

Factors and Beliefs that Influence Higher Education Teachers' Intention to Integrate Web 2.0 Technologies into Their Constructivist Pedagogy: A Study with the Reasoned Action Approach

Factoren en Overtuigingen die de Intentie Beïnvloeden van Docenten in Hoger Onderwijs om Web 2.0 Technologieën te Integreren in hun Constructivistische Didactiek:
een Onderzoek met het Model van Beredeneerd Gedrag

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February 2016

Master Educational Sciences

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Acknowledgements (in Dutch)

Voorwoord

Voor u ligt mijn masterthesis: mijn meesterproef voor de opleiding Onderwijswetenschappen die ik de afgelopen vijf jaar met enorm veel plezier heb gevolgd aan de Open Universiteit. Nu het klaar is, kijk ik terug op 15 enerverende maanden waarin ik niet alleen hard heb gewerkt aan het onderzoek en de rapportage ervan, maar waarin ik ook de gehele zwangerschap en geboorte heb beleefd van mijn jongste zoontje. Het was daarom een dubbel bijzondere periode. Ik ben nu blij dat ik mijn masterthesis tot een goed einde heb weten te brengen, maar ik zal best nog eens met gevoelens van heimwee terugkijken op deze tijd.

Ik ben een aantal mensen erg erkentelijk. In dit voorwoord neem ik graag de ruimte om hen te bedanken. Mijn begeleider, Karel Kreijns, wil ik bedanken voor zijn inhoudelijke begeleiding. Hij heeft mij uitgedaagd door de lat hoog te leggen. Ik heb enorm veel geleerd! Nynke Bos bedank ik voor haar medewerking tijdens de analyse van het vooronderzoek, het nuchtere meedenken (ze is Fries) en haar positief-kritische feedback.

Ik heb veel steun gehad aan contacten met medestudenten van de Facebookgroepen van Onderwijswetenschappen waarvan een heel aantal bereid was om mijn vragenlijsten te bekijken en van feedback te voorzien. Er werd meegedacht en studenten moedigden mij aan op moeilijke momenten.

Een paar medestudenten en collega's wil ik in het bijzonder bedanken. Henriëtte Niehof bedank ik voor het meedenken tijdens verschillende fasen van het onderzoek en haar scherpe vragen tijdens onze (nachtelijke) sparsessies die feilloos blootlegden wat ik op dat moment nog niet goed vatte. Maud Philippen wil ik bedanken voor het controleren van deze scriptie op Engelse taal. Verder ben ik blij dat ik met statistiek- en onderzoekkwesities terecht kon bij Rolf Bazuin en Hans Barf.

Ik wil mijn ouders, Herman en Hilda van Twillert, bedanken, omdat zij mij steeds aangemoedigd en gesteund hebben. Dankzij de praktische steun van mijn moeder, is het bovendien gelukt om de thesis uiteindelijk af te krijgen.

Tot slot bedank ik mijn gezin. Ook mijn man, Marc Zorge, heeft mij in praktische zin enorm ondersteund, zodat ik mij kon richten op de thesis. Marc en mijn lieve kinderen, bedankt voor jullie liefdevolle geduld tijdens de afgelopen periode!

Astrid van Twillert

Franeker, februari 2016

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Summary

The modest use of Web 2.0 technologies in teaching is in contrast with its promises to meet 21st century educational demands and to support social constructivist learning. In order to develop successful interventions to elevate its use in higher education, more insight is needed about factors that influence teachers' intention to integrate Web 2.0 technology into teaching. This study aims to provide insight into factors and beliefs that influence higher education teacher's intention to integrate Web 2.0 technology into their constructivist pedagogy.

The reasoned action approach (Fishbein & Ajzen, 2010) was used as this study's framework. A preliminary qualitative study was carried out among 27 teachers from a university of applied sciences in the North of the Netherlands. To elicit salient beliefs towards the behavior under study an online questionnaire with open-format questions was used, according to Fishbein and Ajzen's (2010) suggestions, resulting in a modal set of salient beliefs. Subsequently, a quantitative study was accomplished. All 714 teachers from the university were invited to fill in an online questionnaire, which was based on suggestions of Fishbein and Ajzen. Besides items that were based on the modal set of salient beliefs, and items to measure intention and the proximal variables (attitude, perceived norms, and perceived behavioral control), the questionnaire contained items to measure selected background variables, namely: previous use, perceived competence, constructivist and transmissive teaching beliefs, workload, professionalization activities, and demographic variables. Data were gathered from 168 respondents.

Intention was dichotomized into non-intenders ($n = 54$) and intenders ($n = 114$). Hierarchical logistic regression analysis and mediation analyses revealed that the model could predict teachers' intention to a large extent. Attitude and perceived norms influenced intention significantly. The effects of previous use, perceived competence and constructivist teaching beliefs on intention were mediated by the proximal variables but the significant effect of transmissive teaching beliefs on intention was not found to be mediated. No significant effects were found for workload, age, and gender.

Bivariate correlation analyses showed that each belief from the modal set correlated significantly with the respective proximal variable. Results indicate that to increase attitude of non-intenders, advantageous behavioral beliefs should be promoted, whereas for intenders, disadvantageous behavioral beliefs should be countered as well. To increase perceived norms, students and near colleagues were the main

normative referents. Different control beliefs were marked out for non-intenders and intenders in order to raise perceived behavioral control,

This study adds to a body of literature related to the reasoned action approach and technology use by teachers, and offers considerations for designing interventions to increase teachers' intention. It is advised to target all significant beliefs from the modal set, promote constructivist teaching beliefs and challenge transmissive teaching beliefs. Furthermore, teachers need positive messages from students and colleagues about Web 2.0 technologies, and knowledge and ideas should be exchanged among colleagues. Teachers need support and professionalization activities that focus not only on technical but especially on educational aspects of developing and implementing technologies. Also, teachers should be allotted time and occasions to gain experience in integrating technology into their pedagogy.

Keywords: Reasoned action approach (RAA); theory of planned behavior (TPB); beliefs and intention; Web 2.0; ICT; technology integration; teachers' technology use; higher education

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Samenvatting (in Dutch)

De terughoudendheid in het gebruik van Web 2.0-technologieën in het onderwijs staat in contrast met de mogelijkheden die deze bieden om tegemoet te komen aan de eisen van het 21^e eeuwse onderwijs en om sociaal constructivistisch leren te ondersteunen. Om hiervoor succesvolle interventies te ontwikkelen voor het hoger onderwijs is inzicht nodig in factoren die de intentie van hogeschooldocenten beïnvloeden om Web 2.0-technologieën te integreren in hun onderwijs. Dit onderzoek heeft tot doel inzicht te bieden in factoren en overtuigingen die de intentie van docenten beïnvloeden om Web 2.0-technologieën te integreren in hun constructivistische didactiek.

Het raamwerk van dit onderzoek is het model van beredeneerd gedrag (Fishbein & Ajzen, 2010). Kwalitatief vooronderzoek is uitgevoerd onder 27 docenten van een hogeschool in Noord-Nederland. Middels een online enquête met open vragen zijn saillante overtuigingen ten opzichte van het te onderzoeken gedrag uitgelokt, resulterend in een modale set van saillante overtuigingen. Vervolgens is kwantitatief onderzoek gedaan. Alle 714 docenten van de hogeschool zijn uitgenodigd een online enquête in te vullen die was gebaseerd op suggesties van Fishbein en Ajzen (2010). Naast items die zijn ontleend aan de modale set van saillante overtuigingen en items om intentie en de proximale variabelen (attitude, ervaren normen en ervaren gedragscontrole) te meten, bestond deze uit items om geselecteerde achtergrondvariabelen te meten, te weten: eerder gebruik, ervaren competentie, constructivistische onderwijsopvattingen, transmissie-onderwijsopvattingen, werkdruk, professionaliseringsactiviteiten en demografische variabelen. Van 168 respondenten is data gebruikt.

De variabele intentie is gesplitst in *non-intenders* ($n = 54$) en *intenders* ($n = 114$). Uit hiërarchische logistische regressieanalyse en mediatieanalyses blijkt dat intentie in hoge mate voorspeld kon worden. Attitude en ervaren normen oefenden significante invloed uit. De effecten van de variabelen eerder gebruik, ervaren competentie, en constructivistische onderwijsopvattingen bleken gemedieerd te worden door de proximale variabelen. De significante invloed van transmissie-onderwijsopvattingen op intentie bleek niet gemedieerd te zijn. Geen significante effecten werden gevonden voor werkdruk, leeftijd en geslacht.

Bivariate correlatieanalyses lieten zien dat elke overtuiging uit de modale set significant correleert met de respectievelijke proximale variabele. Om attitude te verhogen bij *non-intenders* zouden gunstige gedragsovertuigingen bevorderd moeten worden. Bij *intenders* zouden daarbij ook ongunstige

gedragsovertuigingen weerlegd moeten worden. Voor verhogen van ervaren normen zijn studenten en nabije collega's de belangrijkste normatieve referenten. De resultaten indiceren dat voor *non-intenders* en *intenders* verschillende controleovertuigingen relevant zijn om ervaren gedragscontrole te verhogen.

Dit onderzoek draagt bij aan literatuur die is gerelateerd aan het model van beredeneerd gedrag en technologiegebruik door docenten en biedt overwegingen bij het ontwerpen van interventies om intentie van docenten te verhogen. Geadviseerd wordt om interventies te richten op alle significante overtuigingen, constructivistische onderwijs-overtuigingen te bevorderen en transmissie-overtuigingen aan te vechten. Verder zouden hogeschooldocenten van studenten en collega's positieve signalen moeten krijgen over Web 2.0-technologieën, en kennis en ideeën zouden collegiaal uitgewisseld moeten worden. Docenten hebben ondersteuning en professionaliseringsactiviteiten nodig die niet alleen gericht zijn op technische, maar vooral ook op onderwijskundige aspecten van het ontwikkelen en implementeren van technologie in het onderwijs. Tot slot zouden docenten tijd en gelegenheid moeten krijgen om ervaring op te doen in het integreren van Web 2.0-technologieën in hun didactiek.

Trefwoorden: Model van beredeneerd gedrag; theorie van gepland gedrag; overtuigingen en intentie; Web 2.0; ICT; integratie technologie; technologiegebruik docenten; hoger onderwijs

Factors and Beliefs that Influence Higher Education Teachers' Intention to Integrate Web 2.0 Technologies into Their Constructivist Pedagogy: A Study with the Reasoned Action Approach

1. Introduction

As our society changes from an industrial to an information society, education in so-called 21st century skills such as collaboration, digital literacy, problem-solving skills, and lifelong learning becomes crucial (European Commission, 2002; OECD, 2007). To acquire these skills, education should incorporate active, collaborative, creative, integrative, and evaluative elements, meaning for instance that education should be more student-driven and student-centered, with students actively involved, collaborating and finding new solutions to problems (Voogt, 2003; Voogt & Pelgrum, 2005). These elements have roots in social constructivism that advocates learning as an active process of constructing knowledge that happens by processes of dialogue and negotiation with others and within a sociocultural milieu. It advocates instruction as a process that supports this knowledge construction instead of a process of transmitting knowledge (Duffy & Cunningham, 1996).

ICT offers possibilities for these educative changes by facilitating collaborative learning and knowledge construction (Dede, 2000; Newland & Byles, 2014) as technology enables us to teach and learn in modes that are difficult to realize without ICT, especially when it involves collaboration and communication (Ten Brummelhuis, 2006). Technology is often even seen as more than just a means for education. ICT can be an important enabler for a knowledge society as viewed by the Innovation Platform that was chaired by the former Dutch Prime Minister Balkenende. As such, ICT is not just a tool but a motor for fundamental changes in society (Veen & Jacobs, 2004).

Web 2.0 technology, e.g., blogs, wiki's, and social networking, in particular, has the potential to change teaching and learning (Alexander, 2006). It supports the social constructivist realm of thoughts (Conole & Alevizou, 2010) as it empowers social interaction and can aid student participation and knowledge construction, and offers ways for learners to collaborate and co-create (Diaz, 2010; McLoughlin & Lee, 2007). Technology, and more specifically Web 2.0 technology, therefore, offers possibilities to reform education from teacher centered transmissive instruction to student-centered education that emphasizes learning communities. Rosen en Nelson (2008) describe this transition into so-called 'Education 2.0', enabled by Web 2.0 tools:

We see Education 2.0 as the use of digital tools to transform teaching and learning by having learners, as well as teachers, participate in knowledge creation and interactively build distributed communities, or networks, of learning. While the one-way nature of the read-only Web 1.0 platform fits well with a transmission, or sage-on-the-stage pedagogy, the multi-way nature of the Web 2.0 platform exemplifies constructivist pedagogy, especially of the social variety. (p. 221)

Despite social urge and evident educational benefits, the modest use of ICT in education is in contrast with its promises and affordances (Collis & Moonen, 2008; Conole, 2010b; Kennisnet, 2013), especially when it comes to Web 2.0 technology in education (Collis & Moonen, 2008; Conole & Alevizou, 2010; Maloney, 2007). Besides, there is a gap between the student's needs and uses of ICT, and the expertise of teachers (Newland & Byles, 2014; Veen & Jacobs, 2004). For about fifteen years, institutes of higher education in Europe and the United States have addressed these issues (Moser, 2007) and investing greatly in ICT infrastructure on campus and offering training (Abrahams, 2010). However, teachers remained reluctant in integrating ICT in their instruction (Gura & Percy, 2005; Moser, 2007) and despite its priority, teachers continue to be slow in integrating ICT in their educational practices (Abrahams, 2010). Although there is an increase in ICT-adoption since the beginning of this century, teachers use technology mainly for delivery of content and not for enhancing what is commonly viewed as good learning by helping students construct knowledge and encourage collaborative and active participation which are the affordances of Web 2.0 (Maloney, 2007).

Now both teacher training programs and good infrastructure seem insufficient to increase the uptake of ICT and Web 2.0 technologies by teachers, the question raises what other intervention programs can be designed to foster teacher's integration of Web 2.0 tools in higher education. In order to develop interventions that will be successful, first, more insight is needed about factors that influence teachers intention to integrate Web 2.0 technology into their pedagogy, as intention is considered a good predictor of behavior (Armitage & Conner, 2001; Fishbein & Ajzen, 2010; Sheeran, 2002). Once the underlying beliefs of teacher's intention are known, it will be possible to design specific interventions that target the change of these beliefs in a given population, so the intention to perform the behavior and thus the behavior itself, will change accordingly (Fishbein & Yzer, 2003).

This study aims to provide insight into the factors and beliefs that play a role in teacher's intention to integrate Web 2.0 technologies into their constructivist pedagogy. It is important to distinguish a constructivist approach from other kinds of uses of Web 2.0 technology. Although Web 2.0 can also be used in a traditional, transmissive manner, the current research focuses on Web 2.0 technologies that have a constructivist approach. In our¹ study, this constructivist approach represents the following:

1. The aim to let students construct meaning and knowledge by themselves;
2. To achieve this by means of interaction, which entails dialogues and/or collaboration between students.

The target population under study comprises teachers of a university of applied sciences in the North of the Netherlands. The framework used for this study is the reasoned action approach (RAA) from

¹ Note of the author: in this master thesis I use the plural personal pronoun in first person as this text will be used for publication of an article with multiple authors as well.

Fishbein and Ajzen (2010), that will be explained in the next paragraph. Within the RAA, it is important to precisely define the behavior under study in terms of target, action, context and timing (TACT) as this directs how to assess the behavior and how to conceptualize and measure each construct of our research model (Fishbein & Ajzen, 2010). For example, it would make a big difference whether we asked about teachers' attitude towards the constructivist use of Web 2.0 technologies, or towards using PowerPoint as a means for teaching in the classroom. It would also make a big difference if we asked for the intention to perform the behavior during the second week of the semester, or the intention to perform the behavior somewhere during the coming year. Therefore, we first defined the target behavior in terms of TACT and used this in all instruments of our research. We formulated the behavior under study as follows: to integrate Web 2.0 technologies within the next 12 months with the aim to let students construct their own knowledge by means of interaction (with dialogues or collaboration).

The continuation of this first chapter discusses the theoretical framework and describes the research questions. The study is done in two steps: first, a preliminary study was conducted to elicit salient beliefs from a sample of the target population. These beliefs constituted input for the main quantitative study. Chapter 2 describes the method and outcomes of the preliminary elicitation study. Chapter 3 describes the method of the main study. The main study consists of two parts. In the first part, intention and the proximal variables are being studied, and background variables are being studied in relation to intention and the proximal variables. In the second part, the underlying beliefs are being studied in relation to the proximal variables in the research model. The results of these two parts of the main study will be discussed in Chapter 4. In the final Chapter 5, conclusions will be drawn and the main results will be discussed. This chapter ends with practical and theoretical implications, limitations of this research and considerations for future research.

1.1 Theoretical Framework

1.1.1 Reasoned action approach. This study investigates factors and beliefs that influence teacher's intention to integrate Web 2.0 technology into their pedagogy and makes use of the reasoned action approach (RAA) from Fishbein en Ajzen (2010). The RAA stems from a decades-long of research cooperation between Martin Fishbein en Isaac Ajzen. Both jointly and solitary they contributed to this model by integrating the theory of reasoned action (Ajzen & Fishbein, 1980), the theory of planned behavior (Ajzen, 1985) which is an adaptation of the theory of reasoned action, and the integrative model of behavior prediction (IMBP) (Fishbein, 2000; Fishbein & Ajzen, 2010). RAA postulates that the performance of a certain behavior by an individual can be predicted largely by a person's intention to perform the behavior. This is supported by many years of research in different disciplines, amongst which a meta-meta-analysis of Sheeran (2002). He found that the overall correlation between intention

and behavior of all included studies is .53. RAA-related theories have been used successfully before within the field of education and specifically within research on technology use by educators, teachers and student teachers (Admiraal, Lockhorst, Smit, & Weijers, 2013; Kreijns, Van Acker, Vermeulen, & Van Buuren, 2013; Lee, Cerreto, & Lee, 2010; Teo & Lee, 2010; Van Acker, Van Buuren, Kreijns, & Vermeulen, 2013). The model of the reasoned action approach, as adapted for this study, is depicted in Figure 1. In the remainder of this chapter, the model will be further explained.

