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Comparing Instructional Factors Related to Students' Academic Self-Discipline in Norway and Finland

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Abstract

School learners can struggle with setting and striving for objectives that require sustained academic self-discipline. We believe that teachers' instructional qualities and school culture are factors that can successfully elicit students' self-discipline in their academic work. This study explores and compares factors related to students' academic self-discipline among Norwegian and Finnish youths at the upper secondary level. The Finnish students' excellent results on international comparative tests have led many commentators to consider the Finnish model of education very worthy of emulation. Another reason to compare these two groups is that Finnish and Norwegian classrooms differ in their levels of in-class Internet access and computer use for learning purposes. From this perspective, it is interesting to compare empirical associations between instructional factors (as well as students' school appreciation) and students' academic self-discipline. The instructional factors in our theoretical model were teachers' classroom management, teaching quality, teachers' expressed expectations and the value students placed on the school as an institution. A total of 1433 urban Finnish and Norwegian upper secondary students in general study programmes participated in our cross-sectional questionnaire. We used structural equation modelling for our analysis, and the results show that the associations between instructional qualities (quality instruction, classroom management and high expectations) and academic self-discipline are overall stronger in the Finnish sample than the Norwegian sample. However, students' appreciation for school was more highly associated with academic self-discipline in Norway than in Finland. Furthermore, the associations between in-class Internet access and motivational conflict were clearly higher in the Norwegian sample than in the Finnish sample. In both samples, we found strong associations between motivational conflict and academic self-discipline. We also discuss the meaning of these results and their implications for research and practice.

Keywords: Self-discipline; Instruction; ICT; Norway; Finland

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Introduction

School learners can sometimes struggle with setting and striving for objectives that require sustained self-discipline in their academic work. Self-discipline is "the ability to suppress prepotent responses in the service of a higher goal and further specifying that such a choice is not automatic but rather requires conscious effort" (Duckworth & Seligman, 2006, p. 199). Several studies have shown that highly self-disciplined learners outperform their more impulsive peers in academic attainment (Tangney, Baumeister, & Boone, 2004; Zhao & Kuo, 2015). For instance, one study showed that self-discipline predicts academic performance more robustly than even IQ (Duckworth & Seligman, 2005). As such, we believe that teachers' instructional qualities and the school culture can elicit academic self-discipline in students. Studies have also shown that learners achieve better when their teachers emphasise academic goals in establishing high expectations, use effective classroom management strategies and high quality instructional strategies to maximise the time spent on-task, and sustain a scholastic culture (Rosenshine, 1983; Brophy, 1986; Hill, Rowan, & Ball, 2005; MacNeil, Prater & Busch, 2009; Baumert, Kunter, Blum, Brunner, Voss, Jordan & Tsai, 2010). It is therefore interesting to study how teachers' classroom management, instructional qualities and expressed expectations, as well as the value students place on school as an institution, affect students' academic self-discipline, assuming that teachers' work do in fact influence students' self-discipline.

The excellent results achieved by Finnish students on international comparative tests have led many commentators to consider the Finnish model of education worthy of emulation (for instance Sahlberg, 2014). Comparison between the education systems in Norway and Finland is also valuable because Finnish and Norwegian classrooms differ in their level of in-class Internet access and computer use for learning purposes. This is noteworthy because a new kind of self-control challenge has appeared with the advent of students' access to computers in technology-rich classrooms (Elstad, 2008). Motivational conflicts can arise between the immediate rewards of net surfing and games and the long-term rewards of academic attainment, and these motivational conflicts can influence students' self-discipline in their academic work. Through this lens, it is worthwhile to compare the associations between instructional factors and students' academic self-discipline. In this study, we compare the instructional factors related to students' self-discipline in two educational settings: (1) Norwegian upper secondary schools where all students have access to their own laptops in the classroom and (2) Finnish upper secondary schools where fewer students have access to their own laptops in the classroom. These two country-specific contexts also differ in the teachers' transactional positions in relation to their students (Elstad, 2002): the employment status of teachers is much higher in Finland than it is in Norway (OECD, 2014). This difference in status and respect could influence teachers' transactional position (Elstad, 2006).

Furthermore, although the education systems in both countries follow mainly the Nordic model of education (Blossing, Imsen & Moos, 2014), they substantially differ in their

educational policies for supporting teachers' work: the decisional autonomy of teachers is assumed to be strong in Finland (Sahlberg, 2014), while strong input regulations in Norway limit individual teacher autonomy (Helgøy & Homme, 2007 & 2016). It is therefore worthwhile to explore and compare instructional factors and their associations with students' self-discipline in Norway and Finland. First, we outline our theoretical framework. Second, we explain the typical aspects of educational policies about the work of teachers in Finland and Norway. Third, we explain our methodological strategies for comparing the Finnish and Norwegian cases. To conclude this paper, we discuss our findings and deduce their implications for further research and practice.

Theoretical framework

In 2008, the Danish Clearinghouse for Educational Research conducted a meta-study of 70 published studies between 1998 and 2007 on how teacher competencies influence student achievement (Nordenbo, Søgaard Larsen, Tiftikçi, Wendt & Østergaard, 2008). One of the three crucial factors identified in this meta-study was teachers' competence, both generally in the overall teaching-learning process and more specifically in the individual subjects taught. Based on these findings, we expect that *teaching quality* is not only cognitively instrumental for helping students to solve difficult tasks, but that it also strengthens the students' willingness to attend, i.e. bolsters their academic self-discipline.

The emphasis placed by institutional arrangements on the development of student autonomy seems to have increased the importance of self-discipline for academic achievement. However, research has also identified potential risks associated with too much self-discipline, such as compulsive tendencies and a lack of enjoyment of life, and highlighted some troublesome assumptions about human nature implicit in concepts like classroom management and discipline (Kohn, 2006).

