



MASTER THESIS

Exploring elementary school teachers' professional information technology (IT) identity

S. A. Eidhof

October 19, 2018

Faculty of Behavioural, Management, and Social Sciences

Communication Science: Corporate Communication

EXAMINATION COMMITTEE

Dr. S. Janssen

Dr. H.A. van Vuuren

UNIVERSITY OF TWENTE.

Abstract

Aim: This current study focusses on the concept of information technology (IT) identity as proposed by Carter and Grover (2015). IT identity is a rather new concept and the original model of Carter and Grover (2015) has not been tested. Therefore, the description as well as the proposed measurement of this concept was elaborated upon. Elementary school teachers were used as a context to measure the IT identity, because the role of technology in the classroom is becoming increasingly important. Therefore, it is important for teachers to integrate technology in their teaching as best as possible. Method: An online survey was distributed among elementary school teachers (N = 152). Different independent variables were used to measure the IT identity, that consists of the factors dependence, relatedness, and emotional energy. The independent variables are: Self-efficacy, actualized rewards, functionality, support, IT dynamism, and obligation. Results: The results in the correlation and multiple linear regression analyses revealed that self-efficacy, functionality, support, actualized rewards, and obligation have a positive relationship with IT identity. IT dynamism does not have a relationship with IT identity. Implications: From a theoretical point of view, this study fills the literature gap regarding IT identity by implementing different independent variables and by using the context of elementary school teachers. From a practical point of view, this study provides insights for teachers and their supervisors in identifying a possible reason why teachers are not fully embracing technology. Conclusion: While the IT identity model is not tested enough, this study does give some insights in which factors are influencing the IT identity of elementary school teachers. However, future research is needed into how to measure the concept of IT identity in different contexts and the usability of the original model in general.

Keywords: IT Identity; Elementary School Teachers; Experience; IT Characteristics; Teachers' Professional Identity

Table of contents

1. Introduction	
2. Theoretical framework	7
2.2. Dependent variable IT identity	
2.3. Independent variables	10
2.3.1. Experience	10
2.3.2. IT characteristics	11
2.3.3. Situational influences	12
3. Methodology	14
3.1. Sample	14
3.2. Instrument	16
3.2.1. Scales IT identity	16
3.2.2. Scales independent variables	17
3.2.3. Pre-test	
3.2.4. Procedure	20
3.3. Reliability	20
3.4. Data analysis	22
4. Results	24
4.1. Descriptive results	24
4.2. Influence of Control Variables	25
4.3. Correlations	26
4.4. Hierarchical multiple linear regression	
4.5. Support for the hypotheses	
5. Discussion	
5.1. Discussion of the questionnaire results	
5.2. Limitations of the research	
5.3. Discussion of the model from Carter and Grover (2015)	
5.4. Implications and future research	
5.4.1 Theoretical implications and future research	
5.4.2 Practical implications	40
6. Conclusion	41
References	42
Appendices	45
Appendix A: Main test questionnaire English	45
Appendix B: Main test questionnaire Dutch	49

List of Tables

Table 1 Sample Descriptives (N = 152)	15
Table 2 Cronbach's Alpha for all scales	
Table 3 Correlations single and multiple item scales IT identity	
Table 4 Means and standard deviations of all variables	
Table 5 Test of Between Subject Effects	
Table 6 Pearson Correlation	
Table 7 Hierarchical multiple regression analysis predicting dependence	
Table 8 Hierarchical multiple regression analysis predicting relatedness	
Table 9 Hierarchical multiple regression analysis predicting emotional energy	
Table 10 Regression Coefficients Dependence	
Table 11 Regression Coefficients Relatedness	
Table 12 Regression Coefficients Emotional Energy	
Table 13 Overview of the support for hypotheses	

List of Figures

Figure 1 Conceptual model	
Figure 2 Normal P-P Plot Dependence and Age	22
Figure 3 Homoscedasticity Dependence and Age	23

1. Introduction

Nowadays, information technologies (ITs) are becoming essential for maintaining relationships and social roles. There are new expectations for how, where, and when people maintain their social networks. Therefore, new constructs are being introduced to expand the understanding of this intertwinement between humans and information technologies and human behavior in general. One such construct is called IT identity. This study tests and operationalizes the concept of IT identity, defined as "the extent to which a person views the use of IT as integral to his or her sense of self" (Carter & Grover, 2015, p. 938). Carter and Grover (2015) claim that this novel and powerful concept has potential to furnish a rich understanding of how technologies can become routinized and infused within organizations. Carter and Grover (2015) developed a set of variables to measure IT identity. However, this novel and possibly powerful concept has not been tested enough to say that it is applicable to every situation. The main goal of this study is, therefore, to see if the original model as proposed by Carter and Grover (2015) is applicable to the context of elementary school teachers.

The context of elementary school teachers from the Netherlands is chosen, because the continuous development of innovative and interactive technological applications have changed the learning methods available to teachers in elementary schools. Teachers constantly need to adapt to new kinds of technology (whiteboards, laptops, iPads, different software applications, et cetera). Because technology cannot replace teachers, it is important for teachers to fully embrace the technology and use it to their benefits. That is what Carter and Grover (2015) call an 'IT identity'. Elementary school teachers use more than one technology, therefore, IT (in this research) is the technology in general and not one specific technology type, because it is not one technology that can change the beliefs and identity of teachers, but the use of technology as a whole.

As previously told, IT identity is a rather new concept and there is currently no research available that shows the incorporation of an IT identity by elementary school teachers. However, a lot of research has been done on teachers and their beliefs, identity, and roles. Researchers have, for example, extensively investigated the professional identity of teachers and how their roles are changing (Beijaard, Meijer, & Verloop, 2014; Murchú, 2005; Nykvista & Mukherjee, 2016; Zhu, 2010), the impact of the technologies on the learning effectiveness of students (Chauhan, 2016), the changing integration of technology of teachers (Hsu, 2017),

the beliefs of teachers on teaching and technology (Admiraal et al., 2017; Ertmer et al., 2012), and teachers' perspectives on ICT (Van den Beemt & Diepstraten, 2016).

Unfortunately, there is still a lack of research on the impact of the technologies on the incorporation of an IT identity, and especially a lack of research on elementary school teachers alone. Admiraal et al. (2017) claim that some findings are specific to the context of secondary education and others to the context of elementary school. Almost all studies investigate elementary and secondary schools together, while there could be a difference between these types of schools. One of the main differences is the way of teaching: an elementary teacher is responsible for teaching all subjects, varying from language, to math, and history. In secondary school, teachers are only responsible for teaching one specific subject. Hence, in elementary school, teachers need to adopt diverse technologies, while in secondary school it often depends on which subject the teacher teaches. This is the reason why in this research the focus is placed on elementary school teachers.

Furthermore, this research will broaden the literature on IT identity. Nowadays, social relationships are becoming inseparable from a person's interactions with technologies. This increases the importance of the research into the effect that technologies can have on people, social institutions, or society. Besides that, it is important to the specific context of elementary school teachers, because IT identity can expand the understanding of how and why teachers use IT and what needs to be improved when teachers are not fully embracing the technology. Maybe schools need to improve their training and support, but it can also be due to the technology itself or due to the teacher self. Furthermore, it is important to understand how teachers respond to and mitigate challenges to their current self-concepts (Carter & Grover, 2015). IT identity helps to understand individuals' own behaviour relative to IT in embedded social contexts.

To find out if the model created by Carter and Grover (2015) is applicable to the context of elementary school teachers and to see which factors can influence IT identity, the main question of this research is:

MQ: 'To what extent do embeddedness, self-efficacy, actualized rewards, functionality, support, IT dynamism, and obligation influence the extent to which elementary school teachers incorporate an IT identity?'

The theoretical framework is presented in the next chapter. This includes the description of the dependent and independent variables based on previous studies. Besides that, the hypotheses and the conceptual model are introduced.

2. Theoretical framework

Based on a literature study, the theoretical framework starts by explaining the (IT) identity of teachers. Furthermore, the dependent variables, independent variables, and hypotheses are determined.

2.1. The (IT) identity of teachers

In recent years, technological developments have had an enormous impact on our society and, therefore, on education. The possibilities to communicate and the amount of information available have increased enormously in a short time. Are these developments positive? On the one hand, these developments are positive, because in a personalized education in a digital environment, students can learn and develop themselves according to their own needs, level, and pace. Therefore, teachers can act more as a coach. On the other hand, teachers constantly need to adapt to different technologies. Besides that, the introduction of new technologies in the classroom generally does not stem from a demand from users, such as teachers, pupils, parents or schools, but it is driven by politicians, administrators and technology companies. Therefore, teachers might feel obligated to use technologies and are not all advocates of it. The question is whether or not these developments are needed and if all teachers should embrace technologies.

The identity literature of teachers is varied and rich and has become a separate research agenda in the last few years (Beijaard et al., 2014). While many researchers define the concept of teacher identity differently, the main definition of teacher identity contains the following: *"The concept of teacher identity refers to how teachers identify themselves as teachers, including who they are as professionals, and who they strive and are empowered to become in a constant process of reflecting on their practices and experiences" (Vokatis & Zhang, 2016, p. 59).*

Therefore, teacher identity is not static, but is constantly developing. It is not limited to answering the question "Who am I at this moment?", but it also entails answering the question "Who do I want to become?" (Beijaard et al., 2004). Besides that, teacher identity is dependent on the context, the agency, the relationships that teachers have with colleagues and students, and the school structure.

However, teacher identity and teacher IT identity are merging together because of the technological developments in the classroom: "Teachers' professional identity in relation to learning technologies should encompass work-related identity, how they prefer to work and how they see themselves as a teacher; teaching-related identity, how they perceive and conduct teaching; and technology-related identity, how they perceive the role of and use technology at work" (Liu & Geertshuis, 2016, p. 7). Teacher identity nowadays should contain the concept of technology.

