MASTER'S THESIS

Using the Integrative Model of Behaviour Prediction to Elicit Factors Predicting Intention among Secondary Teachers to Use Chromebooks Pedagogically in their Classroom Practice.

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Using the Integrative Model of Behaviour Prediction to Elicit Factors Predicting Intention among Secondary Teachers to Use Chromebooks Pedagogically in their Classroom Practice

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Using the Integrative Model of Behaviour Prediction to Elicit Factors Predicting Intention among Secondary Teachers to Use Chromebooks Pedagogically in their Classroom Practice

Dirk Witten

Summary

The study was carried out at a comprehensive school for secondary education in the middle of the Netherlands which teaches some 4,000 pupils and employs 354 teachers; hereafter referred to as research school. All pupils have been issued Chromebooks. Chromebooks are laptop-computers that use cloud-storage with access to a wide variety of (online) educational software. Chromebooks are considered ideal tools to stimulate collaborative-learning and differentiated-learning. The research school’s educational vision propagates these two socio-constructivist educational principles. In the actual lesson-practice of the research school it can be seen that pedagogical use of the Chromebooks has not yet been fully embraced by its teachers. These teachers play a pivotal role when trying to increase pedagogical use of ICT objects.

Teachers were asked to fill in a questionnaire based on the Integrative Model of Behaviour Prediction (IMBP). Items from the questionnaire testing the proximal variables were constructed with the help of existing RAA-literature (Ajzen, 2006; Francis, Eccles, Johnston, Walker, Grimshaw, Foy, Kaner, Smith, & Bonetti, 2004). Items testing distal variables were taken from existing scales. The following proximal and distal variables were measured: behavioural intention, subjective norm, self-efficacy, pedagogical beliefs, workload, trust in management, emotional-connectedness beliefs, innovative culture, feelings of competence, burnout feelings, policy-alienation and positive lockdown-effects. Demographical and individual variables were: age, department, instructional level, subject and device (Win- or Chromebook). 238 complete questionnaires were returned. By using a median split, 129 teachers were categorised as non-intenders and 109 as intenders.

In the regression analyses it was confirmed that teacher attitudes, subjective norm and feelings of self-efficacy play a deciding role with respect to teachers reporting intention. Additionally, we found an increase in intention among teachers who had had positive experiences with the (pedagogical) use of the Chromebook during the lockdowns. The more teachers adhered to socio-constructivist teaching principles, the higher their intention. Belonging to a specific subject group affected intention as well. Teachers of the social-sciences subject group reported the highest intention. Language and beta-subjects teachers reported less intention.

Through mediation analysis we found that intention increased indirectly mostly through attitude. Having socio-constructivist teaching beliefs indirectly increased intention. Contrary to what was anticipated, emotional connectedness beliefs proved to indirectly advance intention as well.
Having experienced success with ICT usage indirectly improved intention, making it the distal variable having the largest accumulative (i.e., direct and indirect) effect on intention.

The two distal variables, experiencing an innovative culture and having trust in management were significant indirect increasers of intention, mainly through attitude and to a lesser extent via social norm.

IMBP lent itself to the purpose for present study. The model allowed us to test the three hypotheses and explain which proximal and distal factors advanced intention. In order to advance intention, we advise to set up professional learning communities for same-subject groups in which experiences, best practices and knowledge are shared. Co-constructing new practices might result in a more positive stance towards socio-constructive teaching principles, which in turn will have a positive effect on seeing the need to pedagogically use ICT.

**Keywords:** Integrative Model of Behaviour Prediction (IMBP); Theory of Planned Behaviour (TPB); Chromebook; teachers’ beliefs; teacher intentions; ICT; secondary education; pedagogical use of ICT
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1. Introduction

1.1 Problem definition and objective of this research

For our pupils the world outside of school has been fundamentally transformed by digital technology (OECD, 2019). Mobile technology has become so obvious in the lives of our present-day society that using it for teaching and learning has become a necessity (Sahin, Top, & Delen, 2016). Because of a growth in affordability and accessibility of mobile devices, pupils are provided with them progressively more (OECD, 2019; Teo, Lee, & Chai, 2008). The use of mobile devices provides students with the flexibility of working on school-projects without being dependent on a fixed location like for instance, a classroom (Black, Beck, Dawson, Jinks, & DiPietro, 2007; Demb, Erickson, & Hawkins-Wilding, 2004). Cell-phones, laptops or Chromebooks can be used by multiple users in different settings enabling teachers to create a digital collaborative classroom setting (Cervantes, Warschauer, Nardi, & Sambasivan, 2011).

In the Netherlands, secondary schools have been investing a great deal in ICT infrastructures in order to enable their staff and pupils to use all sorts of technological devices for educational purposes (Janssen, 2017; Voogt, Sligte, Van den Beemt, van Braak, & Aesaert, 2017). Investments also geared at enabling Dutch secondary school teachers to adopt educational technology into their educational practices. Most research into ICT adoption suggests that teachers play a key role in the successful implementation of pedagogical ICT applications (Admiraal, Lockhorst, Smit, & Weijers, 2013; Davis & Eickelmann, 2014; Drossel, Eickelmann, & Gerick, 2016).

At present, ICT is mostly adopted into an already existing classroom practice based on teachers’ educational beliefs (Bocconi, Kampylis, & Punie, 2013; Hill, 2018; Tondeur, Hermans, van Braak, & Valcke, 2008a) resulting in a rather limited, peripheral use of ICT (Calderhead, 1996; Hayes, 2007; Tondeur, Valcke, & Van Braak, 2008b; Van Acker, Van Buuren, Kreijns, & Vermeulen, 2013). With peripheral we mean that the teacher is still acting as the core actor in the pedagogical process in which the teacher remains the source of knowledge and the student the passive receivers (Teo & Zhou, 2017). Tondeur, Van Braak, and Valcke (2007) characterised and compared these two different uses of ICT as follows: The use of computers as information tools (to research and process information) and the use of computers as learning tools (to practice knowledge and skills). Research into which applications of ICT are being used by (Dutch) secondary teachers suggested that word processing, the administrative and the communicative features of ICT are predominantly used (Bocconi et al., 2013; Ertmer, 2005; Kennisnet, 2017; Kreijns, Van Acker, Vermeulen, & Van Buuren, 2013a; Wastiau, Blamire, Kearney, Quintre, Van de Gaer, & Monsieur, 2013).
The present research studies ICT adoption at a research school. The research school has invested in an appropriate ICT infrastructure with a well-functioning helpdesk and flawless Wi-Fi. Educational publishers are ready and willing to supply the teachers with digital (web-based) learning environments.

In addition, the research school embraced both the idea of collaboration in learning and that of differentiated learning by awarding them the status of two of its core values in the school’s mission statement. One of the (socio)constructivist pedagogical persuasions is that good teaching is brought about by having the pupils learn collaboratively (Cunningham, 1991; Ertmer & Newby, 1993). Collaboration is also one of the four skills making up the four C’s of the 21st Century skills: Critical Thinking, Creativity, Communication and Collaboration (Kivunjia, 2015).

Both on macro and on meso level the research school’s teachers are coached into collaborative learning as a means to reach their pedagogical and didactical objectives and all conditions have been met to introduce a more ICT-, less teacher-centred approach to teaching. In light of these educational developments, all teachers at the research school and all of their pupils were issued Chromebooks, four years ago.

Chromebooks are affordable and very suitable for classroom settings, their main distinction from regular laptops is that they are cloud-based (Sahin et al., 2016) and they run on an operating system called Chrome OS by Google. Some advantages of the Chromebook are its fast boot time, low maintenance, inbuilt spam protection and antivirus software and its automatically programmed software updates (Marjan, Meide-Oomen, Visser, & Fransen, 2017). Most schools combine the purchase of Chromebooks with the digital toolkit called G Suite for Education from which they can use educational tools such as Google Classroom, Docs, Forms and Hangouts.

Research suggests that Chromebooks are particularly suited for differentiated teaching (Nie, 2019) and are good facilitators of collaborative learning (Al-Emran, Elsherif, & Shaalan, 2016; Janitschke, 2014), making them ideal ICT tools for the research school. Consequently, at the research school it is to be expected that teachers will be using these Chromebooks pedagogically. However, pedagogical use of Chromebooks is still quite limited. Pedagogical use of Chromebooks as opposed to peripheral use of Chromebooks supposes that the Chromebook assumes the role of learning tool and positions the teacher in the background creating a more student-centred learning environment (Tallvid, 2016).

Every year all pupils at the research school still receive paper work- and textbooks for almost all of the subjects they take. The layout of most of the classrooms at the research school hasn’t changed much over the past 50 years either. Both the paper work- and textbooks and the classroom lay-outs suggest a teacher-centred learning environment in which the Chromebooks are largely used peripherally. (i.e., for administration, communication and word processing) Given this undesired situation, the objective of this present research is to find answers to the question as to what factors influence teachers’ intention to pedagogically use their Chromebooks. Fishbein’s Integrative Model of
Behaviour Prediction (IMBP; Fishbein, 2000) will be used to find answers to this question. This model posits that intention is the most important predictor of behaviour.

By using this model, we aim to predict teachers’ intention for pedagogical use by testing the effects of attitude, subjective norm and self-efficacy (the three proximal variables) on intention. Additionally, we try to predict intention directly, and indirectly through the proximal variables, with the following distal variables: pedagogical convictions, workload, trust in management, emotional connectedness beliefs, innovative culture, feelings of competence, burnout feelings, policy alienation and positive lockdown effects. Demographical and individual variables we use are: age, department, instructional level, subject and device (Win- or Chromebook).

1.2 Theoretical Framework

1.2.1 IMBP; background. The Theory of Reasoned Action (TRA; Fishbein & Ajzen, 1975) was devised to explain how specified behaviours under volitional control are products of beliefs, attitudes and intentions to perform that behaviour (Hankins, French, & Horne, 2000). Key assumption of the model is that people will perform a behaviour when they have actually formed the intention to perform that specific behaviour (Kreijns, Vermeulen, Kirschner, Buuren, & Acker, 2013b; Yzer, Cappella, fishbein, Hornik, Sayeed, & Ahern, 2004). The Theory of Planned Behaviour (TPB; Ajzen, 1985) posited that behaviour is not only anteceded by intentions, but by a person’s degree of control over the behaviour as well. This claim was operationalised by adding the measure of perceived behavioural control (PBC) as a predictor of intention (Tornikoski & Maalouf, 2019).

One of the latest developments in the prediction of behaviour with the help of the reasoned action approach (RAA; Yzer, 2012) is the Integrative Model of Behaviour Prediction (IMBP; Fishbein & Ajzen, 2011). Based on the Theory of Reasoned Action and the Theory of Planned Behaviour, IMBP was first developed and used mostly in healthcare contexts (Admiraal et al., 2013). At present, IMBP is a well-established powerful model widely used in disciplines such as education, communication and social psychology (Vaala, 2014; Wang, 2013).

1.2.2 IMBP; its properties. IMBP lends itself for the purpose of determining the factors obstructing (or facilitating) the pedagogical use of Chromebooks at the research school. On the right side in Figure 1 we see the outcome variable real behaviour. In the present research that would be ‘pedagogical use of Chromebooks in the classroom in the following month’; as opposed to the peripheral use of the Chromebook. What is to be understood under ‘the following month’ will be dealt with in the section ‘Objectives, Research questions and Hypotheses’.

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**Behaviour intention** can be seen affecting real behaviour directly. IMBP posits that an individual (i.e., the teacher in present study) will perform actual behaviour (i.e., using Chromebooks pedagogically) only if the intention to perform that behaviour has been formed (Chen, 2011; Kreijns et al., 2013a; Vermeulen, Kreijns, Van Buuren, & Van Acker, 2017). In this specific study, behavioural intention would represent the strength of the teachers’ disposition to pedagogically use Chromebooks in the near future.

According to IMBP, the three direct antecedents of behavioural intention are attitude towards the behaviour, subjective norm and self-efficacy. These three variables comprise the explanatory core of the model (Admiraal et al., 2013). In turn, “Attitudes, perceived norms and self-efficacy are all, themselves, functions of underlying beliefs about the outcomes of performing the behaviour in question” (Fishbein, 2000, p. 275).

All of the proximal or dispositional variables influence behavioural intention directly and indirectly (Tikir & Lehmann, 2011; Van Acker et al., 2013). On the left side of the model, the distal (or background/external) variables affecting these proximal variables are depicted. They are adopted in the model since they transmit their effect on behaviour intention and/or actual behaviour through the proximal variables (Vermeulen et al., 2017).

Kreijns and colleagues proposed the adoption of IMBP for explaining teachers’ willingness to use ICT (2013b). Compared to its most-used predecessors, the three TAM versions (Technology Acceptance Model), Kreijns and colleagues found IMBP to have more explanatory power. Whereas TAM’s primary focus is on the technological aspect (perceived usefulness and perceived ease of use), IMBP takes into account psychological and environmental variables. Using a multidimensional approach is crucial when trying to explain teachers’ reluctance/willingness to implement ICT (Tearle, 2003; Tondeur et al., 2008b).

The model both accomplishes a high level of explanation with a relatively low number of variables and at the same time allows for an exact identification of the level which is obstructing ICT
implementation (Kreijns et al., 2013b). The fact that it permits discrimination between specific populations (Kreijns et al., 2013b) enables the researcher to pinpoint whether the intervention should be carried out at micro, meso or macro level (Valcke, 2007).

IMBP can be regarded as a suitable framework for the study of educational ICT usage (Van Acker et al., 2013). Previous research into teachers’ intention to use Digital Learning Materials with IMBP proved that a rather large proportion of 68% of variance could be explained by the variables in the model (Kreijns et al., 2013a). In a study into teacher trainers’ use of software and hardware technology in their educational practice the IMBP model was used and found to be suitable for the purpose of exposing factors preventing teachers from integrating ICT in their pedagogical practices (Admiraal et al., 2013).

In the following paragraphs all of the variables of the model will be explicated in more detail and translated into a Chromebook-use context leading up to an adapted model ready for present study into teachers’ willingness to use Chromebooks pedagogically.

1.2.3 IMBP; proximal variables for study into pedagogical use of the Chromebook. A strong relationship between teachers’ attitude (ATT) and technology use has been reported in a large number of studies (Wang, Tigelaar, & Admiraal, 2019). In fact, attitude seems to be the most important predictor of intention to use technology (Teo & van Schaik, 2012). Attitude is the teacher’s overall favourable or unfavourable evaluation of the behaviour in question (Ajzen, 2006; Vermeulen, Van Acker, Kreijns, & van Buuren, 2014). It consists of an instrumental and an experiential element. Respectively, an evaluation of what is achieved by the behaviour and what it feels like to perform the behaviour.

Subjective norm (SN) is the teacher’s perception of the extent of the combined psychological pressure put on him by all significant others to perform a certain behaviour (Ajzen, 1991; Teo et al., 2008; Vermeulen et al., 2014), e.g., ‘the schoolboard wants me to use Chromebooks during my classes’. In literature, the four main contributors of exerted social pressure on teachers are his colleagues, management, pupils and pupils’ parents (MacFarlane & Woolfson, 2013; Stoeber & Rennert, 2008; Yan & Sin, 2014).

In this study, the term self-efficacy, (SE) as coined by Bandura (1986), refers to teachers’ convictions about their capabilities to successfully use Chromebooks pedagogically and overcome all the troubles and barriers they associate with the pedagogical implementation of the object (Kreijns et al., 2013a; Kreijns, Vermeulen, Van Acker, & van Buuren, 2014). In her literary review Mumtaz (2000) explains that for teachers to be willing to implement ICT-learning, a positive stance towards ICT-learning does not suffice. A positive attitude needs to go hand in hand with a sense of confidence (Kreijns et al., 2013a). In order to measure this construct, the items should reflect teachers’ confidence of using the Chromebook pedagogically (Francis et al., 2004).
These three proximal variables in turn are affected by belief variables, outcome beliefs, normative beliefs, control beliefs and their three respective composite measures (Figure 1).

1.2.4 IMBP; distal variables. As opposed to the proximal variables which are internal to the model, distal variables or background variables do not always affect intention to perform certain behaviours (Fishbein & Ajzen, 2010) and when they do, they do so indirectly by mediation (Kreijns, Vermeulen, Buuren, & Acker, 2017; Kreijns et al., 2013b; Vermeulen et al., 2014). These distal variables allow the researcher to distinguish between populations (Yzer et al., 2004). A similar degree of intention to use Chromebooks pedagogically does not necessarily have to be the result of identical cumulative effects. For present research for example, younger teachers might be more susceptible to social pressure than their older colleagues while at the same time these older teachers feel more self-efficacious towards experimenting with the pedagogical use of Chromebooks because of their stronger sense of competence.