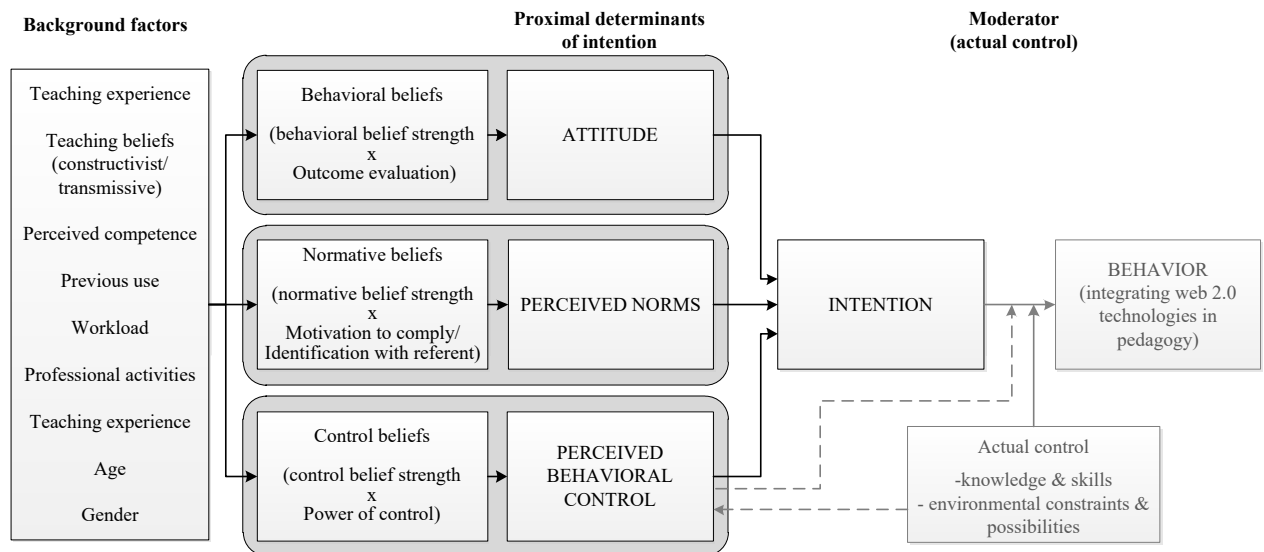


Figure 1. Reasoned action approach (Fishbein & Ajzen, 2010), adapted for the purpose of this study.

One's intention to perform certain behavior is effected by three proximal determinants, i.e., attitude, perceived norms, and perceived behavioral control towards the particular behavior. Attitude is a person's positive or negative evaluation regarding his/her performing the particular behavior (Ajzen, 2006; Fishbein & Ajzen, 2010). Perceived norms can be defined as the social pressure one perceives to perform or not perform the behavior (Ajzen, 1991; Fishbein & Ajzen, 2010). Finally, perceived behavioral control can be defined as someone's perception of being capable of and having control over performing the behavior (Ajzen, 2006). This is closely related to Bandura's overly known concept of self-efficacy: the belief in one's capabilities to perform a given behavior (Bandura, 1995). Perceived behavioral control encompasses the extent to which one has information, skills, opportunities, and other resources at one's disposal and the degree to which one may be able to overcome possible barriers to performing the behavior. If teachers believe they have low control over their performance, they may not form strong intentions to perform it, even though attitudes and perceived norms are highly positive (Fishbein & Ajzen, 2010).

It should be remarked that although teachers have a high level of intention, they may still not perform the behavior when actual control is low as actual control moderates the intention-behavior relationship.

Hence, people will only act on their intention and actually perform the behavior when they indeed possess the necessary knowledge and skills, and provided that there are no unsolicited environmental circumstances that obstruct their intention to be transferred into behavior. When actual control is difficult to measure, perceived behavioral control can serve as a proxy for actual control (Fishbein & Ajzen, 2010). In Figure 1 this is depicted with the dotted lines.

RAA assumes that behavior is determined by underlying beliefs and information people hold, regarding either reasoned and deliberated behavior, or spontaneous, automatic, behavior (Ajzen & Fishbein, 2000; Fishbein & Ajzen, 2010). Thus, at the level of underlying beliefs most insights can be gained into ways people think and the considerations that guide the decisions to perform or not perform the behavior (Ajzen, 1991). So, for example, on the basis of a teacher's decision to let students write a blog can be the belief that doing so will have the positive consequence of students being able to reflect and learn from each other. Such a belief affects the attitude of that teacher. Likewise, all determinants of intention (i.e., attitude, perceived norms, and perceived behavioral control) are steered by underlying beliefs. As such, beliefs are assumed to be the cognitive and affective foundations for the three proximal determinants. They thus refer to the same underlying construct (Ajzen, 2006). It can be inferred that each proximal construct, for example attitude, has a direct measure (attitude), and a belief-based measure (behavioral beliefs). This leads to the assumption that attitude is formed by behavioral beliefs, perceived norms is formed by normative beliefs and perceived behavioral control is formed by control beliefs (Fishbein & Ajzen, 2010).

All three kinds of belief-based measures can be obtained by multiplying two measures. Behavioral beliefs can be defined as expectations and opinions that integrating Web 2.0 technologies into their pedagogy will lead to positive or negative outcomes (e.g., when I let students write blogs, they will better learn how to reflect). To get the belief-based measure of attitude, the strength of such a behavioral belief is multiplied by the outcome evaluation (i.e., the extent to which the belief is perceived to be good or bad). The belief-based measure is thus a weighted belief (Fishbein & Ajzen, 2010).

Perceived norms are formed by normative beliefs that can comprise injunctive and descriptive beliefs. Injunctive beliefs can be viewed of as a teacher's beliefs that persons or groups that are important to him/her (the referents, e.g., students) think he or she should or shouldn't integrate technology. Descriptive beliefs are the teacher's expectations that people that are important to him/her also perform the behavior themselves (e.g., colleagues that integrate Web 2.0 technologies). Normative beliefs are weighted beliefs as well, which means that the belief strength of those injunctive and descriptive beliefs is multiplied by the extent to which the teacher is motivated to comply with the referent (in case of injunctive beliefs) or the extent to which he or she identifies with the referent (in case of descriptive beliefs) (Fishbein & Ajzen, 2010).

Perceived behavioral control is determined by control beliefs that either make it possible for the teacher to perform the behavior (e.g., I have access to applications for writing and supervising students' blogs) or that impede him or her to perform the behavior (e.g., I don't know how to incorporate this into my pedagogy). To get the weighted measure, the strength of the control belief is multiplied by perceived power, which is the extent to which the control belief will help or impede the teacher to perform the behavior (e.g., if I have access to the appropriate applications, this would help me perform the behavior) (Fishbein & Ajzen, 2010).

It is important to know that beliefs can differ from behavior to behavior, and from population to population. Also, the specific weights of the proximal variables can vary for different persons, groups of persons, and behavior (Fishbein & Ajzen, 2010). In any behavior and within any population, however, information about beliefs that form a specific combination of the proximal determinants of intention, offers insights into what we should take into account when we aim to develop interventions to change behavior or intention (Fishbein & Ajzen, 2010). Especially by studying what beliefs are held by teachers that do not intend to perform certain behavior as opposed to beliefs that are held by others who do hold that intention, we can try to discover how we should target interventions to change behavior and intention. By targeting the beliefs we can try to change the determinants of intention, so intention increases and therewith the likelihood that the behavior will be performed.

To find out which beliefs are present in a population, it is necessary to ask people within that population (Fishbein, 2000). Although people can hold many beliefs about a specific behavior, it is assumed that at any specific moment, a human being can have in mind no more than five to nine units of information (Miller, 1956). This implies that only a limited amount of beliefs are available in human memory at a certain time to form an opinion or an attitude. The beliefs that are quickly available are the so-called salient beliefs; beliefs that are highly accessible in memory (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975). One can activate those salient beliefs without much cognitive effort and even spontaneous, and so these beliefs can steer one's attitude rapidly, even on an unconscious level. Therefore, to understand what forms someone's attitude, we do not have to know all beliefs around a certain behavior but we would have to find out the most accessible (salient) beliefs within a population (Fishbein & Ajzen, 2010).

Although RAA is built on the assumption that the determinants of intention are formed by salient beliefs within a population, researchers pay less attention to the elicitation of these beliefs (Fishbein & Ajzen, 2010; Herath, 2010). Although there is a limited amount of research to the question what explains technology use of intention to use technology based on RAA-related theories (Admiraal et al., 2013; Ajjan & Hartshorne, 2008; Kreijns, Van Acker, et al., 2013; Teo & Lee, 2010), very few studies explored the salient beliefs within the population. The studies we know focus on secondary education (Chien, Wu, & Hsu, 2014; Lee, Ceretto, & Lee, 2010; Sugar, Crawley, & Fine, 2004). Ajjan and Hartshorne (2008)

studied higher education teachers' intention to use Web 2.0 technology with the decomposed theory of planned behavior, an adaptation of the RAA. They did not study salient beliefs within the population either. Also, in previous research, the IMBP (Fishbein, 2000) was used to explain teachers' intention for using digital learning materials in secondary education (Kreijns, Vermeulen, Kirschner, Van Buuren, & Van Acker, 2013; Van Acker et al., 2013). The authors concluded the IMBP to be a useful model to explain teachers' intention. Apart from the fact that the behavior and the population under study were different, it was again not studied which salient beliefs are involved within that particular population.

All in all, although RAA has proven its value and although in earlier relevant studies to technology adoption this theory has been successfully applied, to our knowledge it has not yet been used to study higher education teachers' intention to integrate Web 2.0 technologies in relation to the underlying beliefs. Therefore, our study expands the growing body of literature that focuses on teachers' intention to use technology and more specifically Web 2.0 technologies.

1.1.2 Background factors. Adjacent to the proximal determinants of intention many other variables can play a role, e.g., demographic or cultural factors. These background variables are sometimes labeled as distal variables (Fishbein & Yzer, 2003; Kreijns, Van Acker, et al., 2013). The influences of these background variables are generally mediated by the proximal determinants of intention and most often they hardly add to the explained variance of intention. What is more, these background factors can be very behavior specific. Therefore, the background variables do not always play a role in all behavior and within all populations, in contrast to the proximal variables of the model (Fishbein & Ajzen, 2010). However, just as salient beliefs form attitude, perceived norms, and perceived behavioral control, and therewith offer valuable information for developing interventions, background factors can also yield important information to take into account when developing interventions (Kreijns, Vermeulen, et al., 2013). Therefore, our study brings a selection of background factors within the research model (Figure 1).

The first three background factors are age, gender, and teaching experience. Although not many studies found demographical variables to influence technology adoption by teachers (Singh & Hardaker, 2014), results vary. Differences were measured in gender (Cooper, 2006; Zelick, 2013), where Zelick also found age correlating with perceptions of Web 2.0 technologies in education. Morris en Venkatesh (2000) found that age significantly influenced the determinants of intention of employees to use new a software system. Although not measured in an educational setting, it could imply that age effects teachers' intention to integrate technology. Kreijns, Van Acker et al. (2013) did not find a significant relation between age, gender, and the proximal variables in their study to explain the intention of teachers to use digital learning materials. Admiraal et al. (2013) found age to correlate negatively with the use of software tools by teachers. They also found a significant correlation between years of teaching experience and age. Although there are indications that years of teaching experience correlate negatively

with the use of ICT (Admiraal et al., 2013; Buabeng-Andoh, 2012; Torrasi, 2012) and that years of teaching experience correlate negatively with self-efficacy (Lee & Tsai, 2010), literature is ambiguous about the relations between years of teaching and the use of technology (Buabeng-Andoh, 2012).

A fourth background factor we will study in relation to our model is previous use. In previous studies, this is found to be a predictor of either integrating ICT in teaching or intending to do so. According to Tondeur, Van Keer, Van Braak, and Valcke (2008), the extent to which teachers already use computers influences the extent to which teachers integrate ICT in the classroom as previous experience can have an effect on e.g., attitude and behavioral control. Kreijns, Van Acker et al. (2013) found that previous use of digital learning materials was found to have an indirect as well as a direct effect on the intention to use digital learning materials. Indeed, Fishbein and Ajzen (2010) already pointed out that previous behavior can increase the explained variance of behavioral intention compared with the explained variance of the three proximal determinants of intention alone.

The fifth background factor is perceived competence as the integration of ICT in education is found to correlate with perceived computer competence (Buabeng-Andoh, 2012) and self-reported levels of knowledge and use (Sturgeon, 2011). According to Ulrich en Karvonen (2011) current knowledge of Web 2.0 technology is a predictor of the intention to integrate Web 2.0 technologies into education. Drent (2005), however, did not find a direct effect of ICT competence on the innovative use of ICT by teacher educators. She concludes competence is a necessary condition but other factors are more important. In their study to teachers' intention to use digital learning materials with the use of the IMBP, Kreijns, Van Acker et al. (2013) found that perceived knowledge and skills influenced all three proximal variables and they also found the three proximal variables to mediate the relation between perceived knowledge and skills, and intention. Van Acker et al. (2013) found that the relationship between perceived ICT skills and intention was fully mediated by self-efficacy, the counterpart of perceived behavioral control.

Professionalization activities make our sixth background factor. Professional training is seen as an important condition for the uptake of technology by teachers (Mumtaz, 2000; Tondeur, Van Keer, et al., 2008). Pritchett, Pritchett, and Wohleb (2013) found that educational professionals have a higher intention using Web 2.0 technology into their educational practices when they have had training and professional development opportunities, especially when these addressed how to use and implement these technologies. Also, Valtonen et al. (2015) found that experiences of learning with ICT in pedagogically meaningful ways can affect pre-service teachers' intentions to use ICT for teaching and learning, primary because it directly influences teachers' self-efficacy and subjective norms (the counterpart of perceived norms in our study). This is in line with the suggestion of Ertmer, Ottenbreit-Leftwich, Sadik, Sendurur, and Sendurur (2012) to utilize the same tools for professional development that teachers can use in their teaching. Also, according to Kale and Goh (2012), experience only is not

enough for teachers to find Web 2.0 technologies appealing. This can be overcome by offering teachers experiences in professional development practices where Web 2.0 technologies are incorporated into. Professionalization activities may therefore influence one's intention. Not only does it seem helpful for teachers to have some training in how to use and integrate Web 2.0 technology but also having good examples, by participating in professionalization activities while making use of Web 2.0 technologies, may help increase the proximal variables of intention.

The seventh background factor in this study is workload. In literature this is one of the most frequently mentioned impeding factors for ICT integration by teachers (Buabeng-Andoh, 2012; Chen, 2009; Smith, 2012), and accordingly, workload is found to be a large inhibitor for Web 2.0 adoption (Kale & Goh, 2012). Workload is seen as a neutral term that refers to multiple themes such as the amount of work an employee has to do, its difficulty, the work demands, and the work tempo. Workload is therefore not necessarily a problem, unlike the term work-related stress (Kirsch, Van, & Tilkon, 2010). In the Netherlands, the workload in higher education is higher than in other professions, so in the year 2000, the Dutch government aimed to reduce workload in higher education with ten percent (Ridderbos, 2009; Verheij & Gemmeke, 2005). Although some targets have been met partly, workload is still high (Ridderbos, 2009), and therefore workload still has the attention of Dutch higher education (Zestor, 2016).

The last background factors are related to teaching beliefs. As Kirkwood and Price (2013) point out: "... teachers' underlying conceptions of teaching influence their general approach to teaching and their more specific approach to using technology." (p.336). In literature, teachers' teaching beliefs are often said to vary along two dimensions that refer to the meaning of teaching and learning, and the roles of students and teachers, i.e., a traditional/transmissive mode of teaching which is more teacher centered, and a progressive/constructivist mode of teaching and learning which is more student centered (Chai, 2010; Chan & Elliott, 2004; Kirkwood, 2009; Woolley, Benjamin, & Woolley, 2004). Both are often contrasted in literature (Chan & Elliott, 2004), although there are more indications that teachers have eclectic positions and mix aspects from both views, depending on the context (Chai, 2010; Chan & Elliott, 2004; Tondeur, Hermans, Van Braak, & Valcke, 2008; Woolley et al., 2004). Teachers with a more transmissive approach more often tend to use ICT for presentation and to let students interact with teacher-presented resources. Teachers with a more student-centered, constructivist approach more often attempt to use ICT to promote active engagement, and support dialogue and collaboration to help students foster understanding (Kirkwood, 2009). Tondeur, Hermans, et al. (2008) also found that teachers with a profile of high constructivist teaching beliefs tend to use technology more learner-centered and for autonomous student-content interaction, whereas teachers with a profile of high traditional teaching beliefs tend to use technology as learning tools with a drill-and-practice-character. This is in line with two other studies that found that teacher beliefs generally influence the kind of ICT

adoption by teachers (Chai, 2010; Teo, Chai, Hung, & Lee, 2008). Although in these studies, constructivist teaching beliefs influenced both the use of transmissive and constructivist use of ICT, no (negative) relation was found between transmissive teaching beliefs and the constructivist use of ICT. Kale and Goh (2012) found that teaching style (which involves teaching beliefs) correlates positively with the likelihood of finding Web 2.0 appealing for teaching. Despite this correlation, teaching style was not found a significant predictor of finding Web 2.0 appealing.

1.2 Research Questions

This study focusses on the question: Which factors and beliefs influence higher education teachers' intention to integrate Web 2.0 technologies into their constructivist pedagogy? It should be remarked that for methodological motives, as will be explained in chapter 3, a time constrain to this question was added, namely: 'within the next 12 months'. Henceforth in the paper, we mostly refer to the behavior under study simply as 'integrating Web 2.0 Technologies'. To answer this question, three research questions were formulated:

1. To what extent do the proximal and background variables predict whether teachers do or do not hold the intention to integrate Web 2.0 technologies?
2. Do the proximal variables attitude, perceived norm, and perceived behavior control mediate the influence of the background variables on intention to integrate Web 2.0 technologies?
3. What behavioral, normative, and control beliefs do teachers hold regarding them integrating Web 2.0 technologies and which correlate most with their respective proximal determinant of intention for the groups of teachers that do or do not hold the intention to integrate Web 2.0 technologies?

2. Preliminary Elicitation Study

The main study encompasses two parts. In the first part of the main study, relations between intention, proximal, and background variables were assessed. In the second part of the main study, relations between the proximal variables and the underlying beliefs were studied. In order to carry out this second part of the study on teachers' beliefs, we first needed to identify the set of beliefs that are held with the highest frequency in the target population. This is called the modal set of salient beliefs (Fishbein & Ajzen, 2010).

For this, a preliminary elicitation study was carried out in which we aimed to answer the following question: What behavioral, normative, and control beliefs are held with the highest frequencies in the target population? The answer to this question involves the modal set of beliefs, which was used to construct the questionnaire of the main study and answer the main study's research questions.