While the identity of teachers has received extensive attention from researchers, the IT identity of teachers did not receive attention. Because IT changes the way people work, IT may reshape roles and challenge identities. Carter and Grover (2015) conceptualize IT identity as "the extent to which a person views the use of IT as integral to his or her sense of self, where a strong IT identity represents identification (the use of IT is integral to my sense of self) and a weak IT identity represents dis-identification" (p. 938). IT identity is more easily accepted when it does not conflict with already existing identities. This does not mean that IT identity is the same as IT acceptance, because teachers can accept the technology, but not incorporate an IT identity. For example, teachers can accept the technologies because they have to, but they will not feel connected with the technologies. Furthermore, research concluded that when a person has a strong IT identity, he or she will have a better attitude towards IT, will continue using IT, will use IT more frequently, will intend to explore more aspects of IT (trying to innovate), and will engage in deeper use of IT (Carter, 2012).

Although the incorporation of an IT identity by elementary school teachers did not receive attention, there is a research that shows the incorporation of an IT identity by youngsters in relation to their mobile phones (Carter, 2012). In this research, Carter called it 'mobile phone identity'. She found that mobile phone identity is developed over time, because interactions with IT become embedded in their lives. Three interrelated dimensions of mobile phone identity have played an important role in her research: Dependence, relatedness, and emotional energy (Carter, 2012). Carter is also stating that there is a need for more research to study IT identity in a different context than youngsters and mobile phones. Her studies published in 2012 and 2015 are the basis of the conceptual model used in this study in the context of elementary school teachers. The question is also whether it is possible to measure IT identity, as proposed by Carter and Grover, in different contexts. Especially in a context where people use multiple

technologies and where it is not voluntary to use the technologies, as was the case with the context of mobile phone identity.

2.2. Dependent variable IT identity

The first dependent variable is the IT identity, divided into three different concepts. Therefore, a high IT identity is characterized by high dependence, high relatedness, and high emotional energy (Carter, 2012).

Firstly, **dependence** can be conceptualized as "a reliance upon IT as a source of personal wellbeing" (Carter & Grover, 2015, p. 945). Nowadays, people are becoming increasingly dependent on IT, because everybody wants to maintain their relationships with friends and family, as well as maintaining their work relationships. New technologies are, therefore, enabling people to easily maintain those relationships. For example, teachers can depend on IT to communicate with other colleagues, especially when they teach the same class and need to inform their colleague about what happened.

Secondly, **relatedness** represents the feeling of connectedness with IT (Carter & Grover, 2015). People with a really strong connection with IT are more likely to show their IT identity in different situations. It is a "blurring of boundaries between notions of the self and IT" (Carter, 2012, p. 189). Due to the blurred boundaries, people incorporate resources and characteristics of IT into their self-concepts. For example, someone with a really strong mobile phone identity is more likely to show their mobile phone and carry it with him or her all the time, whereas people with a weak mobile phone identity are more hesitant in their use of mobile phones in public.

Thirdly, **emotional energy** is conceptualized as feeling emotionally attached and enthusiastic in relation to a class of ITs. It is the extent to which an individual expresses feelings of confidence, enthusiasm, and energy when thinking about her or him-self in relation to IT (Carter, 2012). Contrarily, people with low emotional energy feel little emotions and can sometimes even feel bored when using IT.

2.3. Independent variables

The aim of this study is to research if elementary school teachers incorporate an IT identity, but forming an IT identity could be influenced by different independent variables. For this study, the experience with using IT, IT characteristics, and situational influences are the independent variables previously formed by Carter and Grover (2015). These variables can be explained using sub variables, as will be explained below.

2.3.1. Experience

Experience with using IT can shape the strength of an IT identity. The experience is divided in embeddedness, self-efficacy, and actualized reward (Carter & Grover, 2015).

Firstly, **embeddedness** is how an individual was dealing with past interactions with an identity, across a variety of situations. In other words, it is the extent to which an individual has previously invested in another identity. As noted further on in this thesis, embeddedness will not be measured in the main questionnaire, because of the vagueness of the statements.

Secondly, **self-efficacy** is "an individual's beliefs about his or her capabilities to use IT" (Compeau & Higgins, 1995, p. 189). Self-efficacy in this research contains teachers' capabilities to use a broad range of IT in the classroom. According to Carter and Grover (2015), IT identity is verified when the nature and outcomes of interacting with IT demonstrate control over its feature set and, therefore, efficacy-based self-esteem is one outcome of feature use and enhanced use behaviours that, in turn, exerts a significant influence on IT identity.

Finally, the focus of **actualized rewards** is on the benefits from past IT use, the enjoyment of past interactions with IT, and the satisfaction of past usage behaviours (Carter & Grover, 2015). "Identities that have materially benefitted individuals or have provided some intrinsic gratifications are more likely to become integral to the self than those that gain a person little or nothing. Further, studies indicate that when past experiences evoke feelings of satisfaction or enjoyment, this positively influences individuals' ongoing commitment to using specific technologies" (Carter & Grover, 2015, p. 947).

When all three factors of experience are high, it is expected that the IT identity will be higher (Carter & Grover, 2015). Therefore, the following hypotheses can be formed:

H1a: Embeddedness has a positive relationship with IT identity (dependence, relatedness, and emotional energy).

H1b: Self-efficacy has a positive relationship with IT identity (dependence, relatedness, and emotional energy).

H1c: Actualized rewards has a positive relationship with IT identity (dependence, relatedness, and emotional energy).

2.3.2. IT characteristics

Carter and Grover (2015) identified four different IT characteristics that may have an effect on IT identity, namely functionality, malleability, bandwidth, and mobility. These can also help realize the experience and, therefore, can have an impact on the strength of an IT identity. Firstly, **functionality** is about the different uses, or capabilities, to which IT can be applied. Secondly, **malleability** is "the capacity to support a wide variety of everyday practices without needing technical customization" (Carter & Grover, 2015, p. 944). Thirdly, **bandwidth** makes it possible to communicate many different types of information, as well as large amounts of information. Finally, **mobility** is the ability to move from one place to another, without losing your connectivity.

Because this research tries to understand the IT identity that teachers create within their classroom, mobility will be disregarded for further research. Besides that, bandwidth will also be disregarded, because there is no need for teachers to communicate other types of information than teaching related information. Malleability will be deleted, because it is a vague concept, as described by Carter and Grover (2015), and it was not possible to measure this characteristic with questions in the questionnaire. Furthermore, some aspects of malleability can be explained by functionality, too.

The main focus of IT characteristics is, therefore, on the functionality of using IT in the classroom. It is possible to envision situations where interacting with particular IT characteristics promote an emotional response, such as enjoyment or arousal. Still, there is no means by which IT characteristics can influence IT identity, except through an individual's interactions with the technology, as an end-user. Moreover, since emotional energy, relatedness, and dependence represent long-term outcomes of a history of interactions that transcend

specific emotional experiences, the effects of IT characteristics on IT identity will manifest only when there is a broad set of situations in which interactions occur (embeddedness), individuals have confidence in using IT (computer self-efficacy), and expected rewards are actualized. However, the mediation function of functionality is deleted in this research, because functionality may have an effect on IT identity without the mediation effect of experience (Carter & Grover, 20150). Based on Carter and Grover (2015), the following hypothesis can be formed:

H2: Functionality has a positive relationship with IT identity (dependence, relatedness, and emotional energy).

2.3.3. Situational influences

IT identity also depends on situational influences, such as support, perceived behavioural control, and IT dynamism (Carter & Grover, 2015).

Firstly, Carter and Grover (2015) included perceived behavioural control and conceptualized it as 'the extent to which a person feels able to enact the behaviour in accordance with IT identity' (p. 944). This contains practically the same information as self-efficacy and, therefore, perceived behavioural control will not be included in this research.

Secondly, **support** contains training to be able to explore IT features, the access to resources, and the help that the school offers to the teachers when they are facing problems with the technologies. Organizations may indirectly help promote IT identity by providing users with access to technological changes that extend the feature set of an IT, as well as opportunities to use the IT in new contexts, and by implementing mechanisms to support and reward feature use and enhanced use behaviours (Carter & Grover, 2015).

Thirdly, **IT dynamism** is the extent to which, and how often, a particular IT is changing. This could be important, because the technologies available to teachers are changing continuously, due to upgrades and new software applications. Dynamic technologies present opportunities to expand the self through applying IT to new tasks and situations (enhanced use). Carter and Grover (2015) mentioned that IT with high dynamism and more support will have a stronger influence on IT identity. Therefore, the following hypotheses can be formed:

H3a: Support has a positive relationship with IT identity (dependence, relatedness, and emotional energy).

H3b: IT dynamism has a positive relationship with IT identity (dependence, relatedness, and emotional energy).

Besides the situational influences mentioned in Carter and Grover (2015), it is also important to include **obligation** as a possible influence. Therefore, obligation is added as a new situational influencer in this study. The question is if teachers will also incorporate an IT identity if they feel obligated to use IT, because everyone else is using it. This is a form of social pressure from your colleagues, staff, or social environment. For this research, obligation will be expected to negatively influence IT identity and the following hypothesis can be formed:

H3c: Obligation has a negative relationship with IT identity (dependence, relatedness, and emotional energy).

Finally, there are also some control variables, namely working experience (years), age, gender, the group they teach, and the place of the school. These demographic control variables are used to see if there are any additional results. For example, older teachers can have more difficulties in incorporating an IT identity than younger teachers. Besides that, there could be a difference between men and women.

Figure 1 represents the assumed relationships between the variables in a comprehensive conceptual model.



Figure 1 Conceptual model

3. Methodology

Previously, the theoretical framework is explained and the hypotheses are posed. In order to research this, a questionnaire was used. In this section, the sample, instrument, reliability, and data analysis will be explained.

3.1. Sample

In order to reach a statistically significant sample size of elementary school teachers for the questionnaire, firstly, teachers in personal circles were asked to fill in the survey. They were contacted through WhatsApp, Facebook, or E-mail. A snowball sampling was used, as teachers were asked to send the survey to other teachers. This first step resulted in 46 responses. After that, teachers were personally emailed to fill in the survey. From every province, approximately 10 schools were contacted. These schools were chosen via a Google Maps search on 'elementary schools'. This was also done to make sure that participants were not only from the region of Twente. Thus, teachers from all over the Netherlands, from Groningen to Maastricht and from Haarlem till Eindhoven, were sent an email.

