship between ICT and student outcomes (De Witte & Rogge, 2014).

Despite the fact that most young Irish people now interact with technology on a daily basis (McCoy et al., 2012), schools appear to be slower keeping pace with this trend (Traxler, 2010; Klopfer et al., 2010). Current pedagogical approaches are challenged by the increasing capabilities of personal electronic devices and other technologies (Male & Burden, 2014; Burden et al., 2012). One potential reason for this lag is the fact that change processes which affect teaching and learning tend to be slow and incremental (Fullan, 1991).

Where computers are used in schools, the impact on student performance tends to be mixed due to variations in technologies, research methods and measures of impact (Hyland et al., 2015; Coyne et al., 2015). Howard highlights that technology in education can actually hinder integration and change (Howard, 2013). Enyedy suggests that variations in school ICT systems make it difficult to make claims about their effectiveness (Enyedy, 2014). Other evidence suggests that computer use is not well integrated into teaching and learning (Voogt et al., 2013; OECD, 2015; Meyer et al., 2011; Orlando, 2013, 2014).

An OECD study (2015) finds no notable improvements in student achievement in Reading, Mathematics or Science in countries that invested heavily in ICT for education (OECD, 2015). However, the findings of this report have been debated as the results are based on associations between computer use and test scores obtained through cross sectional PISA data. The EU considers safety, information, communication and problem solving to be key components of digital competence (Ferrari, 2013). Other research notes that the perceived digital competence of youth relies on the strong assumption that "mere use of technology fosters new and inherently positive high-order cognitive and socio-ethical skills" (Calvani et al., 2012). Other work finds that social background plays a

role in determining the internet safety awareness of second-level students (Hatlevik & Tømte, 2014).

In Ireland, the provision of a 100Mbps broadband connection to every secondary school represents is a departure from slow and often unreliable internet which inhibits the use of ICT within education (DCENR, 2015). Over the next five years, it is envisioned that ICT will become more embedded and "enhance the overall quality of Irish education." (DES, 2015a) through development across technical and curricular areas.

3   Methodology

This research investigates the use of ICT in Irish post-primary schools. As mentioned in the previous section, the qualitative data analysed in this paper are drawn for a broader mixed methods study which looks at changes in post-primary schools since the introduction of a 100Mbps internet connection (McCoy et al., 2016). A theoretical sample[1] of ten case study schools was selected from schools that participated in the initial survey.

The initial survey was conducted as part of a phased roll-out of the high-speed broadband upgrade, following a pilot programme consisted of 78 schools (DCENR, 2015). The survey was designed to capture the attitudes of principals and teachers towards the use of ICT in teaching and learning and the barriers restricting the (effective) use of ICT in the classroom. The survey data used by Coyne et al. (2015) consists of two phases during which upgrades were delivered to 436 second-level schools. The first phase delivered upgrades to schools in counties Dublin, Kildare and Meath. The second phase was administered to schools in Waterford, Wexford, Cork, Kerry, Kilkenny and Limerick (Coyne et al., 2015).

In all cases, surveys were administered to principals and teachers shortly before the existing school internet connection was upgraded to a high-speed 100Mbps connection. Schools in the first group received the upgrade in the second half of 2013 and schools in the second group received service in the second half of 2014. The project delivered upgrades to every second-level school in the country, approximately 730 schools (DCENR, 2015). A second round of survey data (post-upgrade) was collected during the second half of 2015 (summer) for both groups simultaneously, providing a time lag ranging from six to 24 months. The case study schools who participated in the qualitative phase of the research project were selected on the basis of size, socioeconomic composition and the period they received upgraded broadband.

