Can Teacher Awareness, Attitude and Identity Increase Technology Vulnerability?

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Abstract

Can teacher awareness of growing technology demands and skillsets of new teachers increase their vulnerability with school districts? Can teacher attitudes toward learning new technology and use of technology in the classroom increase their vulnerability? Can a teacher's identity, their perception of their ability to use and understand technology increase their vulnerability? In this 2022 study, 37 teachers and 14 administrators rate their expertise with technology, while identifying vulnerable and marginalized populations, believed to be at risk for use of technology, through survey and semi-structured interview questions. Results indicate 60.7 % (31 of 51) feel comfortable using technology in education settings, 17.6% (9 of 51) believe they are an expert and 35 % (18 of 51) help others. In terms of vulnerability, only 7.8% of participants (4 of 51) believe teachers are vulnerable and 97.7% of participants (43 of 44) believe teachers are encouraged to use technology as part of their classroom practice.

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Can Teacher Awareness, Attitude and Identity Increase Technology Vulnerability?

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ABSTRACT

Can teacher awareness, attitude and identity increase their vulnerability with technology? In this 2022 study, 37 teachers and 14 administrators rate their expertise with technology, while identifying vulnerable and marginalized populations from a categorical list (i.e. teachers) they believed to be at risk for use of technology, through survey and semi-structured interview questions. Results indicate 60.7 % (31 of 51) feel comfortable using technology in education settings, 17.6% (9 of 51) believe they are an expert and 35 % (18 of 51) help others. In terms of vulnerability, only 7.8% of participants (4 of 51) believe teachers are vulnerable and 97.7% of participants (43 of 44) believe teachers are encouraged to use technology as part of their classroom practice.

INTRODUCTION

Engaging in self and professional reflection related to the use of technology and teacher beliefs about how this affects their teaching identity is of direct benefit to the community. This study was conducted with the sole purpose of contributing to the development of understanding for teachers, and school boards regarding technology and bring your own device policies. In this 2022 study, 37 teachers and 14 administrators rated their expertise with technology, and noted their age, current position in educational settings, attitudes and beliefs. The study was interested primarily in answering the following questions:

Research of teacher knowledge and use of technology:

- *Does a teacher's sense of professional identity relate to their level of comfort with technology?*
- *Does a teacher's sense of professional identity affect how a teacher understands and interacts with new mandates related to the use of technology?*
- *In what ways do teachers feel professionally vulnerable when using technology in the classroom?*

To achieve this, participants reflected on their teaching practice, use of technology and time spent with personal devices away from school. While the majority of participants were practicing teachers, a handful of administrators also responded to questions related to their own teaching practices, comfort with technology in front of the school community and time with personal devices away from school. Participants were asked to reflect on the following guiding questions: (1) Do teachers use technology in their personal life away from the classroom? (2) If yes, how comfortable do teachers feel using technology in the classroom? (3) In what ways do teachers use technology in the classroom? (4) Do teachers believe that teachers are encouraged to use technology as part of classroom practice? If yes, what are teachers encouraged to do? (5) Have teachers felt uncomfortable using technology in the classroom? (6) Do teachers believe that the use of technology in the classroom is easier for a certain type of teacher? If yes, what is the typology of the technology savvy teacher? What typology of teacher does the participant identify as? (7) Do teachers own a personal laptop? or smart phone? How is personally owned technology different or the same as the laptop provided by the school district? How much time do teachers spend on personal laptops compared to the one provided by the school district? Which laptop personal or school owned do teachers prefer?

THEORETICAL POSITIONING

For many teachers and administrators, regardless of gender or age, the social context of teaching with technology and teacher identity are driven by individual or cultural motivations. The threat of feeling vulnerable in the classroom can be difficult to address both for administrators and for teachers and school boards. Different positions within school boards relevant to technology from a security perspective carry additional responsibilities and training relevant to the role and often contrast with the goals a teacher or administrator may have in the school or classroom setting. Miller (2021) notes the concept of zero trust as beneficial for the majority of users in most technology

settings and places the burden of responsibility on the technology expert, often far removed from the classroom, for the security of the network and information stored on it.