This study draws upon these studies as well as Berliner's (1990) understanding of how time-on-task in the classroom is a key construct for understanding variations in learning. The basic assumption is that all innovations in education affect students only through the students' own active involvement in learning. It follows that the duration and quality of students' active attempts to learn specific academic content are crucially important. Allocated time refers to all time available for study. Within allocated time, there is a proportion of engaged time, and this proportion depends on many factors, including self-discipline. In turn, the proportion of engaged time must be seen in light of the time required to learn specific content, which is determined by the students' aptitude and the teachers' quality of instruction. Based on these theoretical assumptions, we assume that students' academic self-discipline positively relates to engaged time within allocated time. As such, an increased proportion of engaged time will improve academic learning outcomes *ceteris paribus*.

It is worth mentioning that we refer specifically to *academic self-discipline* in order to limit the self-discipline contexts to those related to academic studies. An example of such

self-discipline thus includes persisting on long-term assignments despite boredom and frustration and is in line with Berliner's (1990, p. 5) reference to students' willingness to attend. In other words, self-discipline can help students spend time on processing academic information in an effortful, non-automatic and non-passive way. Utilising the conscious system (Kahneman, 2011), the students process at a deeper level and with more genuine thought about the information they process. A tenet of our theoretical model is that teacher behaviour (classroom management, explanatory quality, high expectations) might influence learners' academic self-discipline (figure 1). Below we explain this assumption in detail.

Classroom management is a construct included in this study for scrutiny. We understand classroom management as the methods for facilitating positive student behaviour and achievement based on maximising the allocations of time for instruction, the arrangement of instructional activities for maximising academic engagement and achievement, and proactive behaviour management practices (Sugai & Horner, 2002). Hence, classroom management is by definition a factor that is supposed to help students attend to the academic tasks at hand, thereby increasing the amount of engaged time. The meta-study identified that one of the three crucial factors for academic achievement is the teacher's competence at directing the work of the class, whereby the teacher is visibly the leader in charge throughout the course of the teaching (Nordenbo et al., 2008). Therefore, we assume that classroom management and quality instruction positively relate to students' academic self-discipline (figure 1).

A common feature among effective teachers is holding *high expectations* of their students' academic behaviour, learning and achievement, a phenomenon often referred to as the *Pygmalion effect* (Rubie-Davies, Peterson, Sibley & Rosenthal, 2015). Understood in light of the instructional time model presented below, the Pygmalion effect occurs because the teachers' expectations influence their students' beliefs. In turn, these beliefs lead the students to invest more effort, thereby increasing the duration of their active engagement in striving to learn specific academic content. Based on these theoretical assumptions, we hypothesise that high expectations positively relates to students' academic self-discipline (figure 1).

Research shows that the degree to which students feel accepted and valued in a school community affect their academic behaviour and achievement (see e.g. Voelkl, 2012). We assume that students respond to this kind of personal validation with an increased appreciation for institutionalised schooling. We expect that students who appreciate school and school learning, and who experience these as empowering and emancipatory processes, will demonstrate higher levels of school motivation and a corresponding willingness to attend. Theoretically, this increase in engaged learning time is important for academic outcomes. Based on this line of thinking, we assume that *appreciation for school* positively relates to academic self-discipline (figure 1).

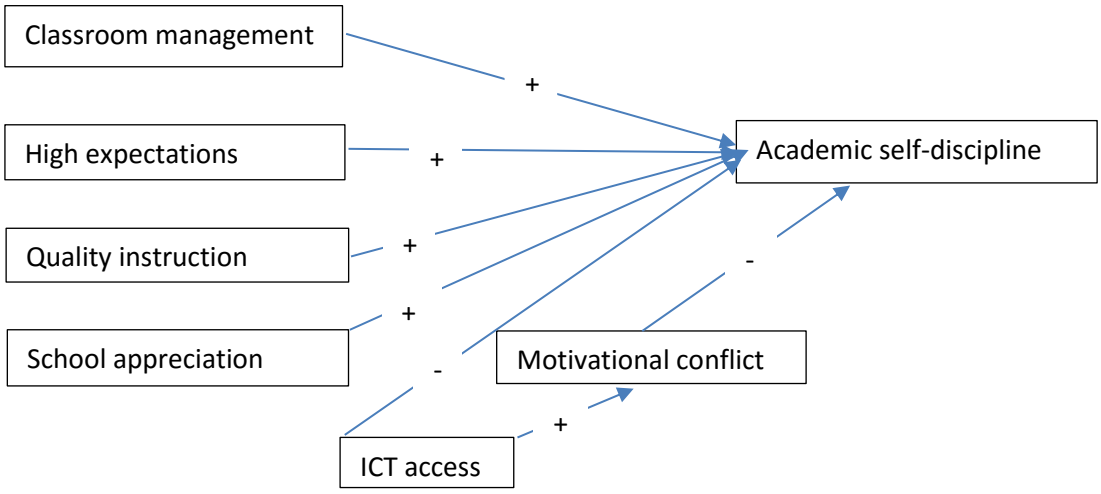
The introduction of Internet access in the classroom has implications for students at the cognitive, conative and affective levels. It follows that the cognitive benefits of learning

with, of and through technology (Salomon & Perkins, 2005) can be undermined by unforeseen conative or affective side-effects, such as a debilitation of students' ability to exercise academic self-discipline. The instructional time model effectively reframes the effects across cognitive, conative and affective domains into a measure of time. Based on the model's theoretical assumptions, an increase in students' academic self-discipline would constitute an increase of engaged time. Conversely, an increase in digital procrastination constitutes a decrease of engaged time via its negative effect on self-discipline (figure 1).

A potential risk associated with open Internet access is increased academic procrastination induced by digital distractions, i.e. digital procrastination. Digital procrastination can be a serious problem for students who want to succeed academically but lack adequate self-control. Their sense of a *school-Internet conflict* can undermine their ability to exercise academic self-discipline (figure 1). However, the instructional environment has the ability to enable or constrain this potentially debilitating effect of Internet access, and the teachers' authority and instructional acts are likely to be crucially important. We explore the associations between school-Internet conflict and self-discipline in this study, and we expect a negative relationship between the two (figure 1).