In total, 160 elementary school teachers filled in the survey, but not every survey was filled in completely. After deleting incomplete responses, there were 152 completed surveys left that were useful for this study. Teachers' ages ranged from 20 till 64 (24 males, 128 females, $M_{age} = 40.56$ years and $M_{workingexperience} = 15.96$ years). Age was divided into 5 different groups (20-29, 30-39, 40-49, 50-59, and 60-69 years) and working experience was also divided into 5 different groups (0-9, 10-19, 20-29, 30-39, and 40-49 years). The amount of teachers in all groups was almost the same, only the latter group had a smaller amount of teachers. There were more teachers from the province of Overijssel (28.95%), due to the distribution in personal circles, but every other province was also represented, except Flevoland. Besides that, teachers were equally divided amongst the groups in which they teach.

However, for the control variable 'group' respondents could fill in more than one group, so the total amount was higher than N = 152. This means that there were some teachers who filled in multiple groups, especially teachers who did not have one fixed group in which they teach. Besides that, when a teacher teaches both group 1 and 8, for example, it will be hard to make a distinction between groups based on their IT identity. The only way to make this distinction is

to only use teachers that teach a single group. However, that was not possible in this research, because deleting teachers with more than one group would lead to a really low sample size of teachers.

Table 1 gives a complete overview of the frequencies for the sample descriptives gender, age, working experience, place (province), and group.

Variable		N	Percentage
Gender	Male	24	15.79%
	Female	128	84.21%
Age (in years)	20-29	37	24.34%
	30-39	39	25.66%
	40-49	27	17.76%
	50-59	38	25.00%
	60-69	11	7.24%
Experience (in years)	0-9	60	39.47%
	10-19	36	23.68%
	20-29	28	18.42%
	30-39	24	15.79%
	40-49	4	2.63%
Province	Overijssel	44	28.95%
	Noord-Holland	22	14.47%
	Gelderland	14	9.21%
	Utrecht	14	9.21%
	Noord-Brabant	13	8.55%
	Zuid-Holland	12	7.89%
	Groningen	10	6.58%
	Limburg	10	6.58%
	Friesland	9	5.92%
	Zeeland	3	1.97%
	Drenthe	1	0.66%
Group	1	39	15.42%
	2	33	13.04%
	3	23	9.09%
	4	26	10.28%
	5	30	11.86%
	6	36	14.23%
	7	32	12.65%
	8	34	13.44%

Table 1 Sample Descriptives (N = 152)

3.2. Instrument

The main questionnaire was created with Qualtrics. It was translated into Dutch, because participants were only Dutch, therefore not everyone was able to fill in a survey in English. All items from the independent and dependent variables in this study were measured on a seven-point Likert scale, ranging from 1 = strongly disagree to 7 = strongly agree. Given the explorative nature of this study, a seven-point scale can give more variation in the answers than a five-point Likert scale.

3.2.1. Scales IT identity

The dependent variable 'IT identity' was divided into dependence, relatedness, and emotional energy. The scales for these three variables were all retrieved from the same study conducted by Carter (2012).

Firstly, **dependence** was measured by four items. Two example items are 'when I think about myself in relation to the ITs I use in the classroom, I need the ITs' and 'when I think about myself in relation to the ITs I use in the classroom, I am dependent on the ITs'. This scale measured how much the elementary school teachers rely upon the technology they use in the classroom.

Secondly, **relatedness** was also measured by four items. Two example items are 'thinking about myself in relation to the ITs I use in the classroom, I am close with the ITs', and 'thinking about myself in relation to the ITs I use in the classroom, I am detached from the ITs'. Relatedness measured how much the teacher feels connected with IT.

Thirdly, two example items from the four items to measure **emotional energy** are 'thinking about myself in relation to the ITs I use in the classroom, I feel enthusiastic' and 'thinking about myself in relation to the ITs I use in the classroom, I feel energized'. Emotional energy measured if, and how much, teachers feel emotionally attached to IT.

Because it is not sure whether these three variables are a good fit to measure the whole concept of **IT identity**, a single item measure was created. Participants could choose between two small descriptions about what kind of person they are. They could indicate on a scale from 0% till 100% if they agree with the given description. The first description was: "I am a person who

feels connected very quickly with different technologies. That is why I attach great value to new technologies, I am enthusiastic about using them and I feel that I cannot live without technologies". The second description was: "I am a person who does not feel connected very quickly to different technologies. That is why I do not value new technologies, I find it tiring to use them and I can do well without the technologies".

3.2.2. Scales independent variables

Firstly, **embeddedness** measured the previous investment in an identity besides the IT identity. In this study, the investment in teacher identity was measured, because the respondents all have that identity in common. The embeddedness scale was based on the work of White and Dahl (in Bruner, 2012, p. 437). The scale consisted of four items. An example statement is: 'being a teacher is important to my sense of the kind of person I am'.

Secondly, **self-efficacy** was measured by five statements. Example statements are 'I am fully capable of using IT in the classroom' and 'using IT in the classroom is well within the scope of my abilities'. The scale was based on the scale 'self-efficacy' of Meuter et al. (in Bruner, 2012, p. 598). This construct measured if teachers feel able to use IT in the classroom.

Thirdly, **functionality**, was measured with the System Usability Scale (SUS). This scale consists of ten items and was originally created in 1986 by Brooke. Over the years, it has been widely used in more than 1300 articles. This scale gave a general view of the subjective assessments of usability. An example statement is 'I found IT in the classroom unnecessarily complex'.

Fourthly, the POS (perceived organizational support) scale was used to measure **support** (Wayne, Shore, & Liden, 1997). Support measured the degree to which the teachers believe that their school values their contributions and cares about their well-being. Four statements were used to measure this. Example statements are 'help is available from (name of school) when I have problems regarding IT' and '(name of the school) shows a lot of concern for me when it comes to using IT'.

The following three constructs contained statements that were especially designed for this study, because there were no existing scales available. These statements were pre-tested

beforehand to ensure that they are understandable. Actualized rewards, IT dynamism, and obligation contained three statements each.

Fifthly, **actualized rewards** measured if the teachers enjoyed past IT-use and if they have benefitted from it. This was measured with the following example statements: 'Past experience with using IT made me feel rewarded' and 'I am satisfied with my overall experience with using IT in the classroom'.

Sixthly, **IT dynamism** measured if teachers think that the IT in the classroom is changing (too much). This was measured with the following example statements: 'I feel that the IT I use in the classroom is changing too much' and 'when IT in the classroom changes, the technologies are changing drastically'.

Finally, **obligation** measured feelings of social pressure to use IT. This was measured with the following example statements: 'I feel obligated to use IT in the classroom' and 'because everyone else is using IT in the classroom, I need to use it too'.

Besides the independent variables, other variables could have an influence on the dependent variables. Therefore, the **gender**, **age**, **working experience**, **province**, and **group** of the teachers were also asked and were analysed together with the independent variables in Section 4.

3.2.3. Pre-test

A small pre-test was constructed to ensure that all constructs explained above were seen as relevant to measure according to teachers themselves. Besides that, it was used to check whether there was missing a potentially important construct. Finally, the pre-test was a good opportunity to check if respondents understood the questions and statements properly. Therefore, 5 different teachers were asked a couple of questions in a short interview. These 5 teachers differed in age, gender, and working experience. Teachers' ages ranged from 24 till 56 (2 males, 3 females, $M_{age} = 38$ and $M_{workingexperience} = 15.20$).

The pre-test consisted of three different steps. Firstly, the research aim was explained to the teachers. After explaining this, the teachers were asked about their first opinions. What do they

think of the research and can they come up with potentially missing independent variables? Secondly, the model was explained and shown to the teachers. They were asked questions like 'do you agree with all independent variables?' and 'do you think one variable should not be included and why?' Finally, the questionnaire was shown to the teachers. This was a good opportunity to see if the introduction of the questionnaire was clear, if it was clear what is meant by 'the technologies in the class', and if the statements were clear. Teachers needed to put a minus sign if they found the statements to be unclear, and a plus sign if they found the statements to be clear. After this, all statements with a minus sign were discussed with the researcher. Why did they think a statement was not clear and how could that be changed?

The results of the pre-test

The research aim was clear for every teacher involved in the pre-test. Besides that, they all thought that an IT identity was relevant to research. However, it seemed to be hard to come up with possible influencers. They named, age, gender, and personal characteristics, but these were already covered in the research model.

When the research model was shown and explained to the teachers, they almost agreed with every variable in the model. Embeddedness was the variable they had the most doubts about. They did not really see the relevance of measuring this. This was also shown in the third part of the pre-test, because the statements of embeddedness were the only ones with some minus scores. Thus, it was not only that they did not see the relevance in measuring embeddedness, they also did not quite understand the statements of it. One teacher said that "when I need to fill in this statement, I really do not know what I should fill in". Another teacher said "I think this statement is a bit vague". Therefore, it was decided not to measure embeddedness in the main questionnaire to avoid misunderstandings. Furthermore, some small modifications were made to the questionnaire, regarding the language used. They thought it was better to use 'groep' instead of 'klas' in Question 6. Besides that, they thought it was better to use 'leerkrachten' instead of 'leraren'.

There were also positive conclusions drawn from the pre-test. Several teachers were very enthusiastic about the research, and even put '++' to some statements about self-efficacy, functionality, and dependence.

3.2.4. Procedure

The questionnaire was distributed via Qualtrics, an online survey platform. The questionnaire started with an introduction, to explain what participants needed to do. After that, participants were asked if they agree to participate in the survey. The survey ended if they did not agree. Next, they were presented with demographic questions, namely their gender, age, working experience, place of their school, and the class in which they teach. These questions can be used to see if there are any additional results for this study. After that, all the Likert scales needed to be answered. Finally, the survey ended with an annotation to thank them for participating. The complete questionnaire can be found in Appendix A (English) and Appendix B (Dutch).

3.3. Reliability

For the different constructs in this study, the Cronbach's Alpha was calculated to determine the internal reliability. Table 2 displays these results.