Kreijns et al (2013b) found that in order to be able to accurately pinpoint potential obstacles in the advancement of ICT use in teachers’ pedagogical practices “there is a need to distinguish between the various levels at which variables may be operating” (p. 7). In present study we follow up on his suggestion and use Valcke’s description of the three aggregation-levels that constitute a teachers’ work-related context (Valcke, 2007). These levels: micro, meso and macro respectively embody a teacher’s individual class level context, school- and organizational level context and his political, educational policy-formulating context. Most of the distal variables in present study are taken from the adopted IMBP model for educational usage as proposed by Kreijns et al. (2013b) (see Figure 2). In order to be able to gear forthcoming interventions at the right levels and spheres, the influence of several distal variables on self-efficacy, subjective norm and attitude will be tested. In the following paragraph the distal variables for present study will be explicated in more detail.
1.2.5 distal variables for present study, demographics and other individual difference variables. Demographic variables such as age, years of experience or gender usually do not account for much variance (Gil-Flores, Rodríguez-Santero, & Torres-Gordillo, 2017; Singh, Paul, Dr Heather Skinner, & Hardaker, 2014). Nevertheless, in this research four demographic variables will be counted in for the purpose of creating subgroups and for including covariates in the regression analyses. The following four demographic variables are included in the research: subject taught and age. Teaching a specific subject (SUB) and working closely with your direct subject colleagues on a day-to-day basis result in subject-subcultures within schools (John, 2006). STEM subject teachers for example, are inclined to have greater affinity with technology than language teachers working in their book-dominated culture (Ellis & Loveless, 2013; John & La Velle, 2004). It is hypothesised that teaching a particular subject with its own subject pedagogy influences the proximal variables.

The variable age (AGE) is included in the (demographic) distal variables. Both innovativeness and technology-adoption negatively relate to age (Maurer, 2001; Schubert & Andersson, 2014). This decline in innovativeness is often ascribed to a fall in cognitive performance with age, a lower risk tolerance among older people and the fact that the younger generations tend to have more recent technological skills (Schubert et al., 2014). In ICT-adoption studies, age frequently proved to affect computer use (Tondeur et al., 2008b). Therefore, we hypothesise a relation between this demographic variable and the proximal variables.

Individual difference variables that will be tested are instructional level and department.
At the research school, pupils of similar instructional level are placed in homogenous groups. Pupils from preparatory secondary vocational education (VMBO) level do not necessarily benefit from the same didactical and pedagogical (ICT) approaches as pupils at university preparatory and senior general secondary education (HAVO/VWO) level (Hamstra & Van den Ende, 2006; Onderwijsraad, 2011; Wartenbergh-Cas, Bendig-Jacobs, Kurver, Essen, & Braam, 2018). The individual difference variable instructional level (INL) is included to measure variance between teachers’ approaches at different instructional levels with respect to the pedagogical use of Chromebooks. One of the factors setting VMBO pupils apart from HAVO/VWO pupils is that they cope with motivational issues more often than their HAVO/VWO peers (Hamstra et al., 2006; Peetsma & Veen, 2008). Exchanging traditional teaching methods for teaching with the help of ICT is known to boost motivation among pupils (Janssen, Louws, Saab, Lockhorst, & Kester, 2019; Van der Neut, Teurlings, & Kools, 2005). Therefore, it is hypothesised that teachers teaching at VMBO level show more intention to use Chromebooks pedagogically.

The second individual difference variable department (DEP) is a meso level variable. Teachers at the research school work at one of four departments with their own specific cultures and management. It is included in this study with a view to creating subgroups for the purpose of establishing truth in the hypothesised relation between innovative culture (IC) and trust in management (TRM) on the one hand and the three proximal variables on the other (see distal variables at meso level).

1.2.6 distal variables for present study at micro level. “When considering ways to change teachers' practice, particularly their uses of technology, the literature reviewed here suggests that it is impossible to overestimate the influence of teachers' beliefs” (Ertmer, 2005, p. 36). Teachers’ pedagogical convictions (PC) play a crucial role in their decisions as to whether and how (i.e., pedagogically or peripherally) they wish to integrate ICT in their classroom practices (Teo et al., 2017; Tondeur, Van Braak, Ertmer, & Ottenbreit-Leftwich, 2017). As stated before, Chromebooks enable teachers to (re-)organise their curricula and classroom practice into a more constructivist approach. A constructivist approach to teaching generally correlates positively with pedagogical use of ICT (Ertmer, 2005; Kester, Cviko, Janssen, de Jonge, Louws, Nouwens, Paas, van der Ven, Admiraal, & Post, 2018; Li, Garza, Keicher, & Popov, 2019; Overbay, Patterson, Vasu, & Grable, 2010; Tondeur et al., 2017). Therefore, we include the distal variable pedagogical conviction, hypothesising a positive relationship between constructivist convictions and willingness to use Chromebooks pedagogically.

Research among secondary school teachers suggests that in comparison to other professional groups, secondary teachers experience a high workload (Central Bureau for Statistics, 2020). In literature, workload is often mentioned as the major barrier to adopting new teaching practices (Smith, 2012). Giving space or time for experimenting with innovations increases the chances of success (Seels, Campbell, & Talsma, 2003). Dutch secondary school teachers teach a high number of classes,
leaving little time for other activities (Onderwijsinspectie, 2019). Teachers in the Netherlands do not seem to have enough time left for innovation and to keep up with latest educational (ICT) developments (Algemene Onderwijsbond, 2017). Therefore, we hypothesise a negative relation between high workload and pedagogical use of the Chromebook.

Linked with workload, in their meta-analysis of scientific literature ($N=$14,410) García-Carmona, Marín, and Aguayo (2018) found that secondary school teachers, compared to other occupational groups, present the highest level of sick leave and burnout-syndrome, a response to chronic work stress consisting of three components: emotional exhaustion, depersonalisation and low personal accomplishment (Maslach & Jackson, 1981b). Correspondingly, El Helou, Nabhani, and Bahous (2016) found that teachers run an above average risk of falling victim to burnout-syndrome. Psychological consequences of burnout-syndrome include reluctance (attitude), isolation (subjective norm) and a sense of incompetence (self-efficacy) (García-Carmona et al., 2018). Research among Dutch secondary teachers suggests that burnout-syndrome and willingness towards educational innovation correlate with each other negatively (Evers, Brouwers, & Tomic, 2002; Hakanen, Bakker, & Schaufeli, 2006). Consequently, we hypothesise a correlation between teachers’ level of burnout (BO) and their intention to invest effort in the pedagogical use of their Chromebooks.

While in public educational policy the role of emotions in teaching is often downplayed (Klassen, Perry, & Frenzel, 2012; O’Connor, 2008), teachers themselves attribute the psychological aspect of teaching a pivotal role in their intrinsic motivation to teach. Teachers believe that in order to be good teachers they have to be emotionally involved and connected with their pupils. (Beauchamp & Thomas, 2009; Biesta, Priestley, & Robinson, 2015; Hargreaves, 1998; O’Connor, 2008). Establishing good relationships requires teachers to aim for emotional connectedness (Hargreaves, 1998; O’Connor, 2008). One of the dimensions of connection is the experience of mutual empathy. To be connected to another human being, each person must be (literally and figuratively) visible or seen by the other (Cordes & Miller, 2000; Rodgers & Raider-Roth, 2006). Teachers feel that working with computers will deprive children of the emotional connection they need for growing up and developing (Reynolds, Treharne, & Tripp, 2003). In present research we hypothesise that teachers believe this emotional connectedness (EC) between a teacher and his pupils will be negatively affected by Chromebook use because it replaces the interaction taking place during teacher-centred instruction-time.

Before using technology in their lesson practice, teachers are supposed to have sufficient experience in teaching (Sahin et al., 2016). A teacher with a high competence level by way of traditional teaching techniques is more likely to look for new approaches and integrate technology in teaching (Peralta & Costata, 2007; Sahin et al., 2016). Professional competence is linked with an individual’s ability to deal intelligently with novel situations. (Elliott, 1991; Leat, 2006). Teachers who feel competent tend to be more open to new ideas (Tsigitis, Grammatikopoulos, & Koustelios, 2007). Therefore, we hypothesise a relation between pedagogical use of Chromebooks and general
feelings of *competence* (COM) in teaching. On the other hand, it has to be noted that these competent teachers might not feel a need to adopt educational technology in their lessons because they feel that their classroom practice is good enough as it is already (Tondeur et al., 2008a).

**1.2.7 distal variables for present study at meso level.** Teachers mostly work within a school organisation characterised by a certain extent of hierarchy (Connolly, James, & Fertig, 2017; Tschannen-Moran, 2009). Schools have had to implement numerous educational innovations during the last three decades (Hendrikkx, 2019; Tschannen-Moran, 2009). As for school management and its administration, they might easily have resolved to bureaucratisation and formalism in order to realise all these educational changes (Putters, 2015). Teachers’ experience of bureaucracy is associated with (dis)trust-issues with school management and school administration (Kuiper, Dikkers, Ledoux, Van den Berg, & Bos, 2015; Willink, 2019). Research suggests that distrust towards management negatively correlates with willingness to take risks and to innovate (Afsar & Masood, 2018; Min & Ko, 2016; Schellenbach-Zell & Grisel, 2011). Before teachers find themselves prepared to embark upon educational innovation, they need to be able to trust their management and superiors (Biesta et al., 2015; Freire & Fernandes, 2016; Peters, 2015). Additionally, Pettersson (2018) suggests in her literature review that digital teaching skills should be regarded not as something that is the sole responsibility of teachers, but as a phenomenon benefiting from a manifold of school organisational factors. Therefore, we include the meso variable; *Trust in management* (TRM).

In this research we hypothesise a relation between the meso variable of *innovative culture* (IC) and the proximal variables. An innovative culture is one that supports the creation and implementation of new ideas (Yusop, 2016). Chances of successful ICT integration rise significantly if there is a focus on developing a culture of innovation and a shared vision (Albion, Tondeur, Forkosh-Baruch, & Peeraer, 2015). A positive relation has been found between schools open to innovation and their use of computers as learning tools (i.e., pedagogical use) (Tondeur et al., 2008b; Vanderlinde, Aesaert, & van Braak, 2014). Therefore, the variable innovative culture is included in the meso variables.

**1.2.8 distal variables for present study at macro level.** Teachers, like nurses, doctors, the army and the police are public servants. Under the government’s jurisdiction they offer the public service of education to the people (Demmke, 2005). Valké (2007) provides this aspect of a teachers’ occupational context with the label *macro level*. Public officials, such as teachers, sometimes appear to have difficulties with the policies they have to implement (Demmke, 2005; Hendrikkx, 2019). In order to be able to identify with the governments’ educational policymakers, teachers need to appreciate their consistency, capability and reliability. When teachers do not seem to be able to do so, they might fall subject to *policy alienation* (POL) (Tummers, 2012b). “Policy Alienation is defined as a general cognitive state of psychological disconnection from the policy program being implemented”
(Tummers, Bekkers, & Steijn, 2009, p. 686). Frequently changing policies increases policy alienation (Tummers et al., 2009).

In the Dutch educational context, a number of past innovational policies partly failed; examples include: renewing senior high school phase, the arithmetic test, Education 2032, the societal apprenticeship and inclusive education. In 2008 the Dijsselbloem parliamentary committee presented their evaluative report of educational reforms of the 1990s (Tijd voor Onderwijs; Commissie Dijsselbloem, 2008). One of their recommendations was that the government should abstain from interfering with the how and should primarily focus on the what of the curriculum, granting teachers more professional freedom (Commissie Dijsselbloem, 2008; Onderwijsraad, 2014; van Engen, Tummers, Bekkers, & Steijn, 2015). The most recent Dutch development in educational policy, Curriculum.nu, for example, only describes the what and refrains from prescribing the how of their proposed curriculum. However, a poll among Dutch teachers (N = 2283) by the largest educational trade union (AOB) stated that the larger part of the respondents did not put much faith in a successful implementation of the proposed curriculum (Jansma, 2019).

Teachers who feel that they have been confronted with (partly) failed new educational policies in former stages of their careers may have developed a negative stance towards educational policies in general (van Engen et al., 2015). This negative policy accumulation among teachers influences openness and willingness towards change and innovation in subsequent stages (Bordia, Restubog, Jimmieson, & Irmer, 2011; van Engen et al., 2015). Therefore, the effect of the variable policy alienation (PA) on the proximal variables will be tested.

Kreijns et al (2017) found that teachers who perceived success using DLMs (digital learning materials) are more willing to use them in the near future. Quite recently during the COVID-19 pandemic Dutch secondary teachers were made to experience teaching their lessons online (Flores, 2020). Thus, the teachers had no choice but to professionalise in terms of digitalisation (van der Spoel, Noroozi, Schuurink, & van Ginkel, 2020). For this study we include the variable effect of COVID-19 pandemic (LE). We hypothesise an effect of the experience of having been forced to teach online during the pandemic, on all of the three proximal variables and on intention.

### 1.2.9 TACT principles

While performing research under the assumption of behavioural intention to be a proxy for actual behaviour the importance of providing specific definitions of the behaviour in question is of paramount importance (Lee, Cerreto, & Lee, 2010). It is, therefore, essential to adhere to the TACT principle. The description of the behaviour under investigation should be described as detailed as possible and contain the following four elements: Target, Action, Context and Time (Fishbein et al., 2011). The question whether the respondent intends to use his Chromebook pedagogically any time soon would generate an intention with a weaker predictive power towards actual behaviour than a question with the mentioning of a specific moment in time. The context of the behaviour is the classroom context. Though the action, use of Chromebook, is quite obvious, the
target of the behaviour is somewhat hidden within the adjective pedagogical. Consequently, teachers are informed in depth about the characteristics of this particular behaviour in the introduction of the questionnaire. Both in the introduction and in the questionnaire the teachers will be given a description of the two different approaches to ICT use in the classroom. An example question of measuring the variable *behavioural intention* for present research would read as follows: ‘Do you intend to use the Chromebook pedagogically in your classroom practice within the following month?’ In the questionnaire, the text accompanying this question describes the difference between peripheral use and pedagogical use of Chromebooks.

*Note.* Because of the first and second lockdown due to Covid-19 and the subsequent changes to online teaching we had to postpone conducting the questionnaire twice. When it was announced that schools would (partly) reopen, we decided to change the phrasing ‘with the following month’ into ‘soon’. In the questionnaire, soon was then defined as ‘three months after reopening the schools’ (see appendix C).

### 1.3 Objectives, Research questions and Hypotheses

The objective of present research is to expose the factors causing potential reluctance or willingness among teachers at the research school to pedagogically use their Chromebooks. For this purpose, the following research question and three subquestions have been put together.

RQ: To what extent do the proximal and distal variables predict teachers’ intent to use their Chromebooks pedagogically in their classroom practice within the following month?¹

Subquestion 1: Do the proximal variables attitude, subjective norm and self-efficacy affect teachers’ intention to pedagogically integrate Chromebooks in their classroom practice within the following month?

Hypothesis 1. The proximal variables attitude, subjective norm and self-efficacy differentially affect teachers’ intent to pedagogically integrate Chromebooks in their classroom practice within the following month.

Subquestion 2: Do the distal variables at micro, meso, and macro level affect teachers’ intent to pedagogically integrate Chromebooks in their classroom practice in their lesson practice within the following month?

¹ In the questionnaire we changed ‘the following month’ into ‘soon’.
Hypothesis 2. Distal variables at micro, meso, and macro level influence teachers’ intent to pedagogically integrate Chromebooks in their classroom practice within the following month.

Subquestion 3: Do the distal variables at micro, meso and macro level indirectly affect teachers’ intent to pedagogically integrate Chromebooks in their classroom practice within the following month?

Hypothesis 3. Distal variable at micro, meso and macro level indirectly influence teachers’ intent to pedagogically integrate Chromebooks in their classroom practice within the following month.

2. Method

2.1 Design

The three hypotheses were tested by means of a survey. For this study the convenience sampling strategy was used, which is a form of nonprobability sampling (Creswell, 2014). In present research individuals from the population working at the research school were available and we expected many of them to be willing to participate.

2.2 Participants

In the present study 354 teachers, employed at a comprehensive school for secondary education were sent an email in which they were asked to participate in a survey. The research school consists of four departments situated in two towns and two cities in the middle of the Netherlands.

The participants have either been educated at academic level or at college level. All of the teachers have had ample time to get used to working with their Chromebooks. Those who had to change to Winbooks did not experience major problems or differences. After having interviewed four teachers, they indicated that most of their colleagues continue working with the Google applications because of the research school’s subscription to Google’s G Suite for Education. They do not experience that much of a difference with respect to use of the device within the classroom.