What is also important to consider is that schools can influence learners' academic self-control. The ways in which teachers execute their work, such as how they manage their classroom or explain difficult material, can directly influence learners' behaviour. Additionally, teachers also indirectly influence learners' academic performance by expressing their expectations for assignments. Figure 1 summarizes the research model.

Figure 1: The theoretical model.
+ denotes a positive relation. – denotes a negative relation.



Comparing instructional factors in two contexts: Norway and Finland

There are some clear similarities between the Norwegian and Finnish education systems. Both have attributes of the so-called "Nordic model of education", in which "schools should be inclusive, comprehensive, with no streaming and with easy passages between the levels" (Blossing et al., 2014, p. 1). The overarching aims of education are developing social justice, equity, equal opportunities, participative democracy and inclusion, which align with the important values in Nordic welfare state thinking. However, there are some clear differences between these systems. Finnish students have less access to and classroom use of computers compared to Norwegian students (European Commission, 2013). However, Finnish students have repeatedly outperformed Norwegian students on international comparative tests.

Some explanations for Finland's educational success include Finnish teachers' instructional styles and the fact that Finland's "knowledge-based society, educational equality, the devolution of decision power at the local level, and teacher education are named as the most important educational policy issues" (Lavonen & Laaksonen, 2009, p. 940). As for Norway, in 2006, Norwegian authorities implemented a new national curriculum that increased the status of digital competence to the fifth basic skill in Norwegian schools (Krumsvik, 2011). Local education authorities also decided in 2008 that all pupils in all schools should have their own laptops. At grade 11 general, 99% of Norwegian students (2011-12) attended schools where both teachers and students use information and communication technology (ICT) devices in lessons involving ICT. For comparison, at the same time, only 65% of Finnish students had access to ICT (European Commission, 2013). The same investigation revealed that 94% of Norwegian students used computers for learning purposes on at least a weekly basis (grade 11 general) compared to 25% of Finnish students (grade 11 general). Almost every student in Norwegian upper secondary schools has a personal computer. The policy on computer access is driven by education authorities at both the national and local levels. The national curriculum defines many digital competence objectives for different school levels (Hatlevik & Christophersen, 2013). For example, one objective of English language learning studies is to enable pupils to "evaluate different digital resources and other aids critically and independently and use them in one's own language learning" (The Norwegian Directorate for Education and Training, 2013). However, studies have shown substantial variation in digital competence both between and within schools (Hatlevik & Christophersen, 2013).

Within the chosen contexts, we find it worthwhile to explore and compare the instructional factors related to students' academic self-discipline among Norwegian and Finnish students at the upper secondary level, as well as the associations between students' appreciation for school and the ICT used at school on the one hand and their self-discipline on the other (figure 1). We also include students' motivational conflict as a mediation variable in our theoretical model.

Method

Sample

The empirical study that forms the basis for the analysis was completed with 44 secondary and upper secondary schools located in Norway (20 schools) and Finland (24 schools) in February and March of 2013. We chose schools located in or close to major city areas, since urban teens in these countries are most likely to have full broadband access, and they have thus likely had the opportunity to engage in the same spectrum of digital activities and develop similar digital habits. The data set we used consists of 469 Finnish students and 964 Norwegian students in general study programmes. None of the students who were present declined to take part in the survey. It became practically impossible for us to comply with the requirement of random sampling from the population, thus reducing the possibility of inferring to the population results pertaining to our sample, i.e. weakening the external validity of the study (Shadish, Cook, & Campbell, 2002).

Instrument

The participants answered a questionnaire on different aspects of school situations and propositions about schools. The questionnaire is partly self-developed and partly adapted from internationally validated scales and surveys, such as OECD's (2009) constructs "Student-related aspects of school climate scale", "Approaches to learning scale" and "Disciplinary climate scale", as well as Tangney, Baumeister and Boone's (2004) "Self-control scale". We conducted the research within a classical test theoretical paradigm by contextualising psychological constructs through a set of indicators in the form of propositions to which the students responded. The students were asked to choose responses from a six-point Likert-scale that included the following choices: Strongly disagree (1), Disagree (2), More disagree than agree (3), More agree than disagree (4), Agree (5) or Strongly agree (6). An exception to this was the ICT-use construct, wherein the participants checked one of the following boxes: Between 0-1 hours, 1-2 hours, 2-3 hours, 3-4 hours, 4-5 hours or more than 5 hours. Seven constructs (and ditto items) were included in the analysis:

1. Academic self-discipline (e.g. "Procrastination hinders my attempts to get work done"—reversed);
2. Appreciation for school (e.g. "I enjoy school learning");
3. School-Internet conflict (e.g. "My Internet habits hinder me from achieving my academic ambitions");
4. High expectations (e.g. "I look up to teachers who set high academic standards");
5. Quality instruction (e.g. "Teacher explanations make it possible for me to solve difficult tasks");
6. Classroom management (e.g. "The students do not manage to work well"—reversed);

7. Internet use at school ("Time spent online while at school").

We used Cronbach's alpha to assess the indicators' measurement reliability for each of the scales (Nunnally & Bernstein, 1994). Alpha captures the breadth of the construct. One of the constructs had an alpha lower than .65 (.62), but we still consider this measure acceptable. Cronbach's alpha is a function of the number of items in a test. Our construct "academic self-discipline" consists of only two distinct items, and what a satisfactory level of reliability is, depends on how a measure is used and on the theoretical knowledge of the scale in question (Loewenthal, 2004). We consider these two indicators' measurement reliability not fully satisfying, but acceptable at this stage of research.

Procedure

First, we had to translate the questionnaires from Norwegian to Finnish before distributing them. The students answered questionnaires in their own language. We double-checked these translations by running the questionnaires by our professor colleagues in Finland. Once the students had completed the paper-based survey, the data set was coded into SPSS.