Construct	Number of items	Cronbach's Alpha
Self-Efficacy	5	.79
Actualized Rewards	3	.58
Functionality	9	.78 (1 item deleted)
Support	4	.70
IT dynamism	2	.61 (1 item deleted)
Obligation	2	.54 (1 item deleted)
Dependence	4	.70
Relatedness	4	.86
Emotional Energy	4	.88

 Table 2 Cronbach's Alpha for all scales

The Cronbach's Alpha of IT dynamism was .61 after the deletion of the statement 'I think the continuous changes of the technologies in the class are good and necessary'. Before this deletion, the Cronbach's Alpha was .56, so the Alpha was improved by .05. Furthermore, the statement 'I find the mandatory use of technologies in the classroom annoying' had a really low Corrected Item Total Correlation (.08). Therefore, this statement was deleted, and the Cronbach's Alpha for obligation became .54 instead of .40.

Further deletion of items of constructs with a low Cronbach's Alpha (actualized Rewards, IT dynamism, and obligation) did not deliver an Alpha score above .70, therefore, the items in these constructs were not used together in further analyses. For IT dynamism and obligation,

only the first item was used for further analyses, because these explained the construct the best. These are the items 'I feel that the IT in the classroom is changing too much (due to upgrades)' and 'I feel obligated to use IT in the classroom'. For actualized rewards, the item 'using the technologies in the classroom has yielded a lot to me personally' was used for further analyses.

All other Cronbach's Alphas were above .70, which is the minimum to be able to say that the scales are reliable. However, the statement 'I would imagine that most teachers would learn to use this system very quickly' to measure functionality was also deleted. The Cronbach's Alpha then becomes .78 instead of .74. The Corrected Item Total Correlation of this statement was also very low (.04), which was a reason to delete this statement even though the overall Cronbach's Alpha was acceptable at first.

Furthermore, it is difficult to measure the reliability for the single-item measures in this research. Earlier research showed that single item scales can be reliable, with a test-retest correlation. Besides that, researchers need to check if the single item correlates with the corresponding multiple item measures, this measured the validity of the single item (Woods & Hampson, 2005). In this research, the correlations between the single and multiple measures were performed (see Table 3).

Table	3	Correlations	single a	and	multiple iter	m scales II	[¬] identity

		1	2	3	4	5	6
1. "I am a person who feels connected very quickly with different technologies. That is why I attach great value to new technologies, I am enthusiastic about using them and I feel that I cannot live without technologies".	Pearson Correlation	1					
2. "I am a person who does not feel connected very quickly to different technologies. That is why I do not value new technologies, I find it tiring to use them and I can do well without the technologies".	Pearson Correlation	-,65**	1				
3.Dependence	Pearson Correlation	,58**	-,42**	1			
4.Relatedness	Pearson Correlation	,74**	-,56**	,75**	1		
5.Emotional energy	Pearson Correlation	,64**	-,49**	,57**	,79**	1	

^{**} Correlation is significant at the 0.01 level (2-tailed).

As noted in Table 3, the two single items to measure IT identity (1 and 2) correlated highly or moderately with the multiple items (3, 4, and 5) separately. There were moderate correlations between the second single item and dependence and emotional energy. The other correlations were high correlations.

The first single item was created to represent a high IT identity, so the correlations were all highly positive. The second single item represented a low IT identity, therefore, the correlations were all highly or moderately negative. All correlations were significant at the 0.01 level (2-tailed).

3.4. Data analysis

Before conducting a regression analysis, several assumptions needed to be checked. Firstly, the normality assumption was checked for, using a Normal P-P Plot. When the dots follow the normality line, the assumption can be made that the data follow a normal distribution. In Figure 2, the dots follow the line, therefore, it can be assumed that it is normally distributed. Figure 2 is an example of the relationship between dependence and age, but every other relationship was found to be normally distributed, except the relationships between the dependent variables and gender. Besides that, there were no big outliers.



Figure 2 Normal P-P Plot Dependence and Age

Secondly, the assumption of homoscedasticity implies the normal distribution of the residuals. If the data looks like some sort of a shotgun blast, the data is homoscedastic. In Figure 3, the dots do not show a specific pattern, therefore, the assumption of homoscedasticity is met and the residuals are normally distributed.



Figure 3 Homoscedasticity Dependence and Age

If the data and the residuals are normally distributed, the assumption of linearity is also met.

Finally, the assumption of absence of multicollinearity needs to be met before conducting a multiple linear regression. Their needs to be an absence of multicollinearity (high correlation) in the data. This assumption is met when the variance inflation factors (VIF's) are not bigger than 10. As the VIF's for the three multiple regressions performed in this study are not bigger than 10 (with the highest VIF value being 6.142), it can be stated that there is no threat of collinearity.

4. Results

This section shows the results of the research. Firstly, some descriptive results will be discussed, followed by a Multivariate Analysis of Variance (MANOVA) to check for significant effects between the control variables and the dependent variables. In the end, correlation analysis and three hierarchical multiple linear regression analyses will be elaborated upon to see which independent variables have a (significant) relationship with the dependent variables.

4.1. Descriptive results

As shown below in Table 4, the mean score of self-efficacy is the highest overall (M = 5.61). This means that teachers, overall, feel that they are able to use IT in the classroom. The lowest score is for IT dynamism, which means that teachers in general do not think that the technologies used in the classroom are changing too much. The first single item, which was made to represent a high IT identity, has a mean of 67.55%. The second single item, which was made to represent a low IT identity, has a mean of 19.92%. Therefore, elementary school teachers agreed more with the description of having a high IT identity.

Construct	Mean	SD
Self-Efficacy	5.61 ^{a)}	0.85
Actualized Rewards ¹	5.50 ^{a)}	1.17
Functionality	5.04 ^{a)}	0.80
Support	4.98 ^{a)}	0.94
IT Dynamism ²	3.86 ^{a)}	1.52
Obligation ³	5.01 ^{a)}	1.61
Dependence	5.22 ^{a)}	0.94
Relatedness	4.90 ^{a)}	1.15
Emotional energy	4.66 ^{a)}	1.20
IT identity1 (single measure) ⁴	67.55 ^{b)}	19.9
IT identity2 (single measure) ⁵	19.92 ^{b)}	21.9

Table 4 Means and standard deviations of all variables

a) All statements are measured on a 7-point Likert scale (1=strongly disagree / 7=strongly agree)

b) Measured with 0 = strongly disagree / 100 = strongly agree

1) Item used: 'using the technologies in the classroom has yielded a lot to me personally'

2) Item used: 'I feel like that the IT in the classroom is changing too much (due to upgrades)'

3) Item used: 'I feel obligated to use the IT in the classroom'

4) "I am a person who feels connected very quickly with different technologies. That is why I attach great value to

new technologies, I am enthusiastic about using them and I feel that I cannot live without technologies' 5) "I am a person who does not feel connected very quickly to different technologies. That is why I do not value

Furthermore, a score of 4 is the midpoint on a 7-point Likert scale, which means that teachers are quite neutral (or slightly positive or negative) about the topic. IT dynamism and emotional energy have scores close to this midpoint.

Table 4 gives an indication about the means of all independent and dependent variables, but it does not say anything about significance of the relationships between the independent variables against the dependent variables. This will be discussed in Sections 4.3 and 4.4.

4.2. Influence of Control Variables

A Multivariate Analysis of Variance (MANOVA) is performed in order to find possible effects for the control variables against the dependent variables, because some of these variables cannot be tested in the correlation and the regression analyses. Besides that, post-hoc tests can be performed to see which groups differ from each other.

Men score higher on all dependent variables than women. However, these differences are not significant. For the province of the teachers it is the same, teachers from Zeeland, Zuid-Holland, and Friesland score the lowest on the dependent variables, but these differences are not significant. Besides that, there is no significant difference between the working experience groups.

However, there are significant differences between age groups on emotional energy. The posthoc test (Bonferroni) reveals that the 20-29 age group differed significantly with the 60-69 age group (p = 0.02) on emotional energy.

Furthermore, another post-hoc test was performed (LSD). This test showed significant differences on dependence between the 40-49 age group and the 60-69 age group (p = 0.012). For relatedness and emotional energy, there were significant differences between the 60-69 age group and all other groups, (age group 60-69 compared with $p_{20-29} = 0.003$, $p_{30-39} = 0.03$, and $p_{40-49} = 0.02$) except the 50-59 age group. The LSD-test also gave significant differences on relatedness for the 20-29 age group and the 50-59 age group (p = 0.03).

Looking at the means, the age group 60-69 scores the lowest on all dependent variables. The highest scores are not only for the age group 20-29, but also for the age group 40-49.

Finally, the control variable group gives significant differences between group 1 and other groups and between group 2 and other groups. However, these results cannot be used, because, as previously told, not every teachers teaches only one specific group.

Table 5 gives an overview of the results for the MANOVA test.

Source		F	Sig
Gender	Dependence	0.51	0.48
	Relatedness	1.81	0.18
	Emotional Energy	0.10	0.76
Province	Dependence	0.43	0.93
	Relatedness	1.48	0.15
	Emotional Energy	1.47	0.16
Age	Dependence	1.85	0.12
	Relatedness	2.05	0.09
	Emotional Energy	3.08	0.02
Working Experience	Dependence	1.53	0.20
	Relatedness	1.46	0.22
	Emotional Energy	1.03	0.39

Table 5 Test of Between Subject Effects

4.3. Correlations

All the variables are tested whether they correlate with each other. All the correlations are displayed in Table 6. A Pearson Correlation between .50 and 1 means that there is a high correlation between the two variables. A correlation between .30 and .49 means a moderate correlation and below .29 is a low correlation. In Table 6, high correlations are marked green, moderate correlations orange, and low correlations (that are still significant) red. Low correlations that are not significant are deleted.

The correlations between the independent and the dependent variables will be explained first. Self-efficacy has a high positive correlation with relatedness (r = .56, p = .00) and a moderate positive correlation with the other dependent variables, namely dependence (r = .42, p = .00) and emotional energy (r = .45, p = .00). This indicates that teachers who feel able to use IT in

the classroom also score high on IT identity. Furthermore, self-efficacy correlates highly with the two single items that measure IT identity (r = .52 and -.58, p = .00 and .00).

Functionality has moderate positive correlations with dependence (r = .39, p = .00), relatedness (r = .49, p = .00), emotional energy (r = .34, p = .00), and the first single item that measures a high IT identity (r = .48, p = .00). It has a highly negative correlation with the second single item that measures a low IT identity (r = -.55, p = .00). This means that teachers who think it is easy to use IT have a higher IT identity.