METHODOLOGY

During the months of February and March 2022, participants currently employed in educational settings in the three provinces of British Columbia, Alberta and Ontario were asked to complete a background survey that collected demographic information related to identity, age, and attitudes about technology as well as expertise and time spent on devices at work and in their personal lives. Participants were also asked in the background survey to identify vulnerable and marginalized populations from a categorical list (i.e. teachers) and to indicate which categories they believed to be at risk for use of technology (Figure 1). Participants were asked to volunteer to participate in one 45-minute semi-structured interview by checking a box to indicate they were volunteering for a follow up interview on the background survey. Interviews ranged from 45 minutes to 60 minutes in length and took place over the phone for teacher participants, with some on Zoom Video Conferencing software or Google Classroom. During the semi-structured interview participants were asked to provide greater details to their initial responses on the survey and were provided with a transcript to verify the recorded responses prior to publication. Data collection occurred through the use of an excel spreadsheet that recorded demographic information and produced small amounts of quantitative data in the response to numbers of participants who provided the same response or selected the same categories.

Participants invited to participate in follow up semi-structured interviews were selected based on their background and experience with technology use at school. Due to the timing of the study post COVID a large majority of participants revealed they had undergone extensive training during COVID to put their particular grade or course online and training to use technology to teach and assess student work remotely and to enable the availability of course material for students to access remotely. Data was analyzed based on the answers to the background survey and to the semi-structured interview question responses recorded in the transcript. The researcher provided each participating school district with copies of anonymized data and initial correlation tables shared in the results and appendices section of this paper for their own direct benefit and review. Personally, identifiable information was excluded or concealed to ensure confidentiality. While the study encompasses two ethics protocol aimed at different levels of technology expertise, teacher participants remained within one protocol, and administrators floated between both sometimes answering all available questions regarding both studies, and depending on expertise in technology and current position selecting the most appropriate research questions to respond to. All participants submitted responses to the background survey and these results point to interesting discussions at the end of this paper.

RESULTS

A more comprehensive data table has been made available for review (10.31124/advance.20154749) and verification of results. Initial demographic data revealed 16 males, 33 females and 2 undisclosed participants completed the study of which 34 participants were aged in the category of 40 plus and 14 participants in the age category of 35-39 and 3 participants in the 25-29 age category.

	Age Category					
Gender	19-24	25-29	30-34	35-39	40 plus	TOTAL
Male		2		8	6	16
Female		1		6	26	33
Prefer Not to Say					2	2
Other						
TOTAL		3		14	34	51

TABLE 1- GENDER AND AGE CATEGORY

Of the 16 male participants, 5 were teachers and 11 were administrators. Of the 33 female participants, 30 were teachers and 3 were administrators. Both participants that remained undisclosed were teachers during the study.

	Current Position					
Gender	Student	Teacher	Admin	IT Staff	Sch Bd	TOTAL
Male		5	11			16
Female		30	3			33
Prefer Not to Say		2				2
Other						
TOTAL		37	14	0	0	51

TABLE 2- GENDER AND CURRENT POSITIONS

Within a total of 37 teachers, 2 participants were aged 25-29, 9 participants were aged 35-39 and 26 participants were aged 40 plus. In comparison, the 14 participants who stated their current position as administrator were represented by 1 participant in the 25-29 age category, 5 in the 35-39 age category and 8 in the 40 plus age category.