The two inclusion criteria for participation were: ownership of a Chrome- or Winbook and being employed at the school as a teacher. Classroom assistants and management were excluded. The questionnaire was completed by 238 participants.

2.3 Measures

The survey was conducted digitally by using Limesurvey. The questionnaire was composed with the help of two manuals explaining how to construct questionnaires following the Theory of Planned Behaviour (Ajzen, 2006; Francis et al., 2004). With a view to unambiguously reveal teacher intentions, the TACT principle (i.e., specifying target, action, context and timing of the behaviour) was adhered to throughout the whole section of proximal-variable items. The questions were phrased in
Dutch. The questionnaire has been enclosed in Appendix B and C. Before actually filling in the questionnaire, participants were informed in depth about the characteristics of pedagogical use and peripheral use of Chromebooks and were advised to reread the information in order to fill in the questionnaire as accurately as possible. In order to prevent the participants from having to scroll back to the introduction page of the questionnaire for reference, participants were shown the two definitions of Chromebook use (peripheral and didactic) while filling in the BI, ATT, SN and SE items.

Behavioural intention (BI, three items) was measured on a seven-point bipolar Likert scale. (For example, “It is my intention to use the Chromebook pedagogically within the following month;” 1 = totally agree, 7 = totally disagree) For measuring the experiential component of the proximal variable attitude (ATT; five items) we used bipolar adjectives such as enjoyable - unenjoyable and pleasant - unpleasant. For the instrumental component, opposites such as valuable – worthless were used. The items measuring subjective norm (SN; four bipolar items) refer to the opinions of important others. Three items ask the participants for their perceptions of what others think they ought to do and one item is related to the participant’s belief about what important others (i.e., colleagues) do themselves. Participants had to decide to what extent they thought a statement is completely true or completely false. One of the items for self-efficacy (SE; two bipolar items) reflect the teachers’ perception of his autonomy in using the Chromebook pedagogically and with the other item the participant had to assess how difficult he feels it is to perform the behaviour. (For example, “For me, using Chromebooks pedagogically is;” 1 = easy, 7 = difficult)

Most of the items for measuring the background variables were based on already existing scales and measurement instruments. For the background items we used seven-point bipolar Likert bipolar.

The four items for the measurement of pedagogical conviction (PC) were taken from the Teaching and Learning Conceptions Questionnaire. (TLCQ; α = .84) (Chan & Elliott, 2004). (For example, “Different objectives and expectations in learning should be applied to accommodate individual differences among students;” 1 = totally disagree, 7 = totally agree) The higher the score, the more the teachers believe in a socio-constructivist approach to teaching.

The four items measuring workload were derived from the findings of extensive workload-research among teachers on the amount of time they spend on what activities (Algemene Onderwijsbond, 2017). Four of the five main conclusions of that research were that: teachers structurally have to work overtime, they have to work during their holidays, they hardly have any breaks during their workdays at school and think they have too little time for innovation and professionalisation activities. The focus of the workload items (WL) in the questionnaire were on the time aspect of workload and not on the psychological aspect of workload. (For example, “I have little time left for innovation and professionalization activities;” 1 = totally true for me, 7 = totally untrue for me) We chose for this approach to secure a clear distinction between the workload variable and the burnout variable.
The three items measuring level of burn out (BO), with subscales emotional exhaustion, personal accomplishment, depersonalization, were translated from the Maslach burnout inventory for educators survey (MBI-ES, α for emotional exhaustion was .88; see Schaufeli, Daamen, & Van Mierlo, 1994). (For example, “I feel burnt out by my work;” 1 = always, 7 = never)

The three items measuring teachers’ beliefs that in order to be good teachers they need to strive for emotional connectedness (EC) were based on the Goal Orientations for Teaching (GOT) scale by Butler (2007). In 2012 she expanded the model by including relational goals for teaching. Items for present study were taken from this extension (Butler, 2012). (For example, “As a teacher, showing that I care for my pupils is a priority for me;” 1 = totally disagree, 7 = totally agree)

Each of the three items measuring teacher competence (COM) was taken from one of the following three dimensions of general teacher efficacy: classroom management, instructional strategies and efficacy in student engagement. They were taken from the Ohio state teacher self-efficacy scale (OSTES, α = 0.94) by Tschannen-Moran and Hoy (2001). (For example, “I am able to get all the children to follow my classroom rules;” 1 = totally agree, 7 = totally disagree)

For this study we used Dobni’s (2008) generalised innovation culture construct (IC) for organisations (α = 0.81). In the items for present study the word organisation was replaced by the word department. The following four factors of the innovation-culture construct were measured: Organisational learning, innovation propensity and employee creativity and empowerment. (For example, “Our department uses my creativity to its benefit;” 1 = always, 7 = never)

The three items for the measurement of the meso variable trust in management (TRM) for present study were taken and adapted from Freire’s (2010) operationalisation of the construct ‘Trust in the team leader’ (α = 0.92), with a focus on the facets of professional trust, manager integrity and manager competence. (For example, “I have absolute faith in my manager’s leadership skills;” 1 = totally agree, 7 = totally disagree)

The five items that measure the extent of policy alienation (PA) among the participants were taken and adapted from the policy alienation scale by Tummers (Policy Alienation Scale; Tummers, 2012a). For every one of the five subdimensions of the construct one item was taken and translated to the educational context. (Five subdimensions of the policy alienation scale are: strategic powerlessness, tactical powerlessness, operational powerlessness, societal meaningfulness and client meaningfulness; average Cronbach’s α for the subdimension of the scales was above .85) (For example, “Carrying out and implementing the government’s educational policy, in the long run, is better for my pupils;” 1 = totally agree, 7 = totally disagree)

The four items measuring attitudinal and behavioural changes among teachers towards pedagogical use of the Chromebook due to the experience of having to provide online education during the two recent lockdowns referred to a hypothesised teachers’ change in attitude, knowledge and self-efficacy and a hypothesised increase in actual present pedagogical usage of the Chromebook. (For example, “Having had to opt for online teaching during the pandemic has resulted in an increase
of the pedagogical use of the Chromebook in my present-day teaching practice;” 1 = totally agree, 7 = totally disagree)

The aspect setting this variable apart from the other variables is that it measures a change whereas the other variables measure a state. It was included last minute, simply because it would seem inopportune not to when conducting research into teachers’ ICT beliefs and attitudes. After conducting a literature search in the field of pedagogical adoption of ICT we found that the LE variable resembled perceived success most and should be grouped among the micro variables. Kreijns et al. (2017) found that perceived success during use of digital learning materials directly and indirectly affected teachers’ intention to integrate ICT in their lesson practice.

Figure 3 illustrates how the IMBP model was adapted for this research. With a view to feasibility of present research, the effect of the two moderators (in light-grey) were not tested. Besides, at the research school teachers did not experience any autonomy issues (PBC) towards the behaviour under research and ICT infrastructure could be qualified as excellent.

![Diagram of IMBP model](image)

*Figure 3. Model of IMBP for testing the behavioral intention of pedagogical use of the Chromebook.*

be too much of a challenge for participants who quickly want to go through the survey?’ A few changes in wording and phrasing were made and variation in negative and positive endpoints of the scales was not maintained because the testers thought it too strenuous. After having processed all of
their feedback into a second version the test-readers were asked to determine whether they thought corrections and changes could be regarded as improvements.

In the last week of February, all teachers at the research school were sent an email with the link to the online questionnaire. The sixteen team managers were also asked to promote filling in the questionnaire among their teams. Fourteen days later, after the spring break, all teachers were sent a reminder. On March 9th one last reminder was sent and the deadline given.

In the introduction, participants (see: Appendix A) were informed about the two purposes of the study (masterthesis and presentation to the Board of Directors). The information section then continued with a detailed description of the behaviour under research. The difference between peripheral and pedagogical use was described and examples of both were given. This enabled the participants to distinguish between the two and fill out the questionnaire more accurately.

The introduction continued with information about respondents’ rights and guarantee of anonymity and their rights for abandoning the questionnaire or withdrawing their response without having to state reasons. No rewards were offered to participants. They were offered right of access to the final product of the research. Communication between the researcher and the respondents was to take place via an OU provided email-address.

All completed questionnaires were then gathered and exported to SPSS for further analysis. During the whole process data was secured by several passwords. One for logging in on the computer and one for Limesurvey. The hard drive folder containing SPSS output, syntax and data was encrypted.

2.5 Analyses

For statistical analyses SPSS version 26 and the HAYES PROCESS version 3.5 plugin were used. Throughout the analyses, significance levels were set at .05. Effect sizes were reported in Pearson’s r. To begin with, all returned surveys were checked for outliers (unusual patterns or responses and any other abnormalities). Before establishing internal consistency of the predictor variables, we recoded the negatively worded items BO2, PA4 and PA5 (Appendix C: in bold print). Then descriptives of all of the distal and proximal variables were calculated and displayed (i.e., n, number of items, the scoring range, M, SD and Cronbach’s α). Skewness and kurtosis of the data were calculated and displayed.

This was followed by a descriptive analysis of the individual and demographical distribution of the sample (i.e., subject group (SUB), age group (AGE), Win- or Chromebook (WC), department (DEP) and instructional level (IL)). The individual and demographical variables SUB and AGE were computed into categorical variables with respectively 5 and 3 categories. As we were focusing on pedagogical use of the Chromebook, the logic underlying the 5 categories for SUB was that of grouping those subjects that shared the most pedagogical analogy in their teaching practices. After
having consulted the biology department at the research school, the subject Biology was categorised as one of the social sciences since at the research school, its pedagogy had the most semblances with that of this specific subject group. Subjects that are taught practically with relatively small theoretical components such as PE, woodworking and metalworking were labelled practical subjects. The decision to categorise the variable AGE into 3 groups was based on Hargreaves’ (2005) classification of teachers into early-, mid- and late-career teachers with their own specific approach to educational reforms and innovations.

As suggested by Francis et al. (2004) we divided the complete sample into two subsamples of intenders and non-intenders by dichotomising behavioural intention using a median split. In the sample distribution table of the five subgroups, we reported the figures and percentages of intenders and non-intenders per subsample. For answering subquestion 2 we pre-analysed our data by trying to establish statistical significance of the differences in BI means of the separate subsamples. We ran two t-tests for WC (Winbook or Chromebook) and IL (instructional level). For DEP, SUB and AGE we performed multivariate analyses (ANOVA).

Then correlational analyses were carried out for all distal and proximal variables. They were carried out for both the whole sample and for the two separate categories of intenders and non-intenders. Significance levels of the correlations were reported. Non-significant correlations were left out. We tested the (significant) correlations we retrieved from the separate samples against each other for establishing statistically significant differences using Z-scores. For this procedure we used one of the online calculation tools by Psychometrica (Lenhard & Lenhard, 2014). It should be noted that due to small sample size, comparison of intenders and non-intender subsample correlations (respectively; n = 109, n = 129) are somewhat unreliable. In order to generalise retrieved data to the target population, value sample sizes should approach 250 for stable estimates (Schoenbrodt & Perugini, 2013) suggesting that to some extent, whole sample (N =238) correlational values would in fact converge to average population values of Dutch secondary teachers (Teaching classes with pupils in possession of either a Chromebook or a Winbook).

The three hypotheses were then tested using multiple regression analyses. Regarding Hypothesis 1, BI was regressed on the proximal variables. Secondly, we regressed intention on the distal variables. We included the subgroups which had returned significant mean differences in BI mean scores (i.e., DEP and SUB). We wanted to establish whether being employed at a department would predict intention. We assumed that this information, in combination with the distal means per subgroup would help us to answer our subquestions more accurately. Finally, the proximal variables ATT, SN and SE were regressed on the distal variables by means of hierarchical multiple regression. Distal variables were entered in three blocks; micro variables were included in the first block, meso in the second and macro in the last.

For determining which proximal and distal variables would significantly increase the odds of teachers classifying as intenders, we ran a logistic regression analysis in which we entered three
consecutive variable blocks (i.e., demographical/individual, distal and proximal variables). Before running the four multiple regression analyses, data were checked for normality, homoscedasticity and multicollinearity. VIF-values and tolerance levels were checked. Even though all scores in present research ranged from 1-7; with a view to replication, standardised beta-values were reported.

In the final stage the indirect effects of the distal variables through SE, SN and ATT on BI were tested by running a mediation analysis applying the statistical procedure first described by Baron and Kenny (1986). For carrying out the mediation analysis we used the SPSS plugin PROCESS, version 3.5 (Hayes, 2012). Completely standardised regression coefficients were reported. With a view to facilitating use of our data in meta-analyses (Miočević, O’Rourke, MacKinnon, & Brown, 2018; Preacher & Kelley, 2011), confidence intervals were calculated by means of bootstrapping. Significant mediation effects were reported including their effect sizes.
3. Results

Of a total of 354 participants, 238 completed their questionnaires establishing a 67.2% response rate. Because of Wi-Fi issues there was a high number (54) of uncompleted questionnaires. These were discarded. Two participants generated two outlying values on two separate distal variables, but didn’t do so on any other variables. No outliers were found in the responses to the proximal variables; therefore, all responses were deemed suitable for answering the research questions. As suggested by Francis et al. (2004), we used the median split to divide the sample into intenders and non-intenders based on the responses to the BI items. Of the 238 participants, 109 (45.8%) were categorised as intenders and 129 (54.2%) as non-intenders.

Then normality of the data was looked into. All Normal Q-Q plots showed linear relationships and no major skewness or kurtosis issues were found. Cronbach’s α’s were then computed (see Table 1). The four scales of the reasoned action model were tested first (i.e., ATT, SN, SE, and BI). Cronbach’s α for the variable Self Efficacy was very low (α = 0.003). It consisted of two items: one measuring autonomy and the other capacity. At the research school, teachers do not experience any autonomy issues with respect to pedagogical use of their Chromebooks; as matter of fact, the school’s educational vision warrants pedagogical use of the Chromebooks. Their self-efficacious beliefs with respect to pedagogical use and feelings of autonomy in doing so are therefore two unrelated constructs. For further analysis of the proximal variable SE, we used the item measuring self-reported capacity.

With regard to the scales of the distal variables, the items measuring level of burnout (BO) seemed to be measuring more than just one dimension. Removing an item would increase the reliability with a mere .04. Therefore, we decided to use one item (BO1, I feel burnt out by my work; never – always) in further statistical analyses. So, all scales but SE and BO, were classified as sufficiently internally consistent for further use in our statistical analyses.

After having studied reliability and normality of the data, the mean scores for the four RAA variables were examined (See Table 1). BI average was slightly above 4 indicating that participants intended to use Chromebooks pedagogically in the near future (i.e., ‘soon’) to a small extent. It was the variable with the highest standard deviation implying there were sizable differences in intention among participants to perform the behaviour under research.

ATT and SE average scores were moderately positive. The SN score was the only score below the scale midpoint, suggesting that teachers did not experience much social pressure to use their Chromebooks pedagogically. Teachers felt the least pressure from their pupils (M = 3.37, SD = 1.60) and the most from management and school administration (M = 4.08, SD = 1.76).

The distal variables were studied and the following observations were made. PC average attested to a preference for a constructivist pedagogy among participants. Workload was experienced
as being too high to only a small degree. Participants did not perceive the additional workload that comes with teaching (administration/interaction with parents) as high \((M = 3.84, SD = 1.60)\). At the same time, they thought that they had to work too much on a structural basis \((M = 4.74, SD = 1.62)\) and had little time for schooling and innovation \((M = 4.25, SD = 1.64)\). On average participants seemed to have no major trust issues with their management. Participants strongly felt that in order to be able to be good teachers they needed to be emotionally connected (EC) to their pupils. The highest mean for EC \((M = 5.93, SD = 1.06)\) was recorded for the item: ‘Showing that I care for my pupils is an immediate priority for me’, suggesting that emotional connectedness fulfilled a pivotal role in their teaching practices. Teachers reported high levels of Competence (COM). On a scale of 1-7, they realised a relatively high mean for the item: ‘I am quite capable of maintaining classroom order’ \((M = 6.10, SD = 0.74)\).

