þÿ Singing is no longer forbidden to me it s like
þÿhuman dignity has been restored. Adult non-sin
to sing : An explorative intervention study

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Sixth graders' Use of Technologies in Learning, Technology Attitudes and School Well-being

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Abstract

Using digital technologies (DT) in learning is expected to foster students' school engagement. International surveys, however, show that using of technologies for learning in Finnish schools is still far from optimal. This study was conducted as a part of Mind the Gap project. The aim was to examine how frequently students use technologies for learning, what kinds of attitudes they hold towards using technologies, and how these, compared to the students' overall school experiences, explain academic well-being. Gender differences were also examined. The data was collected with a questionnaire in 2013 from 36 schools in Helsinki (n=735, 56% female, ~12-13 years) which assessed the students' use of and attitudes to digital technologies in learning, perceptions of school, school value, school engagement and burnout. Gender differences were analysed with t-tests. Relationships between technology, school-perception measures and academic well-being were analysed with linear regression. DTs were reportedly used in school mostly for knowledge acquisition and mechanical tasks. However, most students reported wanting to use technology more and experienced it to foster school engagement. Regarding technology-related indicators, fear-of-failing and digital learning engagement were related to lower school value and also burnout symptoms. As DTs were used in learning infrequently, their contribution to school well-being was expectedly low. However, students' attitudes for DTs were related to problems in school well-being. Thus, we propose a need for novel pedagogical practices for using DTs, while

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maintaining good student-teacher relationships and conditions. To conclude, how technologies are used, instead of how much, should be the key question.

Keywords: Digital technology, school value, schoolwork engagement, school burnout.

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1. Introduction

Although the Finnish educational system has gotten plenty of global attention as one of the best in the world (Sahlberg, 2014), it still faces many challenges (EU Parliament, 2015). For instance, the PISA results are diminishing, especially in rural areas and among boys (OECD, 2013). Even worse, Finnish adolescents were ranked very low on their liking for school (OECD, 2013). Consequently, reforms in teacher education and school have been suggested by emphasizing 21st Century skills, student-activating methods, inquiry-, project-, problem- and phenomenon-based learning (EU Parliament, 2015).

The new national core curriculum also emphasizes on using digital technologies in school in meaningful and inclusive ways. Learning 21st skills is necessary for all citizens in a continually changing society and meaningful use of novel technologies and digital practices are seen as key factors in developing these abilities (Trilling & Fadal, 2009). It appears, however, that even though digital technologies have developed exponentially during the recent years, schools have, to some extent, failed to really make use of their full potential. The current knowledge-intensive society needs people who can collaboratively solve complex problems with novel tools and methods, but the conventional knowledge practices at school are considered to be the major hindrance to creating such a workforce (Robinson, 2011). Due to the fact that pedagogical use of technologies is still far from optimal in Finland, heavy users of socio-digital technologies appear to be feeling alienated and bored at school (Salmela-Aro, 2016). Towards that end, we are still struggling with lack of evidence on the relationship between using technologies and academic well-being. Therefore, in this study we are examining how and how much digital technologies are used for learning, students' attitudes towards technologies, perceptions of school and how these are connected to academic well-being.

1.1. Digital technologies and learning in school

Technology is going to challenge our ability for renewal. It will influence not only economic or social relations but the whole development of the human species (Sitra, 2016). There will be

approximately 5 billion internet users by 2020 and every user would have approximately 5 network connected devices (Frost & Sullivan, 2014). Digitalization and globalization has changed our practices, communication and thinking (De Paoli, 2015). In an international and integrated world of cultures and economics every member of community should find better ways to compete and collaborate (Heifetz, Linsky & Grashow, 2009).

The concept of 'digital native' (Prensky, 2001) refers those children and young people who have been born into the digital world and have grown up surrounded by novel technology. They cannot recall the world without digital technologies. The term itself is debatable and being a digital native, does not necessarily indicate sophisticated use of technology in educational settings (Hakkarainen, Hietajärvi, Alho, Lonka & Salmela-Aro, 2015). The big question remaining is, how to ensure that school can teach and provide 21st century skills for learners to acquire to cope with the constantly changing world and future work requirements (McFarlane, 2015). Interaction, collaboration, problem solving, social skills are going to be even more important in the future both in education and in work life. In the near future "born global" will be the standard (EK, 2011) and abilities for lifelong learning, professional development and continuous renewal of community and individuals are premises to work, learning and development (Ståhle, 2004).