2.1 Method

2.1.1 Procedure. The preliminary elicitation study was carried out early spring 2015. Because the target behavior is actually a category of behaviors it was of great importance that participants had a clear definition of the behavior (Fishbein & Ajzen, 2010). Participants of the elicitation and the main study must thus be given a clear explanation of the behavior and be provided with examples before we could elicit their beliefs regarding the target behavior. For that reason, we carried out a small initial study to be able to select relevant examples of Web 2.0 technologies that we could use for the elicitation and the main study. Subsequently, we conducted the elicitation study.

Selection of relevant examples. To select examples of Web 2.0 technologies with a constructivist approach that are relevant to the target population, four teacher members of an expert group of educational technology within the university were interviewed: one teacher member from each of the four institutes of the university: Technology, Economics & Management, Education & Communication, and Healthcare & Social work. During the interview, each teacher was given the definition of the target behavior (as explained in the introduction of this thesis) and a concept map containing a typology of Web 2.0 in education from Bower (2015). The teachers were asked to mention those examples of technologies that would be relevant and familiar to other teachers within the school, either because those applications were already being used within the school, or because an application was familiar for other reasons. At the end of each interview, the list with examples was drawn up, and the teacher was asked to rate these from 1 to 10, for the least to the most appealing examples. When all interviews were held, we gave scores to each example for the ranking in the list (a higher ranking gave higher scores) and the number of participating teachers that mentioned it. The

examples with the highest scores were selected to be presented in both the elicitation study and the closed-ended surveys. Selected examples of the technologies were amongst others: Google docs, blogs, wiki's, forums, Facebook, sharing videos, and online mind mapping.

Elicitation of beliefs. Following the recommended surveying technique for the elicitation study (Fishbein and Ajzen, 2010), an online questionnaire was conducted. Google Forms was chosen as a survey tool as online questionnaires in Google Forms were familiar to the target population and Google Forms was available for free with no advertisements. Furthermore, all teachers of the school were assigned a Google account for teaching.

Before administering the questionnaire, it was piloted with six teachers outside of the target population. The teachers completed the questionnaire and gave feedback on the clearance, the wording, and the time it took to complete it. Subsequently, minor changes in wording and lay-out were made and it was presented again to two of the teachers for a final check.

To promote a high and early response rate, 27 selected participants were contacted by telephone and asked for their willingness to complete the questionnaire within two weeks. Anonymous handling of all responses was assured. Three teachers were ill and two other teachers couldn't be reached. In those cases, another teacher was selected and asked to participate. Participants received an invitation to the questionnaire by e-mail. After a week, a first reminder was sent and five days later, the second and last reminder was sent to non-responding participants.

2.1.2 Participants. Maximal variation sampling was used to represent individuals that differ on characteristics or traits (Creswell, 2012). According to the recommendations of Francis et al. (2004), about 25 participants should be included in an elicitation sample. This study sampled a total of 27 teacher participants from each of the four institutes (Technology, Healthcare & Social Work, Economics & Management, and Education & Communication). In the sample, all departments within an institute were represented and a representative distribution of full-time and part-time, male and female teachers and age groups were being pursued.

27 participants entered the questionnaire. In one case the questionnaire was being ended after a negative response to the selection question to confirm a good understanding of the behavior under study. 26 participants completed the questionnaire. Table 1 shows the demographic characteristics of the sample.

Table 1

Demographics of the Elicitation Sample

	<i>Frequency</i> <i>N = 26</i>	<i>M</i>	<i>SD</i>
<i>Institute</i>			
Technology	7		
Economics & Management	6		
Education & Communication	7		
Healthcare & Social work	6		
<i>Gender</i>			
Male	16		
Female	10		
<i>Full time equivalent</i>		.82	.20
0,20 to 0,65 fte	5		
0,65 to 0,85 fte	9		
0,86 to 1,00 fte	12		
<i>Age</i>		47.35	11.00
27 to 39	8		
40 to 54	9		
55 to 64	9		
<i>Years of teaching experience</i>			
Range: 1 – 42 years		16.77	13.30

2.1.3 Instrument. The online questionnaire contained questions formulated in open response format as suggested by Fishbein and Ajzen (2010). To meet the principle of compatibility (Ajzen, 2006; Fishbein & Ajzen, 2010), all questions about the behavior were defined by the same terms (TACT) throughout the survey. Moreover, throughout the questionnaire (Appendix A), special attention was given to explaining and highlighting the specifications of the target behavior. To make sure participants were fully aware of the specifications of the behavior under study, the first question was meant for selection and asked participants to confirm they fully understood each of the details. Answering ‘no’ led to ending the questionnaire. In a second selection question, participants were asked to confirm that they had teaching responsibilities within the next twelve months. Answering ‘no’ to this question led to ending the questionnaire as well. On top of each next page of the questionnaire the behavior and examples of relevant Web 2.0 technologies were presented.

In the first section of the questionnaire, participants were asked to take a few minutes to note their thoughts about: Advantages and disadvantages of them performing the behavior (behavioral beliefs); Other things that come to mind when thinking of performing the behavior; Individuals or groups of persons that would approve or disapprove them performing the behavior (injunctive normative beliefs); Individuals or groups of persons that would most or least likely perform the behavior themselves (descriptive normative beliefs); Factors and circumstances that would enable them or make it easier to perform the behavior, and factors and circumstances that would impede them or make it difficult to perform the behavior (control beliefs). Each question was illustrated by a clarifying example of a different kind of behavior (i.e., intention to sport on a daily basis).

The second section contained questions for the direct measures of the proximal variables and intention, and the final section contained demographical questions. The questions for the direct measures were piloted and each measured on a 7-point Likert scale. See Table 3 for the questions for intention, attitude, perceived norms, and perceived behavioral control.

2.1.4 Analyses. Content analysis was done by analyzing the responses to the open-format questions and labeling these in codes and themes (Francis et al., 2004; Kondracki, Wellman, & Amundson, 2002). Responses were first read and reread to get a global view of themes that might come out of the data. All responses were analyzed on sentence level with the use of analysis software Kwalitan (Peters, 2000), using a combination of inductive and deductive approaches (Kondracki et al., 2002). The analysis is inductive in a way that responses are examined and coded without prior notions and categories in mind, and deductive, because the responses were largely ordered in essential main themes by the order of the questionnaire (e.g., advantages/ disadvantages). After the first round of analysis, the responses were reread and compared with the codes. Codes were refined and smaller or overlapping codes were sometimes condensed in a new, single code. The process of (re)reading, comparing, and coding was iterative until no changes were tenable and more condensing of codes would lead to too general themes. Two other researchers, an expert on educational technology in higher education and an expert on teacher professionalization and RAA-related research, reviewed the analysis and the results, which were discussed until consensus was reached.

Next, a frequency analysis was done in Excel. It appeared Fishbein and Ajzen (2010) are ambiguous in their decision rules of which beliefs to include in the modal set of salient beliefs and their rules of thumb lead to different results. For that reason, a more guiding computation of the modal set was used to determine the definitive set of modal beliefs, based on another decision rule, set forth by Sutton et al. (2003). They reasoned that two errors can be made when assembling a modal set of salient beliefs. The first is failing to include a person's salient belief into the modal set. The second is supplying a person with a belief that is not salient. The consequence of the latter can be a change in attitude as beliefs may become reactive, i.e., reading a non-salient belief may lead to the teacher thinking it over and as such it may become salient as a reaction. Sutton et al. came up with a computational rule that is a trade-off between maximizing the number of the person's salient beliefs that fall in the modal set and minimizing the number of "errors".

The frequency analysis was reviewed by both experts and after consensus was reached, a definitive modal set of beliefs was formulated. Cronbach's alpha was computed for each of the direct measures of intention, attitude, perceived norms, and perceived behavioral control.

2.2 Results

The frequency analyses resulted in a modal set of beliefs that contained nine behavioral beliefs, six normative beliefs that focused on four different normative referents, and seven control beliefs. An overview of these beliefs is presented in Table 2. More details about the exact formulation of the beliefs can be found in the main questionnaire (Appendix B).

Six of the behavioral beliefs can be seen as advantageous outcomes of integrating Web 2.0 technologies and three of the behavioral beliefs can be viewed of as disadvantageous. Of the normative referents, we formulated four injunctive beliefs and two descriptive beliefs. Of the seven control beliefs, four can be viewed of as helping, and three can be seen as impeding to the target behavior. The positive beliefs, namely the perceived advantages and helping beliefs, were thus outweighing the beliefs that were disadvantageous or impeding.

Values for internal consistency were well above the acceptable norm of .60 (Francis et al., 2004) for the piloted direct measures of intention ($\alpha = .94$), attitude ($\alpha = .91$), perceived norms ($\alpha = .70$), and perceived behavioral control ($\alpha = .73$).

Table 2

Modal Set of Salient Beliefs

Behavioral beliefs (outcome expectations)	Normative beliefs (social referents)	Control beliefs (helping and impeding factors)
<i>Advantageous</i>	<i>Injunctive</i>	<i>Helping</i>
<ul style="list-style-type: none"> • Appealing education, connecting to students' lives • Active, engaged and self-directed learning • Better and accessible communication • Promoting interaction and collaboration • Time- and place-independent education • Students and teachers developing (new) skills 	<ul style="list-style-type: none"> • Students • Colleagues within my department • Colleagues outside of my department • My manager 	<ul style="list-style-type: none"> • Exchange of knowledge with colleagues • Support for development and implementation • Opportunities for professionalization • Suitable vision and policy
<i>Disadvantageous</i>	<i>Descriptive</i>	<i>Impeding</i>
<ul style="list-style-type: none"> • Impersonal and limited communication • Unwanted effects to learning • Time-consuming education 	<ul style="list-style-type: none"> • Colleagues within my department • Colleagues outside of my department 	<ul style="list-style-type: none"> • Lack of time • Personal incompetence and lack of experience • Lack of technical facilities

2.3 Conclusion

The preliminary elicitation study aimed to answer the question: What behavioral, normative, and control beliefs are held with the highest frequencies in the target population? Following the computational rules of Sutton et al. (2003), a definite set of modal salient beliefs was determined that contained nine behavioral beliefs, six normative beliefs that focused on four different normative referents, and seven control beliefs. This set of beliefs could be used for the further investigation during the main study, which will be set forth in the remainder of this paper. The found beliefs will be further discussed in the final chapter.

3. Method Main Study

3.1 Procedure

In order to carry out the main study, an online survey was prepared in Qualtrics. Qualtrics was chosen because of the advanced technical features and possibilities for inviting and reminding participants. Eight teachers outside the target population reviewed the survey by completing it and giving feedback on clearance, wording, and completion time. Minor changes were made and before the definitive survey was conducted a final check was performed by two of these teachers. In May 2015, the definitive survey with the draft invitation text was presented to four teachers within the target population, so it would have been possible to make changes when necessary. Without further changes, all other teachers were invited by an e-mail in which the behavior under study was explained and the importance was highlighted. Confidentiality and anonymity were assured. Two weeks before this invitation, an in-company online newsletter paid attention to the research and upcoming invitation. Two reminders were sent, one week after the invitation and one week thereafter. After 2,5 weeks the survey was closed.

3.2 Participants

The survey was administered to all 714 teachers within the university. 198 participants finished it completely. Another 21 persons started answering questions without finishing the survey. Responses of these drop-outs that did not at least contain answers to the direct measure questions were not useful and therefore deleted. Demographic details of those drop-outs were not available. However, there is little reason to believe these respondents varied systematically from other respondents, since the questions until the point of dropping out did not ask for sensitive or personal information. Three of the unfinished responses did contain answers to the direct measures and were therefore included. From the set of 201 useable respondents, another 33 respondents were deleted because selection criteria were not met. 18 respondents indicated they did not get a good understanding of the behavior under study despite thorough explanation with examples. 15 respondents indicated that they did not have teaching responsibilities. The final dataset contained data from 168 respondents.

3.3 Instrument

In the design of the questionnaire, instructions and example questions of Fishbein and Ajzen (2010) were followed. As with the elicitation questionnaire, the main questionnaire started with an explanation of the behavior under study and examples of Web 2.0 tools derived from the expert interviews. To

highlight the focus of the behavior, the term knowledge construction was explicated and contrasted with a contra-example of knowledge transmission. To meet the principle of compatibility (Ajzen, 2006; Fishbein & Ajzen, 2010), all questions about the behavior were defined by the same terms (TACT) throughout the survey. Before starting the survey, two selection question were presented. Participants were asked if they could confirm they had a good understanding of the behavior under study and that they had teaching responsibilities within the next twelve months. Answering 'no' ended the questionnaire.

The questionnaire is enclosed in Appendix B. In the first section, questions for the belief-based measures were presented, based on the modal set of salient beliefs (see chapter 2 of this paper). Each belief-based item was measured on a 7-point Likert scale. *Behavioral belief strength (b)* was measured by asking participants to indicate how likely each of the nine outcomes of the respondent performing the behavior in the next 12 months would be (e.g., offering appealing education relates to students' social environments; 1 = highly unlikely, 7 = highly likely). *Outcome evaluations (e)* were measured by asking how good or bad such an outcome would be (1 = bad, 7 = good). For *injunctive norms, normative belief strength (n_i)* was measured by asking participants how likely it would be that each of the four normative referents (e.g., students) would think they should integrate Web 2.0 technologies into their pedagogy in the next 12 months. (e.g., students or colleagues in the same department; 1 = very unlikely, 7 = very likely). *Motivation to comply (mc)* was assessed for each referent with statements that respondents could agree with or not (e.g., When it comes to teaching, I want to do what my students think I should do; 1 = totally disagree, 7 = totally agree). For *descriptive norms, normative belief strength (n_d)* was measured by asking respondents how likely they thought it was that each of the two normative referents would integrate Web 2.0-technologies into their pedagogy themselves (e.g., colleagues within the department; 1 = very unlikely, 7 = very likely). *Identification with referents (ir)* was measured by asking how much respondents wanted to be like those referents when it comes to their pedagogy (1 = totally not, 7 = very much). We measured *Control belief strength (c)* by presenting nine belief statements and asking how likely thought these would be present in the next 12 months (e.g.: the next 12 months I will be having lack of time; 1 = very unlikely, 7 = very likely). For *Power of control (pc)* we asked participants to what extent they agreed with the fact that the helping beliefs helped them integrate Web 2.0 technologies into their pedagogy in the next 12 months. For impeding beliefs we asked how much they agreed with the fact that a belief impeded them performing the behavior (1 = totally disagree, 7 = totally agree).

The remainder of the questionnaire was used in light of the first part of our analyses in which we study relations between intention, the proximal and the background variables. For this part of the study, the belief-based measures were not taken into account. The second section of the questionnaire contained the direct measures on a 7-point Likert scale for the dependent variable *Behavioral intention (INT)* and the proximal variables *Attitude (ATT)*, *Perceived norms (PN)* and *Perceived behavioral control (PBC)*.

The composition of items was guided by the appendix of Fishbein and Ajzen (2010). Table 3 provides an overview of the sample items of the direct measures and the background variables along with the descriptive statistics and values for Cronbach's alpha. In the third section of the questionnaire, we assessed the background variables (See also Table 3). We based our overall framework on the RAA but also used items from other scales to measure constructs to fit our context. To get a view of the degree of *Perceived competence (PC)* we asked how competent respondents perceived themselves when it comes to dealing with ICT in general, and dealing with Web 2.0 technologies in general. Prior to the two questions it was remarked that these questions did not concern teaching in particular but their general sense of competence. *Constructivist teaching beliefs (CTB)* and *Transmissive teaching beliefs (TTB)* were assessed with a single item each in the form of a statement of good teachership that was based on the indices for teachers' beliefs about instruction by OECD (2009). The measure for *Previous use (PU)* was based on a single measure as was used by Kreijns, Van Acker et al. (2013) but made suitable for higher education teachers as they often do not work fulltime. *Workload (WL)* was assessed with two items from the 'Groninger Werkbeleving Screeningslijst'. Perceived workload is most often measured with an 11-item scale of the VBBA, the Dutch golden standard for measuring work perceptions, by Van Veldhoven & Meijman (1994). However, according to Heinen (2011) and Heinen et al. (2014), these two items correlate significantly with a subscale measuring 'work speed and amount of work' and 'physical workload' of the VBBA. *Teaching experience (TE)* was measured by asking how many years respondents had teaching experience. We measured the amount of relevant *Professional activities (PA)* that respondents participated in with two items: estimated days of professionalization activities (training days, workshops, MOOCs) about using Web 2.0 tools in teaching, and estimated days of activities about any other subject while making use of Web 2.0-technologies within those activities. In the final section with demographical questions, we asked for *Institution*, *Age (AGE)*, *Gender (GEN)*, and *Fulltime equivalent*.

Table 3

Overview of Sample Items Used for Further Analyses and Internal Consistency Values

<i>Variable</i>	<i>Sample item</i>	<i>Answer categories and range</i>	<i>N</i>	<i>α</i>
INT 4 items	In the next 12 months I plan to integrate Web 2.0 technologies in my pedagogy with the aim to let students construct knowledge by themselves by means of interaction.	totally disagree (1) to totally agree (7)	168	.94
ATT 5 items	Integrating Web 2.0 technologies in my pedagogy in the next 12 months with the aim to let students construct knowledge by themselves by means of interaction is...	<i>Overall evaluative:</i> ...horrible (1) to fantastic (7) ¹ ...unnecessary (1) to necessary (7) ¹	168	.94
PN 4 items	<i>Injunctive:</i> Most people whose opinion I appreciate, would approve of me integrating Web 2.0 technologies into my pedagogy in the next 12 months <i>Descriptive:</i> Most teachers like me integrate Web 2.0 applications in their pedagogy.	<i>Injunctive (2 items):</i> totally disagree (1) to totally agree (7) <i>Descriptive (2 items):</i> totally disagree (1) to totally agree (7)	168	.79
PBC 5 items	<i>Capacity:</i> When I want to integrate Web 2.0-technologies into my pedagogy in the next 12 months with the aim to let students construct knowledge by themselves by means of interaction, I am capable of overcoming difficulties and solving hindering problems. <i>Autonomy:</i> It is up to me to integrate Web 2.0 technologies into my pedagogy in the next 12 months with the aim to let students construct knowledge by themselves by means of interaction.	<i>Capacity (2 items):</i> totally disagree (1) to totally agree (7) <i>Autonomy (3 items):</i> totally disagree (1) to totally agree (7)	168	.85
PC 2 items	To what extent do you think of yourself as competent when it comes to Web 2.0 technologies in general?	totally incompetent (1) to very competent (7)	168	.83
CTB 1 item	Students ought to find solutions to problems at their own first, and my role as a teacher is to facilitate them in this.	totally disagree (-3) to totally agree (3)	167	
TTB 1 item	As a good teacher I should provide students with clear and correct information, and demonstrate how a problem should be solved in a correct manner.	totally disagree (-3) to totally agree (3)	167	
PU 1 item	How often did you integrate Web 2.0 applications in your pedagogy during the past three years?	never (1) to all days I was teaching (7)	167	
WL 2 items	I experience the physical pressure of my work as a teacher as...	not pressing (1) to strongly pressing (4).	167	.73
TE 1 item	How many years of teaching experience do you have?	open question	165	
AGE 1 item	What is your age?	open question	165	
GEN 1 item	What is your gender?	0 = male 1 = female	165	
PA 2 items	During your teaching career, how many days did you spent by estimation on professionalization activities about making use of Web 2.0 applications in your pedagogy? Every workshop or day of training counts as a day. Make an estimation when you attended online courses.	amount of days (open question) 0 = ≤ 2 days = low 1 = > 2 days = high	159	

Note: ATT = Attitude; PN = Perceived Norms; PBC = Perceived Behavioral Control; PC = Perceived Competence; CTB = Constructivist Teaching Beliefs; TTB = Transmissive Teaching Beliefs; PU = Previous Use; WL = Workload; TE =

Teaching Experience; AGE = Age; GEN = Gender; PA = Professional Activities.