**Table 1**

*Internal Consistency and Descriptive Statistics for All Variables. (All scales range from 1-7)*

<table>
<thead>
<tr>
<th>Scale</th>
<th>Code</th>
<th>Items</th>
<th>α</th>
<th>M</th>
<th>SD</th>
<th>Skew</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Behavioural Intention</td>
<td>BI</td>
<td>3</td>
<td>.92</td>
<td>4.46</td>
<td>1.76</td>
<td>-.18</td>
<td>-.99</td>
</tr>
<tr>
<td>Attitude</td>
<td>AT</td>
<td>4</td>
<td>.94</td>
<td>4.44</td>
<td>1.39</td>
<td>-.14</td>
<td>-.66</td>
</tr>
<tr>
<td>Subjective Norm</td>
<td>SN</td>
<td>4</td>
<td>.86</td>
<td>3.75</td>
<td>1.40</td>
<td>.22</td>
<td>-.28</td>
</tr>
<tr>
<td>Self-Efficacy *</td>
<td>SE</td>
<td>2 (1)</td>
<td>-.</td>
<td>4.56</td>
<td>1.64</td>
<td>-.27</td>
<td>-.77</td>
</tr>
<tr>
<td>Pedagogical Conviction</td>
<td>PC</td>
<td>4</td>
<td>.74</td>
<td>5.01</td>
<td>1.04</td>
<td>-.28</td>
<td>-.23</td>
</tr>
<tr>
<td>Workload</td>
<td>WL</td>
<td>4</td>
<td>.70</td>
<td>4.40</td>
<td>1.18</td>
<td>-.36</td>
<td>-.15</td>
</tr>
<tr>
<td>Trust in Management</td>
<td>TRM</td>
<td>3</td>
<td>.83</td>
<td>5.31</td>
<td>1.16</td>
<td>-.68</td>
<td>.57</td>
</tr>
<tr>
<td>Emotional Connectedness</td>
<td>EC</td>
<td>3</td>
<td>.77</td>
<td>5.50</td>
<td>1.03</td>
<td>-.64</td>
<td>.12</td>
</tr>
<tr>
<td>Innovative Culture</td>
<td>IC</td>
<td>3</td>
<td>.77</td>
<td>4.45</td>
<td>1.15</td>
<td>-.29</td>
<td>.05</td>
</tr>
<tr>
<td>Feeling of Competence</td>
<td>COM</td>
<td>3</td>
<td>.69</td>
<td>5.50</td>
<td>0.77</td>
<td>-.23</td>
<td>-.10</td>
</tr>
<tr>
<td>Burnout *</td>
<td>BO</td>
<td>3 (1)</td>
<td>-.</td>
<td>2.95</td>
<td>1.40</td>
<td>.51</td>
<td>-.48</td>
</tr>
<tr>
<td>Policy Alienation</td>
<td>PA</td>
<td>5</td>
<td>.78</td>
<td>4.39</td>
<td>0.98</td>
<td>.13</td>
<td>.28</td>
</tr>
<tr>
<td>Lockdown effect</td>
<td>LE</td>
<td>4</td>
<td>.85</td>
<td>4.51</td>
<td>1.45</td>
<td>-.32</td>
<td>-.39</td>
</tr>
</tbody>
</table>

*Note.* *a* For further analyses SE and BO were changed into one-itemed variables. *M, SD, kurtosis and skewness were reported for the one-itemed variables SE and BO.* *b* Cronbach’s *α* is not reported, as variables consist of one item only.

On average, at the research school, an innovative culture was experienced to a small degree. Participants averaged lowest on the item: ‘innovation is more than just a word for us, it defines our culture’ \((M = 4.23, SD = 4.23)\). Burnout (BO) equalled the lowest mean, indicating that teachers seemed to be able to cope well with their workload. Participants did feel some extent of policy alienation (PA) towards governmental educational policy. Teachers reported that the lockdowns had had a minor positive effect on their knowledge, self-efficacy and attitude with respect to pedagogical use of their Chromebooks. On a scale of 1 to 7 (totally disagree – totally agree) teachers reported to have more knowledge about the pedagogical use of the Chromebook \((M = 4.73, SD = 1.83)\), to feel more self-efficacious towards it \((M = 4.54, SD = 1.71)\) and to have a more positive stance towards it \((M = 4.50, SD = 1.63)\) than before the two lockdowns.
For gaining insight in the values for demographical and individual variables, the participants were then divided into five varying subsamples (i.e., age-group, subject-group, device-group, instructional level-group and department-groups). Characteristics of these subsamples are displayed in Table 2. On average, participants using a Chromebook showed more BI than Winbook users; this difference was not significant ($t(236) = 0.92, p = .357$). BI mean difference for teaching mostly at havo/vwo or vmbo was not significant either ($t(236) = -0.31, p = .754$). In the two right hand columns of Table 2, intender/non-intender ratios for WC and IL testify to a similar tendency. When consulting the crosstabulation columns we found that the proportion of intenders/non-intenders between Chrome- or Winbook holders and VMBO or H/V teachers did not differ from each other significantly at the .05 level.

Being employed at a specific department had a significant effect on BI, $F(3, 234) = 2.92, p = .035, r = .19$. It was observed that teachers at the M-department showed a high percentage of intenders. In the post-hoc, for which we used Hochberg’s GT2 because of considerable difference in subsample sizes, it was observed that the difference between the M-department and the Z-department was the one that was closest to statistical significance, $p = .089$.

Table 2

(BI) Intention per Subgroup; Size, Means and Standard Deviation. Subgroup Intender/Non-intender Figures and Percentages between Brackets

<table>
<thead>
<tr>
<th>Individual and demographical variables</th>
<th>$n$</th>
<th>$M$</th>
<th>$SD$</th>
<th>Intenders $(n=109)$</th>
<th>Non-Intenders $(n=129)$</th>
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<td>IL</td>
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</tr>
<tr>
<td>havo/vwo</td>
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<td>1.81</td>
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<td>5.05</td>
<td>1.71</td>
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<td>1.70</td>
<td>64 (41.0)</td>
<td>92 (59.0)</td>
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<td>1.61</td>
<td>32 (37.6)</td>
<td>53 (62.4)</td>
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<td>22 (51.1)</td>
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<td>1.24</td>
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<td>3 (23.0)</td>
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<td>3.29</td>
<td>2.05</td>
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<td>20 (74.1)</td>
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<td>Early-career (21-35)</td>
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<td>4.61</td>
<td>1.58</td>
<td>40 (51.3)</td>
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<td>1.84</td>
<td>36 (40.4)</td>
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<td>71</td>
<td>4.57</td>
<td>1.85</td>
<td>33 (46.5)</td>
<td>38 (53.5)</td>
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</tbody>
</table>

Note. WC = Win- or Chromebook; IL = instructional level; DEP = department; SUB = subject-group; AGE = age-group
We checked for mean differences in the distal variables per department for determining what set apart the four departments. Three significant variable mean differences (ANOVA) between the four departments were found for PC, IC and TRM. Of these three variables, the M-department scored the highest on TRM and IC and second highest on PC. Only the E-department with the lowest number of participants \( (n = 9) \) scored slightly higher.

Analysis of variance in BI between the five subject groups returned significant results as well, suggesting that the differences in pedagogy between these subjects affect teachers’ intention to pedagogically integrate their Chromebooks, \( F(4, 233) = 5.40, \ p < .001, r = .29 \). We noticed that subject-group mean differences for the three proximal variables (ATT, SN, SN) were statistically highly significant as well.

In the post-hoc, a statistically significant difference in BI mean was noted between arts-subjects teachers and practical-subjects teachers (Hochberg’s GT2). When looking at the percentages of intenders it was observed that the arts-subjects teachers had the highest percentage of intenders and the practical-subjects teachers the lowest. Between the five different subject groups we found more statistically significant mean differences for the following variables: ATT, SN, SE, PC and PA. WL approximated statistical significance, \( F(4, 233) = 2.31, \ p = 0.59, r = .20 \). The arts-subjects teachers scored highest on all of these 6 aforementioned variables.

No significant differences were found between early-, mid- or late-career teachers and their intention to pedagogically use Chromebooks, \( F(2,235) = 1.04, \ p = .36, r = .01 \). For the variables PC, COMP and LE however, we did find significant mean differences. Early-career teachers held significantly more socio-constructivist teaching beliefs than mid-career teachers and they felt significantly less competent than their late-career colleagues. The late-career teachers reported significantly higher on LE, SE and BI than their mid-career peers. It was also noted that age (as a continuous variable) and intention seemed to be negatively related to each other. The M-department, with the one but lowest age mean \( (M = 37.7) \) scored highest on BI; the E-department and the Z-department with the highest age mean \( (M = 43.6) \) scored the lowest BI mean.

In our attempt to expose factors explaining teachers’ intention to pedagogically use the Chromebook we decided to look at which variables distinguish intenders from non-intenders. \( t \)-tests were run to find significant differences between these groups and effect sizes were computed and displayed in Table 3. The mean difference was the largest for the ATT variable. Not only was the \( t \)-value statistically significant, its effect size of .68 indicated a substantial effect of differences in ATT on BI. The mean differences between intenders and non-intenders for the other two proximal variables (SN and SE) were also statistically significant and had relatively large effect sizes (Gignac &
Differences in ATT, SN and SE significantly influenced participants' intention to pedagogically use their Chromebooks.

Of the distal variables: PC, WL, EC, IC and LE mean differences between intenders and non-intenders were statistically significant. PC, IC and LE mean differences between intenders and non-intenders, represented typical effect sizes (i.e., between .20 and .30). For WL, TRM, EC and COM small effect sizes (i.e., between .10 and .20) were reported. Effect sizes for AGE, BO and PA were negligible.

It was observed that the BI mean difference between intenders and non-intenders was a sizable one with the highest $t$-statistic by far. Of all the variables that we had included, participants seemed to diverge most on intention. For PA, the smallest mean difference (i.e., 0.02) was found between the two groups. Both groups scored high on feelings of competence; the variable with the lowest standard error of the mean. On the face of it, it looked as if reporting intention and feelings of competence in teaching were two unrelated matters for intenders and non-intenders alike.

Table 3

<table>
<thead>
<tr>
<th>Proximal and Distal Variables: Means and Standard Deviations</th>
<th>Differences between non-intender and Intender Means Including Effect Sizes</th>
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</thead>
<tbody>
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<td>Complete Sample $^a$</td>
<td>Non-Intenders $(n = 129)$</td>
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<tr>
<td>BI $^b$</td>
<td>1 to 7</td>
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<tr>
<td>ATT $^b$</td>
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<td>SN</td>
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<td>SE</td>
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<td>EC</td>
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<td>BO</td>
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<td>PA</td>
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<tr>
<td>LE</td>
<td>1 to 7</td>
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<tr>
<td>Age group</td>
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</table>

Note. $^a p < .05$. $^b p < .01$. (2-tailed). Pearson's $r$ was used for computing and reporting effect sizes. $^c$ Means and SD of complete sample are reported to facilitate comparison between the scores of the whole sample with those of intenders and non-intenders. $^d$ BI and ATT variable did not meet the assumption of homogeneity of variance.

In the subsequent stage we ran a bivariate correlational analysis. The strengths of the linear associations between the variables are displayed in Table 4.1. Non-significant correlations were not included. BI positively correlated (significantly) with the following variables: AT, SN, SE, PC, WL, LE.

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2 Gignac's & Szodorai's taxonomy was used for reporting effect sizes. In their meta-analysis of reporting individual differences in quantitative research they recommend correlations of 0.10, 0.20, and 0.30 to be considered relatively small, typical and relatively large.
EC, IC and LE. We thought this high number of correlational relationships to be indicative of the multifaceted nature of the construct of behavioural intention.

Strong correlations were found\(^3\) between BI, ATT and SN. Of the proximal variables, SE correlated less strongly with the other proximal variables suggesting that the degree of self-efficaciousness felt by teachers was in fact associated with their intention, attitude and experienced social pressure, but to a lower extent.

The macro variable policy alienation did not show many linear relationships, it correlated weakly with BO and PC. The highest correlational value among the distal variables was found for the TRM-IC relationship. The more teachers reported they trusted their managers, the more they reported to experience an innovative culture at their workplace, or alternatively, the more they experienced an innovative culture the more they reported to trust their managers.

AGE as a continuous variable showed weak positive correlations with both feelings of competence (.19, \(p < 001\)) and policy alienation (.15, \(p = .018\)) and negative associations with the PC variable (-.14, \(p = .029\)) High PC score represented high adherence to socio-constructivist teaching learning principles.

In the next step we compared intender and non-intender correlational values. We calculated statistical significance of these differences. They are displayed in Table 4.2. Among the proximal relationships we found one statistically significant correlational difference between intenders and non-intenders for the relation between SN and ATT. Non-intender ATT-SN statistical relationship was significantly higher than that for the group of intenders.

Reverse relationships for intenders and non-intenders were found between COM on the one hand and BI, ATT and WL on the other. From a correlational point of view, COM behaved as the most contrasting variable between intenders and non-intenders. The opposite was observed for LE. Intender/non-intender bivariate correlational differences with BI, ATT, SN and EC were negligible. Intender correlational relationship between IC and TRM was significantly stronger than for non-intenders.

\(^3\) We used Dancey and Reidy’s taxonomy (2007) for use in psychological studies for interpreting Pearson’s correlation coefficients. (0-3 = weak; 4-6 = moderate; 7-9 = strong)
Table 4.1

*Whole Sample (N = 238) Bivariate Correlations of Potential (Proximal and Distal) Predictor Variables of Teachers’ Intention to Pedagogically use Chrome- or Winbooks*

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Note. *p < .05. **p < .01.
BI = behavioural Intention; ATT = attitude; SN = subjective norm; SE = self-efficacy; PC = pedagogical conviction; WL = workload; TRM = trust in management; EC = emotional connectedness; IC = innovative culture; COM = feeling of competence; BO = burnout; PA = policy alienation; LE = lockdown effects. Hyphens indicate non-significant correlations. Negative correlation values are in bold print.
Table 4.2

Comparison of Intender and Non-intender Bivariate Correlations of Potential (Proximal and Distal) Predictor Variables on Teachers’ Intention to Pedagogically use Chrome- or Winbooks.
(intender $n=108$, non-intenders, $n=129$)

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</table>

Note. *p < .05, **p < .01.
int = intenders; non = non-intenders; BI = behavioural Intention; ATT = attitude; SN = subjective norm; SE = self-efficacy; PC = pedagogical conviction; WL = workload; TRM = trust in management; EC = emotional connectedness; IC = innovative culture; COM = feeling of competence; BO = burnout; PA = policy alienation; LE = lockdown effects. Hyphens indicate non-significant correlations. Significant correlational differences are in grey, (p < .05) Highly Significant correlational differences in black and white. (p < .01). Negative correlation values are in bold print. For calculating statistical significance between correlational differences Lenhard and Lenhard’s online calculator was used (Lenhard et al., 2014).

Two multiple hierarchical regression analyses were then run to predict behavioural intention; one to predict BI from the proximal variables and a second to predict BI from the distal variables (total effects). A third one was run to predict attitude, subjective norm and self-efficacy from the distal variables. Finally, a logistic regression was run, contrasting the intender/non-intender categories.
Before the regression analyses were run, the assumptions of linear regression were checked. Residuals of the regression followed a normal distribution; these residuals were equally distributed and predictor variables did not correlate highly with one another. VIF values were all well below 10.

For answering the first subquestion, our focus of attention was on how successfully each of the proximal variables could predict behavioural intention. We entered each proximal variable in three consecutive blocks. With every new inclusion of a predictor (i.e., ATT, SN and SE) the amount of explained variance significantly improved. The proximal variables significantly predicted BI, $F(3, 234) = 188.669, p < .001$, $R^2 = .708$. All three variables added significantly to the prediction, $p = .002$. Adjusted $R^2$ had a virtually equal value of 70.4%, indicating that cross-validity of the model was high.