Although enriched with novel technologies, people tend to continue working the customary way, by exchanging information and performing tasks, now only in virtual space. Traditions and cultures at work appear quite conservative and unchangeable (De Paoli, 2015). Also in educational institutions, the development of new 21st practices have been rather modest (Hietajärvi, Tuominen-Soini, Hakkarainen, Salmela-Aro & Lonka, 2015). According to many researchers (De Paoli, 2015; DasGupta, 2011) there is a need to develop new practices, supported by socio-digital technologies. By socio-digital technologies (Hietajärvi et al., 2014) we refer to recently emerged integrated systems of novel technological tools, social media, and the Internet that enable constant and intensive online-interaction with information, people, and artefacts.

More than four decades of research on educational technologies support the notion the technology enhances learning when used in pedagogically sophisticated ways (Li, Hietajärvi, Palonen, Salmela-Aro & Hakkarainen, 2016; Vasbø, Silseth, & Erstad, 2014). However, in most cases technology is just being used to enhance conventional practices of schooling. The full potential can be unlocked only with novel practices (Hakkarainen, 2009) including collaborative, inquiry-based and creative ways of learning and knowledge creation. We suggest that the knowledge practices of the so-called digital natives are different from previous generations (Prensky, 2011). Further, their attitudes towards school may be colored by the experience that their

ways of using technology outside school is becoming very different from current institutional routines. We suggest that there is an increasing gap between youth using digital technologies outside and inside school. Their needs may simply not have been met in this sense. Since they are mainly using technology outside school for entertainment, it may be difficult to use is as a tool for learning at school. Digital engagement may even be a hazard for school engagement in the case that schools do not support digital knowledge practices of the young generation. There is a risk that the important 21st century skills that they shall need in the future working life are not learned at schools. In many cases, current working life relies on digital technology for communication and innovative work. (Sahlberg, 2014; MacFarlane, 2015).

1.2. School engagement and digital technologies

Research shows that school engagement is positively associated with academic success, and negatively associated with students' ill-being, such as depressive symptoms and burnout. High school engagement also fosters several aspects of students' well-being, such as positive emotions and life satisfaction (Salmela-Aro & Upadyaya, 2014).

In this study we used the concepts of school value, school engagement and school burnout as indicators of well-being at school (Tuominen-Soini, Salmela-Aro & Niemivirta, 2011). Research on school engagement has a long tradition and engagement at school has a positive influence on students' adjustment in academic settings (Salmela-Aro & Upadyaya, 2012). The relationship between engagement and using technologies at school is, however, very complex and research of technology-mediated practices at primary school level is still in its infancy (Hietajärvi et. al., 2014). Salmela-Aro (2016) proposes the demands-resources model (Demerouti, Bakker, Nachreinen & Schaufeli, 2001) to be applied in this context: severe study demands may be seen as determinants of school burnout and the availability of motivational resources, such as support may foster engagement. It is possible that school context provides for adolescents such demands which are in contrast with their digital skills learned outside of school.

School burnout may predict later Internet addiction and depression (Salmela-Aro et al, in press). Of the components of school burnout, cynicism has been reported to be especially decisive among so-called digital natives, who have well-developed skills for using socio-digital technologies (Hietajärvi, Nuorteva, Tuominen-Soini, Hakkarainen, Salmela-Aro & Lonka, 2014). Such cynicism may be a result of constant misfit between resources and demands. It may be the *quality* of demands that does not meet the needs of adolescents. For instance, the need to communicate or to create something new using digital devices may be totally hindered or even absent at school. This

study looks at the complex relationship among school engagement, digital engagement and current knowledge practices in the Finnish schools that participated in our study.

2. Problem statement

Using digital technologies (DT) in learning is expected to foster students' school engagement. International surveys, however, show that in Finnish schools the use of technologies in learning is far from optimal. We suggest that the demands may also have to do with academic demands for mechanical knowledge acquisition with inappropriate technological tools and practices. Further, for students who are early adaptors of digital technologies and who are digitally engaged outside school, such demands may become a burden, given that they are not allowed to use their natural resources, that is, digital technologies that have become almost a part of their cognitive architecture (Hakkarainen et al., 2015).

3. Research questions

The first aim of this study was to examine the distributions and gender differences in how digital technologies are used for learning in school, what kind of technology attitudes students hold and, further, their perceptions of their school conditions as well as their overall academic well-being.