Support also has moderate positive correlations with dependence (r = .43, p = .00), relatedness (r = .40, p = .00), and emotional energy (r = .33, p = .00). It has low correlations with the two single items that measure IT identity (r = .21 and -.19, p = .01 and .02). Teachers who feel that their school is supportive towards them with regard to the use of technologies, also scored higher on IT identity.

IT dynamism does not correlate highly or moderately with the dependent variables. It has low correlations with relatedness (r = .18, p = .03) and the two single items that measure IT identity (r = -.18 and .28, p = .02 and .00). The correlations with dependence (r = -.11, p = .17) and emotional energy (r = -.12, p = .14) are low and not significant.

Obligation has a moderate positive correlation with dependence (r = .35, p = .00) and relatedness (r = .30, p = .00). When teachers feel obligated to use the IT in the classroom, they depend on it more and feel more related to it. The correlation between obligation and emotional energy (r = .22, p = .01) is low, but still significant. The correlations between obligation and the two single items that measure IT identity are low and not significant.

Actualized rewards has mostly significant positive correlations with the dependent variables. 'Using the technologies in the classroom has yielded a lot to me personally' has a high correlation with dependence (r = .55, p = .00), relatedness (r = .64, p = .00), emotional energy (r = .52, p = .00), and the first single item that measures a high IT identity (r = .51, p = .00). It has a moderate negative correlation with the second single item that measures a low IT identity (r = .36, p = .00). Overall, when teachers have positive associations with past experiences with using IT, they have a higher IT identity. There are also correlations between some independent variables: Firstly, self-efficacy has a high correlation with functionality (r = .80, p = .00), which is logical, because they are measuring quite similar aspects. Self-efficacy also moderately correlates with support (r = .42, p = .00), IT dynamism (r = .29, p = .00), and actualized rewards (r = .30, p = .00). Secondly, functionality correlates moderately with support (r = .34, p = .00) and IT dynamism (r = .46, p = .00) and has a low correlation with actualized rewards (r = .27, p = .00). Thirdly, support moderately correlates with obligation (r = .29, p = .00) and has a low correlates with obligation (r = .29, p = .00) and has a low correlates with obligation (r = .29, p = .00) and has a low correlates with obligation (r = .29, p = .00) and has a low correlates with obligation (r = .39, p = .00). Fourthly, actualized rewards significantly correlates with obligation (r = .39, p = .00) and IT dynamism has a low correlation with obligation (r = .16, p = .04).

To conclude this section, the control variables give some significant correlations. There are significant negative correlations between age and functionality (r = -.39, p = .00), age and self-efficacy (r = -.24, p = .00), age and relatedness (r = -.20, p = .02), age and emotional energy (r = -.23, p = .00), and age and the single items that measure IT identity (r = -.24 and .21, p = .00 and .01). Besides that, there are significant positive correlations between age and IT dynamism (r = .38, p = .00) and age and obligation (r = .22, p = 0.01). However, the correlations are not extremely high. Almost the same applies to working experience. Gender does not give many significant correlations, but females do feel more obligated to use IT (r = .25, p = .00) and they score lower on the single item measure of a high IT identity (r = -.21, p = .01).

On the next page, the complete correlation overview can be found.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1.Gender	1													
2. Age		1												
3. Working experience		,90**	1											
4. Self-efficacy		-,24**	-,18*	1										
5. Functionality		-,39**	-,30**	.80**	1									
6. Support				,42**	,34**	1								
7. IT dynamism ¹		,38**	,34**	-,29**	-,46**		1							
8. Obligation ²	,25**	,22**	,24**			,29**	,16*	1						
9. Actualized rewards ³		,	,	,30**	,27**	,29**		,39**	1					
10. Dependence				.42**	,39**	.43**		.35**	,55**	1				
11. Relatedness		-,20*		.56**	.49**	.40**	18*	.30**	.64**	.75**	1			
12. Emotional Energy		23**	16*	.45**	.34**	.33**		.22**	.52**	.57**	.79**	1		
13. Single item 1 ^a	-,21**	24**	-,23**	,52**	.48**	.21**	-,18*	,	.51**	.58**	.74**	.64**	1	
14. Single item 2 ^b		.21**	.18*	58**	- 55**	19 [*]	.28**		36**	42**	- 56**	- 49**	65**	1

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

1) Item used: 'I feel like that the IT in the classroom is changing too much (due to upgrades)'

2) Item used: 'I feel obligated to use the IT in the classroom'

3) Item used: 'using the technologies in the classroom has yielded a lot to me personally'

a) "I am a person who feels connected very quickly with different technologies. That is why I attach great value to new technologies, I am enthusiastic about using them and I feel that I cannot live without technologies"

b) "I am a person who does not feel connected very quickly to different technologies. That is why I do not value new technologies, I find it tiring to use them and I can do well without the technologies"

4.4. Hierarchical multiple linear regression

A hierarchical multiple linear regression is performed to predict the value of a variable based on the value of other variables. All independent variables are tested together against one dependent variable. A hierarchical regression analysis is done with the control variables in the first step and the other independent variables in the second step. In Tables 7, 8, and 9 overviews of the multiple regressions are given and in Tables 10, 11, and 12 the regression coefficients are given.

 Table 7 Hierarchical multiple regression analysis predicting dependence

Model	Variables Entered	R-squared	F	Sig
1	Age, gender, working experience	0.011	0.57	0.64
2	Self-efficacy, functionality, support, actualized rewards, obligation, and IT dynamism	0.469	12.40	0.00

Table 8 Hierarchical multiple regression analysis predicting relatedness

Model	Variables Entered	R-squared	F	Sig
1	Age, gender, working experience	0.049	2.56	0.06
2	Self-efficacy, functionality, support, actualized rewards, obligation, and IT dynamism	0.623	23.34	0.00

 Table 9 Hierarchical multiple regression analysis predicting emotional energy

Model	Variables Entered	R-squared	F	Sig
1	Age, gender, working experience	0.064	3.37	0.02
2	Self-efficacy, functionality, support, actualized rewards, obligation, and IT dynamism	0.437	10.93	0.00

For dependence, the control variables are not significant (p = 0.64). Therefore, they do not have an influence on dependence. The R-squared is 1.1% in the first step with the control variables and 46.9% with the other independent variables. Likewise, the control variables do not have an influence on relatedness (p = 0.06). The R-squared in Model 1 of relatedness is a bit higher (4.9%) than the R-squared of dependence.

However, for emotional energy, the control variables in Model 1 are significant (p = 0.02). The hierarchical multiple regression revealed that in Model 1, the control variables contributed significantly to the regression model. Therefore, they do have an influence on emotional energy. The R-squared went up from 6.4% for the control variables to 43.7% for the other independent

variables, so there is an influence of the control variables, but the change in R-squared from Model 1 to Model 2 is significant (p = 0.00).

The following can be concluded from the Tables 7, 8, and 9:

46.9% of the variability in **dependence** is accounted for by all the predictors in the model. 62.3% of the variability in **relatedness** is accounted for by all the predictors in the model. 43.7% of the variability in **emotional energy** is accounted for by all the predictors in the model.

In general, the higher the R-squared, the better the data fits the model. The R-squared of relatedness is really high compared to the other two. However, these R-squares are still good and significant.

In the next tables, the regression coefficients are given:

Model		В	Std. Error	β	t	Sig.
	(Constant)	5,72	0,53		10,9	0,000
1	Age	-0,01	0,01	-0,08	-0,46	0,649
1	Gender	-0,13	0,21	-0,05	-0,63	0,533
	Working experience	-0,00	0,02	-0,01	-0,04	0,972
	(Constant)	0,95	0,76		1,25	0,214
	Age	0,01	0,01	0,13	0,89	0,373
	Gender	-0,25	0,17	-0,10	-1,47	0,143
	Working experience	-0,02	0,01	-0,25	-1,74	0,085
2	Self-efficacy	0,05	0,14	0,04	0,35	0,73
2	Functionality	0,14	0,14	0,12	0,99	0,32
	Support	0,22	0,08	0,22	2,88	0,005
	IT dynamism	0,01	0,05	0,01	0,10	0,919
	Obligation	0,11	0,04	0,18	2,50	0,013
	Actualized Rewards	0,29	0,06	0,36	5,04	0,000

Table 10 Regression Coefficients Dependence

Μ	odel	В	Std. Error	В	t	Sig
1	(Constant)	6,32	0,63		10,1	0,000
	Gender	-0,30	0,25	-0,10	-1,19	0,235
	Age	-0,03	0,02	-0,28	-1,56	0,121
	Working experience	0,01	0,02	0,10	0,58	0,566
2	(Constant)	0,15	0,76		0,19	0,847
	Gender	-0,38	0,17	-0,1	-2,18	0,031
	Age	-0,01	0,01	-0,09	-0,68	0,499
	Working experience	-0,01	0,01	-0,09	-0,75	0,452
	Self-efficacy	0,41	0,13	0,31	3,30	0,001
	Functionality	-0,02	0,15	-0,01	-0,11	0,911
	Support	0,14	0,08	0,12	1,88	0,062
	Actualized rewards	0,47	0,06	0,48	7,84	0,000
	IT dynamism	-0,02	0,05	-0,03	-0,50	0,616
	Obligation	0,10	0,04	0,14	2,16	0,032

Table 11 Regression Coefficients Relatedness

Table 12 Regression Coefficients Emotional Energy

Model		В	Std. Error	β	t	Sig.
	(Constant)	6,03	0,65		9,25	0,000
1	Age	-0,04	0,02	-0,44	-2,46	0,015
1	Gender	-0,04	0,26	-0,01	-0,13	0,893
	Working experience	0,02	0,02	0,23	1,31	0,193
	(Constant)	1,28	0,10		1,29	0,198
2	Age	-0,03	0,01	-0,3	-2,24	0,026
	Gender	-0,10	0,22	-0,03	-0,45	0,653
	Working experience	0,01	0,02	0,09	0,60	0,55
	Self-efficacy	0,44	0,18	0,32	2,44	0,016
	Functionality	-0,34	0,18	-0,23	-1,86	0,065
	Support	0,13	0,10	0,1	1,30	0,196
	IT dynamism	-0,00	0,06	-0,00	-0,06	0,955
	Obligation	0,04	0,06	0,05	0,70	0,485
	Actualized rewards	0,42	0,08	0,41	5,59	0,000

Not every independent variable appeared to be significant in the hierarchical multiple regression analyses. Firstly, for dependence only support ($\beta = 0.22$, p = 0.005), actualized rewards ($\beta = 0.36$, p = 0.000), and obligation ($\beta = 0.18$, p = 0.013) are significant.