	Age Category			
Current Position	25-29	35-39	40 plus	TOTAL
Teacher	2	9	26	37
Administrator	1	5	8	14
TOTAL	3	14	34	51

TABLE 3- CURRENT POSITIONS AND AGE CATEGORY

Of the male participants that responded 5 participants self-assessed their technology expertise at "I am still learning", this was echoed by the female participants with a total of 5 participants self-assessed their technology expertise at the same level. However, in the category of "I have more to learn" only 2 male participants self-assessed their technology expertise at this stage while 18 female participants felt they still had more to learn. In education settings, 25 female participants felt comfortable using technology but only 3 female participants felt like experts and of interest 13 of the female participants help others to use technology. This is contrasted by 6 male participants who feel comfortable using technology in education settings, 5 male participants that identify as an expert and 4 male participants that help others to use technology.

	Gender			
Level of Self-Assessed Technology Expertise	Male	Female	Prefer Not to Say	Total
I am brand new				0
I don't know anything				0
I am still learning	5	5		10
I feel comfortable using it in education settings	6	25		31
I have questions		2		2
I know a little				0
I have more to learn	2	18	2	22
I am an expert	5	3	1	9
I help other people	4	13	1	18
TOTAL	22	66	4	92

TABLE 4- RATE YOUR EXPERTISE AND GENDER

Of the teacher participants that responded 7 participants self-assessed their technology expertise at "I am still learning", while only 3 administrative participants self-assessed their technology expertise at the same level. However, in the category of "I have more to learn" 19 teacher participants self-assessed their technology expertise at

this stage while 3 administrator participants felt they still had more to learn. In education settings, 25 teacher participants felt comfortable using technology but only 5 teacher participants felt like experts and of interest 14 of the teacher participants help others to use technology. This is contrasted by 6 administrative participants who feel comfortable using technology in education settings, 4 administrative participants that identify as an expert and 4 administrative participants that help others to use technology.

	Current Position		
Level of Self-Assessed Technology Expertise	Teacher	Administrator	TOTAL
I am brand new			0
I don't know anything			0
I am still learning	7	3	10
I feel comfortable using it in education settings	25	6	31
I have questions	2		2
I know a little	1	2	3
I have more to learn	19	3	22
I am an expert	5	4	9
I help other people	14	4	18
TOTAL	73	22	95

TABLE 5- RATE YOUR EXPERTISE AND CURRENT POSITION

Of the "40 plus" age category of participants that responded 8 participants self-assessed their technology expertise at "I am still learning", while only 2 of the "35-39" age category of participants self-assessed their technology expertise at the same level. However, in the category of "I have more to learn" and 17 of the "40 plus" age category of participants self-assessed their technology expertise at this stage while 5 of the "35-39" age category of participants felt they still had more to learn. In education settings, 23 of the "40 plus" age category of participants felt comfortable using technology but only 6 of the "35-39" age category of participants felt comfortable using technology and also felt like experts compared to only 3 of the "40 plus" age group of participants that felt like experts. Also of interest was the 13 "40 plus" age group of participants that help others to use technology.

	Age Category			
Level of Self-Assessed Technology Expertise	25-29	35-39	40 plus	TOTAL
I am brand new				0
I don't know anything				0
I am still learning		2	8	10
I feel comfortable using it in education settings	2	6	23	31
I have questions			3	2
I know a little				0
I have more to learn		5	17	22
I am an expert	2	4	3	9
I help other people	2	3	13	18
TOTAL	6	20	66	92

TABLE 6- RATE YOUR EXPERTISE AND AGE CATEGORY

In terms of vulnerability, only 7.8% of participants (4 of 51) believe teachers are vulnerable and 97.7% of participants (43 of 44) believe teachers are encouraged to use technology as part of their classroom practice.