We expected, based on previous research that using digital technologies in school would be infrequent and mostly focused on solving mechanical tasks (Hakkarainen, 2000; Kupiainen, 2013, MacFarlane, 2015). The other distributions we approached as open empirical questions, with no prior expectations. Regarding gender differences, we cautiously expected that boys would report more positive attitudes towards using and learning with technologies, as well as lower school value, school engagement and higher cynicism (Upadaya & Salmela-Aro, 2013; Salmela-Aro & Upadaya, 2013)

The second aim was to examine how the use of digital technology and technology attitudes, compared to perceptions of school are related to school value, school engagement and school burnout. We expected that the overall experience of the school environment would explain the most variance regarding academic well-being outcomes, but were interested in exploring the possible relationship between using technologies in school as well as technology attitudes with academic well-being as an open empirical question.

4. Purpose of the study

This study was a part of the Mind the Gap project. The aim was to examine how frequently students use technologies for learning, what kinds of attitudes they hold towards using technologies, and how these, compared to the students' overall school experiences, explain academic well-being.

5. Research methods

5.1 Context

The Finnish education system is characterized by equity, high quality teaching and inclusiveness (Salmela-Aro, 2016). One of the leading principles is that everybody must have equal access to high-quality education and training. The Finnish education system consists of nine years of compulsory schooling between the age 7 and 15 and all schools follow the same national curriculum, (Finnish education in a nutshell, 2014). The first six years are spent at primary school followed by three years at lower secondary school. Teachers are highly educated and students have same class teacher in most subjects in the first six-year classes. Finnish students have consistently ranked among the best performers on the PISA, achieving top scores in mathematics, science, and reading (OECD, 2013). However, recent evidence shows that the top scores are decreasing and school burnout symptoms are more common among Finnish students (Salmela-Aro, 2016).

5.2. Participants and procedure

This study is part of the ongoing Mind the Gap between Digital Natives and Educational Practices project (2013–2016) funded by the Mind Program of the Academy of Finland (Mind the Gap, 2014). The data used in the present study were collected in May 2013 in 36 schools in Helsinki, Finland. The participants (N = 735, 56% female) were sixth graders (12-13 year olds) who filled in a self-report questionnaire. The participants completed the questionnaire during regular school hours. Participation in the study was voluntary.

5.3. Measures

The self-report questionnaire assessed the students' use of digital technologies in learning and attitudes towards using technology (*digital learning engagement, digital problem solving, fear-of-failing*), their perceptions of the school environment (*experience of teacher, learning environment*)

as well as academic well-being (i.e., *school engagement, school burnout, school value*) and background information.

5.3.1. Using digital technologies in learning

Use of digital technologies were measured with ICT school use inventory which contains sections that measure the temporal frequency and versatility of technology used in learning at school and outside of school. These dimensions are based on previous research (Barron, 2004; Hakkarainen et al., 2000) and prepared by Mind the Gap - project researchers. In consists of tour dimensions: *mechanical technology use* (2 items, e.g., "I use a computer or a tablet for writing at school", α = .67), *productive*, referring to more creative practices (3 items, e.g., "I film or edit pictures or videos as part of my schoolwork", α = .74), *knowledge acquisition* (2 items, "I search information from internet for my schoolwork", α =.65), and *communicative* (3 items "I share to others schoolwork related outputs I have created", α =.82). All items were rated using a 7-point Likert-type scale ranging from 1 (never) to 7 (all the time). Sum variables were constructed by calculating the averages of each item in each construct.

5.3.2. Attitudes towards using technology and digital engagement in learning

Attitudes towards using technology were measured with three scales derived from earlier research (Barron, 2004; Hakkarainen et al., 2000). *Digital problem solving* assessed a positive attitude towards learning and solving problems with technologies (4 items, "I think it's fun to learn ICT, because it offers continually new challenges", α .92), *fear of failing* using technology assessed fears of making mistakes and failing with technologies (4 items, "I'm afraid to make mistakes which I can't fix when computing, α.75), and, *digital learning engagement* with technologies assessed students' aspirations of using technologies in their schoolwork (3 items, "I'm more enthusiastic in my schoolwork when I'm able to use technology in learning", α .88). All items were rated using a 5-point Likert-type scale ranging from 1 (Not true at all) to 5 (Very true). Sum variables were constructed by calculating the averages of each item in each construct.