As can be seen in Figure 4, the analysis returned three positive $b$-values signifying that an increase in ATT, SN and SE would result in an increase in BI. Thus, an increase of one standard deviation in ATT, which was 1.39, would result in an increase of .57 standard deviation of BI (i.e., $57 \times 1.76 = 1.00$).

\begin{figure}[ht]
\centering
\includegraphics[width=\textwidth]{path_diagram.png}
\caption{Path diagram of results of hierarchical regression. Model: three predictors: ATT, SN, SE; dependent variable BI. Values are in standardized $\beta$. *$p < .05$, **$p < .01$}
\end{figure}

Figure 4. Path diagram of results of hierarchical regression. Model: three predictors: ATT, SN, SE; dependent variable BI. Values are in standardized $\beta$. *$p < .05$, **$p < .01$

with the lowest BI-mean as baseline for calculating beta-coefficients for the other departments and subject-groups. Categories were entered in ascending order of behavioural intention mean. In block 1 we entered DEP and SUB and the rest of the distal variables were included in the second block. The distal variables significantly predicted intention, $F(16, 221) = 6.626, p < .001$, $R^2 = .324$. Adjusted $R$ of .275 was slightly lower. Including the distal variables, significantly added to the prediction, $p < .001$. All the significant standardised beta-coefficients are displayed in Figure 5. It was noted that teaching the social sciences resulted in a rather high beta-coefficient, but then again, it is hardly surprising that PE, wood- and metalwork teachers have lower intention of using their Chromebooks pedagogically when compared to this group.
For further sorting the second question, we ran three separate multiple hierarchical regression rounds in which we successively regressed the three proximal variables ATT, SN and SE onto the distal variables (see Figure 6). In these three rounds we used three blocks. In block 1 the micro variables were put in, block 2 contained the meso variables and in block 3 we included the macro variable. Lockdown Effects were considered to be a micro level variable. In Figure 6, the statistically (highly) significant predictive values of the three rounds of regression are displayed. Distal variables significantly predicted attitude, $F(9, 238) = 8.199$, $p < .001$, $R^2 = .245$. Adjusted $R^2$ was slightly lower with a value of .215, indicating that the population value might be slightly lower. The micro and meso variables added significantly to the prediction, $p = .45$, whereas the macro variable did not. The $F$-change was statistically insignificant, $p = .128$.

In the coefficient table we found three variables which significantly positively predicted attitude: PC, LE and IC. Their standardised $\beta$-values were displayed in Figure 6. It should be noted that EC verged on statistical significance.

For predicting SN from the micro and meso variables we found that they were significant predictors, $F(9, 228) = 6.174$, $p < .001$, $R^2 = .196$. Adjusted $R^2$ was slightly lower with a value of .164. Adding the meso to the micro variables resulted in a significant $F$ change, $p < .001$. Adding the macro variable did not, $p = .362$. Consequently, we turned to the second model for obtaining beta-coefficients. When consulting the coefficients table, we found that two distal variables significantly predicted SN, LE and IC (see Figure 6).
Variability in the outcome of teachers’ self-efficaciousness towards pedagogical use of the Chromebooks in their classroom practice could for 10.9% be accounted for by the distal variables, $F(9, 228) = 3.238, p = .001, R^2 = .113$. Adjusted $R^2$ was 8.6%. Incorporation of meso and macro variables did not result in significant $F$-changes (inclusion of meso, $p = .593$ and inclusion of macro, $p = .750$). Therefore, we consulted the first model for retrieval of beta-coefficients and $R$ values. LE and EC returned two significant positive beta coefficients for SE.

It was noted that the micro variables were better BI predictors than the meso and macro variable predictors. LE was the one variable that significantly predicted all three proximal variables. The linear relationship with SN was a notable one. The more teachers had experienced positive effects from the lockdown period in terms of growth in knowledge, self-efficacy and skills, the more they felt social pressure from colleagues, pupils and management.

By creating a model which could predict probability of group membership of the intender-category, we intended to improve our explanation as to which factors resulted either in willingness or reluctance. For this specific purpose we ran a hierarchical logistic regression. First, collinearity was checked. For ATT, the maximum VIF value of 2.82 was found, which suggested that there were no
serious multicollinearity issues. It was also observed that one of the department subsamples (DEP_E) was relatively small (n = 9).

For our independent variable we used the two categories of our dichotomised variable of intenders and non-intenders (On a 7-point scale, cut-point was 4.67). The two
demographical/individual variables were entered in the first block, the distal variables in the second
and the proximal variables in the third. The H-department, which of the four ranked third in BI mean
and in intender percentage, served as reference category for DEP. For the SUB variable, the arts
subjects category was used. This group had shown the highest BI mean and the highest intender
percentage. For providing a complete and clean-cut outline of the three stages of the logistic
regression, we decided to present the regression results in three tables (i.e., Table 5.1, 5.2, and 5.3).

In Table 5.1 the results of the first block can be seen. Hosmer and Lemeshow goodness of fit
test for block 1 showed statistical insignificance, $\chi^2 = 4.81; df = 6; p = .57$, indicating that the model
was fitting the data. The two categorical variables accounted for 8% variance ($R^2$, Nagelkerke, 1991)
of teachers’ reporting intention. The classification table indicated that 37.6% of intenders and 75.2%
of non-intenders were correctly classified.

Even though they were not statistically significant and had rather wide confidence intervals we
observed that the odds ratios for the M and E department were quite high. The odds of reporting
intention at the M and E department were respectively one and a half and three times higher than for
those of the H-department. Compared to the H-department, teachers at the (largest) Z-department were
one-third less likely to have reported intention.

The arts teachers reported the highest levels of intention, hence the odds ratios being less than
one for three of the other four subject-groups and the negative directions of three of the coefficients.
Between the subjects, there was one statistically significant difference in odds ratios; compared to arts
teachers, language teachers’ odds of reporting intention decreased by 73 per cent. It was observed that
the variable SUB as a whole was approaching statistical significance, $\chi^2 = 8.47, df 4, p = .07$. This was
in line with the earlier finding that the difference in BI-mean (ANOVA) between subjects was
statistically significant.
Table 5.1

Hierarchical Logistic Regression Results of First Block; Predicting Likelihood of Teachers Being Categorized as Intenders.

<table>
<thead>
<tr>
<th>Block</th>
<th>Variable</th>
<th>$\chi^2$</th>
<th>R$^2$</th>
<th>B (SE)</th>
<th>Wald statistic</th>
<th>Lower</th>
<th>Odds ratio</th>
<th>Upper</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Intercept</td>
<td></td>
<td></td>
<td>0.32 (0.40)</td>
<td>0.64</td>
<td>1.38</td>
<td>1.38</td>
<td></td>
</tr>
<tr>
<td></td>
<td>DEP1 (M)</td>
<td></td>
<td></td>
<td>0.33 (0.48)</td>
<td>0.46</td>
<td>0.54</td>
<td>1.39</td>
<td>3.62</td>
</tr>
<tr>
<td></td>
<td>DEP2 (E)</td>
<td></td>
<td></td>
<td>0.95 (0.82)</td>
<td>1.36</td>
<td>0.52</td>
<td>2.97</td>
<td>12.91</td>
</tr>
<tr>
<td></td>
<td>DEP3 (Z)</td>
<td></td>
<td></td>
<td>-0.39 (0.37)</td>
<td>1.14</td>
<td>0.32</td>
<td>0.68</td>
<td>1.39</td>
</tr>
<tr>
<td></td>
<td>SUB1 (beta)</td>
<td></td>
<td></td>
<td>0.37 (0.63)</td>
<td>0.35</td>
<td>0.43</td>
<td>1.45</td>
<td>4.96</td>
</tr>
<tr>
<td></td>
<td>SUB2 (prac)</td>
<td></td>
<td></td>
<td>-0.55 (0.40)</td>
<td>1.89</td>
<td>0.26</td>
<td>0.58</td>
<td>1.26</td>
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<td>SUB3 (lang)</td>
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<td>-1.32 (0.52)</td>
<td>**6.44</td>
<td>0.10</td>
<td>0.27</td>
<td>0.74</td>
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<tr>
<td></td>
<td>SUB4 (soci)</td>
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<td>-0.27 (0.33)</td>
<td>0.68</td>
<td>0.40</td>
<td>0.76</td>
<td>1.45</td>
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<td>14.44**</td>
<td>.04</td>
<td>**6.44</td>
<td>0.10</td>
</tr>
</tbody>
</table>

Note. *p < .05, ** p < .01. CI = Confidence Interval; Explanatory variables entered in first block: DEP; department, SUB; subject; beta = beta subjects; prac = practical subjects; lang = languages; soci = social sciences.

Dichotomic Dependent Variable: BI_Cat = intender. Reference category for DEP = H. Reference category for SUB = arts.

Including the distal variables in the second block (see Table 5.2) lead to a significant increase of Chi-squares of 60, amounting to 75, implying that the inclusion of the variables was an improvement. The Hosmer and Lemeshow goodness of fit test for block 2 suggested that the model was a good fit to the data, $\chi^2 = 5.90$, df = 8; $p = .66$. The explained ($R^2$, Nagelkerke, 1991) variance accounted for by the predictors of the model, rose from 8 per cent to 36 per cent in the second block.

The distal variables, PC and LE proved to be statistically significant predictors of having reported intention. The likelihood statistics indicated that one unit rise in PC (i.e., social-constructivist teaching convictions) increased the odds of teachers reporting intention by 1.81 units. Teachers who experienced positive after-effects of the two lockdowns were also more likely to be classified as intenders; an increase of one unit in experiencing success, resulted in a rise in odds of 1.54 to fall within the category of intenders. Interestingly, one unit increase in workload would increase the odds of reporting intention by one and a half as well. Though be it less statistically significant, experiencing an innovative culture at school also increased the odds by the same amount. In block 2, 72.5% of intenders were correctly categorised and 77.5% of non-intenders.

Table 5.2

Hierarchical Logistic Regression Results of First Two Blocks; Predicting Likelihood of Teachers Being Categorised as Intenders.

<table>
<thead>
<tr>
<th>Block</th>
<th>Variable</th>
<th>$\chi^2$</th>
<th>R$^2$</th>
<th>B (SE)</th>
<th>Wald statistic</th>
<th>Lower</th>
<th>Odds ratio</th>
<th>Upper</th>
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</table>
2 Intercept -7.13 (1.92) **13.77 0.00
DEP1 (M) -3.68 (0.58) 0.40 0.22 0.69 2.17
DEP2 (E) -0.57 (0.99) 0.33 0.08 0.57 3.96
DEP3 (Z) -0.87 (0.43) *3.93 0.18 0.42 0.99
SUB1 (beta) 0.22 (0.73) 0.09 0.30 1.25 5.27
SUB2 (prac) -0.60 (0.46) 1.71 0.22 0.55 1.35
SUB3 (lang) -1.90 (0.61) **9.88 0.05 0.15 0.49
SUB4 (soci) -0.55 (0.40) 1.95 0.26 0.58 1.25
PC 0.60 (0.18) **10.55 1.27 1.81 2.60
WL 0.42 (0.15) **7.17 1.12 1.52 2.07
TRM 0.01 (0.17) 0.00 0.72 1.00 1.39
EC 0.26 (0.17) 2.22 0.92 1.30 1.82
IC 0.39 (0.18) *4.46 1.02 1.47 2.11
COM -0.07 (0.24) 0.09 0.58 0.93 1.49
BO 0.12 (0.14) 0.78 0.68 0.89 1.16
PA -0.26 (0.17) 2.28 0.55 0.77 1.08
LE 0.43 (0.12) ***13.14 1.54 1.54 1.95

74.73** .36

Note. *p < .05. ** p < .01; CI = Confidence Interval; Newly included explanatory factors in block 2: PC = pedagogical conviction; WL = workload; TRM = trust in management; EC = emotional connectedness; IC = innovative culture; COM = feelings of competence; BO = burn out; PA = policy alienation; LE = lockdown effects. Dichotomic Dependent Variable: BI_Cat = intender.

After having included the proximal variables, Chi-squares increased to 190.94. Again, this change in Chi-squares was significant, $\chi^2 = 74.73; df = 3; p = .001$. Hosmer and Lemeshow goodness of fit test for block 3 was insignificant, $\chi^2 = 13.95; df = 8; p = .08$, implying that the model was a good fit. The final model correctly classified 88.4% (93 out of 109) of the intenders and 85.3% (114 out of 119) of the non-intenders. Of the total amount of variation in either having reported intention or not, the model could explain 73.7% ($R^2$, Nagelkerke, 1991).

ATT, with an odds ratio of 3.27, turned out to be the most influential predictor of intention. With each increase of one unit of SN, teachers were 1.93 times more likely to fall into the category of intenders. A growth of one unit in feelings of self-efficaciousness resulted in an increase of likelihood of 1.73 for teachers reporting intention. It was observed that an increase in workload (WL) did not decrease the odds of falling within the intender category ($p = .096$). Another notable aspect we observed was that even in the final model WL had a significant positive odds ratio ($OR = 1.71, p = 0.33$). In the total model, the comparison between arts teachers’ and language teachers’ intention resulted in the highest negative beta-coefficient.
### Table 5.3

*Hierarchical Logistic Regression Results of All Three Blocks; Predicting Likelihood of Teachers Being Classified as Intenders.*

<table>
<thead>
<tr>
<th>Block</th>
<th>Variable</th>
<th>$\chi^2$</th>
<th>R$^2$</th>
<th>B(SE)</th>
<th>Wald statistic</th>
<th>Lower Odds ratio</th>
<th>Upper Odds ratio</th>
<th>95% CI for Odds Ratio</th>
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<td>Intercept**</td>
<td>-14.10 (3.27)</td>
<td>**18.62</td>
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<tr>
<td></td>
<td>DEP1 (M)</td>
<td>0.42 (0.87)</td>
<td>0.02</td>
<td>0.19</td>
<td>1.04</td>
<td>5.73</td>
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<tr>
<td></td>
<td>DEP2 (E)</td>
<td>0.48 (1.91)</td>
<td>0.06</td>
<td>0.04</td>
<td>1.61</td>
<td>68.60</td>
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<td></td>
<td>DEP3 (Z)</td>
<td>-0.29 (0.71)</td>
<td>0.17</td>
<td>0.18</td>
<td>0.75</td>
<td>3.01</td>
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<td>SUB1 (beta)</td>
<td>1.57 (1.19)</td>
<td>1.75</td>
<td>0.47</td>
<td>4.79</td>
<td>48.97</td>
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<td>SUB2 (prac)</td>
<td>-0.28 (0.69)</td>
<td>0.18</td>
<td>0.20</td>
<td>0.75</td>
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<td>SUB3 (lang)</td>
<td>-2.07 (0.85)</td>
<td>**6.02</td>
<td>0.02</td>
<td>0.13</td>
<td>0.66</td>
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<tr>
<td></td>
<td>SUB4 (soci)</td>
<td>-0.70 (0.56)</td>
<td>1.56</td>
<td>0.17</td>
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<td>1.50</td>
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<td>PC</td>
<td>0.58 (0.29)</td>
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<td>WL</td>
<td>0.53 (0.25)</td>
<td>*4.53</td>
<td>1.04</td>
<td>1.71</td>
<td>2.79</td>
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<td>0.04 (0.25)</td>
<td>0.02</td>
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<td>1.04</td>
<td>1.70</td>
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<td>0.68</td>
<td>1.11</td>
<td>1.81</td>
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<td></td>
<td>IC</td>
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<td>0.69</td>
<td>1.16</td>
<td>1.94</td>
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<td>COM</td>
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<td>BO</td>
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<td>1.38</td>
<td>0.54</td>
<td>0.79</td>
<td>1.17</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>PA</td>
<td>-0.37 (0.27)</td>
<td>1.82</td>
<td>0.41</td>
<td>0.69</td>
<td>1.18</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>LE</td>
<td>0.10 (0.17)</td>
<td>0.34</td>
<td>0.79</td>
<td>1.10</td>
<td>1.53</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ATT</td>
<td>1.18 (0.32)</td>
<td>**14.22</td>
<td>1.77</td>
<td>3.27</td>
<td>6.06</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SN</td>
<td>0.66 (0.27)</td>
<td>*6.00</td>
<td>1.14</td>
<td>1.93</td>
<td>3.25</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SE</td>
<td>0.55 (0.20)</td>
<td>**7.15</td>
<td>1.16</td>
<td>1.73</td>
<td>2.57</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note.** *p < .05. **p < .01; CI = Confidence Interval. Newly included explanatory variables in block 3. ATT = attitude; SN = subjective norm; SE = self-efficacy. Dichotomic dependent variable: BI_Cat = intender*

For further answering the third subquestion we aimed to uncover potential underlying indirect effects of distal variables on BI. We wanted to establish whether and to what extent the relationships between the distal variables and BI could be explained through ATT, SN and SE. For this purpose, we ran a mediation analysis using PROCESS macro. In Table 6 the results of the mediation analysis can be seen.
As can be seen in the displayed results in Table 6, there were several mediated effects suggesting that when attempting to increase BI there is a high probability that advancement of teachers’ ATT, SN and SE with respect to pedagogical use of ICT could prove worthwhile. Of the three proximal variables, ATT was the mediator with the largest effect sizes. Teachers did not report significant mean differences between the instrumental and experiential aspect of ATT, leaving a wide window for interventions when indirectly wishing to enhance intention through ATT.