Table 1 presents school-specific information (type, size and DEIS status). Schools which are designated DEIS status are considered to be in a disadvantaged socioeconomic community and are

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[1]Schools were selected to capture a broad range of school types in terms of size, composition and orientation towards ICT.

provided additional supports such as home school liaison, a school meals programme, support under the School Completion Programme and initiatives for improving literacy and numeracy (DES, 2015b). Details are also provided on the period each school received the upgraded broadband connection. The roll out of the improved broadband connection occurred at two points in time: Group 1 schools (based in Dublin, Kildare and Meath) received service in the second half of 2013. Group 2 schools (based in Waterford, Wexford, Cork, Kerry, Kilkenny and Limerick) received service in the second half of 2014 (Coyne et al., 2015).

Table 1: Case study school information

School ID	School Type	DEIS Status	Size	Group 1	Group 2
Alder Lane	Coeducational Secondary	No	400-599		Yes
Beech Street	Community/comprehensive	Yes	200-399	Yes	
Cedar Avenue	Community/comprehensive	Yes	0-199		Yes
Daisy Road	Vocational	Yes	200-399		Yes
Elm Road	Boys' Secondary	No	600+		Yes
Fern Avenue	Community/comprehensive	No	600+	Yes	
Green Lane	Girls' Secondary	Yes	200-399	Yes	
Holly Road	Vocational	Yes	0-199	Yes	
Ivy Lane	Vocational	Yes	600+	No	Yes
Juniper Avenue	Vocational	No	600+	Yes	

Source: Department of Education and Skills (DES)

Schools are not intended to be representative of the population. Rather, selecting schools with different characteristics and ICT orientation illustrates experiences and attitudes across a range of school contexts. Schools were grouped by the researchers on the basis of three key themes: Vision, Equipment and Connectivity (see Table 2). Although tablet computers were only implemented in two of the ten schools, students from every school were asked about the potential benefits and drawbacks they viewed.

4   Results: Personal electronic devices

Students were eager to share their experience with personal electronic devices (tablet computers) in- and outside school. This section presents findings regarding the benefits and issues of in-school use and concludes with a discussion of more home-related issues.

4.1   School benefits

Students from almost every school cite the reduced weight of school bags and the convenience of having all of their textbooks on one device as a major potential benefit:

Table 2: Case study school ICT rating

School ID	Vision	Equipment	Connectivity	ICT Ranking	2nd Year Focus Group	5th Year Focus Group
Holly Road	1	0	0	Low	2	2
Green Street	1	0	0	Low	2	2
Cedar Avenue	1	2	0	Low	2	2
Ivy Lane	2	1	1	Medium	1	2
Beech Street	2	2	0	Medium	2	1
Fern Avenue	2	2	1	Medium	2	1
Elm Road	2	2	1	Medium	1	1
Juniper Avenue	2	2	2	High	1	0
Daisy Road	2	2	2	High	2	2
Alder Lane	2	2	2	High	2	2

"You've the weight off your back and you've your whole curriculum in one box like." (Cedar Avenue, Low ICT, 2nd Year)

"sometimes you might have six books in your bag at one stage. Then you might not even use them in some classes... you're hauling a book for no reason."
(Elm Road, Medium ICT, 2nd Year)

They were also generally enthusiastic about their experience with personal devices for textbook and research purposes:

"It's good for like projects and stuff because like in some classes you need to do all these projects but like the book just doesn't have the information or it takes forever to find it and then you're like wasting time." (Beech Street, Medium ICT, 5th Year)

In Daisy Road, second year students completed tablet-based projects worth 25 per cent of their subject grade (10 per cent in the first term, 15 per cent in the second):

"We didn't use our iPads at all but we are doing our junior cert, the 15 per cent project and we're typing that up on our iPads.... in music like, we're using it more like to research composers and stuff like in class." (Daisy Road, High ICT, 2nd Year)

Students note how they actively used their device to create interesting presentations which helped them learn:

"For maths, we had, we'd to do mind maps on terminology and statistics and the sets. ....when we were doing the maths, I was a bit shaky on some of it, on some of them at points. But then after doing it, I had a better understanding of it."
(Daisy Road, High ICT, 2nd Year)