5.3.3. Perceptions of school and teachers' activities

Students self-reported academic well-being were measured with two scales and one single item indicator. Experiences of teacher assessing how the students perceive their teacher and *teacher's activities* towards students (4 items, "I like my class teacher", α=.82), and *general school*

conditions consisting of indicators of safety and other learning environment conditions (4 items, "Students in my class feel comfortable together", α=.65) were formed based on School Health Promotion indicator originally developed by National Institute for Health and Welfare (THL, 2014) and were rated using a 5-point Likert-type scale ranging from 1 (Not true at all) to 5 (Very). Sum variables were constructed by calculating the averages of each item in each construct.

5.3.4. Academic well-being

School engagement was assessed by using the Schoolwork Engagement Inventory (EDA; Salmela-Aro & Upadyaya, 2012) developed originally by Schaufeli et al. (2002); Salmela-Aro, (2004) on the basis of the Utrecht work engagement scale (UWES-9; Schaufeli et al., 2006). The scale consists of nine items measuring vigor ("When I study, I feel that I am bursting with energy"), dedication ("I am enthusiastic about my studies"), and absorption ("Time flies when I'm studying") in relation to schoolwork. Students rated all items on a 7-point Likert-type scale ranging from 0 (Never) to 6 (Every day). A composite score was computed from all nine items. The scale for lack of *school value* (Niemivirta, 2004) comprised three items assessing students' perceived importance, utility, and how interesting studying was ("I think going to school is a waste of time"). All items were rated using a 7-point Likert-type scale ranging from 1 (Not true at all) to 7 (Very true). For the purpose of this study, a sum score was calculated from all nine items to indicate the level of adolescents' school engagement. Cronbach's α was .93.

School burnout symptoms were measured using a School Burnout Inventory (SBI-10) instrument developed by Salmela-Aro & Näätänen (2005) on the basis of the Bergen Burnout Indicator 15 (BBI-15) for working life, with dimensions for work exhaustion, cynicism toward work, and sense of inadequacy at work (Näätänen, Aro, Matthiesen, & Salmela-Aro, 2003; Salmela-Aro, Näätänen, & Nurmi, 2004). The SBI was constructed by changing the work context to the school context. The inventory consists of 10 best suited school context items measuring three factors of school burnout: *exhaustion* at school (4 items, i.e., "I feel overwhelmed by my schoolwork", α=68), *cynicism* toward the meaning of school (3 items, i.e., "I feel lack of motivation in my schoolwork and often think of giving up" α=77) and sense of *inadequacy* at school (3 items, i.e., "I often have feelings of inadequacy in my schoolwork", α=75). All the items were rated on a 6-point Likert-type scale ranging from 1 (completely disagree) to 6 (completely agree).

5.4. Data analysis

All analysis was performed with IBM SPSS Statistics 21 software. First, to answer how and how much technology is used for learning in school as well as how the students' technology attitudes and perceptions of school and academic well-being are distributed, we examined descriptive statistics. Table 1 shows the mean and standard deviations and ranges for the study variables. We also investigated gender differences using t-tests and calculating Cohen's d's, as well as examined correlations.

In order to analyze multivariate relationships between the use of digital technologies, technology attitudes, perceptions of school and academic well-being, we conducted a series of linear multivariate regression analyses.

6. Findings

Table 1. Descriptive statistics for use of digital technologies, technology attitudes, perceptions of school and academic well-being

			All			Girls			Boys				
Variable name	*N*	*Scale*	M	*SD*	*N*	M	*SD*	*N*	M	*SD*	*t*	*p*	*d*[1]
Mechanical	655	1-7	2.33	1.02	359	2.31	1.01	295	2.35	1.04	*t*(652) = −.53	.601	.04
Productive	622	1-7	2.30	.96	342	2.19	.83	279	2.42	1.10	*t*(506.56) = -2.78	.006	.25
Knowledge Acquisition	635	1-7	2.57	1.13	345	2.57	1.07	289	2.58	1.20	*t*(582.46) = −.07	.943	.01
Communicative	643	1-7	1.80	1.03	352	1.78	.93	290	1.82	1.13	*t*(555.88) = −1.44	.658	.12
Digital learning engagement (DLE)	656	1-5	3.43	1.20	362	3.19	1.21	293	3.73	1.12	*t*(653) = -5.98	.000	.47
Digital problem solving	643	1-5	3.10	1.07	354	2.78	.98	288	3.50	1.03	*t*(640) = -9.14	.000	.72
Fear-of-failing	634	1-5	2.11	.82	347	2.09	.74	286	2.13	.90	*t*(550.71) = -.64	.525	.05
Teacher's activity	650	1-5	3.73	.86	361	3.77	.86	288	3.69	.86	*t*(647) = 1.18	.237	.09
General school conditions	654	1-5	3.82	.64	360	3.83	.61	293	3.80	.67	*t*(651) = .60	.551	.05
School value	640	1-7	5.29	1.32	349	5.46	1.22	290	5.09	1.40	*t*(575.98) = 3.57	.000	.30
School Engagement	618	1-7	4.50	1.40	342	4.57	1.38	275	4.42	1.44	*t*(615) = 1.25	.212	.10