Data analysis

We used confirmatory factor analyses (CFA) to assess the factor structure. The assessments were based on the p-value for the $\chi 2$-statistic, the RMSEA (root mean square error of approximation), the CFI (confirmative fit index), the GFI (goodness of fit index) and the TLI (Tucker-Lewis index). The standard criteria of $p < .05$, RMSEA < .05, and GFI and CFI > .95 were used to determine good fit (Kline, 2005). We estimated the measurement and structural models with IBM SPSS Amos 22. The actual values of RMSEA, GFI and CFI indicate that the structural models of the Finnish and Norwegian sample have an acceptable fit. The p-values for the $\chi 2$-statistic in the two models were also acceptable.

Results

Table 1 shows descriptive attributes of the data. The kurtosis of item v44 in the Finnish sample is somewhat high. Further, the skewness of item v02r is also somewhat high in the samples. The other attributes are satisfying.

Table 1: Descriptive data

Latent variable	*Item*	***Norway N = 964***				***Finland. N = 469***				***Totally N = 1433***			
		Mean	*SD*	*Skewness*	*Kurtosis*	*Mean*	*SD*	*Skewness*	*Kurtosis*	*Mean*	*SD*	*Skewness*	*Kurtosis*
	v02r	*4.57*	*1.3*	*-.94*	*.43*	*4.33*	*1.3*	*-.88*	*.20*	*4.50*	*1.3*	*-.92*	*.34*
	v05	*3.86*	*1.1*	*-.43*	*.11*	*4.10*	*1.1*	*-.60*	*.16*	*3.94*	*1.1*	*-.49*	*.10*
	v44	*3.89*	*1.4*	*-.35*	*-.42*	*3.41*	*1.5*	*-.01*	*-1.08*	*3.64*	*1.4*	*-.18*	*-.89*
	v46	*3.84*	*1.2*	*-.28*	*-.12*	*2.70*	*1.2*	*.69*	*-.04*	*3.10*	*1.3*	*.31*	*-.64*

clm_l	*v94r*	*4.18*	*1.2*	*-.39*	*-.55*	*3.14*	*1.4*	*.09*	*-.74*	*3.65*	*1.4*	*-.21*	*-.65*
	v95r	*4.19*	*1.3*	*-.51*	*-.37*	*3.23*	*1.3*	*-.02*	*-.66*	*3.64*	*1.3*	*-.22*	*-.38*
	v96r	*4.15*	*1.3*	*-.44*	*-.54*	*3.71*	*1.3*	*-.17*	*-.62*	*4.03*	*1.3*	*-.32*	*-.60*
	v97r	*4.18*	*1.2*	*-.49*	*-.18*	*4.13*	*1.3*	*-.67*	*-.05*	*4.17*	*1.3*	*-.56*	*-.26*
	v114	*4.24*	*1.2*	*-.65*	*.11*	*3.76*	*1.3*	*-.29*	*-.62*	*4.02*	*1.3*	*-.38*	*-.59*
	v115	*4.11*	*1.2*	*-.48*	*-.15*	*4.17*	*1.2*	*-.63*	*-.19*	*4.18*	*1.2*	*-.54*	*-.18*
	v116	*4.39*	*1.2*	*-.70*	*.33*	*4.17*	*1.4*	*-.63*	*-.41*	*4.22*	*1.3*	*-.66*	*-.07*
	v37	*3.75*	*1.4*	*-.25*	*-.75*	*3.96*	*1.3*	*-.37*	*-.52*	*4.06*	*1.2*	*-.45*	*-.27*
	v38	*3.29*	*1.4*	*.14*	*-.69*	*3.94*	*1.3*	*-.48*	*-.36*	*4.24*	*1.2*	*-.64*	*.05*
	v79r	*3.73*	*1.3*	*-.14*	*-.60*	*3.78*	*1.4*	*-.28*	*-.83*	*3.75*	*1.4*	*-.19*	*-.68*
	v80r	*3.76*	*1.5*	*-.30*	*-.83*	*4.19*	*1.4*	*-.54*	*-.59*	*3.90*	*1.5*	*-.37*	*-.78*

Table 2. Correlation matrix. The Norwegian sample. N = 964

Norway	*v02r*	*v05*	*v44*	*v46*	*v94r*	*v95r*	*v96r*	*v97r*	*v114*	*v115*	*v116*	*v37*	*v38*	*v79r*
v05	*.55*													
v44	*.32*	*.38*												
v46	*.31*	*.39*	*.63*											
v94r	*.19*	*.15*	*.06*	*.09*										
v95r	*.26*	*.20*	*.08*	*.12*	*.68*									
v96r	*.22*	*.18*	*.10*	*.11*	*.62*	*.79*								
v97r	*.18*	*.15*	*.06*	*.06*	*.64*	*.67*	*.65*							
v114	*.30*	*.35*	*.19*	*.28*	*.24*	*.20*	*.17*	*.23*						
v115	*.24*	*.30*	*.14*	*.23*	*.27*	*.22*	*.18*	*.24*	*.66*					
v116	*.25*	*.31*	*.20*	*.23*	*.25*	*.26*	*.23*	*.24*	*.57*	*.60*				
v37	*.01*	*-.03*	*.00*	*-.02*	*-.06*	*-.02*	*-.04*	*-.10*	*-.05*	*-.05*	*-.01*			
v38	*-.07*	*-.06*	*.02*	*-.06*	*-.11*	*-.08*	*-.07*	*-.14*	*-.06*	*-.09*	*-.03*	*.52*		
v79r	*.07*	*.07*	*.00*	*.01*	*.11*	*.08*	*.05*	*.11*	*.11*	*.12*	*.09*	*-.34*	*-.28*	
v80r	*.30*	*.28*	*.07*	*.16*	*.16*	*.19*	*.15*	*.19*	*.26*	*.22*	*.18*	*-.30*	*-.28*	*.52*