REFERENCES

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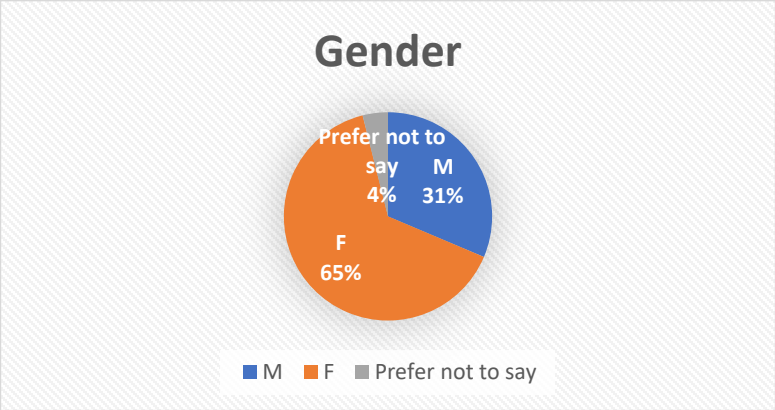
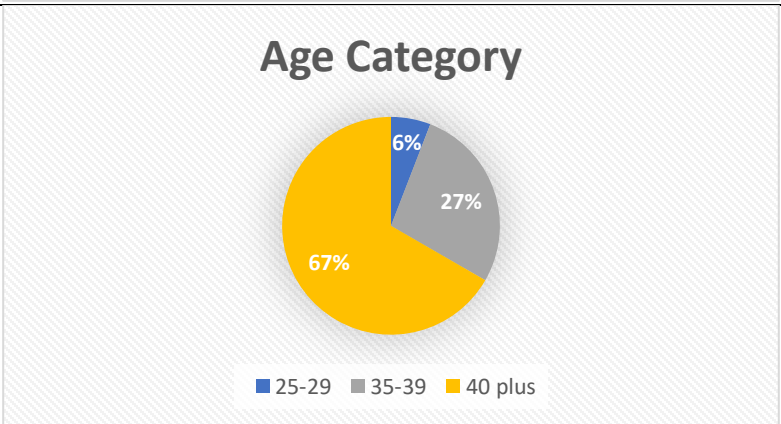