Exhaustion	640	1-6	2.45	.99	354	2.46	.97	285	2.43	1.01	$t(637) = .37$	.716	.03
Cynicism	641	1-6	2.17	1.17	353	2.05	1.09	287	2.32	1.25	$t(571.70) = -2.90$	.004	.24
Inadequacy	624	1-6	2.39	1.12	341	2.30	1.07	282	2.49	1.18	$t(572.11) = -2.05$	.041	.17

6.1 Distributions and gender differences

6.1.1 How are digital technologies used for learning in school?

Table 1 shows that that technology was not used on a regular basis to support learning. Digital technologies were reported used mostly for knowledge acquisition like searching information from internet and for mechanical tasks like writing or doing tasks using a computer. The majority of respondents reported using technology for knowledge acquisition mechanically couple of times a month. Productive technology use (multimedia, projects, group work) was almost as common as mechanical use. Communicative use of technology which means, for instance, online discussion about schoolwork was reported the least common.

Regarding gender differences boys reported that they used technology more productively for activities such as creating or editing digital content alone or in groups.

6.1.2 Digital learning engagement and technology attitudes

Despite irregular technology use, students reported to have quite high digital learning engagement (DLE), indicating that the use of technology in learning was seen as a positive contribution to school engagement (see Table 1). On average, the students also reported to have more interest than disinterest in digital problem solving. Furthermore, the students also reported low scores in fear of failing using technologies. Regarding gender differences boys reported more digital learning engagement and digital problem solving.

6.1.3 Perceptions of school

Table 1 shows that most of the students reported high general interest towards school conditions; safety and satisfaction of school district and learning environment and experiences towards teacher's activities were reported.

Significant gender differences were found from school value and general interest in school. Girls reported that they value school more than boys and they also were more interested in school than boys.

6.1.4 Academic well-being

In line with previous school well-being research (Tuominen-Soini & Salmela-Aro 2014; Wang & Peck, 2013), students felt clearly more school engagement than school burnout symptoms. Table 1 shows that most of the students reported that they liked their teacher, that the teacher was fair, encouraging and were interested in students' life. General school conditions were experienced very positively. Learning environment, safety, class norms and working peace were perceived positively. The majority of students reported high or very high school value. Only a small number of students appeared to value school less than the average. Most reported school burnout symptom was exhaustion. Boys reported more cynicism and inadequacy than girls. There was also significant gender difference in these variables.

6.2. Correlational results

Correlations between the study variables are presented in Table 2. When viewing technology variables, digital learning engagement was associated with knowledge acquisition (.25**) and communicative technology use (.23**) and as expected, had a stronger correlation with digital problem solving (.42**).

Interestingly, digital learning engagement was associated with lower school value, school engagement as well as negative experiences of teacher's activities. Digital learning engagement and communicative use of technology were also related to school burnout symptoms.

Table 2 shows that general conditions of school were connected positively to teacher's activity (.55*) and digital learning engagement (.42**). Experiences of teacher's activities were not connected at all to other aspects of digital learning and even negatively with digital learning engagement and communicative technology. Instead, experiences of teachers' activities were positively related to school value (.47**), school engagement (.49**) and general conditions of school (.55**). Teacher's activities were negatively associated to school burnout i.e. the more positive the experience of teacher was, the lower was school burnout expectation.