Table 3. Correlation matrix. The Finnish sample. N = 469

Finland	*v02r*	*v05*	*v44*	*v46*	*v94r*	*v95r*	*v96r*	*v97r*	*v114*	*v115*	*v116*	*v37*	*v38*	*v79r*
v05	*.56*													
v44	*.41*	*.40*												
v46	*.38*	*.39*	*.59*											
v94r	*.03*	*.00*	*-.03*	*.03*										
v95r	*.15*	*.08*	*.00*	*.04*	*.63*									
v96r	*.06*	*.01*	*-.06*	*.00*	*.63*	*.70*								
v97r	*.09*	*.02*	*-.02*	*-.03*	*.63*	*.67*	*.61*							
v114	*.24*	*.23*	*.20*	*.19*	*.12*	*.14*	*.10*	*.21*						
v115	*.24*	*.21*	*.22*	*.20*	*.14*	*.14*	*.11*	*.18*	*.75*					
v116	*.19*	*.22*	*.28*	*.23*	*.16*	*.12*	*.10*	*.16*	*.58*	*.69*				
v37	*.11*	*.09*	*.13*	*.12*	*-.13*	*-.09*	*-.11*	*-.11*	*.01*	*.01*	*.06*			
v38	*.03*	*.06*	*.07*	*.06*	*.00*	*-.07*	*-.08*	*-.07*	*.00*	*-.04*	*.04*	*.44*		
v79r	*.25*	*.17*	*.15*	*.17*	*.11*	*.13*	*.09*	*.12*	*.24*	*.24*	*.13*	*-.25*	*-.20*	
v80r	*.16*	*.08*	*.08*	*.15*	*.20*	*.15*	*.16*	*.19*	*.22*	*.20*	*.10*	*-.23*	*-.18*	*.42*

Table 4. Correlation matrix (Finland and Norway spliced together). N = 1433

Totalt	*v02r*	*v05*	*v44*	*v46*	*v94r*	*v95r*	*v96r*	*v97r*	*v114*	*v115*	*v116*	*v37*	*v38*	*v79r*
v05	*.54*													
v44	*.36*	*.35*												

v46	*.34*	*.36*	*.63*											
v94r	*.15*	*.08*	*.07*	*.11*										
v95r	*.22*	*.16*	*.06*	*.09*	*.66*									
v96r	*.18*	*.11*	*.08*	*.10*	*.63*	*.76*								
v97r	*.15*	*.11*	*.03*	*.03*	*.63*	*.67*	*.63*							
v114	*.28*	*.31*	*.19*	*.25*	*.20*	*.18*	*.15*	*.23*						
v115	*.24*	*.26*	*.18*	*.23*	*.23*	*.19*	*.16*	*.22*	*.69*					
v116	*.24*	*.25*	*.26*	*.26*	*.24*	*.21*	*.21*	*.20*	*.57*	*.63*				
v37	*.05*	*.00*	*.07*	*.05*	*-.06*	*-.04*	*-.04*	*-.10*	*-.03*	*-.03*	*.03*			
v38	*-.02*	*-.04*	*.09*	*.03*	*-.04*	*-.07*	*-.04*	*-.12*	*-.04*	*-.06*	*.03*	*.50*		
v79r	*.13*	*.11*	*.05*	*.06*	*.10*	*.10*	*.06*	*.11*	*.16*	*.16*	*.10*	*-.31*	*-.25*	
v80r	*.24*	*.23*	*.03*	*.12*	*.15*	*.17*	*.13*	*.19*	*.24*	*.20*	*.12*	*-.29*	*-.27*	*.49*

Figures 2 (Finland) and 3 (Norway) show the findings from the structural equation modelling based on the theoretical model.

Figure 2: A structure model of the Finnish sample

Including: academic self-discipline (abbreviated per_I); appreciation for school (val_I); school-Internet conflict (con_I); high expectations (exp_I); quality instruction (tea_I); classroom management (clm_I); and time spent online while at school (ikt).