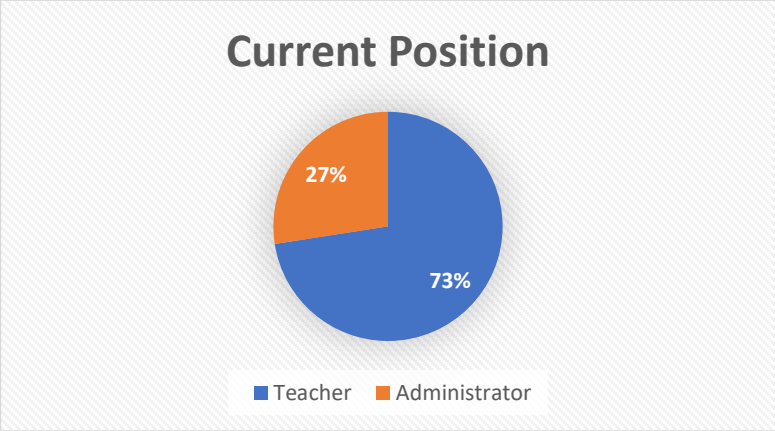
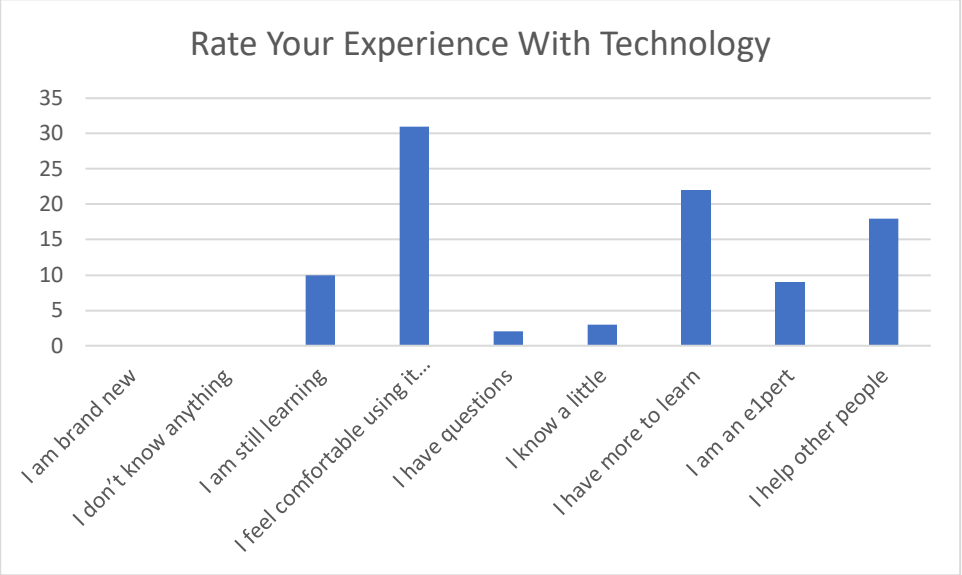
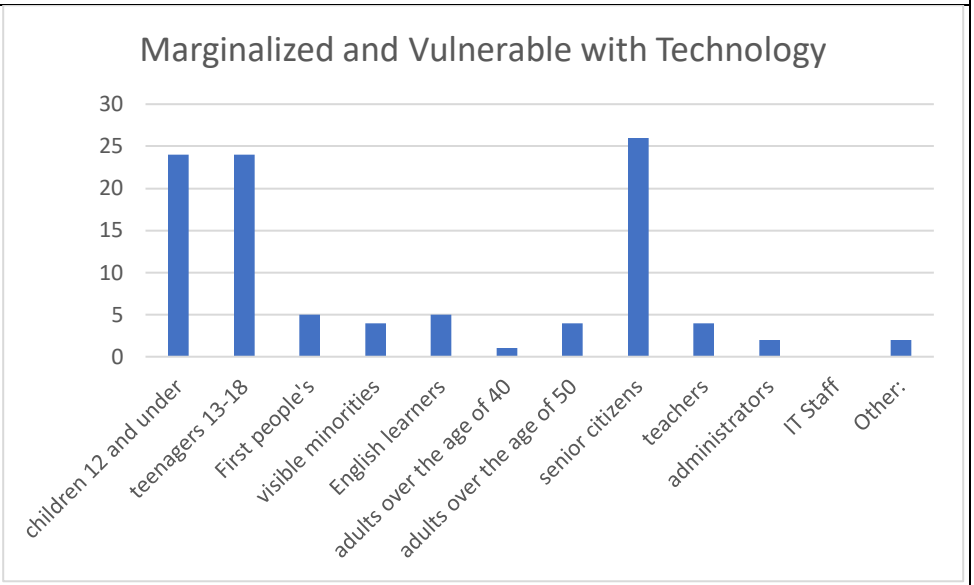
APPENDICES