One benefit mentioned is that tablet computers allow students to research without moving classroom, which is beneficial because the computer room is typically in high demand. Pupils in Daisy Road used their tablet to read back highlighted text or play poems out loud to learn the text. Examples like this showcase the potential for organic and innovative ICT-based learning:

"There's a girl in my class ... she found it very hard to learn the poem and she played it on YouTube while she was doing her homework ... she knew it perfectly the next day."(Daisy Road, High ICT, 2nd Year)

"you don't really have to go into the computer room. Or use computers, like if you have it right in your hands like." (Daisy Road, High ICT, 2nd Year)

4.2   School issues

The proliferation of tablet computers in classrooms places new demands on school resources and ICT co-ordinators. The main issues students cite relate to the quality of tablet applications, the school wireless internet connection and the cost of devices. In Juniper Avenue, students reported issues with the textbook application they used. These issues ranged from requiring the application to be downloaded again, losing access to older books and students losing annotated 'sticky notes' when they progressed from first to second year:

"if I ever wanted to like, look back at stuff we did in first year that isn't in the second year book, I can't do it... even though, like, we paid for the book."
(Juniper Avenue, High ICT, 2nd Year)

Of the ten schools visited, Juniper Avenue was classed by the research group as being highly ICT integrated, with a clear vision for embedding tablets into the learning experience. It is reasonable to expect these issues to be more common if every school used ICT as extensively. Students in Juniper Avenue felt that the tablet did not provide the same convenience that textbooks did, in particular the ease of opening textbooks on a particular page. Without a suitable internet connection, tablet computers are limited in their usefulness as an educational tool. In Daisy Road, students used tablet computers for over a year without quality wireless internet. Researchers visited the school shortly after the wireless internet was upgraded, with vastly improved results:

"In first year, we didn't really use the iPads a lot really. They were a bit of a waste 'cos the Wi-Fi was awful.... [now] the internet is top class, so you're able, everyone's able to go on to use it."
(Daisy Road, High ICT, 2nd Year)

Some students felt that the school internet content filtering should be adjusted to reflect the use of tablet computers, with allowances for applications that can be used outside of school but which are disabled on school premises (for example, social media applications). Students demonstrate an awareness of the cost of tablet computers. They suggest a variety of methods of tackling this

problem, ranging from bulk purchasing devices at a discount, school rental schemes and even the possibility of purchasing alternative tablets which might be more affordable. In addition to the initial cost of purchasing a device, students are aware of the need to repair and replace their devices over time due to noticeable performance decline:

> **Interviewer**: "Have you had to have the iPads repaired much?"
> **Students**:"Yeah, I had to have mine twice." ... "Mine just cracked on the screen."
> "I think last year as well when you'd charge your iPad it would last maybe two days if you didn't use it that much but now it would kind of only last a day and a half with the battery" (Juniper Avenue, High ICT, 2nd Year)

It is important to consider the potential health implications of increased device use. Research has found that increased leisure time involving screens has a negative impact on sleep (Cain & Gradisar, 2010; Hysing et al., 2015), physical activity (Melkevik et al., 2010) and social wellbeing (Richards et al., 2010). Students noted in some cases that they would prefer reading a textbook because they felt that screens placed a strain on their eyesight. In addition to this, students mentioned other possible health-related issues such as obesity and diminished social skills.

In summary, students view the reduced weight of school bags as one of the main benefits of personal devices. When school leadership consider introducing tablets into the curriculum it is important to be aware of potential additional costs imposed on families regarding the purchase, maintenance and replacement of devices. Another consideration might be to seek assurances from device and educational software providers that their products will be kept up to date for the time that students are expected to use it for.