¹ Since these items are bipolar in nature (Fishbein & Ajzen, 2010), these were re-scaled into -3 to 3 afterwards

3.4 Analyses

Analyses were done in SPSS, version 20. Reliability of the direct measures containing multiple items was assessed by computing Cronbach's alphas. For all tests, standard significance levels of .05 were used. Descriptive analyses were run to give an overview of the participants and multivariate analyses (ANOVA) were performed to examine whether groups of participants differed significantly on INT. Next, preliminary analyses were run to guarantee that the appropriate assumptions (i.e., assumptions of normality, linearity, multicollinearity, and homoscedasticity) were not violated for the t-tests, the bivariate correlations, and the regression analyses (Field, 2009).

Following Francis et al. (2004) we dichotomized the variable INT by splitting the sample into non-intenders (with a mean score for INT of 1 to 4) and intenders (with a mean positive score on intention, i.e., scores above 4). Not only did we do this to be able to assess differences in beliefs for both groups, as Francis et al. advised, but also to assess whether means and relations of background, proximal, and outcome variables differed for both groups.

3.4.1 Analysis proximal variables and background variables, and intention. For the first part of the main study, relations between INT, proximal, and background variables were assessed. Because responses to the open question for PA led to outliers, these responses were binned into two categories prior to analysis (see Table 3). The categories seemed sensible and care was given to a leveled distribution of participants.

After descriptive analyses for the whole sample, non-intenders, and intenders, bivariate correlations were computed for those groups. To assess the differences between non-intenders and intenders, we ran a series of t-tests to see whether the means differed significantly and Fisher's Z-tests were calculated to see whether correlations between both groups differed significantly. To examine whether the found t-values are substantive, effect sizes were calculated according to the formula in Field (2009, p. 332).

As we aimed to assess the factors that predict teachers' intention to integrate Web 2.0 technology, and given that we want to look further into differences between intenders and non-intenders, the dependent variable INT was treated dichotomous (non-intention or intention, see section 3.4) and a hierarchical binary logistic regression was selected for further analysis. To evaluate direct and indirect effect (effects of background variables that are mediated by the proximal variables), we complemented this by conducting multiple regression analyses on the three proximal variables as well as a mediation analyses for each of the background variables, using the SPSS plugin PROCESS (Hayes, 2012, 2013).

3.4.2 Analysis of the impact of beliefs on the proximal variables. During the second part of the main study, relations between the proximal variables and the underlying beliefs were studied. Before data were analyzed, some of the belief measures were transformed. We reversely scored power of control for the three impeding control beliefs, so higher scores on power of control indicate helping beliefs and lower scores indicate impeding beliefs. According to the recommendations of Fishbein and Ajzen (2010) and Ajzen (2006) we pre-analyzed the data for optimal scaling (unipolar or bipolar) and transformed the data (to reflect the unipolar or bipolar scoring) where this was appropriate and yielded better results. Table 4 gives an overview of the original scaling as used in the questionnaire and the scaling as used in the multiplications.

Table 4

Overview of Scaling in the Questionnaire and Scaling As Used in Multiplications

Belief-based measure	Answer categories	
	As used in the questionnaire	As used in the multiplications
Behavioral belief strength (<i>b</i>)	Unipolar	Unipolar
Outcome evaluation (<i>e</i>)	Unipolar	Bipolar
Injunctive belief strength (<i>n_i</i>)	Unipolar	Unipolar
Motivation to comply (<i>mc</i>)	Unipolar	Unipolar
Descriptive belief strength (<i>n_d</i>)	Unipolar	Unipolar
Identification with referent (<i>ir</i>)	Unipolar	Unipolar
Control belief strength (<i>c</i>)	Unipolar	Bipolar
Power of control (<i>pc</i>)	Unipolar	Bipolar

The indirect, belief-based measures were then computed by multiplying behavioral belief strength by outcome evaluation, normative belief strength by motivation to comply (for injunctive referents) or identification with referent (for descriptive referents), and control belief strength by power of control. Descriptive analyses were conducted and bivariate correlations were calculated for all weighted belief-based measures (e.g., behavioral beliefs) and the corresponding direct measure (e.g., ATT). This was done for the whole sample, the group of non-intenders, and the group of intenders. Significant differences in means were computed by means of t-tests and from the outcomes effect sizes were calculated. To get an understanding of the amount of explained variance, each directly measured proximal variable was regressed on the corresponding beliefs. We point out that we did not pay attention to the unique contributions of each belief. Fishbein and Ajzen (2010) mention this would be invalid to do, because beliefs can have some overlap and when two or more beliefs are correlated, only one will receive regression weight and the other will, inaptly, seem unimportant.

4. Results Main Study

The response rate was 31 percent (219 participants started answering questions) with a drop-out rate of 8 percent of these respondents that did not finish enough question to be useful, and another 15 percent of deleted respondents that did not meet the selection criteria, leaving 168 useful sets of responses. Cronbach's alpha was acceptable to good for all variables that were composites of multiple items (see Table 3). Table 5 gives an overview of the demographic distribution of the participants. Multivariate analyses (ANOVA) did not show significant differences on INT for the different categories in Table 5.

Table 5

Demographic Distribution of the Participants

	<i>N</i>	<i>n</i>	<i>M</i>	<i>SD</i>
<i>INST</i>	163			
Technology		58		
Economics & Management		33		
Education & Communication		41		
Healthcare & Social work		33		
<i>GEN</i>	164			
Male		81		
Female		83		
<i>AGE</i>			46.51	10.34
27 to 39	165	51		
40 to 54		68		
55 to 65		46		
<i>FTE</i>			.76	.24
0,20 to 0,65 fte	164	54		
0,65 to 0,85 fte		51		
0,86 to 1,00 fte		59		

Note: INST = Institution; GEN = Gender; AGE = Age; FTE = Full time equivalent.

4.1 Results of the Analysis of Proximal and Background Variables, and Intention

To be able to analyze the first two research questions, we first pre-analyzed the mean scores for the whole sample, the group of non-intenders and the group of intenders and studied the mean differences for both sub-groups on INT, the proximal and the background variables, as well as bivariate correlations between all variables. For the definitive analyses, we performed logistic regression analyses on the dichotomized measure of INT (INT_{dich}), multiple regression analyses on the proximal variables and a mediation analysis. In this paragraph, we describe the results of these analyses.

We first analyzed all mean scores as shown in Table 6. INT had a mean that was on the higher side of the range for the whole sample, indicating that on average, participants only had a small degree of intention to perform the behavior. All proximal determinants had means on the higher side of the range for the whole sample; ATT and PBC being higher on average than PN, which is closer to neutral. This

means that on average teachers held positive views toward integrating Web 2.0 technologies, just marginally they felt social pressure to perform the behavior, and on average they felt they have the capacity, the autonomy and the resources to perform the behavior.

As can be seen in Table 6, the means of the RAA variables had the largest significant differences between non-intenders and intenders, with large effect sizes (above .50 according to Cohen, 2013). On average, ATT had a neutral mean for non-intenders, whereas for intenders the mean was quite positive. The mean for PN was on the lower side of the range for non-intenders and well on the higher side of the range for intenders, indicating that non-intenders tended to feel low social pressure, whereas intenders did experience social pressure with regard to integrating Web 2.0 technologies. PBC had a slightly higher than the neutral mean for non-intenders but this was much higher for intenders, meaning the latter had a larger sense of capacity and autonomy regarding the specific behavior of integrating technology into their pedagogy. This is in line with PC as this mean was close to neutral but slightly on the higher side of the range for non-intenders, and much higher for intenders with a medium effect size (above .30 according to Cohen, 2013). The mean for PU was on the lower side of the range for both intenders and non-intenders but the groups differed substantively, meaning that although both groups indicated they did not integrate Web 2.0-technologies into their previous teaching on most of their teaching days. Intenders did have significantly more experience in integrating the technology into their pedagogy. Looking at teaching beliefs, there is a significant difference in means for CTB. On average, non-intenders had a slightly positive score whereas intenders had a substantial more positive score. The opposite is noticeable for TTB, where, on average, non-intenders scored more positively than intenders. There was only a small but significant difference in the means of AGE as on average non-intenders were older than intenders.

For the categorical variables PA and GEN, which are not detailed in Table 6, we saw significant associations between the groups of intenders and non-intenders as well. There was a significant association between the high and low scores of PA and groups of intenders versus non-intenders $\chi^2(1) = 8.28, p < .01$. Based on the odds ratio, the odds of a teacher intending to integrate Web 2.0 technologies into their pedagogy is 2.68 times higher if they attended a higher amount of relevant professionalization activities (2 days or more) than if a low amount of these activities were attended (less than 2 days of activities). GEN was significantly associated with groups of intenders and non-intenders ($\chi^2(1) = 3.98, p < .05$). The odds that a female teacher has the intention to integrate this technology into her pedagogy are 1.96 times higher than the odds of a male teacher having this intention.

Table 6

Means and Standard Deviations for the Whole Sample, Intenders, and Non-Intenders on Proximal and Background Variables, as Well as Their Mean Differences

	Range	Whole sample	Non-intenders	Intenders	<i>t</i>	<i>df</i>	Effect Size <i>r</i>
		<i>N</i> = 168 <i>M</i> (<i>SD</i>)	<i>n</i> = 54 <i>M</i> (<i>SD</i>)	<i>n</i> = 114 <i>M</i> (<i>SD</i>)			
INT	1 to 7	4.88 (1.55)	3.00 (.79)	5.77 (.87)	-19.72**	166	.84
ATT	-3 to 3	1.17 (1.17)	0.06 (.96)	1.70 (.84)	-11.26**	166	.66
PN	1 to 7	4.28 (1.16)	3.23 (.70)	4.79 (.99)	-11.76**	142.09	.70
PBC	1 to 7	5.14 (1.14)	4.43 (1.22)	5.47 (.93)	-5.53**	83.45	.52
PU	1 to 7	3.27 (1.71)	2.30 (1.24)	3.73 (1.71) ³	-6.17**	139.09	.46
PC	1 to 7	4.82 (1.35)	4.13 (1.43)	5.15 (1.19)	-4.57**	89.09	.44
CTB	-3 to 3	1.20 (1.31)	0.61 (1.42)	1.49 (1.15) ³	-4.26**	165	.31
TTB	-3 to 3	0.98 (1.34)	1.35 (1.35)	0.80 (1.30) ³	2.56**	165	.20
WL	1 to 4	2.73 (.86)	2.70 (.82)	2.74 (.88) ³	-.28	165	
TE	1 to 43	14.02 (1.62)	14.89 (11.02) ¹	13.62 (1.46) ⁴	0.72	163	
AGE	22 to 65	46.51 (10.34)	48.81 (9.97) ¹	45.42 (1.38) ⁴	1.98*	163	.15
PA	Low (0) high (1)		1	5			
GEN	Male (0) female (1)		2	4			

Note: Unless indicated otherwise, correlations are computed as Pearson's *r*.

INT = Behavioral Intention; ATT = Attitude; PN = Perceived Norms; PBC = Perceived Behavioral Control; PU = Previous Use; PC = Perceived Competence; CTB = Constructivist Teaching Beliefs; TTB = Transmissive Teaching Beliefs; WL = Workload; TE = Teaching Experience; AGE = Age; PA = Professional Activities; GEN = Gender.

*significant at $p < .05$; **significant at $p < .01$; ¹ $n = 52$; ² $n = 53$; ³ $n = 113$; ⁴ $n = 112$; ⁵ $n = 107$.

In the next step, correlational analyses were carried out. Bivariate correlations are displayed in Table 7 where correlations for all proximal and background variables are displayed for the whole sample, non-intenders and intenders. For the whole sample, large, significant correlations existed between the proximal variables and INT. Also, significant correlations existed between most background variables and INT, except for TE and WL. TE did not correlate with any of the proximal variables but WL had a small, positive correlation with PN, meaning that higher levels of perceived workload are related to higher levels of perceived norms, or the other way around. Except for TE, all background variables related to one or more proximal variables.

Some correlations were significantly different for non-intenders and intenders. This was true for all interrelations between the four main variables (proximal variables and intention). Some correlations had opposite directions for non-intenders and intenders. Correlations between PBC and INT, PC and INT, ATT and PBC, and PN and PBC, were negative for non-intenders and positive for intenders, although some negative relations were (only just) not significant for non-intenders, i.e., the correlations between

PBC and INT, and PBC and PN. It should be noted that due to sample differences (54 for non-intenders vs. 114 for intenders) relations might become more easily significant for intenders than for non-intenders. The correlations indicate that teachers with higher levels of ATT or PN, show lower levels of PBC when they do not hold the intention to integrate Web 2.0 technologies. When they do hold the intention to integrate Web 2.0 technologies, higher levels of ATT and PN are associated with higher levels of PBC. Of the background variables there were significant differences in correlations for non-intenders and intenders for the correlations between PC and INT, CTB and ATT, and TTB and INT. For the first two relations, correlations were in opposite directions for non-intenders (negative correlation) and intenders (positive correlation) but relations for non-intenders were far away from being significant.

Table 7
Bivariate Correlations of Possible Predictors of Teachers' Intention to Adopt Web 2.0 Technology

		N	INT	INT dich	ATT	PN	PBC	PU	PC	CTB	TTB	PA	WL	TE	AGE
1	INT	168													
2	INT ¹ dich	168	.81**												
3	ATT	168	.82**	.65**											
	non	54	.44**												
	int	114	.75**												
4	PN	168	.78**	.65**	.73**										
	non	54	.52**		.32**										
	int	114	.74**		.64**										
5	PBC	168	.53**	.43**	.35**	.44**									
	non	54	-.15		-.27*	-.14									
	int	114	.64**		.37**	.42**									
6	PU	167	.51**	.40**	.40**	.52**	.39**								
	non	54	.52**		.28*	.33**	-								
	int	113	.32**		.18*	.40**	.30**								
7	PC	168	.37**	.33**	.29**	.30**	.48**	.40**							
	non	54	-.05		-	-	.52**	.23*							
	int	114	.26**		.22*	-	.28**	.35**							
8	CTB	167	.36**	.31**	.34**	.38**	.29**	.30**	-						
	non	54			-.03	-	-	-	-						
	int	113	.24**		.34**	.32**	.16*	.23*	-						
9	TTB	167	-.24**	-.19**	-.19**	-.21**	-	-	-	-					
	non	54	-.38**		-	-	-	-	-	-					
	int	113	-.05		-	-	-	-	-	-					
10	PA ¹	159	.25**	.23**	.27**	.26**	.16*	.17**	.20**	-	-.18*				
	non	52			-	-	-	.37**	-	-	-				
	int	107	.24**		.29**	.17*	-	.17*	-	-	-				
11	WL	167		-	-	.17*	-	-	-.15*	.13**	-	-			
	non	54			-	.30**	-.32**	-	-.31*	-	-	-			
	int	113			-	.17*	-	-	-	-	-	-			
12	TE	165		-	-	-	-	-	-	-	-	-	-		
	non	53			-	-	-	-	-	.26*	-	-	-		
	int	112			-	-	-	-	-	-	-	-	-		
13	AGE	165	-.15*	-.15*	-	-.20**	-.13	-	-.20**	-	-	-.15*	-	.72**	
	non	53			.26*	-	-	-	-.33**	-	-	-.27*	-	.68**	
	int	112			-	-.17*	-	-	-	-	-	-	-	.74**	
14	GEN ¹	165	.21**	.16*	.17*	.19**	-	-	-.19**	-	-	-	.25**	-.21**	-.26**
	non	53	.29*	-	-	-	-	-	-	-	-	-	-	-	-
	int	112		-	-	-	-	-	-.29**	-	-	-	-	-.26**	-

Note: Unless indicated otherwise, correlations are computed as Pearson's *r*.

INT = Intention; dich = dichotomized; ATT = Attitude; PN = Perceived Norms; PBC = Perceived Behavioral Control; PU = Previous Use; PC = Perceived Competence; CTB = Constructivist Teaching Beliefs; TTB = Transmissive Teaching Beliefs; WL = Workload; TE = Teaching Experience; AGE = Age; PA = Professional Activities; GEN = Gender; non = non-intenders; int = intenders; Non-significant correlations are left blank, unless they were useful for interpretation. Significant differences in correlations according to Fisher's Z-test are light grey for $p < .05$ and dark grey for $p < .01$.

* $p < .05$; ** $p < .01$; ¹ Spearman's rho; ² Point biserial

In the final analyses, multiple regression and mediation analyses were run. TE was omitted from these analyses. It correlated with AGE above .70 ($r = .72$), and according to Pallant (2011), one should therefore consider to exclude one of the correlating variables. Also, Pallant points out that some correlation with the dependent variable is desirable. TE did not correlate with INT, nor any of the proximal determinants, so it was decided to keep AGE as a control variable and exclude TE. After preliminary analyses it appeared that PA did not have any predictive role in the model as it did not predict INT_{dich} , nor ATT, PN or PBC and significance values were very high, indicating a high chance of coincidence. Also, in mediation analyses neither indirect effects, nor direct effects were measured. Therefore, PA was omitted from the definitive analysis as well.

Hierarchical logistic regression was performed with the definitive variables. Collinearity diagnostics were computed, and the variance inflation factor for each variable did not exceed 2.91, suggesting that there was no problematic multicollinearity. Cross tabulation was conducted to assure there were no categories with few participants. The definitive model, as displayed in Table 12, contained ten independent variables. The control variables GEN and AGE were entered in the first block, the background factors PU, PC, CTB, TTB, and WL were entered in the second block and the proximal variables ATT, PN, and PBC were entered in the third block.