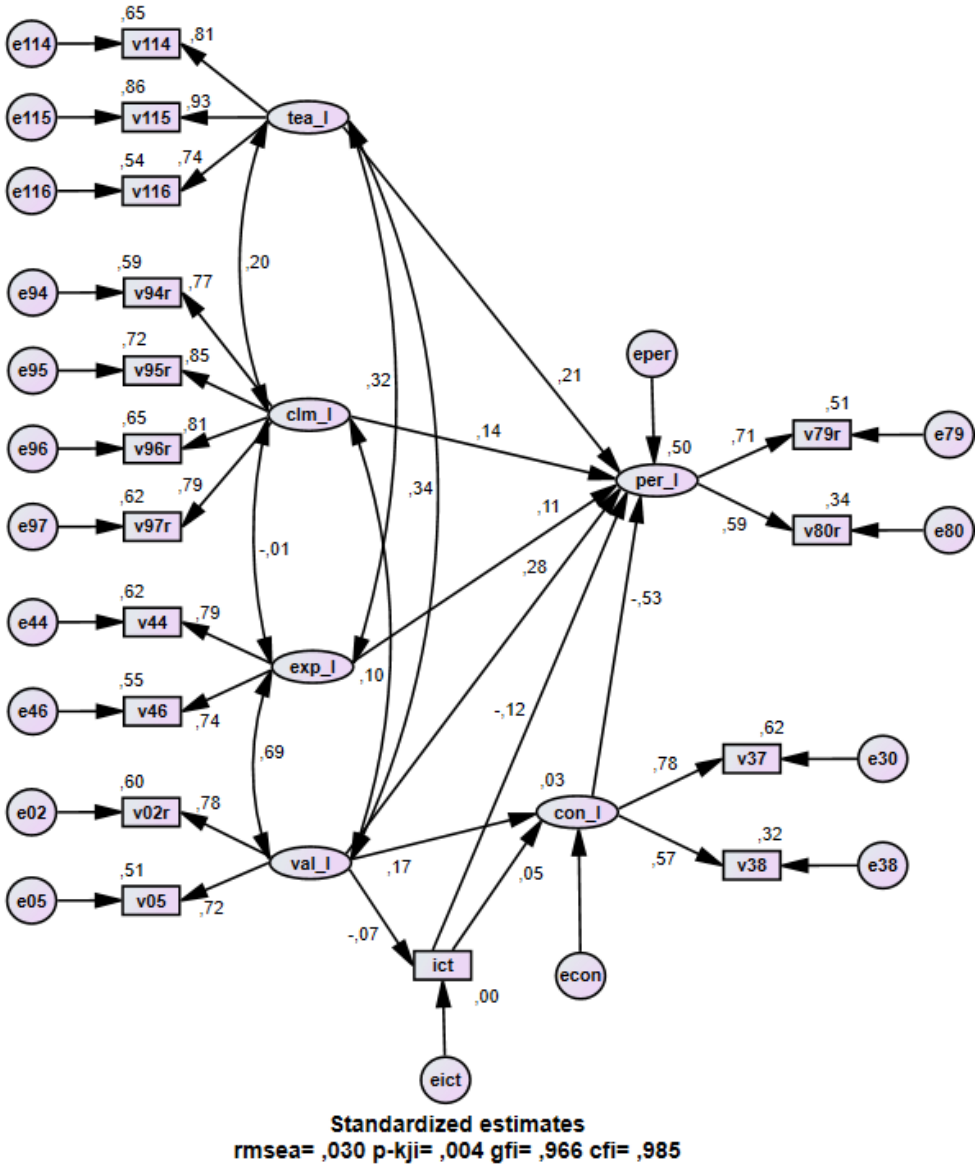
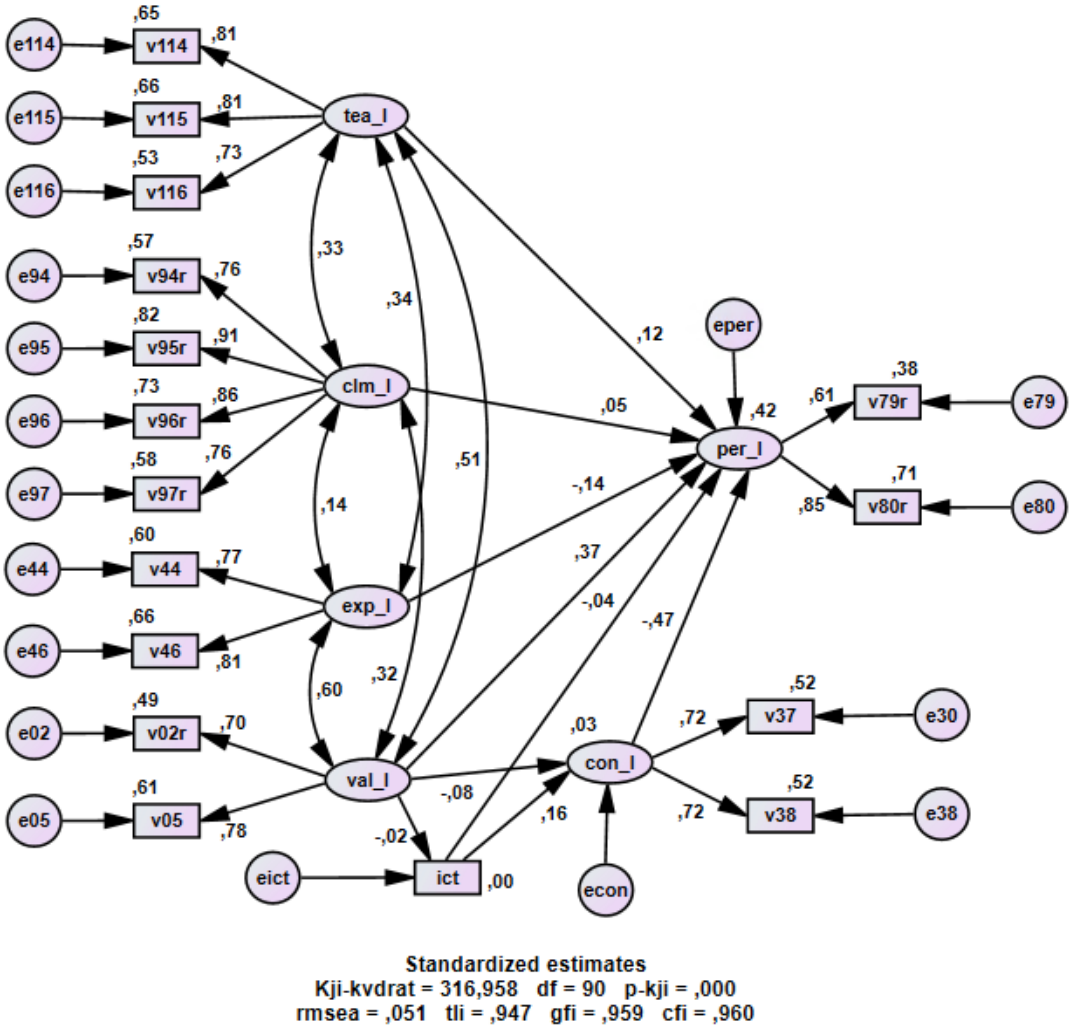


Figure 3: A structure model of the Norwegian sample

Including: academic self-discipline (abbreviated per_I); appreciation for school (val_I); school-Internet conflict (con_I); high expectations (exp_I); quality instruction (tea_I); classroom management (clm_I); and time spent online while at school (ikt).