4.3   Home connectivity

If a more ICT-based learning system is intended to enhance the student experience, a suitable home internet connection becomes an important feature. Students considered home internet connectivity to be important for school success, especially when an e-learning platform was used to facilitate online communication between teachers and students. The online facility is viewed as a way to catch up on homework they might have missed due to absence:

> "If you're out ... the teacher will have posted what you did in school, so then if you miss notes ... you can catch up to what you've missed." (Alder Lane, High ICT, 2nd Year)

Some students also note that online learning platforms help facilitate project co-ordination with classmates:

> "It's also good for group-work because then you can just open a Google document and everybody can put their notes." (Juniper Avenue, High ICT, 2nd Year)

Although recent investments in school internet have made it easier for teachers to 'post' material online, that does not mean that students can access it outside of class time with the same level of ease. Students view the internet as being an essential part of their homework setup, serving as a research tool which often provides richer information than textbooks.

Interviewer: "Do you think using computers and the internet at home improves your school work at all or improves your learning?
Yes because we can, instead of reading from a book and it's just simple ... we can learn more and get more in to what the actual thing is about." (Beech Street, Medium ICT, 2nd Year)

Most students find internet access through a smart phone more readily accessible than it might have been previously on a traditional desktop computer. Despite the reported benefit of home internet, students note how parents often assume that devices are used for the purpose of social media, gaming or media consumption.

In Daisy Road, an upper secondary pupil notes how their younger sibling is distracted by their tablet computer at home, where there is no content filtering. The same issue arose in Juniper Avenue, when a student did not know how to disable 'pop-up notifications' they found distracting.

In general, students think there is typically one student per class without home internet access. They suggest solutions such as using the local library, the school computer room or uploading their homework when they arrive to school. Students facing this problem had a different perspective:

"There is one person in my class who got a detention for not being able to do [homework] because he had no internet at home." (Beech Street, Medium ICT, 2nd Year)

Although the exact number of students with no home internet could not be assessed, the average residential broadband plan in Ireland (from 2010 to 2014) costs €51.60 per month (Lyons & Coyne, 2016). From a social inclusion perspective, there is a need to support families who might not be able to afford internet. Otherwise, certain groups of students could be at a disadvantage.

If a school invests in an e-learning platform or tablet computers but a number of students have no internet access outside of the classroom, the investment in technology will have limited benefit. It is easy to envision a scenario where teachers are faced with two options: Either be burdened with more work from having to cater to students with and without home internet connectivity or resort to the common denominator of offline instruction, ignoring the functionality an e-learning platform provides. The latter scenario would result in a wasted investment on unused technology.

5   Results: Online safety

The increased presence of internet-connected devices into schools raises new questions about how schools handle matters such as online safety and responsible online etiquette. In particular, if

devices are being provided to students on an individual basis (for example, tablet computers) there is a greater need for students to be informed about how to navigate the risks that are present on the internet.

In terms of how case study schools educated incoming students, most invite an external speaker to inform students about online safety, which students found informative. In Alder Lane and Ivy Lane, transition year pupils were more actively engaged, with groups sent to a local internet security firm to learn about internet safety. They then had to educate their peers in younger classes (Alder Lane) or a local primary school (for Ivy Lane). Students enjoyed the active peer-based aspect, noting that it provided a more credible message about the importance of online safety for younger pupils. In another school, the deputy principal is active on the school social media profile, helping make students aware of how visible their comments online can be.

In general, students from the focus group interviews consider themselves to be aware of the risks online, regardless of the ICT integration level of their school. They mention risks such as pop-up advertisements, viruses and the danger of disclosing personal information on social media. Most of them have been previously told about internet safety by their parents or in their primary school. Research has found that the lines between online and offline worlds are becoming blurred, from cyber-bullying being considered an extension of offline bullying (Raskauskas & Stoltz, 2007; Tokunaga, 2010) and online safety, which students view as analogous to offline safety:

> "Clicking on one of those things is like getting into the car with somebody you don't know." (Ivy Lane, Medium ICT, 2nd Year)

Although students report confidence with their own level of online awareness, some upper secondary pupils felt that younger students might not fully comprehend the danger of the internet, implying that younger pupils may overstate their level of online confidence. Upper secondary students also note the importance of having a good online reputation for future career prospects:

> "I know what the implications when I go for an interview, they're probably going to be looking me up on site. " (Alder Lane, High ICT, 5th Year)

It is clear that active engagement helps to increase student awareness of online safety. The increased use of technology in schools (and by youth in general) presents an opportunity for schools to act as leaders in this space and provide accurate, timely information for students of all ages, even though students express confidence in their own level of online awareness.