Chi-squares showed that each block significantly increased the fit of the model. The goodness of fit of all blocks within the model was confirmed by the Homes and Lemeshow tests, expressed as chi-squares. Being insignificant, these imply that the model fits the data, meaning that the model at all levels was able to distinguish between teachers that do and do not hold the intention to integrate Web 2.0 technologies.

Results are shown in Table 8. Block 1 with GEN and AGE, accounted for 5 percent of the overall variance in INT_{dich} . The six background variables that were entered in block 2 accounted for an increase in explained variance of 38 percent. Five background variables made a unique and statistically significant contribution to the model (i.e., GEN, PU, PC, CTB, and TTB). The strongest predictor is PC, with an odds ratio (OR) of 1.91, meaning that for an increase in PC of one unit, respondents are 1.91 times more likely to report to hold the intention to integrate Web 2.0 technologies into their educational practices, controlling for other factors in the model. The OR of TTB is the only one that is less than 1, which indicates that for every unit increase on the scale of TTB, respondents are 0.64 times less likely to report intention when other factors in the model are controlled for. In order to be able to compare effect sizes, odds ratios were converted to effect sizes r (See e.g., Borenstein, Hedges, Higgins, & Rothstein, 2009). Proximal variables were added in the third block. The final model explained 74 percent of the variance in INT (R^2 Nagelkerke), and correctly classified 90,3 percent of cases. Three variables made a unique and statistically significant contribution to the model: The proximal variables ATT ($OR = 5.43$) and PN ($OR = 3.54$), and the background variable TTB ($OR = .59$). ATT was the strongest predictor, implying that for every unit increase in ATT respondents were 5.43 times more likely to report intention. For an increase

of one unit of TTB on the other hand, respondents were 0.59 times less likely to report intention. It is worth noticing that PBC was not significant when controlled for all other variables in the model but it was not far from being significant in the third block ($p = .061$).

Table 8

Results of Hierarchical Logistic Regression: Predicting Likelihood of Teachers Reporting Intention to Integrate Web 2.0 Technology

Block	Variable	R^2 (Nagelkerke)	χ^2	$\Delta \chi^2$	B	SE	Wald statistic	Odds ratio(OR)	OR converted to r
1 ^a		.05	6.35*						
	GEN				0.54	0.35	2.37	1.72	
	AGE				-0.03	0.02	2.29	0.97	
	Constant				1.73	0.90	3.73	5.65	
2 ^b		.43	60.90**	54.56**					
	GEN				0.99	0.45	4.74*	2.68	.26
	AGE				-0.01	0.02	0.37	0.99	
	PU				0.38	0.15	6.73**	1.46	.10
	PC				0.65	0.18	12.27**	1.91	.18
	CTB				0.48	0.16	8.47**	1.62	.13
	TTB				-0.45	0.17	7.12**	0.64	.12
	WL				0.07	0.24	0.07	1.07	
	Constant				-3.42	1.67	4.20*	0.03	
3 ^c		.74	124.23**	63.33**					
	GEN				0.07	0.63	0.01	1.07	
	AGE				-0.01	0.03	0.08	0.99	
	PU				0.05	0.20	0.06	1.05	
	PC				0.40	0.24	2.72	1.50	
	CTB				0.14	0.27	0.27	1.15	
	TTB				-0.53	0.23	5.22*	0.59	.14
	WL				-0.39	0.36	1.23	0.67	
	ATT				1.69	0.42	15.92**	5.43	.42
	PN				1.26	0.45	8.05**	3.54	.33
	PBC				0.54	0.29	3.52 ¹	1.72	(.15)
	Constant				-8.32	2.92	8.10**	0.00	

Note: Hosmer and Lemeshow goodness of fit tests: ^a $\chi^2 = 8.59$; $df = 7$; $p = .28$; ^b $\chi^2 = 6.50$; $df = 7$; $p = .59$; ^c $\chi^2 = 3.84$; $df = 7$; $p = .87$; GEN = Gender, AGE = Age, PU = Previous Use, PC = Perceived Competence, CTB = Constructivist Teaching Beliefs, TTB = Transmissive Teaching Beliefs, WL = Workload, ATT = Attitude, PN = Perceived Norms, PBC = Perceived Behavioral Control.

* $p < .05$; ** $p < .01$; ¹ $p = .061$

Secondly, multiple regression analyses and mediation analyses were carried out to get a picture of the influence of the background variables on the proximal variables and to test direct and indirect effects of the background variables on INT. The outcomes of the logistic regression, the multiple regression analyses, and the mediation analyses are visualized in an integrated path diagram in Figure 2. It should be noted that the effect of PU on PBC is approaching significance ($p = .051$) and therefore included in Figure 2. The background variables accounted for 30 percent of the variance in ATT, $F(7, 157) = 9.62$, $p < .001$, 45 percent of the variance in PN, $F(7, 157) = 17.69$, $p < .001$; and 32 percent of the variance in PBC, $F(7, 157) = 10.50$, $p < .001$.

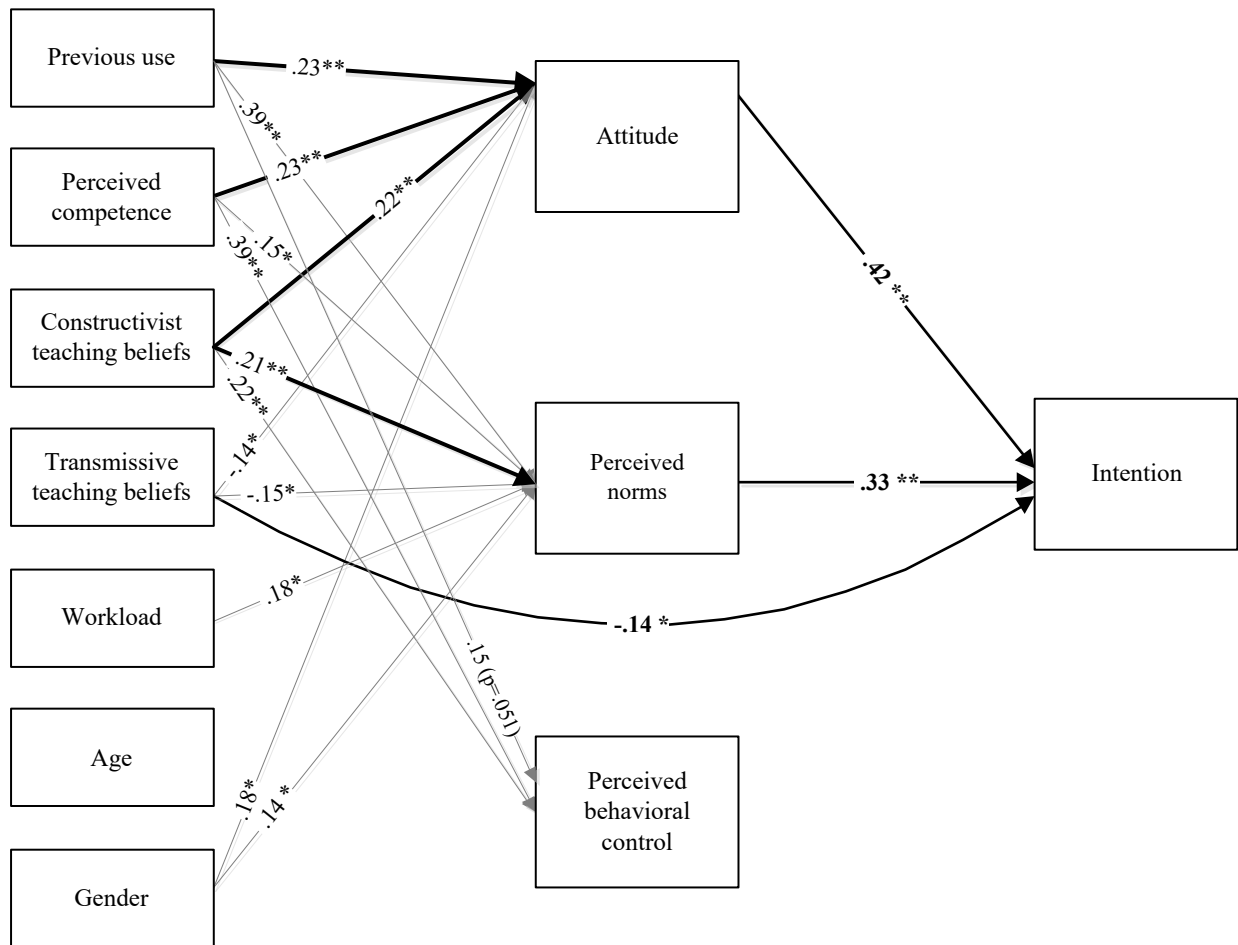


Figure 2. Results of the regression models. Values on the paths are standardized coefficients after controlling for other factors in the model. Thick lines indicate that the indirect effect of the distal variable, through the mediator, is significant.

* $p < .05$ ** $p < .01$

The results of the mediation analyses are displayed in Table 9, showing the bootstrapped confidence intervals around the estimated effects. If zero lies between the lower and upper interval, it cannot be ruled out as a possible value for the direct effect but if the confidence interval is entirely above (or below) zero, the conclusion that the indirect effect is positive (or negative) is supported. Results showed that the effects of PU, PC, and CTB were indeed mediated while controlled for the effects of all other independent variables in the model. PU, PC, and CTB were mediated by ATT. CTB was also mediated by PN. No direct or indirect effects were found for WL, AGE, and GEN. Although this was expected for AGE and WL, based on the non-significant effect in the logistic regression, it could have been possible (Hayes, 2013, p. 169), so it is valuable to know WL has no unique contribution to the prediction of INT_{dich} . All in all, this implies that the influence of PU and PC on INT_{dich} is fully mediated by ATT, and

the influence of CTB on INT_{dich} is fully mediated by ATT and PN. Mediation analyses confirmed the direct effect of TTB on INT_{dich}. No other direct effects were found.

Table 9

Significance Tests of the Indirect Effects¹ of the Background Variables on Intention

Background variable	Mediator	<i>B</i>	<i>SE</i> (boot)	95% Confidence intervals	
				Lower limit	Upper limit
PU	TOTAL	0.65*	0.39	0.19	1.18
	ATT	0.26*	0.18	0.03	0.55
	PN	0.33	0.24	-0.08	0.69
	PBC	0.05	0.07	-0.03	0.22
PC	TOTAL	0.66*	0.42	0.07	1.19
	ATT	0.33*	0.25	0.00	0.74
	PN	0.16	0.16	-0.03	0.49
	PBC	0.18	0.17	-0.12	0.46
CTB	TOTAL	0.66*	0.44	0.14	1.29
	ATT	0.33*	0.25	0.01	0.77
	PN	0.23*	0.21	0.00	0.65
	PBC	0.10	0.11	-0.05	0.31
TTB	TOTAL	-0.39	0.30	-0.90	0.07
	ATT	-0.21	0.18	-0.55	0.06
	PN	-0.16	0.16	-0.50	0.02
	PBC	-0.01	0.06	-0.16	0.07
WL	TOTAL	0.46	0.42	-0.29	1.26
	ATT	0.22	0.23	-0.20	0.66
	PN	0.30	0.26	-0.04	0.78
	PBC	-0.05	0.11	-0.33	0.07
AGE	TOTAL	-0.02	0.04	-0.09	0.04
	ATT	0.00	0.02	-0.04	0.04
	PN	-0.02	0.02	-0.06	0.01
	PBC	0.00	0.01	-0.02	0.01
GEN	TOTAL	1.21	0.88	-0.03	2.56
	ATT	0.72	0.56	-0.04	1.67
	PN	0.41	0.40	-0.05	1.27
	PBC	0.08	0.16	-0.16	0.47

Note: PU = Previous Use, PC = Perceived Competence, CTB = Constructivist Teaching Beliefs, TTB = Transmissive Teaching Beliefs, WL = Workload, GEN = Gender, AGE = Age, ATT = Attitude, PN = Perceived Norms, PBC = Perceived Behavioral Control. Intervals that do not include 0 indicate a significant indirect effect of the distal variable through the proposed mediator.

¹ bias-corrected bootstrap confidence intervals for the indirect effects, based on 10.000 bootstrap samples.

*Significant indirect effect

4.2 Results of the Impact Analysis of Beliefs on the Proximal Variables

For the second part of the main study, underlying beliefs were analyzed. In this part of our research, we studied the modal set of salient beliefs and the relation between the beliefs and the relevant determinant of intention, for example, the behavioral beliefs in relation to ATT. The relations between background variables and beliefs were not studied.

To confirm the validity of the modal set of salient beliefs, bivariate correlations were calculated for each belief and its corresponding direct measure (Table 11, 12 and 13). For the whole sample, all beliefs from the modal set correlated significantly with their direct measure (ATT, PN, and PBC), suggesting a sound modal set of salient beliefs.

We regressed INT_{dich} on ATT, PN, and PBC as the background variables were not taken into account for this part of our study. Results are presented in Table 10. The three proximal determinants of intention accounted for 71 percent of the variance (Nagelkerke R squared) and correctly classified 89.3 percent of cases. The model with the three predictors was statistically significant, $\chi^2(3, N = 168) = 118.97, p < .001$, indicating that this model can distinguish well between respondents who reported to hold and do not hold the intention to integrate Web 2.0 technologies. All three independent variables made a unique statistically significant contribution to the model. The strongest predictor of reporting intention was ATT, recording an odds ratio of 4.62, implying that for every unit increase in ATT respondents were 4.62 times more likely to report intention, controlling for other factors in the model. The odds ratios for PN and PBC were respectively 4.00 and 1.99, which implies that for every unit increase in PN, respondents were 4 times more likely and for every unit increase in PBC respondents were 1.99 times more likely to report intention, controlling for other factors in the model.

Table 10

Results of Logistic Regression with Proximal Variables: Predicting the Likelihood of Teachers Reporting Intention to Integrate Web 2.0 Technology

Variable	R^2 (Nagelkerke)	χ^2	B	SE	Wald statistic	Odds ratio(OR)	OR converted to r
	.71	118.97*					
ATT			1.53	.36	17.84 **	4.62	.39
PN			1.39	.40	12.28**	4.00	.36
PBC			.69	.24	8.41**	1.99	.19
Constant			-9.22	1.87	24.36**	0.00	

** $p < .01$

When the direct measures ATT, PN, and PBC were regressed on their respective beliefs whilst using standardized values, multiple correlations were .65 for behavioral beliefs, explaining 42.2 percent of the variance in ATT, $F(9, 158) = 12.84, p < .001$; .54 for normative beliefs, explaining 28.9 percent of PN, $F(6, 161) = 10.92, p < .001$; and .50 for control beliefs, explaining 24.8 percent of PBC, $F(7, 160) = 7.55, p < .001$. Correlations and means were compared for the groups of non-intenders and intenders, as displayed in the last three columns of Tables 11, 12 and 13. In the next three sub-paragraphs, the results for the behavioral, normative and control beliefs will be presented.

4.2.1 Behavioral beliefs. Looking at the means for the whole sample for behavioral beliefs (see Table 11), it can be noticed that belief strength had means on the higher side of the range for all advantageous beliefs, and means on the lower side of the range for the disadvantageous beliefs, implying that the outcomes of performing the behavior on the higher side of the range were perceived to be more likely to become true, whereas outcomes on the lower side of the range were perceived to be less likely to become true. On average, outcome evaluations were positive for the advantageous beliefs, implying that these were perceived to be ‘good’. For the disadvantageous beliefs only the outcome ‘impersonal and limited communication’ was perceived as somewhat bad. The disadvantageous outcomes ‘Time-consuming education’ and ‘Unwanted effects to learning’ had slightly positive means for outcome evaluation, indicating these are not seen as bad.

When looking at the correlations between each weighted behavioral belief and ATT, the belief ‘Appealing education that connects to students’ lives’ had the highest correlation co-efficient for the whole sample ($r = .48$). This belief also had the strongest correlation with ATT for non-intenders ($r = .48$). Moreover, this belief discriminated most between non-intenders and intenders, $t(166) = -3.77, p < .01$. The belief that had the second highest correlation with ATT was ‘Active, engaged and self-directed learning’ ($r = .46$). Although the mean differences were a bit smaller (but still highly significant), this belief correlated most with ATT for the intenders ($r = .53$). The belief with the third highest correlation with ATT was ‘Better and accessible communication’ ($r = .45$). This belief had the second highest correlation with ATT for both non-intenders and intenders, and discriminated significantly between the groups. As it can be seen from the correlations for non-intenders, the belief with the third highest correlation for non-intenders was ‘Time and place independent education’ ($r = .29$). For intenders, the third highest correlation with ATT was found for the disadvantageous belief ‘Impersonal and limited communication’ ($r = -.39$). This belief had a negative correlation with ATT. For this belief, no significant correlation was found for the group of non-intenders. A fourth, medium-sized, correlation was found for the advantageous belief ‘Promoting interaction and collaboration’ ($r = .34$). This correlation was also the fourth highest for intenders ($r = .31$) but not found to be significant for non-intenders. Smaller-sized correlations and other information can be obtained from Table 11.