Secondly, for relatedness only actualized rewards ($\beta = 0.48$, p = 0.000), gender ($\beta = -0.12$, p = 0.03), self-efficacy ($\beta = 0.31$, p = 0.001), and obligation ($\beta = 0.14$, p = 0.03) are significant. Gender has a negative value, which means that females feel less related to IT, because males were ranked as number 1 and females as number 2.

Thirdly, for emotional energy only age ($\beta = -0.34$, p = 0.026), self-efficacy ($\beta = 0.32$, p = 0.016), and actualized rewards ($\beta = 0.41$, p = 0.000) are significant. The value of age is negative, therefore, the older teachers are, the less they feel emotionally attached to IT.

4.5. Support for the hypotheses

Table 13 gives an overview of the support for the six hypotheses in this study, based on the statistical analyses.

Hypothesis	Supported / not supported
H1b: Self-efficacy has a positive relationship with IT identity.	Supported
H1c: Actualized rewards has a positive relationship with IT identity.	Supported
H2: Functionality has a positive relationship with IT identity.	Supported
H3a: Support has a positive relationship with IT identity.	Supported
H3b: IT dynamism has a positive relationship with IT identity.	Not supported
H3c: Obligation has a negative relationship with IT identity.	Not supported

Table 13 Overview of the support for hypotheses

5. Discussion

The main goal of this research was to test the model of IT identity as created by Carter and Grover (2015) and see if this model is applicable to the context of elementary school teachers. To examine this, six hypotheses were formulated based on the research of Carter and Grover (2015). Several conclusions can be drawn based on the results of this research. First, the conclusions towards the hypotheses will be elaborated upon, followed by the exploration of the model from Carter and Grover (2015) and the implications and future research suggestions.

5.1. Discussion of the questionnaire results

Firstly, actualized rewards is the best predictor of IT identity, because it turned out to be the most significant predictor in the multiple linear regression for dependence, relatedness, and emotional energy. The item 'using the technologies in the classroom has yielded a lot to me personally' is a good predictor of dependence, relatedness, and emotional energy. Overall, when teachers think positively about past experiences with using technologies, they will have a higher IT identity. This is in line with the model of Carter and Grover (2015). They claim that "identities that have materially benefitted individuals or have provided some intrinsic gratifications are more likely to become integral to the self than those that gain a person little or nothing" (p. 947).

Secondly, looking at the outcome of the correlation analysis, self-efficacy has a positive significant relationship with dependence, relatedness, and emotional energy. However, in the multiple linear regression it did not appear to be significant for dependence. Self-efficacy does have a big influence on relatedness and emotional energy, being significant in the multiple regressions. These conclusions implicate that the more teachers feel able to use the IT in their classroom, the more they incorporate an IT identity. Carter and Grover (2015) also claimed this, because the more confidence people have (efficacy-based self-esteem), the more the IT identity is verified, and the more people will use IT.

Thirdly, although it did not turn out to be a significant predictor in the multiple linear regressions, functionality did turn out to be positively significant in the correlation analysis. This means that when teachers feel that the technologies are easy to use, not complex, and well integrated, they will have a higher IT identity. Carter and Grover (2015) proposed that the relationship between IT identity and functionality was mediated by self-efficacy and actualized

rewards. Why? Larger functionality increases the efficiency of using IT, which will also enhance self-efficacy and actualized rewards (Carter & Grover, 2015). When something is easy to use, people think they are more able to use it and will think about their experience more positively. However, functionality also has an influence on IT identity without the mediation of self-efficacy and actualized rewards.

Fourthly, support was found to be significant for dependence in the multiple linear regression and for every dependent variable in the correlation analysis. This signifies that the more teachers feel that their school supports them when using the technologies in the classroom, the more they will incorporate an IT identity. This supports the model from Carter and Grover (2015), because they stated that "organizations can create situations that strengthen the relationship between IT identity and beneficial behaviors and promote a stronger identity" (p. 948).

Fifthly, the statement 'I think that the IT in the classroom is changing too much' of IT dynamism does not have significant relationships in the multiple linear regression. Only the relationship between IT dynamism and relatedness in the correlation analysis was negatively significant. This is not in line with the proposed measures from Carter and Grover (2015), because they expected that IT identity will exert a stronger influence on IT identity for technologies with dynamic feature sets. For elementary school teachers it does not matter whether the IT is changing too much.

Sixthly, obligation does not have a negative relationship with IT identity. Moreover, the item has a positive significant relationship in the multiple linear regression with dependence and relatedness. This means that teachers who feel obligated to use IT, feel more dependent on IT and feel more related to IT. The statement 'I feel obligated to use IT in classroom' does not have a significant relationship with emotional energy in the multiple linear regression, but this relationship was significant in the correlation analysis. It was hypothesized that the more teachers feel obligated to use IT, the less they will incorporate an IT identity. However, the opposite is true. Therefore, feeling obligated to use the technologies in the classroom is not something negative for teachers.

Furthermore, it appeared that teachers from group 1 and group 2 feel that they are less dependent on IT. In lower groups, teachers use less IT than in higher groups, therefore, teachers feel a lower dependence on IT. Thus, they will have a lower IT identity. Next, teachers had the option to fill in more than one group in the questionnaire. Therefore, it is not statistically correct to conclude that teachers from group 1 and 2 have lower IT identities. Hence, this will only be the case when in future research the focus will be on teachers who teach one specific group.

Additionally, older teachers have a lower IT identity than younger teachers. Especially, they feel less enthusiastic, excited, pumped up, and energized when using IT. This does not mean that younger teachers always have a higher IT identity than older teachers, because in some occasions, the 40-49 age group scored higher on IT identity than younger teachers. Meanwhile, the 50-59 and 60-69 age groups score the lowest from all age groups on every dependent variable.

5.2. Limitations of the research

Given the explorative nature of this research, several limitation have been observed. First of all, the questionnaire is translated from English to Dutch. Because all existing scales were only available in English, the actual meaning of some statements cannot be translated that well in Dutch. An example is the statement from emotional energy 'I feel pumped up'. This statement was translated into 'voel ik mij opgewonden', which is a bit vague and can be interpreted in two ways.

Besides that, for some independent variables there were no existing scales available. The scales made for actualized rewards, obligation, and IT dynamism in this research did not have a reliable Cronbach's Alpha and were reduced to one statement. The use of only one statement for one construct may have affected the outcomes. Mclver and Carmines (1981) stated that "it is very unlikely that a single item can fully represent a complex theoretical concept or any specific attribute for that matter" (p. 15). Besides that, a single item measure needs a larger sample size than multiple items to provide enough discrimination. Additionally, when having good scale items and a good description for embeddedness, this construct can be assessed as well.

Furthermore, the sample characteristics could also be a limitation. First of all, there are more participants from the region of Twente. However, this did not make a difference as a control variable. A second limitation of the sample could be the gender. The sample contains way more

females than males, this is due to the fact that there are a lot more female elementary school teachers than male elementary school teachers. On the one hand, this could be a limitation, because males could think different about technology than females. On the other hand, this is no limitation, because it would not be representative for the whole population if the sample would consist of the same amount of males and females. Therefore, the sample did provide a good representation of the teachers population. However, men did score better on IT identity than women did.

Finally, when having a much larger sample than used in this study (N = 152), there could be more significant results. Also, as mentioned before, it was not possible to identify differences between teachers who teach specific groups, due to the possibility in the questionnaire to select multiple groups.

5.3. Discussion of the model from Carter and Grover (2015)

As the original model of Carter and Grover (2015) has not been widely tested, it was interesting to see if the model was applicable to the context of elementary school teachers. Besides that, several questions are still remaining, for example: Are dependence, relatedness, and emotional energy the right constructs to measure IT identity? Or should they be merged into one or two constructs? Or could an extra construct be added? What if emotional energy turns out to be really low while dependence and relatedness are really high? Do people then still have an IT identity or not? Through this study, several conclusions can be drawn regarding the model.

In the factor analysis, dependence, relatedness, and emotional energy did not turn out to be three separate constructs, because relatedness and emotional energy were merged together as one construct. Therefore, this could be a reason to merge IT identity into two constructs, for example into dependence and affinity. Affinity can be a good construct to grasp the core of relatedness and emotional energy, while dependence is about a completely different topic (reliance upon IT versus feeling close to IT). Both variables need to be high to be able to say that people have an IT identity, because only having a high dependence can mean something negative when not feeling affinity.

The proposed model from Carter and Grover (2015) is a good starting point when measuring IT identity. However, the model is too complex to use for one situation. Right now, it needs to

be adapted to different contexts. Besides that, the model shows too many relationships with different moderators and mediators, but these variables could also have been just an independent variable. Next, some independent variables of the original model will be discussed separately.

Firstly, perceived behavioral control (from situational influences) and self-efficacy (from experience) are different variables in the model of Carter and Grover (2015), however, they are measuring quite the same. The variables are both measuring the feeling of being able to use something (in this case the use of IT). Of course, this concept can be linked to both situational influences and experience, but it is not necessary to measure it twice.

Secondly, the term embeddedness is explained vaguely with 'the extent to which an individual associates past interactions with use of a wide range of IT features, across a variety of situations' (Carter and Grover, 2015, p. 944). In fact, it is the previous investment in another identity besides the IT identity, which they do not make clear enough. How can you measure embeddedness and which other previous identity should be measured, because not every participant can have the same previous identities?

Thirdly, IT characteristics could be reduced to only functionality. Measuring bandwidth and mobility is not necessary, because due to new technologies every technology will have a large bandwidth and mobility. Besides that, in some cases (as with elementary school teachers) bandwidth and mobility are not necessary to measure, because technologies are used in one place with one purpose only (to teach).