Table 2. Correlations between the variables *Note.*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Mechanical	-													
2. Productive	.472**	-												
3. Knowledge Acquisition	.506**	.578**	-											
4. Communicative	.287**	.428**	.481**	-										
5. Digital learning engagement (DLE)	.108**	.140**	.243**	.225**	-									
6. Digital problem solving	.104**	.192**	.186**	.177**	.407**	-								
7. Fear-of-failing	.024	.097*	.030	.164**	-.035	-.043	-							
8. Teacher's activities	.000	-.030	.063	-.165**	-.184**	-.020	-.067	-						
9. General school conditions	.099**	.027	.090*	-.093*	-.100**	.003	-.066	.555**	-					
10. School value	-.028	-.080*	.026	-.126**	-.270**	.074	-.151**	.459**	.345**	-				
11. School engagement	.057	.004	.093*	-.069	-.136**	.052	-.003	.485**	.407**	.621**	-			
12. Exhaustion	.065	.099*	.174**	.234**	.180**	.054	.229**	-.297**	-.330**	-.363**	.241**	-		
13. Cynicism	.014	.075	.053	.188**	.204**	.080*	.181**	-.450**	-.416**	-.695**	.515**	.570**	-	
14. Inadequacy	.067	.118**	.087*	.217**	.211**	.101*	.221**	-.375**	-.342**	-.557**	.371**	.680**	.731**	-

6.3. How use of digital technology and technology attitude compared to perceptions of school explain school value, school engagement and school burnout?

In the second part of the study, we continued to describe relationships that exist between variables using multiple linear regression analysis. Table 3 presents the results. We specified a linear regression model.

Table 3. Multiple Liner Regression

		School value				School engagement				Exhaustion				Cynicism				Inadequacy			
		β	SE	std. β	p	β	SE	std. β	p	β	SE	std. β	p	β	SE	std. β	p	β	SE	std. β	p
1.	Mechanical	-.032	.058	-.025	.577	.062	.060	.046	.308	-.022	.047	-.021	.644	-.038	.050	-.033	.444	.027	.051	.024	.600
2.	Productive	-.102	.067	-.072	.130	-.080	.070	-.054	.255	-.050	.054	-.045	.354	.063	.058	.050	.276	.043	.060	.035	.476
3.	Knowledge Aqcuisition	.143	.064	.116	.026	.101	.067	.079	.134	.187	.051	.195	.000	.004	.055	.004	.941	-.002	.057	-.002	.971
4.	Communicative	-.009	.058	-.007	.872	.008	.061	.006	.889	.066	.048	.064	.168	.079	.050	.069	.116	.098	.053	.087	.063
5.	Digital learning engagement	-.298	.047	-.264	.000	-.156	.050	-.133	.002	.094	.038	.106	.015	.173	.041	.173	.000	.164	.043	.167	.000
6.	Digital problem solving	.033	.052	.026	.523	.093	.055	.070	.090	.007	.043	.007	.876	-.008	.045	-.007	.867	.028	.047	.025	.549
7.	Fear-of-failing	-.133	.061	-.081	.030	.104	.064	.061	.105	.230	.050	.179	.000	.127	.053	.086	.017	.208	.055	.146	.000
8.	Teacher's activities	.509	.073	.318	.000	.605	.076	.359	.000	-.150	.058	-.122	.010	-.394	.063	-.279	.000	-.273	.066	-.197	.000
9.	General school conditions	.237	.093	.114	.011	.451	.098	.203	.000	-.430	.075	-.265	.000	-.461	.080	-.251	.000	-.371	.083	-.207	.000

6.3.1 School value and school engagement

The regression coefficients for all models are presented in Table 3. The specified model was able to account for 27% of variance in school value. Regarding using technologies in school, only Knowledge acquisition had a positive relationship to school value. Regarding technology attitudes both Digital learning engagement and Fear of failing were, in turn, negatively related to School value. Further, as expected, both the experience of Teachers activities as well as General school conditions were positively related to School value.

Regarding School engagement, the specified model was able to account for 29% of variance. From technology factors, digital learning engagement predicted school engagement negatively. Digital problem solving predicted school engagement positively. School conditions and teacher's activities i.e. student positive experience from teacher were strong positive factors.

6.3.2 School burnout

Table 3 shows that regarding emotional exhaustion, the model was able to account for 22%. Knowledge acquisition was positively related to Exhaustion. Regarding technology attitudes both Digital learning engagement and Fear of failing predicted exhaustion positively as well as Fear-of-failing. General school conditions and teacher's activities were negatively related to exhaustion.

Regarding using technologies in school, there was no relationship to Cynicism. On the contrary, regarding technology attitudes, Digital school engagement and Fear of failing were positively related to Cynicism. In turn, general school conditions and teacher's activities were both negatively related to experiences of Cynicism of which the model was able to account for 31 %.