Table 11

Correlations of Weighted Behavioral Beliefs with the Direct Measure of Attitude Regarding Web 2.0 Integration for the Whole Sample (N = 168), Non-Intenders (n=54) and Intenders (n = 114), as Well as the Mean Differences

	Whole sample				Non-intenders		Intenders			
	Belief strength(b)	Outcome Evaluation (e)	<i>b*e</i>		<i>b*e</i>		<i>b*e</i>			
Behavioral belief	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>r</i>	<i>M (SD)</i>	<i>r</i>	<i>M (SD)</i>	<i>r</i>	<i>t (df)</i>	Effect size <i>r</i>
Appealing education, connecting to students' lives	5.68 (1.22)	1.39 (1.10)	8.71 (7.07)	.48**	5,83 (6,86)	.48**	10,07 (6,78)	.37**	-3.77** (166)	.28
Active, engaged and self-directed learning	5.60 (1.23)	1.07 (1.22)	6.89 (7.33)	.46**	4,76 (6,97)	.27*	7,89 (7,31)	.53**	-2.64** (166)	.20
Better and accessible communication	5.50 (1.30)	1.10 (1.41)	7.22 (8.56)	.45**	4,24 (7,67)	.34**	8,63 (8,62)	.43**	-3.19** (166)	.24
Promoting interaction and collaboration	5.73 (1.32)	1.32 (1.33)	8.48 (8.03)	.34**	5,93 (7,94)	.18	9,68 (7,82)	.31**	-2.89** (166)	.22
Time- and place-independent education	5.02 (1.57)	1.44 (1.37)	7.96 (8.13)	.28**	6,20 (7,70)	.29*	8,80 (8,22)	.23**	-1.95* (166)	.15
Students and teachers developing (new) skills	5.62 (1.27)	1.68 (1.48)	10.19 (8.91)	.25**	7,46 (7,28)	.10	11,48 (9,34)	.17*	-3.04** (130.64)	.26
Mean advantageous behavioral beliefs	5.52 (0.94)	1.33 (0.87)	8.24 (5.43)	.55**	5,74 (5,16)	.39**	9,43 (5,17)	.52**	-4.33** (104.34)	.39
Impersonal and limited communication	2.80 (1.51)	-0.21 (1.65)	-0.95 (5.28)	-.28**	-0,33 (5,44)	-.13	-1,24 (5,2)	-.39**	1.04 (166)	
Unwanted effects to learning	2.88 (1.54)	0.36 (1.59)	0.45 (5.23)	-.23**	1,59 (4,62)	.01	-0,10 (5,43)	-.26**	1.97* (166)	.15
Time-consuming education	3.49 (1.50)	0.61 (1.64)	1.43 (6.52)	-.16*	2,35 (5,58)	.03	1,00 (6,91)	-.20*	1.26 (166)	
Mean disadvantageous behavioral beliefs	3.06 (1.15)	0.26 (1.23)	0.31 (4.31)	-.29**	1,20 (3,64)	-.05	-0,11 (4,54)	-.36**	1.86* (166)	.14
Mean behavioral beliefs	4.70 (0.81)	0.97 (0.71)	5.60 (3.93)	.40**	4,23 (4,06)	.32**	6,25 (3,7)	.34**	-3.20** (166)	.24

Note: Belief strength can range from 1 to 7; Outcome evaluation can range from -3 to 3.

*significant at $p < .05$; **significant at $p < .01$

4.2.2 Normative beliefs. Looking at the means for the normative belief components (see Table 12), it can be seen that the means for injunctive belief strength were on the lower side of the range for colleagues ('within my department' and 'outside of my department'), and on the higher side for 'Students' and 'My manager', indicating that on average, teachers felt that it is somewhat likely that students and the manager think they should integrate Web 2.0 technologies but somewhat unlikely that colleagues (within or outside of the department) would think that. Motivation to comply for those four referents was close to neutral, except for 'Colleagues outside of my department', with a mean that was on the lower side of the range ($M = 3.05$, $SD = 1.33$), indicating that on average, respondents are unmotivated to comply with colleagues outside of the department. Descriptive belief strength had a mean that was slightly on the higher side of the range for 'Colleagues within my department' and 'Colleagues outside of my department', indicating that teachers thought that their colleagues within and outside of the department would integrate Web 2.0 technologies themselves. Identification with both kinds of colleagues was slightly negative.

More information could be obtained from the weighted beliefs and their correlations with PN and the mean differences for both groups. Results showed that the mean differences between non-intenders and intenders were significant for all weighted normative beliefs. All means for weighted beliefs were higher for intenders than for non-intenders. For the correlations with PN, results showed that overall, injunctive beliefs correlated stronger with PN than descriptive beliefs but the correlational differences between injunctive and descriptive beliefs were more outspoken for the group of intenders. On average, correlations with PN for injunctive and descriptive beliefs hardly differed for the group of non-intenders.

When looking at the beliefs that correlate the most with PN, it can be seen that the injunctive belief for 'Colleagues within my department' had the highest correlation with PN for the whole sample ($r = .47$), the non-intenders ($r = .43$), and the intenders ($r = .43$). The second highest correlation with PN for the whole sample was found for the injunctive belief for 'Students' ($r = .46$), which is also second highest for non-intenders ($r = .41$) and intenders ($r = .30$). It should also be noted that this belief had the largest mean difference, $t(144.05) = -5.81$, $p < .01$. The third highest correlation with PN was found for the descriptive belief for 'Colleagues within my department' ($r = .35$). Again, this also holds for non-intenders ($r = .40$) and intenders ($r = .26$). For the group of non-intenders, there was also a medium-sized correlation with PN for the descriptive belief 'Colleagues outside of my department' ($r = .31$), which was not found for the group of intenders. Smaller-sized correlations and other information can be obtained from Table 12. All in all, the normative beliefs concerning colleagues within the department and students have the highest correlation with the direct measure of PN.

Table 12

Correlations of Weighted Normative Beliefs with the Direct Measure of Perceived Norms Regarding Web 2.0 Integration for the Whole Sample (N = 168), Non-Intenders (n = 54) and Intenders (n = 114), as Well as the Mean Differences

	Whole sample				Non-intenders		Intenders			
	Normative belief strength (n_i/n_d)	Motivation to comply (mc) Identification with referent (ir)	$\frac{n_i*mc}{n_d*ir}$		$\frac{n_i*mc}{n_d*ir}$		$\frac{n_i*mc}{n_d*ir}$			
Normative referent	$M (SD)$	$M (SD)$	$M (SD)$	r	$M (SD)$	r	$M (SD)$	r	$t (df)$	Effect size r
<i>Injunctive</i>	(n_i)	(mc)								
Students	4.28 (1.75)	3.99 (1.43)	17.81 (10.95)	.46**	11.96 (7.72)	.41* *	20.58 (11.19)	.30**	-5.81** (144.05)	.44
Colleagues within my department	3.87 (1.65)	4.03 (1.33)	16.23 (10.01)	.47**	12.85 (8.41)	.43* *	17.83 (10.34)	.43**	-3.09** (166)	.23
Colleagues outside of my department	3.66 (1.56)	3.05 (1.33)	11.62 (7.88)	.22**	9.72 (6.84)	.12	12.52 (8.20)	.16*	-2.32** (123.01)	.20
My manager	4.45 (1.61)	4.11 (1.46)	18.67 (10.32)	.30**	15.02 (9.27)	.23*	20.40 (10.37)	.19*	-3.25** (166)	.24
Mean injunctive beliefs	4.07 (1.29)	3.79 (1.01)	16.08 (7.58)	.48**	12.39 (6.08)	.40* *	17.83 (7.61)	.36**	-4.99** (127.93)	.40
<i>Descriptive</i>	(n_d)	(ir)								
Colleagues within my department	4.60 (1.45)	3.88 (1.34)	18.52 (10.30)	.35**	15.48 (9.04)	.40* *	19.96 (10.58)	.26**	-2.68** (166)	.20
Colleagues outside of my department	4.43 (1.19)	3.61 (1.24)	16.38 (8.14)	.19**	14.63 (6.78)	.31*	17.21 (8.62)	.07	-1.93* (166)	.15

Mean descriptive beliefs	4.51 (1.15)	3.74 (1.11)	17.45 (7.84)	.33**	15.06 (7.36)	.39* *	18.59 (7.84)	.21*	-2.78** (166)	.21
Mean normative beliefs	4.21 (1.09)	3.78 (0.90)	16.54 (6.69)	.49**	13.28 (5.81)	.44* *	18.08 (6.55)	.37**	-4.60** (166)	.34

Note: Strength of normative belief, motivation to comply and identification with referent can range from 1 to 7.

*significant at $p < .05$; **significant at $p < .01$

4.2.3 Control beliefs. Looking at the means for the control belief components (see Table 13), it can be noticed that the means for belief strength were mostly close to neutral. Interesting, however, are the negative means for ‘Suitable vision and policy’ and ‘Lack of time’, meaning that on average, respondents thought it was unlikely that there will be a suitable vision and policy, and lack of time in the next 12 months. ‘Lack of time’ was seen as impeding on average, given its negative mean for power of control. All other control beliefs were either seen as more or less helping (for the helping control beliefs), or as not much impeding but close to neutral (for the impeding control beliefs).

For all three groups (the whole sample, non-intenders, and intenders) helping control beliefs correlated stronger with PBC than impeding control beliefs. Not all means differed for non-intenders and intenders but the largest mean differences were seen for helping beliefs (i.e., ‘Exchange of knowledge with colleagues’ and ‘Opportunities for professionalization’).

Although the correlations between PBC and each of the beliefs were significant for the whole sample, there were several differences between non-intenders and intenders. Therefore, we will discuss results for non-intenders and intenders separately. For non-intenders, there was a large, positive correlation between PBC and the helping belief ‘Support for development and implementation’ ($r = .53$) and a positive, close to large, correlation for the helping belief ‘Opportunities for professionalization’ ($r = .48$). A positive, medium-sized correlation coefficient was found for the helping belief ‘Exchange of knowledge with colleagues’ ($r = .35$) and a smaller-sized, negative correlation coefficient for the impeding belief ‘Lack of technical facilities’ ($r = -.25$). For non-intenders, all other beliefs did not correlate significantly with PBC. For the group of intenders, a medium-sized positive correlation was found for the helping belief ‘Exchange of knowledge with colleagues’ ($r = .32$). Three smaller, positive correlation coefficients were found for the helping beliefs ‘Suitable vision and policy’ ($r = .27$) and ‘Support for development and implementation’ ($r = .20$), and for the impeding belief ‘Lack of time’ ($r = .20$). All in all, for both non-intenders and intenders, three of the helping beliefs and one impeding belief correlated with PBC but the beliefs with the highest correlations were different for both groups.

It should be pointed out that the impeding belief ‘Lack of time’ correlated positively with PBC while the impeding belief ‘Lack of technical facilities’ correlated negatively with PBC. This implies that a higher level of PBC was related to a higher perceived level of ‘Lack of time’ and a lower perceived level of ‘Lack of technical facilities’.

Table 13

Correlations of Weighted Control Beliefs With the Direct Measure of Perceived Behavioral Control Regarding Web 2.0 Integration for the Whole Sample (N = 168), Non-Intenders (n = 54) and Intenders (n = 114), as Well as the Mean Differences

	Whole sample				Non-intenders		Intenders			
	Control belief strength (c)	Power of control (pc)	c*pc		c*pc		c*pc			
Control belief	M (SD)	M (SD)	M (SD)	r	M (SD)	r	M (SD)	r	t (df)	Effect size r
Exchange of knowledge with colleagues	0.40 (1.57)	1.20 (1.47)	1.15 (3.39)	.37**	0.13 (3.10)	.35**	1.63 (3.43)	.32**	-2.73** (166)	.21
Support for development and implementation	-0.19 (1.58)	0.86 (1.51)	0.37 (3.38)	.31**	0.04 (3.15)	.53**	0.53 (3.49)	.20*	-0.88 (166)	
Opportunities for professionalization	0.19 (1.71)	0.81 (1.46)	0.57 (3.33)	.31**	-0.35 (3.40)	.48**	1.01 (3.22)	.11	-2.51** (166)	.19
Suitable vision and policy	-1.25 (1.50)	0.59 (1.67)	-0.30 (3.88)	.17*	-0.39 (4.49)	.06	-0.26 (3.57)	.27**	-0.18 (85.81)	
Mean helping control beliefs	-0.21 (1.14)	0.86 (1.30)	0.45 (2.41)	.41**	-0.14 (2.47)	.47**	0.73 (2.35)	.33**	-2.20* (166)	.17
Lack of time	-1.32 (1.59)	-1.07 (1.70)	-3.15 (4.06)	.18*	-3.98 (4.11)	.03	-2.75 (3.99)	.20*	-1.84* (166)	.14
Personal incompetence and lack of experience	0.20 (1.71)	0.20 (1.77)	-2.21 (3.24)	-.18*	-1.74 (3.42)	-.09	-2.43 (3.14)	-.18	1.29 (166)	
Lack of technical facilities	0.27(1.96)	0.13 (1.82)	-2.83 (3.45)	-.17*	-2.17 (3.60)	-.25*	-3.15 (3.36)	-.04	1.73* (166)	.13
Mean impeding control beliefs	0.28 (1.25)	-0.25 (1.35)	-2.73 (2.41)	-.06	-2.63 (2.69)	-.14	-2.78 (2.29)	.01	0.37 (166)	
Mean control beliefs	0.00 (0.65)	0.39 (0.89)	-0.92 (1.71)	.30**	-1.21 (1.93)	.48**	-0.78 (1.59)	.28**	-1.54* (166)	.15

Note: Control belief and power of control can range from -3 to 3.

*significant at $p < .05$; **significant at $p < .01$.

5. Conclusion and Discussion

This study proposed the following research question: “Which factors and beliefs influence higher education teachers’ intention to integrate Web 2.0 technologies into their constructivist pedagogy?” Henceforth this is shortened into teachers’ intention to integrate Web 2.0 technologies. To address this question, three research questions were studied within the framework of the reasoned action approach (RAA) (Fishbein & Ajzen, 2010). The RAA purports that intention toward performing a certain behavior is influenced by three proximal determinants: attitude (ATT), perceived norms (PN) and perceived behavioral control (PBC). Their relative weights vary from behavior to behavior and from population to population. The proximal variables are steered by underlying beliefs, respectively behavioral beliefs, normative beliefs and control beliefs. It is assumed that the proximal determinant and its beliefs both refer to the same latent construct (Ajzen, 2006). The three proximal variables can, in turn, be influenced by background variables that are related to the behavior and the population under study.

In this study, we included the following background variables: previous use (PU), perceived competence (PC), constructivist teaching beliefs (CTB), transmissive teaching beliefs (TTB), workload, gender and age. It was decided to omit two other background factors from the definitive analyses, i.e., teaching experience (TE) and professionalization activities (PA), after analysis of correlations between all variables. In the first part of the research, we studied the proximal and background variables in relation to teachers’ intention. In the second part, we did not take the background variables into account but studied the beliefs in relation to the respective proximal determinant of intention. In the current section, answers will be formulated to the research questions and these will be discussed in light of previous research. Also, limitations of our study will be discussed, suggestions for future research will be made and theoretical and practical implications will be explicated.

5.1 Research Question 1

The first research question was: “To what extent do the proximal and background variables predict whether teachers do or do not hold the intention to integrate Web 2.0 technologies?” It can be concluded that the full model, based on RAA, can predict teachers’ intention to a large extent as it explains 74 percent of the variance in intention. Of the proximal variables, ATT had the largest effect on intention, PN had a similar, only slightly lower effect on intention; whereas PBC was not able to predict intention when controlled for all other variables.

The finding that attitude was the main predictor of intention is found in many other studies. This holds for studies of teachers’ intentions to use technology (Admiraal et al., 2013; Ajjan & Hartshorne, 2008; Kreijns, Van Acker, et al., 2013; Kreijns, Vermeulen, Van Acker, & Van Buuren, 2014) but also for

many other fields of study outside of education and technology use (Armitage & Conner, 2001). The finding that ATT and PN predict intention while PBC does not is seen more often in studies of teachers' intention to use technology within RAA-related frameworks (Salleh, 2004; Teo & Lee, 2010). However, studies that focus on intention to use technology tend to yield different results for different populations. For example, the study of Sugar et al. (2004) showed that ATT was the sole predictor of the decisions to adopt new technology of teachers from high, middle, and elementary schools, whereas both ATT and subjective norms (the predecessor of PN) predicted the decisions of teachers from private schools. Other studies found that teachers' intention to adopt Web 2.0 technologies was predicted by ATT and PBC and not by PN (Ajjan & Hartshorne, 2008; Sadaf, Newby, & Ertmer, 2012a). On the contrary, earlier research from Czerniak, Lumpe, Haney, & Beck (1999) showed that PBC exerted the strongest influence on K12 teachers' intention, followed by subjective norms. They did not find an influence of ATT. Fishbein and Ajzen (2010) already mention considerable variation in the relative weights of the proximal variables across different domains and populations.

Nevertheless, as is the case in this study, intention can mostly be predicted well from the proximal variables (ATT, PN, and PBC). Our findings imply that to promote teachers' intentions to integrate Web 2.0 technology, the increase of ATT and PN should be supported. Nevertheless, Fishbein and Ajzen (2010) conclude that, although a high regression coefficient usually indicates an important determinant of intention, a low regression coefficient, as we found for PBC, is no proof that the predictor is unimportant unless zero-order correlations are low as well. When there is a high zero-order correlation with intention or other proximal determinants, it is likely there is some influence on intention and it may still be an important determinant of intention. This is likely to be the case in the current study, because the large correlation between PBC and intention, and because the predictive value of PBC was not far from being significant. Moreover, in regression analysis without inclusion of the background variables, PBC showed a significant effect on intention. Still, this effect is smaller than the effects of ATT and PN.

The reason for the differences in relative weights remains unclear and could be caused by differences in behavior, population, study, or measurement (Fishbein & Ajzen, 2010). However, the current study gives a possible explanation for the behavior and the population under study. Bivariate correlation analyses showed significant negative correlations for non-intenders between PBC on the one hand and the three proximal variables on the other hand (i.e., intention, ATT, and PN). For intenders, these correlations were significantly positive as were the correlations for the whole sample. The negative relation might thus suppress the overall positive correlation between PBC and intention. Although the negative correlations for non-intenders were weaker than the positive correlations for intenders, it should be kept in mind that the sample size of non-intenders is rather small ($n = 54$), compared to that of intenders ($n = 114$). In case of a larger sample size, the merely insignificant negative effect for non-intenders would probably be stronger. These findings support the idea that the relative importance of the

proximal variables that predict intention also differs between the two subsamples of the single population in the current research. Complementary future research could be done to further unravel the found effects and look for a fitting model, perhaps by developing a modified model, or by assuming two separate models to represent reality, for example, one for teachers with high levels of PBC and one for low levels of PBC.

5.2 Research Question 2

The second research question was: “Do the proximal variables ATT, PN, and PBC mediate the influence of the background variables on intention to integrate Web 2.0 technologies?” The RAA purports that background variables can also influence intention but that these relationships are generally mediated by the proximal variables. The results obtained from the mediation analyses indicate that the effects of PU, PC, and CTB on intention were indeed mediated. ATT was found to mediate the relation between PU, PC, and CTB on the one hand and intention on the other hand. The relation between CTB and intention was also mediated by PN. There was a small but significant direct effect of TTB on intention. There were no other direct effects over and above the effect of the three proximal variables and no indirect effects were found for workload, age and gender.