ATT, SN and SE did not play a mediating role for the PA variable. So, teachers’ intentions did not seem to be affected by discontent about national educational processes both directly (see regression analysis in Figure 6) and indirectly through ATT, SN and SE. Teachers’ self-reported feelings of competence did not indirectly affect intention either. Mediation effects approaching statistical significance through SN for WL and BO were found. LE had the largest indirect effect on BI through all of the three proximal variables. It was noted that trust in management and innovative

<table>
<thead>
<tr>
<th>Distal variable</th>
<th>Mediator variable</th>
<th>B (SE) boot</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>PC</td>
<td>ATT</td>
<td>0.13 (0.04)</td>
<td>0.05 - 0.21</td>
</tr>
<tr>
<td></td>
<td>SN</td>
<td>0.04 (0.02)</td>
<td>0.00 - 0.08</td>
</tr>
<tr>
<td></td>
<td>SE (†)</td>
<td>0.01 (0.01)</td>
<td>-0.00 - 0.04</td>
</tr>
<tr>
<td>WL</td>
<td>ATT</td>
<td>ns</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>SN (†)</td>
<td>0.03 (0.02)</td>
<td>-0.00 - 0.07</td>
</tr>
<tr>
<td></td>
<td>SE</td>
<td>ns</td>
<td>-</td>
</tr>
<tr>
<td>TRM</td>
<td>ATT</td>
<td>0.12 (0.04)</td>
<td>0.05 - 0.18</td>
</tr>
<tr>
<td></td>
<td>SN</td>
<td>0.05 (0.02)</td>
<td>0.02 - 0.09</td>
</tr>
<tr>
<td></td>
<td>SE</td>
<td>0.02 (0.01)</td>
<td>0.00 - 0.05</td>
</tr>
<tr>
<td>EC</td>
<td>ATT</td>
<td>0.13 (0.04)</td>
<td>0.06 - 0.20</td>
</tr>
<tr>
<td></td>
<td>SN</td>
<td>0.04 (0.01)</td>
<td>0.00 - 0.08</td>
</tr>
<tr>
<td></td>
<td>SE</td>
<td>0.03 (0.01)</td>
<td>0.01 - 0.06</td>
</tr>
<tr>
<td>IC</td>
<td>ATT</td>
<td>0.14 (0.04)</td>
<td>0.07 - 0.21</td>
</tr>
<tr>
<td></td>
<td>SN</td>
<td>0.07 (0.02)</td>
<td>0.03 - 0.12</td>
</tr>
<tr>
<td></td>
<td>SE (†)</td>
<td>0.03 (0.02)</td>
<td>-0.00 - 0.04</td>
</tr>
<tr>
<td>COM</td>
<td>ATT</td>
<td>ns</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>SN</td>
<td>ns</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>SE</td>
<td>ns</td>
<td>-</td>
</tr>
<tr>
<td>BO</td>
<td>ATT</td>
<td>ns</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>SN (†)</td>
<td>0.02 (0.02)</td>
<td>-0.01 - 0.06</td>
</tr>
<tr>
<td></td>
<td>SE</td>
<td>ns</td>
<td>-</td>
</tr>
<tr>
<td>PA</td>
<td>ATT</td>
<td>ns</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>SN</td>
<td>ns</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>SE</td>
<td>ns</td>
<td>-</td>
</tr>
<tr>
<td>LE</td>
<td>ATT</td>
<td>0.20 (0.04)</td>
<td>0.12 - 0.28</td>
</tr>
<tr>
<td></td>
<td>SN</td>
<td>0.06 (0.02)</td>
<td>0.02 - 0.11</td>
</tr>
<tr>
<td></td>
<td>SE</td>
<td>0.04 (0.01)</td>
<td>0.01 - 0.07</td>
</tr>
</tbody>
</table>

Note: a number of bootstrap sample for percentile bootstrap confidence intervals: 5,000; † for effect sizes, completely standardized † was used. † variables followed by an arrow symbol were significant mediators of distal variables; † variables followed by an exclamation mark emerged on being statistically significant.
culture (with the highest bivariate correlation of the distal variables, see Table 4) did not significantly affect BI in the regression analysis (see Figure 5), but did so indirectly, through almost all of the proximal variables.

In order to illustrate the impact of the indirect effects of the distal variables on BI, we measured their proportions of the total effect on BI (i.e., direct and indirect effect on BI combined) (see Table 7). We found that the indirect effects accounted for a considerable portion of variation in teachers’ intention. A notable aspect we came across was that the direct effect coefficient of experiencing an innovative climate was a negative one, whereas the indirect beta-coefficient was markedly positive. In literature this phenomenon is sometimes referred to as inconsistent mediation (Mackinnon, Fairchild, & Fritz, 2007); calculating proportion measures in this case is not of any use.

Table 7

Direct and Indirect Effect Proportions of total effect of Distal Variables on Behavioural Intention (in percentages)

<table>
<thead>
<tr>
<th>Distal variable</th>
<th>Direct effect proportion of total effect</th>
<th>Indirect effect proportion of total effect per mediator variable</th>
<th>Indirect effect proportion of total effect of mediators combined</th>
</tr>
</thead>
<tbody>
<tr>
<td>PC</td>
<td>20.40%</td>
<td>ATT 57.24%</td>
<td>79.60%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SN 16.43%</td>
<td></td>
</tr>
<tr>
<td>TRM</td>
<td>1.26%</td>
<td>ATT 62.29%</td>
<td>98.74%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SN 25.54%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>SE 11.68%</td>
<td></td>
</tr>
<tr>
<td>EC</td>
<td>1.18%</td>
<td>ATT 65.61%</td>
<td>98.82%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SN 18.03%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>SE 15.17%</td>
<td></td>
</tr>
<tr>
<td>IC</td>
<td>------ a</td>
<td>ATT 62.22%</td>
<td>------ a</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SN 29.78%</td>
<td></td>
</tr>
<tr>
<td>LE</td>
<td>15.61%</td>
<td>ATT 56.80%</td>
<td>84.39%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SN 17.04%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>SE 10.55%</td>
<td></td>
</tr>
</tbody>
</table>

Note. Proportions were not calculated for statistically insignificant indirect effects; PC = pedagogical Conviction; TRM = Trust in Management; EC = Emotional Connectedness Beliefs; IC = Innovative Culture; * proportion could not be calculated because direct effect was negative. b proportion of total indirect effect is reported, indirect effect of SE was statistically insignificant.
4. Conclusion and Discussion

4.1 Intention

We strove to expose the factors that could explain teacher intention for pedagogical use of the Chromebook by using the Reasoned Action Approach (RAA). The model we used for this approach was the integrative model of behaviour prediction (IMBP). In this division of behavioural research, intention performs a pivotal role. In RAA, intention precedes actual behaviour (Ajzen, 2012) and changes in intention are thus seen as antecedents of changes in behaviour (Webb & Sheeran, 2006). At the research school both the intender/non-intender ratio (109/129) and the significant BI mean difference with large effect size between these two groups indicated a high extent of division among participants with respect to pedagogical use of the Chromebook.

4.2 Subquestion 1: direct effects of proximal variables on intention; conclusion and discussion

We hypothesised that attitude, subjective norm and self-efficacy would differentially affect teacher’s intent to pedagogically integrate Chromebooks in their classroom practice. Bivariate correlations between these variables mostly suggested strong associations between them. The three proximal variables together were able to account for 71% of variance in intention. Findings on the combined direct effect of these three proximal variables on intention are inconsistent. Lee et al. (2010) for example, found that 70 percent of variability in intention to use educational technology could be accounted for by the three variables, whereas Teo et al. (2008), in their research among teacher-students, found that 39 percent of intention could be explained by the three.

In line with previous research using RAA or alternative approaches, attitude (ATT) proved to be the main predictor of intention (Adov, Pedaste, Leijen, & Rannikmäe, 2020; Kim, Kim, Lee, Spector, & DeMeester, 2013; Kreijns et al., 2013a; Sugar, Crawley, & Fine, 2005; Vermeulen et al., 2017; Vermeulen et al., 2014). To indicate its predictive power, in the regression analyses, attitude had twice the predictive power of SN and thrice that of SE.

Unsurprisingly, mean differences in ATT between intenders and non-intenders were statistically significant, suggesting that in order to persuade non-intenders to become intenders, a change in ATT might prove the most effective. In the logistic regression, the ATT beta-coefficient confirmed this finding.

Increasing social pressure (SN) among teachers to use their Chromebooks pedagogically doubled the odds of them becoming intenders. Contrary to various previous research (Kreijns et al., 2013a; Van Acker et al., 2013; Vermeulen et al., 2014), it was a better predictor of intention than self-efficacy was. This might be the case, but in present study, the participants did not experience much
social pressure from pupils, colleagues or management from the research school. In accordance with previous research, teachers perceived relatively low subjective norm. This feature of individualism and low influenceability among teachers has often been identified in literature (Lortie & Clement, 1975; Muckenthaler, Tillmann, Weiß, & Kiel, 2020; Vangrieken, Grosemans, Dochy, & Kyndt, 2017).

Non-intenders felt a significantly lesser amount of social pressure to use their chromebooks pedagogically. Bivariate correlational SN – ATT difference between intenders and non-intenders showed statistical significance, suggesting that this correlational difference could not be subscribed to coincidence. When trying to find an explanation we hypothesised that intending teachers with positive attitudes moved about in social circles of likeminded colleagues, agreed with management wishes to a higher extent and thus perceived more social pressure than their non-intending colleagues. As to the direction of the SN-ATT association, no inferences could be made. It was concluded that although teachers did not experience much social pressure, increasing it would in fact advance their intention to use Chromebooks pedagogically. Establishing this fact supports the idea of setting up within school PLCs (professional learning communities) in which teachers develop collaboratively (Prenger, Poortman, & Handelzalts, 2019). Having teachers develop in groups rather than individually might make them more willing to adapt their existing teaching practices (Doğan & Adams, 2018).

Albeit with a sizably lower beta-coefficient, self-efficacy significantly predicted intention. SE-BI correlational differences between intenders and non-intenders amounted to zero. Contrary to present study, most previous studies found that, compared to social norm, self-efficacy was a better predictor of intention (Van Acker et al., 2013; Vermeulen et al., 2017; Vermeulen et al., 2014). The rationalisation behind this less pronounced role as a predictor in this present study might be, that the participants at the research school had already been given ample time to get acquainted with their Chromebooks and its pedagogical opportunities. Therefore, we conclude that in this research, participants’ intention is less of an effect of feelings of self-efficacy than of social norm and attitude.

To put it concisely, hypothesis one was confirmed. The three proximal variables, attitude, social norm and self-efficacy differentially affected intention. Increasing intention at the research school can therefore best be achieved by investing in changing teachers’ attitudes and increasing social pressure.

4.3 Subquestion 2: effects of demographical and individual variables on intention; conclusion and discussion

We hypothesised that distal variables at micro, meso, and macro level influence teachers’ intention to pedagogically integrate Chromebooks in their classroom practice. First, we tested direct effects of micro, meso and macro variables on intention.

Intention was neither affected by a difference in instructional level (i.e., VMBO or HAVO/VWO) nor by the device teachers used (i.e., Winbook or Chromebook). Age did not
significantly affect intention either. However, it was determined that age negatively predicted socio-constructivist teaching practices, which in turn predicted intention.

As could be expected, compared to practical subjects, intention to pedagogically use Chromebooks was significantly higher for other subject groups. Consistent with previous research, the results of the regression analysis suggested that teaching a subject with its unique pedagogical characteristics affects ICT integration approaches (Hennessy, Ruthven, & Brindley, 2005; Howard, Chan, & Caputi, 2015; John, 2006). In present study in the regression analysis, the arts and social science teachers seemed to be most intent on pedagogical use of the Chromebook. From the logistic regression we learnt that language teachers were significantly less intent on using the Chromebooks pedagogically. Specific subject group teachers also reported significant mean differences for ATT, SN and SE.

Cowie, Jones, and Harlow (2011) found that professional development in same-subject groups was especially valuable because it was better geared at the subject context. So, in case of setting up PLCs we suggest to compose these communities of same subject-groups.

4.4 Subquestion 2 continued: effects of distal variables on intention; conclusion and discussion

We found that the predictive power of the pooled distal variables on intention was statistically significant. When regressed on intention, they were able to account for 28% percent of variance in intention, considerably less than for the three proximal variables.

Having successful perceptions of Chromebook use during the two lockdowns (LE) proved to be the strongest micro variable predictor of intention. Kreijns et al. (2017) drew a similar conclusion and advised to actively provide teachers with chances to experience success. And more recently, Kim and Jang (2020) found that motivation among Korean teachers to continue technology integration grew after they had experienced positive changes among their students while working in smart classroom settings. The lockdowns have shown that teachers were capable of changing their teaching habits and increasing their use of ICT (König, Jäger-Biela, & Glutsch, 2020). So, when teachers felt the pressure of circumstance, they were in fact able to increase and improve their ICT use. Combined with all of the above-mentioned recommendations, teachers would benefit most from ICT training in same-subject groups with a special focus on the educational necessity and advantages of pedagogical use of the Chromebook.

In the correlational analysis we concluded that PC (pedagogical conviction) for intenders correlated moderately with attitude, which in turn correlated highly with intention. For non-intenders however, we found no statistically significant correlation. In the regression analysis we established the direction of this relation and found that in accordance with previous research (Bas & Bastug, 2021; Burke, Schuck, Aubusson, Kearney, & Frischknecht, 2018; Monacis, Limone, Ceglie, Tanucci, &
Sinatra, 2019; Tondeur et al., 2017) that, the more teachers wanted to conform to socio-constructivist teaching principles, the higher their intention was to pedagogically use their Chromebooks. Of all the distal variables in the logistic regression analysis, the odds ratio of becoming an intender increased the most by an increase in socio-constructivist teaching beliefs. An obvious conclusion when trying to increase intention would be to start working on changing teacher pedagogical beliefs. However, ample research has suggested that teachers are particularly resistant to changing their attitudes and beliefs (Eickelmann & Vennemann, 2017; Pajares, 1992; Wilkinson, Reznitskaya, Bourdage, Oyler, Glina, Drewry, Kim, & Nelson, 2017). Recent research literature among teachers suggests that practice (e.g., by experimenting) might sometimes precede theory (Guskey, 2002; Li, 2010; Wilkinson et al., 2017). Once more, this given calls for setting up PLCs in which best practices and positive experiences are shared, tested and discussed.

The third distal variable which directly influenced BI was experiencing a high workload. Its effect was smaller and less significant. Nonetheless, the relationship was an interesting one. The positive relationship was confirmed by the logistic regression analysis, in which it was found that an increase in experiencing workload increased the odds of falling in the intender category. One explanation for this phenomenon could be that participants who reported intention were compliant and conscientious employees and therefore experienced a higher workload. We did find that intenders experienced a significantly higher SN than non-intenders, \( t(236) = -11.66, p < .01 \). Experiencing a high workload was significantly higher for intending teachers, \( t(236) = -2.20, p = 0.29 \). It was observed that the direct relationship between WL and BI was a stronger one than the indirect relationship. These findings call for caution. In line with Kreijns et al. (2017) we conclude that teacher PLCs should be given earmarked time slots to escape from all of their other urgent tasks at hand.

When summarising the statistical results, we conclude that the second hypothesis, pertaining the effects of distal (including demographical and individual) variables, was confirmed. Granted that the proximal variables were decidedly stronger predictors; the accumulative effect of the distal variables on the proximal variables indicated that they should be taken into account when attempting to advance pedagogical ICT usage. In addition to this, the high number of variables affecting intention, demonstrated the complexity of chartering all the predictors of behavioural intention and their interconnected dynamics.

4.5 Subquestion 3: indirect effects of distal variables on intention; conclusion and discussion

Prior to running the mediation analysis, we regressed the distal variables on the three proximal variables. LE was the sole variable to predict each one of the three proximal variables. We concluded that the successful experiences during the lockdown had initiated a substantial growth in attitude, social norm and self-efficacy. Not surprisingly, experiencing success was the best predictor of feelings
of self-efficacy. When comparing mean scores, we had already established that intenders experienced significantly more positive after-effects of the lockdowns and felt significantly more self-efficacious (SE) than non-intenders.

In the regression analysis, we found that IC significantly predicted SN and less strongly ATT. In the logistic regression analysis, IC had also eventuated a small improvement in the odds of falling in the intender category. Prior to the regression stage we had established that for intenders, IC correlated weakly with BI, ATT, PC and moderately with TRM while for non-intenders there were no significant correlational relationships between any of these variables. Non-intenders experienced a significantly lower innovative culture than intenders. We concluded that experiencing an innovative culture positively influenced social pressure among the participants.

The mediation analyses confirmed that the effects of several distal variables (i.e., PC, TRM, EC, IC and LE) were mediated through the proximal variables and thus had an indirect effect on intention. Their indirect effects on intention were stronger than their direct effects. No indirect influences were found for workload, feelings of competence, feelings of burnout or policy alienation.