6   Concluding remarks

This paper presents insights based on qualitative data collected from student focus groups that discuss the increasing presence of technology in schools. Students provided a unique perspective

and valuable insight regarding the increasing use of technology in their school and the area of online safety, two issues that are rapidly developing in both the Irish and international education context. In most cases, ICT-related developments in schools are designed to improve the student learning experience.

For this reason, the opinion of students is a valuable resource, which can help inform researchers and policymakers about matters such as the perceived benefit of tablet computers. As noted previously, change can often take time to manifest in teaching and learning. For this reason, timely evidence from students regarding issues in a rapidly developing space is of great value.

This paper contributes to the existing literature by showing how students from both lower and upper secondary education provide valuable insights about recent changes in their school experience, in particular with regard to interactive technologies they may be more fluent with than adults. The valuable perspective students provide may be useful when evaluating investments in education designed to improve the learning experience (such as introducing tablet computers) in the future.

Based on the qualitative evidence collected, students find active engagement most beneficial for their learning. High-speed broadband allows teachers to actively engage students through ICT, provided teachers have the desire and resources to do so. Students are broadly receptive to many ICT-related classroom developments. They are generally positive about the benefit that personal devices provide, especially as a research tool.

Despite their positivity about tablet computers, students raise concerns about the quality of textbook applications, the need for internet connectivity (in school and at home) and the significant cost of the purchase and maintenance of devices. In order for the potential of tablet computers in the classroom to be reached, it is clear that many conditions must first be satisfied.

Students consider themselves to be aware of the risks on the internet. In school, they find activities such as talks from external speakers and peer-based information campaign projects effective at furthering awareness. The increased use of technology in schools raises the question of how online safety is emphasised and educated in schools. The need for timely and relevant education regarding online safety presents an opportunity for schools to serve as a leader in this area. This is of particular importance for younger students who may overestimate their perceived level of online security.

In terms of Irish policy, the Department of Education and Skills has outlined the need to improve school ICT integration. Key among those priorities is wireless school internet infrastructure, as is the need for schools to receive tailored advice on "fit-for-purpose and future-proof systems" (DES, 2015a). In addition to this, the National Council for Curriculum and Assessment (NCCA)

has been tasked with developing digital learning within and across curricular areas.

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Year	Number	Title/Author(s) ESRI Authors/Affiliates *Italicised*
2016		
	546	*Recreational Angling Tournaments: Participants' Expenditures,* *John Curtis, Benjamin Breen* and Paul O'Reilly
	545	What Drives People's Opinions of Electricity Infrastructure? Empirical Evidence from Ireland, *Valentin Bertsch, Marie Hyland* and Michael Mahony
	544	The Effects of Home Energy Efficiency Upgrades on Social Housing Tenants: Evidence from Ireland, Bryan Coyne*, Sean Lyons and Daire McCoy*
	543	Price Transparency in Residential Electricity: Experiments for Regulatory Policy *Pete Lunn and Marek Bohacek*
	542	Value for Money in Energy Efficiency Retrofits in Ireland: Grant Provider and Grant Recipients *Matthew Collins and John Curtis*
	541	Examining the Benefits of Load Shedding Strategies using a Rolling-Horizon Stochastic Mixed Complementarity Equilibrium Model *Mel T. Devine and Valentin Bertsch*
	540	How Sensitive is Irish Income Tax Revenue to Underlying Economic Activity? *Yota Deli,* Derek Lambert*, Martina Lawless, Kieran McQuinn, Edgar Morgenroth*
	539	The Timing and other Determinants of Gas Central Heating Adoption *Daire McCoy and John Curtis*
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