The finding that PU and PC indirectly influence intention is in line with previous research (Kreijns, Van Acker, et al., 2013; Van Acker et al., 2013). Again, the specific mediators differ. Kreijns, Van Acker et al. (2013) found all three proximal variables to mediate the effects of both PU and PC. Van Acker et al. (2013) found only self-efficacy (the predecessor of PBC) to mediate perceived ICT skills, whereas in the current study ATT is the sole mediator. Thus, just as the relative regression weights of the proximal variables differ among studies and population, so do their roles in mediation analyses. It might seem somewhat illogical that PU and PC do not influence intention through PBC, because, after all, the saying ‘practice makes perfect’ is about previous practice and increasing skills that put one more and more in control of performing a certain behavior. It should, however, be remembered that PBC was no significant predictor of intention when controlling for all other variables in our model and could therefore not act as a mediator. Still, PC is an important predictor of PBC and PU is almost a significant predictor. Apart from the mediated effects, Kreijns, Van Acker et al. (2013) found a direct effect of PU on intention over and above the effect of the proximal variables. This effect was not found in the current study. The difference might be explained by dissimilar operationalization of subjective norms and self-efficacy (the predecessors of PN and PBC). For example, Kreijns, Van Acker et al. measured subjective norms by one direct question, asking respondents: “To what degree do you experience social pressure from [certain referents]”. In the current study, PN is operationalized in an inferable manner by asking respondents how likely it was that certain referents would think they should perform the behavior, and how likely it was

that certain referents would perform the behavior themselves. Although a direct influence of past behavior on intention is found more often within RAA-studies (Fishbein & Ajzen, 2010; Sandberg & Conner, 2008), we did not find such an effect. All in all, apart from the question how exactly the lines between background variables to intention run within the model, this study confirms previous findings that PU and PC are both able to affect intention. These findings imply that experimental integrating of Web 2.0 technologies should be encouraged and teachers should be trained and skilled to help increase their competence.

The finding that constructivist teacher beliefs and transmissive teacher beliefs influence intention is in line with what could be expected from our theoretical framework as people might be more willing to implement the constructivist use of Web 2.0 technologies when they hold stronger constructivist teaching beliefs (Chai, 2010; Kirkwood & Price, 2013; Kirkwood, 2009; Teo et al., 2008). Conversely, they might be less inclined to implement constructivist use of Web 2.0 technologies when they hold more transmissive or teacher-centered teaching beliefs (Teo et al., 2008). To our knowledge, our finding that there is a positive (indirect) effect of CTB on intention while this effect is negative (and direct) for TTB, has not yet been established in earlier research within higher education, nor within the framework of the RAA. The finding suggests that teachers' constructivist beliefs should be encouraged and their transmissive beliefs should be challenged in order to increase teachers' intention to integrate technology with a constructivist approach.

No direct or indirect effects on intention were found for professionalization activities and workload. The former was not incorporated in the final analyses as it did not predict intention or any of the proximal variables. Arguably, this might be due to measurement as we used a dichotomized scale (high-low). What is more, no information was available about the nature of the professionalization activities. Yet, the contents and format of professional development activities are important for the effect of these activities (Drent, 2005) and effectiveness of teacher training does not occur automatically but depends on many factors (BECTA, 2004; Bingimlas, 2009; Brinkerhoff, 2005; Mouza, 2002). In retrospect, it thus seems likely that it is not the quantity but the quality of teacher professionalization activities that matters. The fact that we found no predictive values should, therefore, be interpreted with great caution.

The finding that workload is no predictor of intention to integrate Web 2.0 technology, and does not influence ATT and PBC, is interesting. Previous studies found workload and lack of time to be important inhibitors of teachers' integration of (Web 2.0) technology (BECTA, 2004; Buabeng-Andoh, 2012; Kale & Goh, 2012). However, these conclusions are either based on literature research of qualitative studies in which teachers were asked what would inhibit them to integrate technology (Buabeng-Andoh), or based on quantitative research in which teachers were presented a list of factors (including workload) and were asked to indicate how much it would prevent them from using internet technologies in teaching (Kale & Goh, 2012). In other words, when asked directly, teachers say workload would inhibit them from

integrating technology but our findings suggest that in reality, teachers' perceived workload does not correlate with teachers' intention at all, nor with ATT or PBC. Interesting is also that no differences were found in the amount of perceived workload, which is perceived quite pressing by both groups of teachers. Our finding is somewhat confirmed in the second part of our research (see section 4.2) as the control belief 'Lack of time' correlates positively with PBC, and does so only for intenders and not for non-intenders.

The demographic factors did not significantly predict intention in our model when controlled for all other variables. When taking a closer look at the results, it becomes plausible that age does not predict intention, nor any of the proximal variables. For gender, however, relations remain somewhat unclear as the predictive values vary in significance, depending on other variables in the model. It cannot be ruled out that there is some relation with intention but our study could not explain for this relation. Future study could try to further clarify the role of gender.

5.3 Research Question 3

The third research question was addressed in the second part of the study and concerned the beliefs that form the foundations of the proximal variables. The question was: "What behavioral, normative, and control beliefs do teachers hold regarding them integrating Web 2.0 technologies and which correlate most with their respective proximal determinant of intention for the groups of teachers that do or do not hold the intention to integrate Web 2.0 technologies?" The preliminary elicitation study showed a modal set of beliefs that encompassed nine behavioral beliefs, six normative beliefs with four different referents, and seven control beliefs. For the whole sample, all beliefs correlated to the respective proximal determinant of intention determinants and multiple correlations were large for each of the three proximal variables. All beliefs are thus helping to explain the variation in the proximal variables. Results also showed that most beliefs distinguished significantly between non-intenders and intenders and that differences in correlations were mostly differences in degree and not in kind. For example, for participants of both groups, the belief that students think they should integrate Web 2.0 technologies was correlating positively with the direct measure of PN. However, non-intending teachers held this belief more strongly than intending teachers.

5.3.1 Behavioral beliefs in relation to attitude. The results section showed that for non-intenders, the three most correlating behavioral beliefs are, in order of power: "Appealing education that connects to students' lives", "Better and accessible communication", and "Time and place independent education". These three beliefs thus form the three main advantages to promote when one wishes to increase ATT for teachers that do not yet hold the intention to integrate Web 2.0 technologies. For

teachers that already hold the intention, the two most strongly correlating beliefs are: “Active, engaged and self-directed learning” and “Better and accessible communication”. Both advantageous beliefs should be promoted when one aims to further increase the ATT of teachers that already hold the intention to integrate Web 2.0 technology and, subsequently, reinforce their intention. The third highest correlating belief was “Impersonal and limited communication”. As this correlation is negative, this belief should somehow be contradicted, in order to increase ATT and reinforce teachers’ intention. Although for non-intenders and intenders advantageous outcomes outweigh disadvantageous outcomes, care should be given towards lessening two other disadvantageous beliefs for teachers that already hold the intention as these will suppress a positive ATT. These teachers hold the intention, yet they experience disadvantageous outcomes, namely “Unwanted effects to learning” and “Time-consuming education”.

5.3.2 Normative beliefs in relation to perceived norms. The normative beliefs that correlated most with PN involved two of the four referents: “Colleagues within my department” and “Students”. Both are important to non-intenders and intenders, whereas relative correlations were stronger for non-intenders. Results suggest that it is important that teachers receive a clear message from students and near colleagues that teachers should perform the behavior (injunctive beliefs) plus that these colleagues are performing the behavior themselves (descriptive belief). Additionally, for non-intending teachers, it is important –although to a lesser extent- that teachers think their colleagues of other departments do integrate Web 2.0 technologies (descriptive belief). There would, however, be no point in merely communicating that colleagues in other departments think teachers should integrate Web 2.0 technologies (injunctive belief). The injunctive belief of the manager thinking a teacher should integrate Web 2.0 technologies is also of significant importance for non-intenders and intenders, although the importance is relatively smaller. All in all, results imply that in order to raise PN and subsequently increase teachers’ intention, particularly students and near colleagues should clearly communicate their vision of the benefits of the targeted behavior and near colleagues that already integrate Web 2.0 technologies should mention their performing the behavior as well.

5.3.3 Control beliefs in relation to perceived behavioral control. The particular control beliefs that correlated the strongest with the direct measure of PBC differed somewhat for non-intenders and intenders. For non-intenders, the beliefs ‘Support for development and implementation’ and ‘Opportunities for professionalization’ are seen as helping to a large extent. Another helping belief is ‘Exchange of knowledge with colleagues’. A smaller effect was found for the impeding belief ‘Lack of technical facilities’. Results indicate that non-intending teachers mostly need help with developing and implementing educational tools and they need training. Also, exchanging knowledge and ideas with colleagues would be helpful. Merely offering facilities or technical support will thus not help raise

feelings of control, although non-intending teachers did experience a lack of technical facilities, which was perceived as impeding them to integrate Web 2.0 technologies. For intending teachers, the correlations with PBC were less outspoken than for non-intending teachers. For intending teachers the helping belief 'Exchange of knowledge with colleagues' correlated most, followed by 'Suitable vision and policy' and 'Support for development and implementation'. Interestingly, the impeding belief 'Lack of time' was not found to correlate negatively but it had a small but significant positive relation with PBC. One should interpret this in a way that the more teachers feel in charge of performing the behavior, the more they experience a lack of time. It makes no sense to interpret this finding the other way around, as in fostering a lack of time will increase perceived control.

Although there is little research on modal sets of teachers' beliefs towards technology integration, and available studies mainly focus on secondary education or pre-service teachers, it can be said that the beliefs within our modal set of salient beliefs are also found in previous research on teachers' beliefs towards technology integration (Czerniak et al., 1999; Lee et al., 2010; Sadaf, Newby, & Ertmer, 2012b).

Interestingly, there is a contrast in behavioral beliefs of our study and those of Lee et al. (2010). In the current study, the beliefs that correlate most with ATT are related to better learning and our modal set of behavioral beliefs showed learning advantages with a constructivist gist (e.g., active, engaged and self-directed learning). Lee et al. found behavioral beliefs that are clearly related to traditional/ transmissive learning, which is not surprising as their research focused on teachers' ICT-use to create and deliver lessons. Additionally, our total modal set of behavioral beliefs encompasses advantageous and disadvantageous beliefs regarding either learning or teaching. This is in line with behavioral beliefs in other research (Sadaf et al., 2012b). It can, therefore, be concluded that attitude towards integrating technology is mainly steered by beliefs that focus on educational advantages or disadvantages.

Furthermore, almost all beliefs in our modal set are also in line with general findings in the literature on factors that influence the integration of technology in teaching. This is, however, not true for the control belief 'Lack of time'. It should be pointed out that the findings that workload does not predict intention and that the belief 'Lack of time' relates positively to PBC should be anticipated on with caution. It should be remembered that actual control moderates the relation between intention and behavior. Hence, teachers that do hold the intention will be more inclined to transform their intention into behavior if they have indeed control over the behavior by possessing the needed skills and knowledge and if there are no circumstances that hinder their intention to become action. A higher perception of workload adds to the belief one has a lack of time, which is a commonly mentioned impeding factor in literature (BECTA, 2004; Buabeng-Andoh, 2012). Experiencing a lack of time when integrating Web 2.0 technology into one's pedagogy is even more likely because results of the second part of the main study show technology integration is believed to be time-consuming. This belief is also often found in

literature (Smith, 2012). Besides, teachers have difficulties finding time for professional development (Zelick, 2013). Thus, workload and lack of time can still be seen as major factors to take into account, since the final purpose is to influence actual integration of technology.

5.4 Limitations of the Study and Future Research

Some limitations of the current study must be acknowledged. These could be addressed in future studies. First, there are some limitations due to the sample. The sample consists of respondents from the same university, which limits the degree to which these findings are generalizable to other higher education institutions. In this respect, it should also be pointed out that the direct and indirect measures of PBC may be specific to the university that was studied although the stated helping and impeding beliefs were also found in previous studies. Furthermore, the sample size of the group of non-intenders ($n = 54$) was quite small compared to the group of non-intenders ($n = 114$) but especially in relation to the number of independent variables. Smaller effects may, therefore, have lacked significance. In future studies, researchers could collect data from more respondents from multiple universities.

Second, there are some measurement limitations. Few respondents stated in the comments section that the questionnaire was difficult and lengthy, with too many recurring questions. However, the opposite was noted as well, as some respondents stated the questionnaire was clear. Yet, the defined behavior may be difficult to grasp at once, which may have hindered some participants. Although we tried to alleviate this effect beforehand by explaining the behavior with examples and asking respondents whether they understood the components of the behavior, this may form a threat to validity. In addition, the survey was indeed lengthy and somewhat complex. In future studies, it could be tried to shorten the number of questions. In their work, Fishbein and Ajzen (2010) describe an example where outcome evaluations were not measured but assigned a value of 1 (advantageous) or -1 (disadvantageous). This may be a suggestion to work out in future, although research should first confirm its validity. With respect to the measurement of the teaching beliefs it should be mentioned that the single questions we used for both measures of teaching beliefs were not validated but served as an indication. Therefore, future studies on teaching beliefs in relation to teachers' intention to use (Web 2.0) technology could make use of more comprehensive measures that use multiple items for CTB and TTB measures in order to make these findings more robust.

The third category of limitations has to do with the design of the study. Analyses were performed on self-reported data. As such, there is a small but inevitable potential threat that some of the responses contained biases due to social desirability (King & Bruner, 2000) or over-estimation of one's own competence (Kruger & Dunning, 2009). It should also be noted that the RAA-approach assumes some relationships being causal. However, although many years of research add to the plausibility of relations

being causal, we want to point out that also in regression relations being tested are correlational and one has to be critical while ruling out other possible relationships (Huck, 2012). It might therefore be interesting for researchers to test the influence of some background variables in an experimental setting. For example, PC could be manipulated to measure the effect on intention. Another interesting future research idea would be to study the influence of professionalization activities in a quasi-experimental setting or by means of educational design research because its effectiveness does not occur automatically but depends on many factors (BECTA, 2004; Bingimlas, 2009; Brinkerhoff, 2005; Mouza, 2002). The emphasis in the current study has been on the quantity of activities but in retrospect it seems likely that it is not the quantity but the quality of teacher professionalization activities that matters. Finally, this study assumes to predict behavior via the measure of intention. Future research could study teachers' future behavior in relation to the findings of this study on intention.

The reasoned action approach was devised to measure specific actions. This implies two things. First, the results of our study only allow for generalizability to the specific behavior that was the subject of study, which is quite limited. A second implication is that the focus of this study on a category of Web 2.0 technologies was rather broad. Some teachers may, for example, intend to integrate video sharing but not wiki's or blogs. Although we narrowed the behavior under study and formulated specifics such as 'with the aim to let students construct knowledge themselves by means of collaboration and dialogue', it is still a behavioral category that comprises several technologies. Future studies could assess differences in specific technologies. Yet, the approach overall proved to offer a robust framework for this research.

5.5 Implications for Practice and Theory

Despite the limitations, the results support several findings from previous research and offer some considerations for designing interventions that may be of value to those developing policy or interventions to promote technology integration, or those concerned with the professionalization of teachers. As results showed ATT and PN to be the significant predictors of teachers' intentions to integrate Web 2.0 technologies, these should be the main focus of interventions to increase intention. At the same time, other interventions should focus on increasing PBC as this is expected to increase the likelihood that teachers who intend to integrate Web 2.0 technology actually succeed in doing so (Fishbein & Ajzen, 2010).

For non-intending teachers, it is of great importance that they receive a signal from students that integration of Web 2.0 technologies in education fits their interest and learning needs and improves their learning. Colleagues should promote the advantages of Web 2.0 technologies and talk about their integrating these technologies, so teachers become aware of each other's initiatives. Based on the results, it may work well when more experienced colleagues within each department could offer support for

development and implementation to other teachers as this would help raise PN and PBC. This will give a clear signal to non-intending teachers who might become more intending by perceiving higher social pressure. What's more, exchanging benefits and ideas could also increase ATT. However, given the findings that respondents already experience pressing workload, that higher levels of perceived behavior control correlate with experiencing a lack of time, and that intending teachers hold beliefs that the outcome of integrating Web 2.0 is more time-consuming education, it is essential to reward teachers with extra time to do this. Teachers should also be allotted time to experiment and gain experience with new technologies as teachers need to evaluate and adapt technologies before they are able to determine on their use in teaching (Conole, 2010b).

For teachers that hold the intention to integrate Web 2.0 technologies it is of great importance that the behavioral advantages are stressed, whereas disadvantages from the modal set of beliefs are explicitly countered. This is even more important as teachers will have to pass on their views and experiences. It is also advisable that the departments support intending teachers by formulating a clear vision and policy towards the use of technology. Furthermore, although it should be taken into account that lack of technical facilities can form a barrier, the emphasis should not just be on technical support but on support for educational development and implementation of Web 2.0 technologies. Tables 11, 12, and 13, and Figure 2 in the results section can aid in explaining to more detail which beliefs contribute to ATT, PN, and PBC. From these results, it is recommended that all significant beliefs should be targeted within programs to promote teacher integration of Web 2.0 technology.

With regard to interventions that may be developed to address our findings and encourage widespread use of Web 2.0 technologies to enhance education, a few lessons can be learned from literature. To assure that there are no inhibitors to transform intention into action, qualitative high opportunities for professionalization should be offered. In this respect, in previous studies it is argued that teacher training should not just focus on technical skills but, if teachers are to be persuaded to value technology in teaching, focus on pedagogical practices in relation to ICT (Balanskat, Blamire, & Kefala, 2006; BECTA, 2004; Bingimlas, 2009). This is in line with our finding that teachers need technical but also educational support on implementation and development. It has also been suggested by Kirkwood and Price (2013), that the essence of teachers' professional development is not to make teachers technical competent but to recognize a scholarly approach of inquiry and evidence towards the nature of teaching and learning, so teachers can reconsider their conceptions of teaching and approaches to teaching. This is consistent with our recommendation to address teachers' teaching beliefs. Conole (2010a) warns: "Depressingly classic mistakes are repeated over and over again: an over emphasis on the technologies and not the people and processes; funding for the technology developments but not use and support." (p. 22). Furthermore, a mere top-down approach to introduce technology policies and strategies is often dissuaded in literature (Singh & Hardaker, 2014). It introduces potential dissonance between the

teachers' beliefs and their practices, as teachers experience social pressure by expectations to use technologies to support a pedagogical model they have not yet adopted, and learning will gain little (Kirkwood, 2009). In order to warrant successful adoption of technology, it works best to combine top-down and bottom-up decision-making processes (Baltaci-Goktalay & Ocak, 2006; Drent & Meelissen, 2008; Johnson, Adams Becker, Estrada, & Freeman, 2014; Singh & Hardaker, 2014). Policy makers and management should recognize that scaling of technology projects starts with the initiatives of single teachers or small groups of teachers (Baltaci-Goktalay, 2006 & Ocak; Singh & Hardaker, 2014), support of the initiatives increases the likelihood of success (Baltaci-Goktalay & Ocak, 2006), stakeholders should participate and collaborate in processes of change (Brown, 2013; Johnson et al. , 2014), and mutual understanding between policy makers and teachers is essential (Singh & Hardaker, 2014).