Regarding Inadequacy, the specific model was able to account 23% of variance. From technology factors Digital learning engagement, Fear-of-failing and unlike other models, communicative technology use was positively related to inadequacy. Knowledge acquisition

communicative technology use and digital problem solving were positive predictors of inadequacy, whereas, again, school conditions and teacher's activities predicted inadequacy negatively.

7. Conclusions and Implications

The results of this study show that the use of digital technologies for learning in and outside of school is still not a common everyday practice in Finland. There seems to be lack of learner centered use of digital technologies and the way technology is used does not support academic well-being. The majority of respondents reported using technology for knowledge acquisition mechanically couple of times a month. *Knowledge acquisition* had a positive relationship to both school value and also for emotional exhaustion. Students reported relatively high *digital learning engagement* meaning they would like to use technology e.g. for *digital problem solving* which was a positive predictor for *school engagement*. These results underline the reality of using technologies in school is almost the opposite of the students' technology attitudes. Most of the existing pedagogies using technology in school seems to be merely mechanistic *knowledge acquisition*, making learning a mundane process.

Schools in Finland are relatively well equipped (OECD, 2012) with digital technologies, but it appears that in using the technologies the classrooms remain very traditional. This may explain why students who are the most intensive users of socio-digital technologies in informal contexts tend to feel alienated and even bored (Salmela-Aro et al. in press). How technology is used for learning indicate the hypothesized gap between the technology-mediated practices of students and school, hindering students' school value and well-being (Hietajärvi et. al., 2014). As previously stated, use of novel technologies for learning seemed to be marginal although many of the students' out-of-school practices are technology mediated and one of the most used channels to explore and share own specific interest areas (Hietajärvi et. al., 2014). As digital technologies were used in learning only infrequently, their contribution to school well-being was expectedly low. Hence, students' attitudes towards digital technologies were related to problems in school well-being. *Digital learning engagement* was related negatively to *school value* and *school engagement* and positively to all burnout symptoms. Results show that because technologies are not used, or the way technologies are used is out-of-date with information orientated practices, this could cause burnout symptoms especially for boys (OECD, 2013).

At first sight results are confusing and even contradictory. Use of technology and technology attitudes are related to *school engagement* and school burnout simultaneously. This might be

explained by different practices in and outside school. Technology mediated practices are mainly not occurring in school as they should from students' perspective.

It seems that technology mediated pedagogical practices change very slowly. On the other hand, the results of this study indicate that there are also students who are afraid of failure with computers, which might indicate also a general fear of failure in school. The existing pedagogical practices are remnants of a bygone era and atmosphere for failure might not always be the most permissive or encouraging. How technology is mainly pedagogically used in school, could represent the myth that all adolescents are naturally sophisticated technology users (Prensky, 2001, 2012; Hietajärvi, et al., 2014). This can just cause more performance pressure, fear of failing and school burnout. It seems that there is also a need to renew pedagogical practices and school culture, not only regarding the use of DTs in learning but also generally to support a more experimental, open, error-permissive culture.

Our results also show that the teacher's role was very important to the students. Teachers' activities correlated positively with school value and school engagement and negatively with signs of burnout. Our regression models indicate that fear of failing and different burnout symptoms, such as cynicism, are more prevalent among those who like digital technologies, but not so much their school. Teachers appear to promote school engagement in general, but there may be room for improvement in their contribution to digital engagement. This possibility should be further investigated.

It is also possible there are subgroups of students, the true digital natives with readiness to use technology, who are suffering at school (Hietajärvi et al., 2015). Another subgroup maybe children who are less fond of face-to-face communication and would prefer socio-digitally mediated interaction. In the future more person-oriented analyses should be carried out to investigate this phenomenon.

Building a bridge between school and society, between formal and informal learning is an imperative for modern schools in order to foster agency and engagement in young people (Rajala et al., in press). Especially today, the fast-paced development of digital technologies puts pressure to integrate technology-mediated practices and 21st pedagogy in school curricula. Learners' out-of-school experiences and socio-digital participation should be given priority in formal education in order to promote engagement and readiness for the future (Hietajärvi, Tuominen-Soini, Hakkarainen & Lonka, 2014; Salmela-Aro, 2016). In this regard, there is yet a lot more that needs to be done to meet the needs of our youth.

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