Pursuant with earlier research (Van Acker et al., 2013; Vermeulen et al., 2017; Zhang & Sun, 2009), ATT was the most powerful mediator of the three proximal variables. Its mediating properties were stronger than those of SN and SE combined; emphasising again its critical role as predictor of intention and the proximate behaviour under research.

The most distinguished mediating effect was found for the indirect relation between LE, through ATT, on BI. In consequence, experiencing success affected intention both directly and indirectly and in that manner proved to be the most powerful distal predictor variable. In line with what Kreijns et al. (2017) observed in their study, SN mediated the LE-BI relationship as well, but less strongly.

Pedagogical convictions played an important role both as direct and indirect predictor of intention. Having socio-constructivist teaching beliefs increased intention by way of attitude and to a lesser extent via subjective norm. No comparable studies were found in which teaching philosophies indirectly increased intention through attitude and social norm.

In the regression analyses, trust in management did not present itself as a strong predictor of one of the four RAA variables (BI, ATT, SN and SE). In the correlational analyses it was noted that the variable moderately correlated with IC and showed negative correlations with both of the ‘negative’ variables (i.e., burnout and policy alienation). The correlational intender/non-intender difference between IC and TRM was a statistically significant one. The mediation analysis enabled us to establish direction of the TRM variable. We concluded that through ATT and SN, TRM was an indirect antecedent of intention. In previous research, Vermeulen et al. (2014) found that transformational leadership (i.e., its intellectual stimulation aspect) positively affected perceived norm (SN in present research). Contrary to present study, they did not find a considerably stronger indirect
relationship through attitude. We concluded that teachers who trusted their management had more positive attitudes towards pedagogical use, which in turn advanced intention.

We already established in the regression phase that experiencing an innovative culture increased attitude and social norm and that in the bivariate correlational analyses the IC and TRM almost had identical relations with all of the other variables. This suggested a high extent of interrelatedness between experiencing an innovative culture and trust in management. In this study we concluded that ATT and SN mediate the effect of IC. We found that the indirect effect of experiencing an innovative culture was stronger than the direct effect. Two of the three IC items used the Dutch first person plural focussing on the group rather than on the individual teacher. Rather unsurprisingly, when compared to the other SN mediational effects, its effect for this relationship was the strongest. (i.e., IC → SN → BI) Moolenaar and Sleegers (2010) found the same relatedness between IC and SN. In their research among Dutch teachers into factors fostering successful educational innovations, they found that raising commitment (intention) to educational innovation can best be achieved by providing opportunities for joint staff developments. This interaction with others (subjective norm) in combination with willingness to adjust (innovative behaviour) determines a large part of the success of the reform (Daly, Moolenaar, Bolivar, & Burke, 2010). We conclude that a communal aspect to (ICT) professionalisation activities is a prerequisite for improving collective intention.

Emotional Connectedness indirectly influenced intention through the three proximal variables. Contrary to our expectations, the more teachers believed in emotional connectedness as imperative for good teaching, the higher their intention through ATT, SN and SE. We assumed that teachers would anticipate a decrease in emotional interaction between teachers and pupils if Chromebook use were to increase. Indeed, at teacher-training college, teachers have often been taught that the quality of the social environment of their face-to-face classrooms is a central feature of good education (Senior, 2010). Emotional expressions, such as humour (Van Praag, Stevens, & Van Houtte, 2017) or self-disclosure (Koster, 2011; Tobin, 2010) are often linked to pupils’ task motivation and persistence (Garrison, Anderson, & Archer, 1999). We thought this was a promising result because teachers quite strongly believed in emotional connectedness in present research.

The third hypothesis, regarding the indirect effects of the distal variables, was thus partially confirmed. Five of the nine distal variables were mediated (LE, IC, EC, TRM and PC) through ATT and less strongly through SN and SE.
4.6 Limitations

All participants worked for the same comprehensive school. This limits generalisability of present study. It has to be noted though, that the four departments and its separate teams have their own specific subcultures and operate in separate buildings and wings. Because of the geographical distances, mutual influenceability is low. It is only every two years the teachers attend the schoolwide teacher conference.

It should be borne in mind that in present research we aimed to measure a specific action. The intention to pedagogically use a Chromebook or Winbook in the following months in the classroom. As a result of this exactitude, generalisability does not go beyond this particular behaviour under research. By way of illustration, because of their distinct soft- and hardware properties, we would advise against setting present research side by side with teacher intentions for pedagogical classroom use of laptops for example.

Other limitations concern measurement limitations. We followed Francis et al. (2004) and used the median split of the intention scale as the cut-point to divide the whole sample into subcategories of intenders and non-intenders. Using a median split causes a loss of information about individual variability (Iacobucci, Posavac, Kardes, Schneider, & Popovich, 2015). Extreme scores and just above or below median scores alike are aggregated into only two categories. Additionally, dichotomising a continuous variable and using it in regression analysis (in our case in logistic regression) has been found to lead to serious bias (Maxwell & Delaney, 1993; Royston, Altman, & Sauerbrei, 2006).

For present research we used micro, meso and macro variables. Initially, the classification of these spheres seemed quite straightforward, but in practice we found this more difficult than expected. The meso and macro variables we used, were innovative culture, trust in management and policy alienation. All of the variables were based on self-reported items. Within the same teams or departments, we saw that teacher trust in management and experience of an innovative culture varied enormously. Similarly, under the same government with the same policies teachers felt different degrees of alienation. In that sense, these meso and macro variables essentially gave us information about the teachers’ personal feelings, experiences and emotions. We concluded that these three variables therefore, in some measure, could be regarded as micro variables as well.

We take the TRM variable to demonstrate our point. The decision to trust someone else is also dependent on factors such as level of self-confidence or anxiety towards organisational change (Hurley, 2006). Therefore, inferences with respect to TRM and the other two variables could only be made explicitly mentioning we were dealing with how teachers experienced innovative culture, trust in management and policy alienation.

Teachers scored the highest average on feelings of competence. It was suggested by van Diggelen, den Brok, and Beijaard (2013) that teachers as self-assessors, tend to be quite positive about
their competence. Positive self-assessment among teachers has been ascribed to wishful thinking (den Brok, Bergen, & Brekelmans, 2006). We realise that this may have had an impact on the self-reported variables which measured teachers’ general and specific competence. In actuality, average scores for the COM variable in present study were remarkably high. In consequence, not only the COM variable, but the SE variable measurements should be regarded with a certain degree of caution as well.

In the questionnaire we asked for teachers’ ages and subsequently categorised them as early-, middle- and late-career. This might work for the larger portion of the sample, but due to lateral entrants it is not one hundred percent fool proof. Besides, as mentioned before, categorising a variable comes with the disadvantage of loss of information.

The last limitation of present research concerns the end variable of this study, intention. The intention-behaviour relationship is not an entirely one-to-one relationship. Literature suggests that habits may have an attenuating effect on this relationship (Gardner, Lally, & Rebar, 2020). Much of human (teacher) behaviour consists of habits, automatic responses to cues (McConchie, 2019; Neal, Wood, & Quinn, 2006). Moreover, changing teaching habits has been found to be a challenging enterprise (Bafumo, 2006). In addition to this, Ajzen, Brown, and Carvajal (2004) explained that in TBP hypothetical contexts, participants tend to overestimate their willingness to engage in the behaviour under research.

Bearing in mind the two aforementioned phenomena with respect to the end variable intention, we believe that a follow-up study into subsequent actual implementation of reported intention might prove worthwhile. Exposing discrepancies between reported intention and actual behaviour (and vice versa) might add to this specific field of RAA research into teacher intentions to integrate ICT.

5. Overall conclusion

Despite the limitations, it can be concluded that the IMBP model lent itself to the purpose of present study. The model allowed us to answer our research question and the three subquestions. It enabled us to test the three hypotheses and explain which proximal and distal factors advanced intention. Moreover, the model enabled us to pinpoint at what level and how interventions could be designed in case of a collective commitment to advance pedagogical use of the Chromebook.

Through the whole of the statistical analyses, we found that the micro variables directly and indirectly affected intention to a much higher degree than the meso and macro variables. This study confirmed that teacher attitudes, subjective norm and feelings of self-efficacy play a deciding role with respect to the intention to pedagogically use Chromebooks in their classroom practices. Additionally, we found an increase in intention among teachers who had had positive experiences with the (pedagogical) use of the Chromebook. The more teachers adhered to socio-constructivist teaching principles, the higher their intention.
Intention increased indirectly mostly through attitude. Having socio-constructivist teaching beliefs indirectly increased intention. Contrary to what we had anticipated, emotional connectedness beliefs proved to indirectly advance intention as well. Having experienced success with ICT usage, indirectly improved intention, making it the distal variable which had the largest accumulative (i.e., direct and indirect) effect on intention. The two meso variables, experiencing an innovative culture and having trust in management, were indirect increasers of intention, mainly through attitude and to a lesser extent via social norm.

Being a member of a specific subject group with its own specific pedagogy also influenced intention. Teachers of the social science subject group were most intent on pedagogical use of the Chromebook. Teachers of the languages and STEM-subjects were the least enthusiastic.

5.2 Recommendations for practice

As Mumtaz (2000) pointed out in her extensive research on teacher use of ICT, teachers are often regarded as being quite resistant to change. At the same time, she found that this image of teachers’ negativity to change, deserves to be regarded with some subtlety. More recently, Tallvid (2016) drew a similar conclusion and called for nuancing the image of teachers being conservative and thus unwilling to adopt technology into their classroom practice. They found that drawing a rigid line between those who are reluctant and those who are accommodating towards technology in the classroom is unfeasible. Teachers can be both at the same time. Hence, the demand for further detailed study into reasons behind teachers’ unwillingness.

By using the IMBP model we aimed to meet this want for nuancing by exposing teacher convictions and attitudes at all three levels (micro, meso and macro). The more nuanced our knowledge about the predictors of intention, the better we would be able to design relevant recommendations for practice. Although the use of these three levels was not undividedly successful, the model did enable us do so. We established that ATT, SN, PC, TRM, EC, IC, LE and subject group were the strongest predictors of intention. Conclusively, we advise to initiate the following intervention.

Invest in setting up within-school PLCs of same-subject groups for the advancement of pedagogical use of Chromebooks. These groups should be encouraged to share their experiences and best practices. Every fortnight/month a teacher should present a best practice, an experience or a question to the others. Since it is mostly attitudes, beliefs and convictions that have to be addressed, it is important to not just focus on the what and how of pedagogical use of the Chromebook, but on the why as well during these group sessions.

In order to guarantee the required innovative climate within the school environment, these PLCs should be made jointly responsible for preserving this climate. They function as the core innovative body of the school organisation. Additionally, these PLCs will serve the purpose of sustaining the much-desired social peer pressure among colleagues. With a view to perpetuating
requisite trust in management and to not exclude them, management should be assigned a specific role. A facilitating role rather than a prescriptive one. In order to counter the workload effects on intention, managers could assume the role of sponsors by granting time and money out of the designated development teacher funds\(^4\) to PLCs. PLCs have to present their research and development designs in advance, in order to qualify for these grants.

Teachers should not only focus on the instrumental aspect of the pedagogical use of their Chromebooks, but also on the experiential. We found that teacher attitudes were based as much on the anticipated learning outcomes as on the ‘fun’ element of pedagogical use of Chromebooks. Appropriate focus should be given on how to integrate ICT and stay emotionally connected with pupils at the same time. Inform teachers about software solutions that have been designed for this very purpose. Have teachers bring in pupils during these group-sessions and gather information about their views on sustaining emotional connectedness in ICT settings, between teachers and pupils.

The most challenging task for the PLCs would be to change pedagogical convictions. Since we earlier saw that practice sometimes precedes theory, we hypothesise a good possibility of a shift in pedagogical convictions among the teachers as a side-effect, following the exposure to the socio-constructivist nature of the PLCs they take part in.

We feel that setting up these PLCs will provide the teachers with a good chance of experiencing success. After all, experience is not always the kindest of teachers, but it surely is the best\(^5\).

5.3 Recommendations for theory

Considering the high inter-correlational values between the three proximal variables, further research into the nature of their interrelatedness might provide insight into advancing attitude, which turned out to be the prominent predictor of intention. Establishing direction between SE, SN and ATT would enable future educational policy makers to target their interventions and innovations at the right levels. If SN for example were to predict ATT, we would advise to focus them at (subject) groups rather than at individuals.

As the intention-actual behaviour relationship is subject to a number of moderating variables, we think that for advancing the use of technology in the classroom it might be propitious to expose these variables. This could be achieved by setting up a design in which participants are asked as to what extent they have put their intentions into practice when the formulated T (i.e., time of TACT) of the questionnaire has expired. The value of such a design would lie in establishing the causes of

\(^4\) in the Dutch collective labour agreement for secondary education with full time employment: 83 hours and/or 600 euros per academic year

\(^5\) Spanish saying
discrepancies, if any. Comprehension of this specific domain will enable policy makers to partly abridge or even remove an intention-behaviour gap for teachers.

Although the COM variable did not greatly predict intention directly nor directly, intender and non-intender correlational values with the proximal variables differed significantly on general feelings of competence. The BI-COM and BI-ATT correlational differences between intenders and non-intenders amounted to over .50. Further research wholly dedicated to this phenomenon might provide more insight into what these feelings of competence entail, how they come about and what they result in. Feelings of competence might for example encourage innovativeness and/or risk-taking behaviours (Howard, 2009; Lopez-Perez, Ramirez-Corra, & Grandon, 2019). These have been associated with willingness to use ICT in classroom practice. It has to be noted that not reporting intention while filling in the questionnaire might have had a negative effect on participants’ feelings of competence.

An interesting distinction we found in our study was that different subject groups do not hold the same views with respect to ICT usage. Generic school ICT implementation policies might therefore not be all that efficient. Research aimed at eliciting the disparate inhibitions of the various subject groups might result in new theory which could be used by policy makers helping them to design differentiated subject group-dependent ICT implementation processes.

“IMBP has not yet been tested in the domain of teachers’ intention to pedagogically use an ICT object” (Kreijns et al., 2013b, p. 67). This fragment inspired us to carry out present research. Conclusively, we find that this study into the use of an ICT object variably adds to the field of IMBP research into implementing ICT. We established that model fit of the IMBP was good for carrying out research into the pedagogical use of an ICT object. Additionally, we found that using the model enabled us to devise an intervention, designed to stimulate intention among the participants. What’s more, this study has the potential to function as a stepping stone for further IMBP research into alternative ICT objects such as AI glasses.


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Appendix A: Accompanying Texts and Instructions for Participants for Online Questionnaire in Limesurvey

Vragenlijst voor onderzoek naar ‘De Didactische inzet van het Chromebook’
* waar Chromebook staat, mag ook Winbook gelezen worden

Voorstellen en inleiding
Mijn naam is Dirk Witten, docent Engels op de vestiging te -----. Ik volg de studie Onderwijswetenschappen en voer voor mijn masterthesis een onderzoek uit naar het didactisch gebruik van Chromebooks.

Context en achtergrond van het onderzoek
Sinds 2015 is er bij ons op school begonnen met de gefaseerde invoering van Chromebooks. (Daar zijn dit jaar Winbooks bijgekomen) Bij de introductie van het Chromebook was de oorspronkelijk insteek dat ze de papieren boeken zouden vervangen. Het Chromebook heeft de potentie om ‘traditioneel’ lesgeven te vervangen door andere manieren van lesgeven die goed aansluiten bij onze waarden Samen en Verschil.


Voorafgaand en tijdens het invullen van de vragen en het beantwoorden van de stellingen is het belangrijk om goed de omschrijving van ‘Didactisch Gebruik van het Chromebook’ even goed op je in te laten werken.


Voor de volledigheid ook nog een omschrijving van ander (periferaal) gebruik van het Chromebook: De docent zelf speelt een centrale rol bij het overbrengen van kennis, vaardigheden en vormende activiteiten. Het Chromebook is aanwezig als referentiemiddel, als inoefenmiddel, als administratietool en/of als communicatiemiddel.

Doel van het onderzoek
Naast publicatie van de resultaten van dit onderzoek in de masterthesis worden deze gepresenteerd worden aan het College van Bestuur van de onderzoeksschool.

Wie mogen er meedoen en wat wordt er van jou verwacht?
Alle docenten met lesgevende taken die in het bezit zijn van een Chromebook en/of Winbook worden uitgenodigd om mee te doen.

Er wordt van je verwacht dat je je 5 minuten lang concentreert en vragen en stellingen beantwoord. Wees zo eerlijk mogelijk.