Which gender do you identify with? Female Male Prefer not to say Other	
Which age category do you belong to? 12 and under 13-18 19-24 25-29 30-34 35-39 40 and above	
What is your current position in relation to this education setting? Teacher Administrator Student Parent or Guardian Other	

How would you rate your experience/knowledge of technology in education settings? Circle as many as you feel relate to you I am brand new I don't know anything I am still learning I feel comfortable using it in education settings I have questions I know a little I have more to learn I am an expert I help other people Other	
Which of the following groups do you consider to be marginalized or vulnerable with technology or personal devices (i.e. cell phones, laptops, apps, iPads, or any other BYOD)? children 12 and under teenagers 13-18 First people's visible minorities English learners adults over the age of 40 adults over the age of 50 senior citizens teachers administrators IT Staff Other	

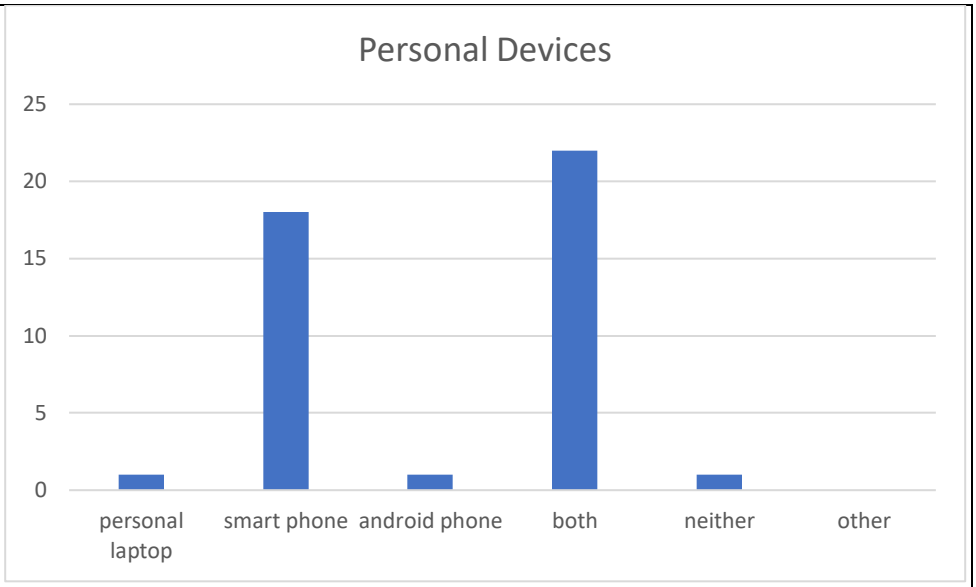
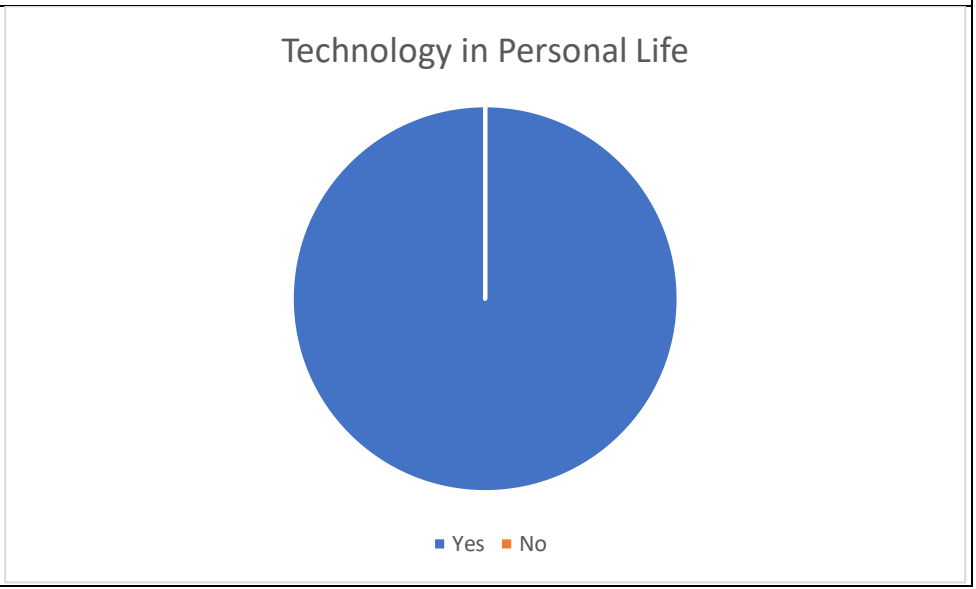
Do you own a personal laptop? or smart phone? A smartphone is a computing platform portable device that combines mobile telephone and computing functions into one unit. (access the internet) Personal laptop Smart phone Android phone Both Neither other	
Do you use technology in your personal life away from the classroom? Yes No Other	

Figure 1- Background Survey

https://analytics.gonzaga.edu/corrmatengine/