Structural equation modelling shows clear differences between the Finnish and Norwegian samples. The Norwegian pathways of instructional qualities are: $b_{[tea\rightarrow per]}$ = .12, $b_{[clm\rightarrow per]}$ = .05 and $b_{[exp\rightarrow per]}$ = -.14. The similar Finnish pathways are: $b_{[tea\rightarrow per]}$ = .21, $b_{[clm\rightarrow per]}$ = .14 and $b_{[exp\rightarrow per]}$ = .11. In other words, overall, the associations between instructional qualities (quality instruction, classroom management and high expectations) and academic self-discipline are stronger in the Finnish sample than in the Norwegian sample. However, the students' appreciation for school is more highly associated with academic self-discipline in Norway ($b_{[val\rightarrow per]}$ = .37) than in Finland ($b_{[val\rightarrow per]}$ = .28). Furthermore, the associations between ICT access and motivational conflict are clearly higher in the Norwegian sample ($b_{[ict\rightarrow net]}$ = .16) compared to the Finnish sample ($b_{[ict\rightarrow net]}$ = .05). In both samples, we found strong associations between motivational conflict and academic self-discipline ($b_{[con\rightarrow per]}$ = -.53 in Finland and $b_{[con\rightarrow per]}$ = -.47 in Norway).

Discussion

The purpose of this study was to explore and compare the instructional factors related to students' academic self-discipline among Norwegian and Finnish youth at the upper secondary level. The instructional factors included teachers' classroom management, instructional explanations and expressed expectations, as well as students' appreciation for school. It is interesting that the associations between quality instruction, classroom management and high expectations on the one hand and academic self-discipline on the other are clearly stronger in the Finnish sample compared to the Norwegian sample. Our interpretation of this result is that Finnish teachers manage to positively influence their students' academic self-discipline by providing quality teaching, implementing productive classroom management and setting high expectations. If these associations represent causal relationships, our findings could have implications for practice.

The Finnish students' results on international comparative tests have led many commentators to consider the Finnish model of education worthy of emulation (Hancock, 2011), and Finnish learners have remained in the top echelon in recent years, despite a decline over time in their TIMSS (Mullis, Martin, Foy & Hooper, 2016; Martin Mullis, Foy & Hooper, 2016) and PISA (OECD, 2016a,b) test scores. The most common explanations for Finland's academic success are its excellent and highly respected teachers, its high quality teacher education and its historical, cultural and social idiosyncrasies (Simola, 2005; Sahlberg, 2014).

Of course, this raises the question of how Norwegian teachers can learn from the practices of Finnish teachers and vice versa. Other research shows that raising the quality of teachers could be instrumental in improving student attainment (Rockoff, 2004). Empirical studies have also corroborated the view that instructional quality, classroom management and high expectations influence student achievement, and this theory provides plausible explanations for the mechanisms involved (Brophy, 1986; Baumert et al., 2010). We do not suggest that the different path coefficients capture all of the important aspects of instructional quality in Finland and Norway. However, the positive influences of the teachers' actions and the students' appreciation for school are likely to be important for students' ability to exercise self-discipline during time spent online in class as well as their sense of school-Internet conflict.

We were curious about the extent to which the effects of Internet access diverged, as well as the degree to which the effects of the instructional acts of teachers in different countries have constrained the debilitating effects of Internet access. The current provision of Internet access in class seems to have increased the emotional conflict that students encounter in completing school-related work versus engaging in digital activities, but it does not seem to have had a direct negative influence on their self-discipline. One explanation for this could be that students have high levels of in-class Internet access and that the institutional rules are either not well understood or are inadequately enforced by the teachers. The ensuing sense of extensive access to digital distractions combined with

extensive discretion in terms of the type of digital activities they choose to engage in could result in increased levels of motivational conflict between school and the Internet.

It is also unprecedented that students encounter software that is professionally designed to capture as much of their attention as possible (see e.g. Fogg, 2009). The combination of open Internet access and high student autonomy in Norwegian classrooms puts a premium on the successful exercise of self-discipline, but it has also made it increasingly hard to achieve even in the presence of good teaching. One could argue that it is the individual's responsibility to pay attention and maintain focus; and that the teachers can only inform students about the risks and let them make up their own minds. However, recent research indicates that the degradation of focus is not merely an individual matter, but a social one as well (Sana, Weston, & Cepeda, 2013). This means that the exercise of self-discipline is influenced even if the student is simply in the direct view of a distracted peer's screen. There is also a worry that it is gradually becoming more acceptable to succumb to instant gratification, which means that educationally meaningful tasks that are not instantly and intrinsically motivating are not carried out with the mental effort required to develop deep knowledge. Students' digital procrastination can gradually become the de facto digital norm in the classroom in spite of institutional rules that aim to limit its occurrence. It can be argued that the current provision of Internet access in Norwegian classrooms exacerbates a school-Internet conflict that can have serious ramifications for the necessary exercise of self-discipline in academic work. However, more research is needed to bolster this inference.

The students' motivational conflict between the digital world of instant gratification and the real-world demands that require delaying gratification undermines their academic self-discipline to such an extent that the current counteracting efforts of teachers do not seem to be effective in open access instructional environments. Some argue that these problems are just expressions of personality traits that are hard to change (Kim, Namkoong, Ku & Kim, 2008; Mehroof & Griffiths, 2010). These scholars tend to argue that impulsive individuals who have limited conscientiousness have always found ways to distract themselves when faced with demanding tasks. However, this argument does not account for how personality traits do not necessarily decide behaviour. Evidence suggests that many individual and contextual factors determine the extent to which personality traits are expressed in behaviour (Mischel & Shoda, 1995; Tett, & Guterman, 2000). Such examples include the influence of metacognition and self-control on the individual level; the influence of access to professionally designed and tempting distractions; the influence of the peers, teachers and parents on a social level; the nature of the tasks that the individual is required to do; and the institutional arrangements.

If we accept that Finnish and Norwegian upper secondary schools are comparable, then the differences in their instructional factors could be a starting point for reflections on improvement processes. Our results could then be considered and compared with other investigations. We found that classroom management is more strongly positively related

to students' academic self-discipline in Finnish classrooms than it is in Norwegian classrooms. If Finnish teachers put more pressure and constraints on students than Norwegian teachers do, an implication could be other unintended consequences, for instance, lower school motivation. Finnish students score below the mean index of achievement motivation (-.63) in the PISA investigation, while Norwegian students score above the mean index of achievement motivation (.10) (OECD, 2017, pp. 41-42). Conversely, the debilitating effects of time spent online on students' self-discipline are less severe in Finland than in Norway. Additionally, we found that the associations between ICT access and motivational conflict are clearly higher in the Norwegian sample compared to the Finnish sample. Another striking result in our findings was that students' appreciation for school was more highly associated with academic self-discipline in Norway ($b_{[val \rightarrow per]} = .37$) than in Finland ($b_{[val \rightarrow per]} = .28$). Several pros and cons could be included in a comparison of how Finnish upper secondary schools and Norwegian upper secondary schools function (Afdal, 2012; Østerud, 2016). These examples show that a multitude of pros and cons are involved when judging qualities of teaching and schooling, and these aspects are clearly avenues for further research.