Fourthly, obligation (or social pressure) can be added as an independent variable. Elementary school teachers are obliged to use IT in the classroom, because they cannot teach without it. However, when measuring a mobile phone identity, social pressure is still important, because people can feel that they need to use a mobile phone in order to keep up with their friends, family, and society. However, in this research it appeared that feeling obligated to use technologies does not affect IT identity negatively.

Finally, how can you measure IT dynamism as 'the extent to which, and how often, an IT's feature set changes' (Carter and Grover, 2015, p. 944), when people have different perceptions about it? Besides that, some participants might find it vexatious when IT is changing all the

time, while others do not have problems with it and can even enjoy the changes. Carter and Grover (2015) claim that dynamic technologies have a greater influence on IT identity. Hence, can the dynamic feature of technologies also be too much? Carter and Grover (2015) conceptualize IT dynamism as not something measurable on a Likert scale, but as something objective. However, should it not be a subjective scale?

5.4. Implications and future research

5.4.1 Theoretical implications and future research

For other researchers who want to work with the model of Carter and Grover (2015), it is necessary to look at the model critically and identify which variables are needed for the chosen context and which can (or should) be removed. This study could be an inspiration for that. Besides that, reliable scales should be made for some constructs, as well as pre-testing these scales. This research could also be a starting point for other researchers to further develop these scales. Furthermore, it could be useful to firstly look critically at the model, before deciding in which context IT identity can be measured. For example, the mobile phone identity was already explored by Carter in 2012. However, only the dependent variables (dependence, relatedness, and emotional energy) were used in her study. Therefore, the complete model could be tested in this context.

As Carter and Grover (2015) are also saying, their model needs to be tested in different contexts. This research contributes to this literature gap. However, further research into IT identity still needs to be done. In other contexts, there could be other variables that are more important than in the context of teachers. Maybe there are some variables that are always important, or others that are specific to one single context. Different contexts could be other professions in which different technologies are becoming more important, but also a context where technologies are being used every day by almost all people (the mobile phone identity or computer identity).

Besides all, adequate, good, and reliable scales for some variables used in this study need to be formed, because there are no existing applicable scales available. Using pre-tests, the scales should be made reliable, especially for the constructs of embeddedness, IT dynamism, obligation, and actualized rewards. These may have some similarities with already existing scales, but are not quite grasping the whole concept as is meant in this study. To conclude, it could also be interesting to research if an IT identity will have a positive relationship with the actual happiness of teachers within their profession. When studying this, the relevance of a IT identity will be made clear. Right now, there is no answer to the question whether having an high IT identity also contributes to the happiness or effectiveness of people using it and, therefore, people might not notice the relevance of measuring IT identity. However, IT identity needs to be researched further before relating it to happiness or other constructs.

5.4.2 Practical implications

The results of this research are of relevance to the scientific domain of IT identity and can form a basis for further research on this concept. Several conclusions can also be of importance to schools and teachers. First of all, teachers who are not able to use IT (or struggle with it) in the classroom need adequate and full support from their schools. They should be made enthusiastic about using IT and see the advantages of it. This could be done by the management of schools or by other colleagues who do have an IT identity and are enthusiastic about using IT in the classroom. Furthermore, schools should take in mind that teachers from group 1 and 2 are using less technologies in their class. Therefore, when they are about to teach a higher group, they should be supported in using more technologies than they were used to.

However, these results can change over years. Maybe in the future, every teacher (even the 60-69 age group) will incorporate an IT identity, because it has become a way of life for everyone.

6. Conclusion

In this study, six main hypotheses were tested to see if different determinants might influence the IT identity of elementary school teachers and to be able to give an answer to the research question.

First of all, the model of Carter and Grover (2015) was applicable to this context, because different constructs appeared to be reliable and most (5 out of 7) hypotheses were supported. The main research question: 'To what extent do self-efficacy, actualized rewards, functionality, support, IT dynamism, and obligation influence the extent to which elementary school teachers incorporate an IT identity?' can be answered by concluding that self-efficacy, obligation, functionality, support, and actualized rewards influence IT identity by a great extent. IT dynamism does not influence the IT identity. Actualized rewards has the biggest influence on IT identity, followed by self-efficacy, obligation, support, and functionality. However, hereby, it is necessary to note the relevance of the age, and the gender of the teachers as well.

Hence, some modifications were made regarding the model, because of context specific features. Therefore, the original model was not applicable as a whole. Besides that, there were no scales available for some constructs. The model needs to be improved by selecting variables that are similar for every context, creating reliable measurement scales for these variables, and determining which variables are moderators, mediators, and independent variables. Future research is needed to determine the usability of the model in different contexts.

References

- Admiraal, W., Louws, M., Lockhorst, D., Paas, T., Buynsters, M., Cviko, A., ...Kester, L. (2017). Teachers in school-based technology innovations: A typology of their beliefs on teaching and technology. *Computers and Education*, 114(3), 57-68. http://doi.org/10.1016/j.compedu.2017.06.013
- Beijaard, D., Meijer, P. C., & Verloop, N. (2004). Reconsidering research on teachers' professional identity. *Teaching and Teacher Education*, 20(2), 107-128. http://dx.doi.org/10.1016/j.tate.2003.07.001
- Bhattacherjee, A., & Premkumar, G. (2004). Understanding changes in belief and attitude toward information technology usage: A theoretical model and longitudinal test. *MIS Quarterly*, 28(2), 229-254. doi: 10.2307/25148634
- Bruner, G. (2012). Marketing scales handbook: A compilation of multi-item measures for consumer behavior & advertising research, Volume 6. Texas USA: GCBII Productions Fort Worth.
- Carter, M. (2012). Information technology (IT) identity: A conceptualization, proposed measures, and research agenda (Doctoral dissertation). Retrieved from https://tigerprints.clemson.edu/all_dissertations/901
- Carter, M., & Grover, V. (2015). Me, myself and I(T): Conceptualizing information technology identity and its implications. *MIS Quarterly*, 39(4), 931-957. doi:10.25300/MISQ/2015/39.4.9
- Chauhan, S. (2016). A meta-analysis of the impact of technology on learning effectiveness of elementary students. *Computers and Education*, 105, 14-30. doi: 10.1016/j.compedu.2016.11.005
- Compeau, D. R., & Higgins, C. A. (1995). Computer self-efficacy: Development of a measure and initial test. *MIS Quarterly*, *19*(2), 189-211. doi:10.2307/249688

- Edison, S. W., & Geissler, G. L. (2003). Measuring attitudes towards general technology: antecedents, hypotheses and scale development. *Journal of Targeting, Measurement and Analysis for Marketing, 12*(2), 137-156. https://doi.org/10.1080/1352726042000286499
- Ertmer, P. A., Ottenbreit-Leftwich, A. T., Sadik, O., Sendurur, E., & Sendurur, P. (2012).
 Teacher beliefs and technology integration practices: A critical relationship.
 Computers and Education, 59(2), 423-435. doi:10.1016/j.compedu.2012.02.001
- Hsu, S. (2017). Developing and validating a scale for measuring changes in teachers' ICT integration proficiency over time. *Computers and Education*, 111(4), 18-30. http://dx.doi.org/10.1016/j.compedu.2017.04.001
- Liu, Q., & Geertshuis, S. (2016). Professional identity and teachers' learning technology adoption: a review of adopter-related antecedents. 15th European Conference on Elearning proceedings. Prague 2016.
- Mclver, J., & Carmines, E. (1981). Unidimensional scaling (quantitative applications in the social sciences. *Sage Publications, 24*, 5-97. http://dx.doi.org/10.4135/9781412986441
- Murchú, D. (2005, February 5). New teacher and student roles in the Technology-supported language classroom. *International Journal of Instructional Technology and Distance Learning, 1*. Retrieved from http://www.itdl.org/journal/feb_05/article01.htm
- Nykvista, S., & Mukherjee, M. (2016). Who am I? Developing pre-service teacher identity in a digital world. *Procedia Social and Behavioral Sciences*, *217*, 851 857. doi:10.1016/j.sbspro.2016.02.012
- Van den Beemt, A., & Diepstraten, I. (2016). Teacher perspectives on ICT: A learning ecology approach. *Computers and Education*, 92-93, 161-170. http://dx.doi.org/10.1016/j.compedu.2015.10.017

- Vokatis, B., & Zhang, J. (2016). The professional identity of three innovative teachers engaging in sustained knowledge building using technology. *European Association* for Research on Learning and Instruction, 4(1), 58-77. Retrieved from https://journals.sfu.ca/flr/index.php/journal/article/view/223/290
- Wayne, S., Shore, L., & Liden, R. (1997). Perceived organizational support and leadermember exchange: A social exchange perspective. *The Academy of Management*, 40(1), 82-111. Retrieved from http://www.jstor.org/stable/257021
- Woods, S. A., & Hampson, S. E. (2005). Measuring the big five with single items using a bipolar response scale. *European Journal of Personality*, 19, 373-390. doi:10.1002/per.542
- Zhu, C. (2010). Teacher roles and adoption of educational technology in the Chinese context. Journal for Educational Research Online, 2(2), 72-86. Retrieved from http://www.j-e-r-o.com/index.php/jero/article/viewFile/80/91

Appendices

Appendix A: Main test questionnaire English

Demographic variables:

1. What is your gender?

Male, female

2. What is your age?

... years

3. How many years are you working as an elementary school teacher?

....years

4. What is the name of your school?

••••

5. And what is the place?

.