N.B. Om invul-automaticisme te voorkomen zijn de items bewust positief én negatief geformuleerd. Dit vraagt enige concentratie bij het lezen van de items.
**Anonimiteit en veiligheid**

Deelname is vrijwillig, je bent dus tot niets verplicht. De antwoordresultaten zullen worden geanonimiseerd en strikt vertrouwelijk geanalyseerd en verwerkt. Tijdens het verwerken van de data wordt er gewerkt met codes. De deelnemers zullen als getallen opgenomen worden in het dataverwerkings-programma. De antwoorden kunnen dus niet herleid worden tot de deelnemer. In het onderzoek zelf wordt naar onze school verwezen als ‘onderzoeksschool’.

De vragenlijst begint met het invullen van de volgende persoonsgegevens: Welke vestiging ben je werkzaam? In welk team geef je les? Welk vak geef je? Hou oud ben je en welk niveau geef je les.

Bij het invullen is het belangrijk om in ogenschouw te nemen dat hier geen sprake is ‘gewenste’ of ‘ongewenste’ antwoorden. Door het meedoen aan dit onderzoek help je de wetenschap een klein stukje verder bij het verwerven van inzicht in de relatie tussen docenten en hun motieven om al dan niet hun lespraktijk aan te passen met behulp van ICT.


**Meer informatie over je rechten tijdens de dataverwerkingsfase van dit onderzoek**

Voor algemene informatie over je rechten kun je de volgende website bezoeken


**Vragen**

Voor vragen kun je terecht bij chromebook.onderzoek@ou.nl of prof. dr. ir. Kreijns, k.kreijns@ou.nl.

**Verklaring van toestemming en informed consent**

Ik geef toestemming aan de onderzoeker om de verzamelde data van dit onderzoek te gebruiken voor dit specifieke wetenschappelijke onderzoek. Ik heb de informatie van de bovenstaande inleiding begrepen en heb de mogelijkheid gehad om de onderzoeker vragen te stellen als ik iets niet begreep. Ik weet dat al de informatie die ik verstrek, anoniem verwerkt zal worden zonder dat deze informatie op enigerlei wijze op mij teruggevoerd kan worden. Ik ben me ervan bewust dat ik mij elk moment kan terugtrekken uit dit onderzoek zonder opgaaf van redenen. Ik ben geïnformeerd over het feit dat de data van dit onderzoek 10 jaar lang bewaard zal worden in overeenstemming met de VSNU-richtlijnen.

Door hieronder het invulvakje aan te vinken, geef je aan dat je instemt met de bovenstaande verklaring.

**Toestemming en informed consent**

KNOP [JA] KNOP [NEE]
Ondersteunende tekst zichtbaar voor participanten gedurende het beantwoorden van de proximale items
* Binnenkort is: binnen drie maanden na het weer opengaan van de scholen.


Afsluitende tekst van de online vragenlijst

Bedankt voor het nemen van de tijd voor het invullen van al de vragen. Je hebt geholpen bij het in kaart brengen van de intenties van VO-docenten om het Chromebook didactisch te willen inzetten.

Mocht je geïnteresseerd zijn geraakt naar de uitkomsten van dit onderzoek dan kun je mailen naar het volgende adres: chromebook.onderzoek@ou.nl.

Vriendelijke groet,

Dirk Witten en Prof. Dr. Ir. Karel Kreijns
Appendix B: Introductory questions of Online Questionnaire in Limesurvey: Demographical and Individual variables

1. **Op welke vestiging werk je?**
   (Als je op meerdere vestigingen werkt, wil je dan de vestiging aanvinken waar je het meeste lesgeeft)
   0 H
   0 Z
   0 M
   0 E

2. **Ben je in het bezit van een Chromebook of van een Winbook?**
   (Als je beide gebruikt, wil je dan het device aanvinken waarvan je het meeste gebruik maakt)
   0 Chromebook
   0 Winbook

3. **Ik geef de meeste les aan het volgende onderwijstype?**
   (Als je in meerdere onderwijstypen lesgeeft, wil je dan de sector aangeven waarin je de meeste lessen verzorgt)
   0 PRO
   0 BB
   0 KB
   0 TL
   0 TLH
   0 HAVO
   0 VWO

4. **In welk team geef je les?**
   (Mocht je in meerdere teams werken, wil je dan het team aanvinken met je leidinggevende)
   0 Z: vmbo onderbouw
   0 Z: tlh onderbouw
   0 Z: h: onderbouw
   0 Z: v: onderbouw
   0 Z: bb/kb bovenbouw
   0 Z: tl: bovenbouw
   0 Z: h: bovenbouw
   0 Z: v: bovenbouw
   0 M: onderbouw
   0 M: bovenbouw
   0 H: vmbo onderbouw
   0 H: bovenbouw
   0 H: hv onderbouw
   0 H: hv bovenbouw
   0 E: onderbouw
   0 E: bovenbouw

5. **Hoe oud ben je?**
   (Vul een getal tussen de 20 en de 70 in)

6. **Welk vak geef je?**
   (Als je meerdere vakken geeft, wil je dan het vak aanvinken dat je het meeste geeft)
   0 Dienstverlening en Producten
   0 Techniek (Bouw, wonen en interieur)
   0 Techniek (Produceren, installeren en energie)
   0 Rekenen
   0 KV1
   0 Muziek
   0 Nederlands
   0 Duits
   0 Frans
   0 Engels
   0 Spaans
   0 Latijn/Grieks
   0 Wiskunde
0 Natuurkunde (NASK-1)
0 Scheikunde
0 Biologie
0 Economie
0 Techniek
0 Verzorging
0 Aardrijkskunde
0 Geschiedenis
0 Maatschappijleer
0 Godsdienst
0 LO
0 BSM
## Appendix C: Questionnaire in Dutch

*(items in bold needed recoding)*

<table>
<thead>
<tr>
<th>Scale</th>
<th>Items</th>
<th>Answer-categories</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Proximal variables in the IMBP model</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BI 1</td>
<td>Ik wil binnenkort* het Chromebook in mijn lessen didactisch gaan inzetten</td>
<td>1 - helemaal mee eens tot 7 - helemaal mee oneens</td>
</tr>
<tr>
<td>BI 2</td>
<td>Ik verwacht dat ik binnenkort het Chromebook didactisch ga inzetten in mijn lessen</td>
<td>1 - helemaal mee eens tot 7 - helemaal mee oneens</td>
</tr>
<tr>
<td>BI 3</td>
<td>Het is mijn intentie om binnenkort mijn didactiek zo ga aan te passen dat ik de didactische mogelijkheden van het Chromebook beter benut</td>
<td>1 - helemaal mee eens tot 7 - helemaal mee oneens</td>
</tr>
<tr>
<td>ATT 1</td>
<td>Binnenkort* Chromebooks didactisch inzetten vind ik (hoe wordt gedrag ervaren)</td>
<td>1 onplezierig tot 7- plezierig</td>
</tr>
<tr>
<td>ATT 2</td>
<td>Binnenkort Chromebooks didactisch inzetten vind ik (hoe wordt gedrag ervaren)</td>
<td>1 verschrikkelijk tot 7 – fantastisch</td>
</tr>
<tr>
<td>ATT 3</td>
<td>Binnenkort Chromebooks didactisch inzetten vind ik (mening over uitkomst van gedrag)</td>
<td>1 waardeloos tot 7 - nuttig</td>
</tr>
<tr>
<td>ATT 4</td>
<td>Binnenkort Chromebooks didactisch inzetten vind ik (mening over uitkomst van gedrag)</td>
<td>1 niet nodig tot 7 - haalbaar</td>
</tr>
<tr>
<td>SN 1</td>
<td>De meeste van mijn leerlingen vinden dat ik binnenkort* het Chromebook didactisch in zou moeten zetten in mijn lessen</td>
<td>1- helemaal NIET waar tot 7 – helemaal waar</td>
</tr>
<tr>
<td>SN 2</td>
<td>De meeste collega’s zouden willen dat ik het Chromebook binnenkort didactisch ga gebruiken in mijn lessen</td>
<td>1- helemaal NIET waar tot 7 - helemaal waar</td>
</tr>
<tr>
<td>SN 3</td>
<td>Docenten zoals ik gebruiken gaan het Chromebook binnenkort didactisch gebruiken in hun lessen</td>
<td>1- helemaal NIET waar tot 7 - helemaal waar</td>
</tr>
<tr>
<td>SN 4</td>
<td>Ik voel dat het management en het bestuur graag wil dat ik binnenkort het Chromebook didactisch ga zetten in mijn lessen</td>
<td>1- helemaal NIET waar tot 7 - helemaal waar</td>
</tr>
<tr>
<td>SE 1</td>
<td>Het binnenkort didactisch inzetten van het Chromebook is iets dat ik helemaal zelf mag bepalen (autonomie)</td>
<td>1- helemaal NIET mee eens tot 7 - helemaal mee eens</td>
</tr>
<tr>
<td>SE 2</td>
<td>Het lesgen van het principe van didactisch gebruik van het Chromebook is voor mij ... (capaciteit)</td>
<td>1- moeilijk uit te voeren tot 7 – gemakkelijk uit te voeren</td>
</tr>
<tr>
<td><strong>Distal variables in the IMBP model</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PC 1</td>
<td>De focus van de lessen ligt op het helpen van leerlingen bij het construeren van kennis door middel van hun leerervaringen in plaats van overdracht van kennis</td>
<td>1 – helemaal NIET mee eens – 7 helemaal mee eens</td>
</tr>
<tr>
<td>PC 2</td>
<td>Elk kind is uniek en verdient maatwerk dat op zijn/haar behoeften is afgestemd</td>
<td>1 – helemaal NIET mee eens – 7 helemaal mee eens</td>
</tr>
<tr>
<td>PC 3</td>
<td>In een goed klaslokaal is er sprake van een democratische vrije sfeer waarin leerlingen worden gestimuleerd na te denken en met elkaar in overleg te gaan</td>
<td>1 – helemaal NIET mee eens – 7 helemaal mee eens</td>
</tr>
<tr>
<td>PC 4</td>
<td>Leerlingen zijn verschillend, dus hebben ze recht op verschillende lesdoelen en leerstofseisen.</td>
<td>1 – helemaal NIET mee eens – 7 helemaal mee eens</td>
</tr>
<tr>
<td>WL 1</td>
<td>Ik werk structureel over</td>
<td>1 - Helemaal NIET op mij van toepassing tot – 7 helemaal wel op mij van</td>
</tr>
<tr>
<td>WL 2</td>
<td>Ik heb weinig tijd over voor scholing en innovatie</td>
<td>1 - Helemaal NIET op mij van toepassing tot – 7 helemaal wel op mij van</td>
</tr>
<tr>
<td>WL 3</td>
<td>Ik ervaar de klussen naast het lesgeven als zwaar (bijv. contact met ouders, administratie)</td>
<td>1 - Helemaal NIET op mij van toepassing tot – 7 helemaal wel op mij van</td>
</tr>
<tr>
<td>WL 4</td>
<td>Ik heb een schooldag nauwelijks echt pauze</td>
<td>1 - Helemaal NIET op mij van toepassing tot – 7 helemaal wel op mij van</td>
</tr>
<tr>
<td>TRM 1</td>
<td>Ik heb vertrouwen in het onderwijskundig wetenschappelijk inzicht van direct leidinggevende</td>
<td>1 – helemaal mee oneens tot - 7 helemaal mee eens</td>
</tr>
<tr>
<td>TRM 2</td>
<td>Ik heb vertrouwen in de vaardigheden van mijn direct leidinggevende</td>
<td>1 – helemaal mee oneens tot - 7 helemaal mee eens</td>
</tr>
<tr>
<td>TRM 3</td>
<td>Ik vertrouw erop dat mijn direct-leidinggevende dat hij/zij altijd zijn beloften nakomt</td>
<td>1 – helemaal mee oneens tot - 7 helemaal mee eens</td>
</tr>
<tr>
<td>EC 1</td>
<td>Als leraar vind ik het belangrijk om te streven naar een diepgaande persoonlijke relatie met al mijn leerlingen</td>
<td>1 - Helemaal NIET op mij van toepassing tot – 7 helemaal wel</td>
</tr>
</tbody>
</table>
| EC 2 | Ik voel me succesvol als leraar wanneer ik merk dat ik goed in staat ben om een emotionele verbinding aan te gaan met mijn leerlingen | 1 - Helemaal NIET op mij van toepassing tot – 7 helemaal wel  
1 - Helemaal NIET op mij van toepassing tot – 7 helemaal wel |
| EC 3 | Het laten zien dat ik om mijn leerlingen geef, heeft een hoge prioriteit | |
| IC 1 | In ons team wordt mijn creativiteit op een goede manier voor het verbeteren van onderwijs | 1 - helemaal mee oneens tot - 7 helemaal mee eens |
| IC 2 | Onderwijsinnovatie is in ons team veel meer dan een woord, het is onze cultuur | 1 - helemaal mee oneens tot - 7 helemaal mee eens |
| IC 3 | Mijn managers hebben de juiste leiderschapseigenschappen om innovatie te sturen en te ondersteunen | 1 - helemaal mee oneens tot - 7 helemaal mee eens |
| COM 1 | Ik ben goed in staat om iets op een andere manier uit te leggen aan mijn leerlingen | 1 - helemaal mee oneens tot - 7 helemaal mee eens |
| COM 2 | Ik ben goed in staat om in mijn klaslokaal orde te houden | 1 - helemaal mee oneens tot - 7 helemaal mee eens |
| COM 3 | Het luft mij goed om al mijn leerlingen te motiveren voor mijn vak | 1 - helemaal mee oneens tot - 7 helemaal mee eens |
| BO 1 | Ik voel me opgebrand door mijn werk | 1 – nooit tot - 7 altijd |
| BO 2 | Tijdens mijn werk lukt het mij goed om kalm om te gaan met emotionele problemen | 1 – nooit tot - 7 altijd |
| BO 3 | Het voelt alsof leerlingen mij de schuld geven voor sommige van hun problemen | 1 - nooit tot - 7 altijd |
| PA 1 | Ik vind dat wij als docenten weinig te zeggen hebben over het onderwijskundige beleid in ons land | 1 - helemaal mee oneens tot - 7 helemaal mee eens |
| PA 2 | Ten opzichte van de overheid worden de docenten zelf te weinig betrokken bij de totstandkoming van onderwijskundig beleid | 1 - helemaal mee oneens tot - 7 helemaal mee eens |
| PA 3 | Het onderwijskundig beleid van de landelijke overheid voelt als een keurslijf waar ik niet gemakkelijk in kan bewegen | 1 - helemaal mee oneens tot - 7 helemaal mee eens |
| PA 4 | Mijn leerlingen hebben baat bij uitvoering van de onderwijskundige ideeën van de overheid | 1 - helemaal mee oneens tot - 7 helemaal mee eens |
| PA 5 | Ik denk dat het uitvoeren van de onderwijskundige ideeën van de landelijke overheid zal leiden naar onderwijsverbetering | 1 - helemaal mee oneens tot - 7 helemaal mee eens |
| LE 1 | Het moeten verzorgen van digitaal afstandsonderwijs tijdens de lockdowns ben ik positiever geworden over de didactische inzet van Chromebooks | 1 – helemaal NIET op mij van toepassing tot – 7 helemaal wel op mij van |
| LE 2 | Het moeten verzorgen van digitaal afstandsonderwijs heeft er toe geleid dat ik ook tijdens mijn ‘normale’ lespraktijk vaker gebruik ben gaan maken van de didactische mogelijkheden van het Chromebook | 1 – helemaal NIET op mij van toepassing tot – 7 helemaal wel op mij van |
| LE 3 | Het moeten verzorgen van digitaal afstandsonderwijs heeft er toe geleid dat ik nu meer weet over de didactische mogelijkheden van het Chromebook | 1 – helemaal NIET op mij van toepassing tot – 7 helemaal wel op mij van |
| LE 4 | Het moeten verzorgen van digitaal afstandsonderwijs heeft er toe geleid dat ik nu meer vertrouwen in mijn ICT-vaardigheden heb gekregen wat betreft het lezen van het lesgeven met het Chromebook | 1 – helemaal NIET op mij van toepassing tot – 7 helemaal op mij van toepassing |

**Demographics and individual variables**

| Schoolvak (subject) | Opsomming van schoolvakken |
| Lifespan (age) | 1 - 4 |
| Vestiging (department) | Van 20 – tot 70 |
| Leeftijd (age) | PRO – VWO |
| Onderwijsstroom (instructional level) | Onderbouw VMBO - tot bovenbouw |
| Werkzaam in team (team) | VWO |
| Mobile device | Chromebook of Winbook |