Students bring their own, predominantly vernacular, conceptions of the Internet to school where academic literacy practices are expected. Thus, conflicting conceptions and practices are integral to the affordances offered by Internet use in school. However, the salience of these conflicts varies according to the individual student's level, the school subject, the teacher, the classroom, the school and the wider educational and social contexts. It follows that the implications drawn from this study must be understood as informed suggestions based on this study's particular set of assumptions, the questions asked and the results obtained, and they will consequently resonate more strongly with some particular contexts than they do with others. However, within these limitations, this study offers valuable new insights into how students perceive their digital environment in relation to their educational endeavours, which deserve to be taken into account when policy initiatives within this area are considered. The crux of the matter is the empirically identified very large negative relationship between students' sense of a digital-academic conflict with their academic self-discipline. The current provision of Internet access in classrooms is positively associated with this digital-academic conflict.

One implication one must consider is the extent to which the net result of the trade-off between cognitive benefits and conative drawbacks of Internet use in the classroom is cumulatively positive based on the educational purposes being pursued. Since the assumption made in this paper is the need for academic self-discipline on the part of the student when acquiring abstract knowledge, the terms of the trade-off include the extent to which Internet access improves epistemic access. In other words, how Internet access is instrumentally valuable in terms of strengthening students' understanding of the defining conceptual frameworks and modes of investigation in different school subjects. Making this kind of professional judgment requires teachers with expert subject knowledge and knowledge of the optimal ways to provide epistemic access to particular student

groups. How teachers' might best influence students' academic self-discipline is an avenue for further research.

Another implication is strengthening the students' metacognitive awareness: How is it possible to lay the groundwork for the students to accept more responsibility for engaging in the activities that lead to school learning via meta-cognitive awareness? It is important to keep in mind that the students who are distracted in class not only lose out on the content of the discussion but also create in the classroom the sense that opting out is permissible and, even worse, provide second-hand distractions for their peers. In such an environment, students need support in their pursuit of their academic ambitions, and they need defences against the powerful short-term incentives to put off complex, frustrating tasks. This support and these defences are not limited to students' individual choices but provided by social structure, and in schools this structure is disproportionately provided by teachers. Metacognition includes skills in exercising agency and self-regulation, and the development of students' strategies for controlling their actions and maintaining intentions becomes an increasingly critical task for schools and teachers, especially as the ability to delay gratification gains importance. Teachers need to develop critical awareness of the trade-offs involved between possible cognitive benefits and conative drawbacks of Internet access. This development can help teachers decide how, when, for what purposes and for whom the cumulative effects seem advantageous or not in light of the educational goals being pursued. More attention needs to be placed on strategies that strengthen teachers' pedagogical content knowledge, as this will allow them to identify viable compromises and alternatives. There is also a need for increased emphasis on explicating students' academic ambitions and how these ambitions relate to their Internet activities and habits, as well as their appreciation for school and its relation to schools' academic mandate. This is also an avenue for further research.

Limitations and needs for further research

Because of our limited research scope, it was not practicable for us to couple our survey data with indicators for value-added measures during the period prior to our data collection. This is also an avenue for further research. Coupling measurements related to student attitudes with performance measurements is highly demanding in terms of research, as this requires taking measurements at several different times. Additionally, Nordic countries have regulations that place limitations on the practical opportunities of researchers in empirical surveys that are based on relatively substantial data material.

This study uses a cross-sectional approach, which involves inherent limitations. For instance, the methodological approach makes it difficult to draw clear conclusions without first acknowledging the need for further validation of the findings that we regard as central. We do not claim that the Norwegian sample and the Finnish sample were representative samples. This is clearly a threat to the external validity. We used 2-5 items linked to each construct. We acknowledge that this is a possible threat to concept validity

(Shadish, Cook & Campbell, 2002). Further, some of the path coefficients are small, and we must urge caution. However, our basic theoretical model is based on such a strong research foundation that we find it very unlikely that the statistical associations highlighted in this study can be the result of coincidence or spurious connections. It should be emphasised that when we speak of instructional factors, the causal processes can go in either direction, from teacher to student or from student to teacher. This is a threat to internal validity. Further, the data sets are gathered from students and not from teachers. The results show how the students perceive the teachers and the teaching. It could be that the differences are due to different experience of teaching or different perceptions of the questions/options in the questionnaire. This is a limitation.

In agreement with a great deal of other research, our study underlines the importance of both the teacher (Piopiunik, Hanushek, & Wiederhold, 2014) and students' appreciation for school. There are strings of statistical associations between the instructional factors and the degree to which the students value the school as an institution in the Finnish sample: $b_{[tea\leftrightarrow val]} = .32$, $b_{[clm\leftrightarrow val]} = .10$ and $b_{[exp\leftrightarrow val]} = .69$. The similar pathways in the Norwegian sample are as follows: $b_{[tea\leftrightarrow val]} = .51$, $b_{[clm\leftrightarrow val]} = .34$ and $b_{[exp\leftrightarrow val]} = .60$. These associations underscore the reciprocal complexity of teachers' supposed influences and students' appreciation for school. Furthermore, the associations between students' appreciation for school and self-discipline illustrate that a greater emphasis on student socialisation in the school community can also affect the student's academic self-discipline in learning. However, we need more research to understand the mechanisms and processes that lead students to value the school more strongly as an institution.

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