6. Which class(es) are you teaching?

1,2,3,4,5,6,7,8 (multiple options)

 \rightarrow from here onwards all 7-point Likert scales (strongly disagree – strongly agree)

7. Self-efficacy

"I am fully capable of using the IT in the classroom"

8. Self-efficacy

"I am confident in my ability to use the IT in the classroom"

9. Self-efficacy

"Using the IT in the classroom is well within the scope of my abilities"

10. Self-efficacy

"I do NOT feel I am qualified of using IT in the classroom" (r)

11. Self-efficacy

"My past experiences increase my confidence that I will be able to successfully use the IT in the classroom"

12. Actualized rewards

"I enjoyed myself when I was using IT"

13. Actualized rewards

"Past experience with using IT made me feel rewarded"

14. Actualized rewards

"I am satisfied with my overall experience with using IT in the classroom"

15. Functionality

"I think that I would like to use this system frequently"

16. Functionality

"I found the system unnecessarily complex"

17. Functionality

"I thought the system was easy to use"

18. Functionality

"I think that I would need the support of a technical person to be able to use this system"

19. Functionality

"I found the various functions in this system were well integrated"

20. Functionality

"I thought there was too much inconsistency in this system"

21. Functionality

"I would imagine that most teachers would learn to use this system very quickly"

22. Functionality

"I found the system very cumbersome to use"

23. Functionality

"I felt very confident using the system"

24. Functionality

"I needed to learn a lot of things before I could get going with this system"

25. Support

"Help is available from (name of school) when I have problems regarding IT"

26. Support

"(Name of the school) shows a lot of concern for me when it comes to using the IT"

27. Support

"(Name of school) is willing to extend itself in order to help me perform my job to the best of my ability"

28. Support

"(Name of school) strongly considers my goals and values"

29. IT dynamism

"I feel like that the IT I use in the classroom is changing too much"

30. IT dynamism

"When the IT in the classroom changes, it changes drastically"

31. IT dynamism

"I think the continuous changes of the technologies in the class are good and needed"

32. Obligation

"I feel obligated to use IT in the classroom"

33. Obligation

"Because everyone else is using IT in the classroom, I need to use it too"

34. Obligation

"I find the mandatory use of technologies in the classroom annoying"

35. Dependence

"Thinking about myself in relation to the IT I use in the classroom, I need it"

36. Dependence

"Thinking about myself in relation to the IT I use in the classroom, I rely on it"

37. Dependence

"Thinking about myself in relation to the IT I use in the classroom, I count on it"

38. Dependence

"Thinking about myself in relation to the IT I use in the classroom, I am dependent on it"

39. Relatedness

"Thinking about myself in relation to the IT I use in the classroom, I am connected with it"

40. Relatedness

"Thinking about myself in relation to the IT I use in the classroom, I am in coordination with it"

41. Relatedness

"Thinking about myself in relation to the IT I use in the classroom, I am close with it"

42. Relatedness

"Thinking about myself in relation to the IT I use in the classroom, I am linked with it"

43. Emotional energy

"Thinking about myself in relation to the IT I use in the classroom, I feel pumped up"

44. Emotional energy

"Thinking about myself in relation to the IT I use in the classroom, I feel excited"

45. Emotional energy

"Thinking about myself in relation to the IT I use in the classroom, I feel enthusiastic"

46. Emotional energy

"Thinking about myself in relation to the IT I use in the classroom, I feel energized"

47. Attitude towards IT

"Using IT for work-related purposes is a bad / good idea"

48. Attitude towards IT

"I dislike / like the idea of using IT for work-related purposes"

49. Attitude towards IT

"Using IT for work-related purposes is unpleasant / pleasant"

50. Attitude towards IT

"The use of technologies in the class is a positive step forward"

Appendix B: Main test questionnaire Dutch

Introductie:

Hallo allemaal!

Ik ben Silke Eidhof, een Master student Corporate Communication aan de Universiteit Twente. Voor mijn scriptie doe ik onderzoek naar het technologiegebruik van basisschool leerkrachten en de mate waarin zij deze technologieën integreren in hun identiteit.

Nu denk je misschien 'wat betekent dit precies?' Technologieën in scholen zijn in de loop van de jaren flink veranderd. Vroeger hadden leerkrachten alleen een schoolbord met een krijtje, nu zijn er veel verschillende technologieën waar mee kan, en soms moet, worden gewerkt. In hoeverre hebben leerkrachten een positieve houding tegenover deze technologieën? Wie ben jij nu als leerkracht met al deze nieuwe technologieën?

Ik wil daarom graag te weten komen hoe basisschool leerkrachten met de technologieën omgaan, of ze daar hulp bij krijgen, of ze het moeilijk vinden, of ze er voldoening uithalen etc.

Wanneer in dit onderzoek wordt gesproken over 'technologieën', wil ik je vragen om aan alle verschillende technologieën die jij als leerkracht in de klas gebruikt te denken. Denk aan digiborden, een IPad, computers, maar ook aan software en de verschillende applicaties waarmee wordt gewerkt. Eigenlijk alles wat anders is dan het vroegere gebruik van een schoolbord en krijtje.

Alle informatie wordt anoniem verwerkt. Heb je vragen over het onderzoek of wil je geïnformeerd worden over de resultaten? Dan kun je mij bereiken via s.a.eidhof@student.utwente.nl.

Alvast bedankt voor jouw deelname aan dit onderzoek!

Demografische variabelen:

1. Wat is jouw geslacht?

Man, vrouw

2. Wat is jouw leeftijd?

... jaren

3. Hoeveel jaren werk je als een basisschool leerkracht?

....jaren

4. Wat is de naam van jouw school?

.

5. In welke plaats ligt jouw school?

.

6. Aan welke groep(en) geef je les?

1,2,3,4,5,6,7,8 (kunt meerdere opties aanklikken)

 \rightarrow vanaf hier 7-punt schalen (helemaal mee oneens – mee oneens – een beetje mee oneens – niet eens en niet oneens – een beetje mee eens - mee eens – helemaal mee eens)

7. Self-efficacy

"Ik ben volledig in staat om de benodigde technologieën in de klas te gebruiken"

8. Self-efficacy

"Ik voel mij zelfverzekerd over mijn capaciteiten om de technologieën in de klas te gebruiken"

9. Self-efficacy

"Het gebruiken van de technologieën in de klas ligt binnen mijn mogelijkheden"

10. Self-efficacy

"Ik heb het gevoel dat ik NIET geschikt ben om de technologieën in de klas te gebruiken" (r)

11. Self-efficacy

"Mijn eerdere ervaringen geven mij het vertrouwen dat ik de technologieën in de klas succesvol kan gebruiken"

12. Actualized rewards

"Het gebruiken van de technologieën in de klas heeft mij persoonlijk veel opgeleverd"

13. Actualized rewards

"Eerder gebruik van de technologieën in de klas gaven mij een gevoel van beloning"

14. Actualized rewards

"In het algemeen ben ik tevreden over mijn ervaringen met het gebruiken van technologieën in de klas"

15. Functionality

"Ik vind het leuk om de technologieën in de klas vaak te gebruiken"

16. Functionality

"Ik vind de technologieën in de klas onnodig moeilijk" (r)

17. Functionality

"Ik vind de technologieën in de klas gemakkelijk te gebruiken"

18. Functionality

"Ik heb vaak hulp nodig van een technisch persoon als ik de technologieën in de klas wil

gebruiken" (r)

19. Functionality

"De verschillende technologieën in de klas zijn goed op elkaar afgestemd"

20. Functionality

"Ik vind dat de verschillende technologieën in de klas te weinig op elkaar zijn afgestemd" (r)

21. Functionality

"De meeste leraren hebben de technologieën snel onder de knie"

22. Functionality

"Ik vind de technologieën in de klas moeilijk te hanteren" (r)

23. Functionality

"Ik voel mij overtuigd van mijzelf wanneer ik de technologieën in de klas gebruik"

24. Functionality

"Voordat ik alle technologieën in de klas kon gebruiken, moest ik veel leren" (r)

25. Support

"Hulp is aanwezig op mijn school wanneer ik problemen heb met de technologieën in de klas"

26. Support

"Mijn school toont veel belangstelling voor mij als het aankomt op het gebruiken van de technologieën in de klas"

27. Support

"Mijn school is bereid om zich in te spannen zodat ik de technologieën in de klas zo goed mogelijk kan gebruiken"

28. Support

"Mijn school houdt sterk rekening met mijn persoonlijke doelen en waarden als het aankomt op het gebruik van technologie"

29. IT dynamism

"Ik vind dat de technologieën in de klas TE vaak veranderen (denk ook aan upgrades)"

30. IT dynamism

"Wanneer de technologieën in de klas veranderen, dan veranderen de technologieën drastisch"

31. IT dynamism

'Ik vind de continue veranderingen van de technologieën in de klas goed en nodig' (r)

32. Obligation

"Ik voel mij verplicht om de technologieën in de klas te gebruiken"

33. Obligation

"Omdat alle leraren de technologieën in de klas gebruiken, moet ik ze ook gebruiken"

34. Obligation

"Ik vind het verplicht gebruiken van de technologieën in de klas vervelend"

Dependence

"Als ik aan mezelf denk in relatie tot de technologieën die ik gebruik in de klas, dan....

- 35. heb ik de technologieën echt nodig
- 36. kan ik bouwen op de technologieën
- 37. reken ik op de technologieën
- 38. ben ik afhankelijk van de technologieën"

Relatedness

"Als ik aan mezelf denk in relatie tot de technologieën die ik gebruik in de klas, dan

- 39. voel ik mij verbonden met de technologieën
- 40. ben ik gehecht aan de technologieën
- 41. voel ik affiniteit met de technologieën
- 42. voel ik mij in verband staan met de technologieën"

Emotional energy

"Als ik aan mezelf denk in relatie tot de technologieën die ik gebruik in de klas, dan....

- 43. voel ik me opgewonden
- 44. voel ik me opgewekt
- 45. voel ik me enthousiast
- 46. voel ik me energiek"

47. Attitude towards IT

"Het gebruiken van de technologieën in de klas is een goed idee"

48. Attitude towards IT

"Ik vind het leuk om de technologieën te gebruiken voor werk gerelateerde doeleinden"

49. Attitude towards IT

"Het gebruiken van de technologieën in de klas is prettig"

50. Attitude towards IT

"Het gebruiken van technologieën in de klas is een positieve stap"

51. Beschrijvingen IT Identity:

"Ik ben een persoon die zich snel verbonden voelt met verschillende technologieën. Ik hecht daarom veel waarde aan nieuwe technologieën, ben enthousiast wanneer ik ze gebruik en heb het gevoel dat ik niet zonder technologieën kan"

52. Beschrijvingen IT Identity:

"Ik ben een persoon die zich niet snel verbonden voelt met verschillende technologieën. Daarom hecht ik geen waarde aan nieuwe technologieën, vind ik het vermoeiend om ze te gebruiken en kan ik goed zonder de technologieën"