Finally, this study contributes to the literature in several ways. First, it confirmed findings from previous research that demonstrated teachers' positive attitude and perceived norms are critical factors that can be used to predict their intention to use technology. Second, it showed which background factors have a direct or indirect effect on teachers' intention. Third, it adds to the limited research on teachers' underlying beliefs towards integrating (Web 2.0) technologies. Finally, it provides a foundation for future research to assess the same and other factors that promote and impede teachers' integration of Web 2.0 technologies. The findings of this study can thus expand the body of knowledge of the RAA and support further insight into how teachers' intention is influenced for by particular behavior, within this particular population.

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Appendix A Online Questionnaire Elicitation Study (in Dutch)

In deze vragenlijst wordt u gevraagd naar uw mening rond de inzet van bepaalde Web 2.0-technologieën in het onderwijs. Het is voor het onderzoek van groot belang dat u weet wat hiermee wel en niet bedoeld wordt. Lees daarom het volgende eerst goed door.

Wat is Web 2.0-technologie?

In de vorige eeuw was het internet voornamelijk een grote bron van informatie. Je zou het internet van toen een 'lees-Web' kunnen noemen, ook wel aangeduid met Web 1.0. Sinds het begin van deze eeuw heeft er een omslag plaatsgevonden en maakt internettechnologie het meer en meer mogelijk om interactief bezig te zijn en zelf dingen te delen via internet. Denk aan Facebook, Youtube, Twitter, forums en wiki's zoals Wikipedia. Het internet is dus getransformeerd van 'lees-Web' naar een 'lees-schrijf-Web'. Het wordt aangeduid met Web 2.0 om het generatieverschil duidelijk te maken. Web 2.0-technologieën bieden allerlei mogelijkheden voor het onderwijs en er zijn inmiddels meer dan 200 Web-gebaseerde toepassingen voor het onderwijs.

Op welke Web 2.0-toepassingen heeft het onderzoek betrekking?

Dit onderzoek gaat over de categorie Web 2.0-toepassingen die het mogelijk maakt om studenten zélf kennis te laten construeren in dialoog of in samenwerking met elkaar. Het gaat hier dus om diep leren (zelf betekenis geven) door middel van interactie. Let op: het gaat dus NIET om toepassingen die kennisoverdracht vanuit de docent mogelijk maken, zoals bij het beschikbaar stellen van een opgenomen college. Er zijn veel Web 2.0-toepassingen die hieronder kunnen vallen.

Om een beeld te schetsen, volgen hieronder enkele voorbeelden die bij de NHL Hogeschool gebruikt worden. - Samenwerken in Google Drive (Google docs, Google sites etc.) - Blogs en groepsblogs met reactiemogelijkheden - Wiki's - Facebook en andere online community's - Video's online delen en becommentariëren - Forums - Digital storytelling - Online mindmapping - GroepsWhatsapp - Google classroom - Twitter - Online 3D-modeling tools – Skype

Lees nu de onderstaande twee stellingen door:

1. Ik heb begrepen dat dit onderzoek gaat over Web 2.0-toepassingen in het onderwijs die het mogelijk maken om studenten in dialoog of in samenwerking met elkaar zélf kennis te laten construeren.
2. Ik heb een goed beeld van voorbeelden van deze Web 2.0-toepassingen.

1a. Kunt u deze beide stellingen bevestigen?

- ☐ Ja
☐ Nee <ga verder naar 'Vervolg A'>
☐ Ik heb hierover vragen, neem contact met mij op <ga verder naar 'Vervolg C'>

Beantwoord nu de onderstaande controlevraag

Voor het onderzoek is het belangrijk dat u als docent zelf onderwijs arrangeert. Dit houdt in dat u zelf didactische beslissingen neemt over uw lessen, de werkvormen etc. Wanneer u zelf geen onderwijs arrangeert, bijvoorbeeld wanneer u alleen een rol heeft als coach, vult u dan 'nee' in bij de onderstaande vraag.

1b. Arrangeert u als docent zelf onderwijs en bent u (mede-) verantwoordelijk voor uw lessen en didactiek?

- ☐ Ja
☐ Nee <ga verder naar 'Vervolg A'>
☐ Ik heb hierover vragen, neem contact met mij op <ga verder naar 'Vervolg C'>

De vragenlijst

Met deze vragenlijst wil de onderzoeker nagaan welke overwegingen en overtuigingen er binnen de NHL Hogeschool leven onder docenten rond de inzet van de bedoelde Web 2.0-toepassingen.

Stelt u zich bij de gehele vragenlijst voor dat u in de komende 12 maanden Web 2.0-technologie inzet in uw onderwijs met als doel studenten zelf kennis te laten construeren door middel van interactie. Om u te ondersteunen wordt dit gedrag op elke pagina herhaald, inclusief de voorbeelden van Web 2.0-toepassingen.

De vragenlijst bestaat uit vijf categorieën vragen. De eerste drie categorieën hebben een vrij antwoordveld. Neem steeds enkele minuten per vraag de tijd om te noteren welke gedachten en overwegingen er direct bij u te binnen schieten. Er zijn geen goede of slechte antwoorden; het gaat uitsluitend om uw persoonlijke overwegingen. Om u te helpen krijgt u steeds een voorbeeldantwoord te zien rond het gedrag 'dagelijks sporten'. De vierde categorie bestaat uit vragen waarbij u op een 7-puntsschaal uw mening kunt geven. In de laatste categorie worden nog enkele demografische en algemene vragen gesteld.

Uw antwoorden worden geanonimiseerd en strikt vertrouwelijk geanalyseerd en verwerkt. De vragenlijst start als u klikt op 'doorgaan'. Met het starten ervan geeft u aan dat u toestemming geeft aan de onderzoeker om de door u verstrekte gegevens geanonimiseerd te gebruiken voor het onderzoek en de rapportage ervan.

Vragen categorie 1

U krijgt zo drie vragen voorgelegd waarin u gevraagd wordt naar gedachten die u direct te binnen schieten. Neem steeds enkele minuten de tijd om elke vraag te overdenken en vul alle voordelen, nadelen of gedachten in die u bij een vraag te binnen schieten.

Schrijf per regel steeds één gedachte op. Sluit de regel af met een enter en noteer op de volgende regel een volgende gedachte.

TIP: U kunt bij de vragen op deze pagina denken vanuit uw eigen perspectief, maar ook vanuit dat van andere mensen die relevant zijn, zoals studenten, of leidinggevend. U mag hen daarom ook meenemen in uw overwegingen.

Stelt u zich bij alle drie de vragen voor dat u de komende 12 maanden Web 2.0-toepassingen in uw onderwijs inzet om studenten zelf kennis te laten construeren middels interactie. Voorbeelden van toepassingen zijn: Google Drive, Blogs, Wiki's, Facebook, Videosharing, Forums, Online Mindmapping, GroepsWhatsapp, Google Classroom, Twitter, Online 3D-modelingtools, Skype, etc.

1a. Welke voordelen of positieve uitkomsten ziet u hiervan?

VOORBEELD:

Een positieve uitkomst van het gedrag 'dagelijks sporten' zou kunnen zijn: 'Ik krijg er een beter figuur van.'

Let op: de vragen in deze categorie gaan niet over sporten, maar over uw denkbeeldige inzet van de bedoelde Web 2.0-technologie, zoals hierboven staat omschreven.

Voordelen en positieve uitkomsten:
[... royaal invulvak...]

1b. Welke nadelen of negatieve uitkomsten ziet u hiervan?**VOORBEELD:**

Een negatieve uitkomst van het gedrag 'dagelijks sporten' zou kunnen zijn: 'Het kost teveel van mijn vrije tijd.'

Nadelen en negatieve uitkomsten:

[... royaal invulvak...]

1c. Welke andere gedachten schieten u hierbij te binnen?**VOORBEELD:**

Een bijkomende gedachte van het gedrag 'dagelijks sporten' zou kunnen zijn: 'Het vraagt misschien wat van mijn voedingspatroon.'

Bijkomende gedachten:

[... royaal invulvak...]

Soms worden uitkomsten dubbelzinnig geformuleerd. Denk aan een gedachte als 'geld'. U kunt daarmee bedoelen: "Het kost geld" of "Het levert geld op". Controleer voor u verdergaat of uw antwoorden duidelijk zijn.

Vragen categorie 2

Als het gaat om het inzetten van de bedoelde Web 2.0-technologieën in het onderwijs in de komende 12 maanden, zijn er wellicht personen of groepen die vinden dat u dat juist wel of juist niet moet doen.

Neem bij de onderstaande vragen weer enkele minuten tijd om alle personen of groepen personen te noteren die u te binnen schieten. Het gaat daarbij om de rol of de functie van de personen, niet om hun specifieke namen. Noteer steeds één persoon of een groep personen per regel en sluit de regel af met een enter.

TIP: probeer te denken aan verschillende groepen mensen, zodat u geen relevante groepen vergeet. Misschien zouden uw ouders, vrienden of toekomstige werkgever dit goed- of afkeuren. Noteer deze dan.

Ter herinnering: het gaat hier om de inzet van Web 2.0-technologie om studenten zélf kennis te laten construeren middels interactie. Voorbeelden zijn: Google Drive, Blogs, Wiki's, Facebook, Videosharing, Forums, Online Mindmapping, GroepsWhatsapp, Google Classroom, Twitter, Online 3D-modelingtools, Skype, etc.

2a. Welke personen in uw omgeving zouden dit goedkeuren, of denken dat u dit zou moeten doen?**VOORBEELD:**

Personen die het gedrag 'dagelijks sporten' goedkeuren zouden kunnen zijn: 'Mijn huisarts', 'Mijn echtgenoot'.

Let op: de vragen in deze categorie gaan niet over sporten, maar over uw denkbeeldige inzet van de bedoelde Web 2.0-technologie, zoals hierboven staat omschreven.

Personen of groepen die dit goedkeuren:

[... royaal invulvak...]

2b. Welke personen in uw omgeving zouden dit afkeuren, of denken dat u dit NIET zou moeten doen?

VOORBEELD:

Personen die het gedrag 'dagelijks sporten' afkeuren zouden kunnen zijn: 'Mijn kinderen', 'Mijn vriendin'.

Personen of groepen die dit afkeuren:

[... royaal invulvak...]

Vragen categorie 2 (vervolg)

Als het gaat om het inzetten van de bedoelde Web 2.0-technologieën in het onderwijs in de komende 12 maanden, zijn er wellicht personen of groepen personen die dit zelf ook uitvoeren of juist niet uitvoeren.

Neem enkele minuten tijd om alle mensen of groepen mensen te noteren die u te binnen schieten. Het gaat daarbij om de rol of de functie van de personen, niet om hun specifieke namen.

Noteer steeds één persoon of een groep personen per regel en sluit de regel af met een enter.

TIP: probeer ook hier te denken aan verschillende groepen mensen.

Ter herinnering: het gaat hier om de inzet van Web 2.0-technologie om studenten zélf kennis te laten construeren middels interactie. Voorbeelden zijn: Google Drive, Blogs, Wiki's, Facebook, Videosharing, Forums, Online Mindmapping, GroepsWhatsapp, Google Classroom, Twitter, Online 3D-modelingtools, Skype, etc.

2c. Welke personen of groepen personen zullen de bedoelde Web 2.0-technologieën volgens u waarschijnlijk inzetten?**VOORBEELD:**

Personen die het gedrag 'dagelijks sporten' waarschijnlijk uitvoeren zouden kunnen zijn: 'Mijn vrienden van de sportclub'.

Let op: de vragen in deze categorie gaan niet over sporten, maar over uw denkbeeldige inzet van de bedoelde Web 2.0-technologie, zoals hierboven staat omschreven.

Personen of groepen die dit waarschijnlijk inzetten:

[... royaal invulvak...]

2d. Welke personen of groepen personen zullen de bedoelde Web 2.0-technologieën volgens u het MINST waarschijnlijk inzetten?**VOORBEELD:**

Personen die het gedrag 'dagelijks sporten' het minst waarschijnlijk uitvoeren zouden kunnen zijn: 'Mijn fulltime collega's'.

Personen of groepen die dit het minst waarschijnlijk inzetten:

[... royaal invulvak...]

Vragen categorie 3

Als u de bedoelde Web 2.0-technologieën de komende 12 maanden in uw onderwijs in zou willen zetten, zijn er factoren die dit kunnen bevorderen of belemmeren.

Neem bij de volgende twee vragen weer enkele minuten de tijd om deze vraag te overdenken en vul alle factoren en omstandigheden in die u te binnenschieten. Noteer per regel één factor of omstandigheid en sluit de regel af met een enter.

Ter herinnering: het gaat hier om de inzet van Web 2.0-technologie om studenten zélf kennis te laten construeren middels interactie. Voorbeelden zijn: Google Drive, Blogs, Wiki's, Facebook, Videosharing, Forums, Online Mindmapping, GroepsWhatsapp, Google Classroom, Twitter, Online 3D-modelingtools, Skype, etc.

3a. Welke factoren of omstandigheden maken het u gemakkelijk of mogelijk dit te doen?

Denk bij deze vraag aan: "Wat heb ik ervoor nodig?" Probeer ook deze vraag vanuit verschillende invalshoeken te overdenken.

VOORBEELD:

Een bevorderende factor of omstandigheid van het gedrag 'dagelijks sporten' zou kunnen zijn: 'Aanwezigheid van kinderopvang.'

Let op: de vragen in deze categorie gaan niet over sporten, maar over uw denkbeeldige inzet van de bedoelde Web 2.0-technologie, zoals hierboven staat omschreven.

Bevorderende factoren en omstandigheden:

[... royaal invulvak...]

3b. Welke factoren of omstandigheden maken het u moeilijk, of belemmeren u om dit te doen?

Denk bij deze vraag aan: "Welke obstakels moeten er dan opgeruimd worden?" Probeer ook deze vraag vanuit verschillende invalshoeken te overdenken.

VOORBEELD:

Een belemmerende factor of omstandigheid van het gedrag 'dagelijks sporten' zou kunnen zijn: 'Een onbeperkt abonnement bij de sportclub is duur'

Belemmerende factoren en omstandigheden

[... royaal invulvak...]

Vragen categorie 4

In deze vierde categorie staan 18 stellingen waarbij u op een 7-puntsschaal aangeeft welk nummer uw mening het beste omschrijft. De vragen en de antwoorden lijken op elkaar, maar verschillen vaak op kleine onderdelen. Lees ze daarom steeds goed door.

Bij alle vragen staat centraal dat Web 2.0-toepassingen 'zoals bedoeld' worden ingezet. Hiermee wordt verwezen naar het doel om studenten zélf kennis te laten construeren door middel van dialoog of samenwerking. Voorbeelden van toepassingen zijn: Google Drive, Blogs, Wiki's, Facebook, Videosharing, Forums, Online Mindmapping, GroepsWhatsapp, Google Classroom, Twitter, Online 3D-modelingtools, Skype, etc.

a. Ik ben van plan Web in de komende 12 maanden 2.0-toepassingen in te zetten.	geheel mee oneens	1-2-3-4-5-6-7	geheel mee eens
b. Inzetten van Web 2.0-toepassingen in de komende 12 maanden vind ik:	onwenselijk	1-2-3-4-5-6-7	wenselijk
c. De meeste docenten die ik respecteer en bewonder zullen Web 2.0-toepassingen inzetten.	zeer onwaarschijnlijk	1-2-3-4-5-6-7	zeer waarschijnlijk
d. Inzetten van Web 2.0-toepassingen in de komende 12 maanden vind ik:	verschrikkelijk	1-2-3-4-5-6-7	fantastisch
e. Ik ben er zeker van dat ik Web 2.0-toepassingen in de komende 12 maanden kan inzetten, als ik dat wil.	geheel mee oneens	1-2-3-4-5-6-7	geheel mee eens
f. De meeste mensen wiens mening ik waardeer, keuren het goed dat ik in de komende 12 maanden 2.0-toepassingen inzet.	zeer onwaarschijnlijk	1-2-3-4-5-6-7	zeer waarschijnlijk
g. Als ik Web 2.0-toepassingen in de komende 12 maanden wil inzetten, ben ik in staat moeilijkheden die mij hiertoe belemmeren te overwinnen en problemen op te lossen.	geheel mee oneens	1-2-3-4-5-6-7	geheel mee eens
h. Inzetten van Web 2.0-toepassingen in de komende 12 maanden vind ik:	af te raden	1-2-3-4-5-6-7	te adviseren
i. Het is aan mijzelf om in de komende 12 maanden Web 2.0-toepassingen in te zetten.	geheel mee oneens	1-2-3-4-5-6-7	geheel mee eens
j. Inzetten van Web 2.0-toepassingen in de komende 12 maanden vind ik:	slecht	1-2-3-4-5-6-7	goed
k. Ik heb controle over mijn inzetten van Web 2.0-toepassingen in de komende 12 maanden.	geheel mee oneens	1-2-3-4-5-6-7	geheel mee eens
l. Ik heb de intentie in de komende 12 maanden Web 2.0-toepassingen in te zetten.	geheel mee oneens	1-2-3-4-5-6-7	geheel mee eens
m. De meeste docenten zoals ik zetten Web 2.0-toepassingen in.	geheel mee oneens	1-2-3-4-5-6-7	geheel mee eens
n. Ik verwacht in de komende 12 maanden Web 2.0-toepassingen in te zetten.	geheel mee oneens	1-2-3-4-5-6-7	geheel mee eens
o. De meeste mensen die belangrijk voor mij zijn, denken dat ik in de komende 12 maanden Web 2.0-toepassingen in zou moeten zetten.	geheel mee oneens	1-2-3-4-5-6-7	geheel mee eens
p. Als ik het echt wil, kan ik in de komende 12 maanden Web 2.0-toepassingen inzetten.	geheel mee oneens	1-2-3-4-5-6-7	geheel mee eens
q. Web 2.0-toepassingen zoals bedoeld inzetten in mijn onderwijs in de komende 12 maanden vind ik:	onnodig	1-2-3-4-5-6-7	nodig
r. Ik ben bereid in de komende 12 maanden Web 2.0-toepassingen in te zetten.	geheel mee oneens	1-2-3-4-5-6-7	geheel mee eens

Vragen categorie 5

Dit is de laatste categorie vragen, waarin nog enkele algemene vragen gesteld worden.

5a. Wat is uw geslacht?

0 Man

0 Vrouw

5b. Wat is uw leeftijd?

(rond af naar hele jaren)

5c. Bij welk instituut bent u voornamelijk werkzaam?

- ☐ Instituut Techniek
☐ Instituut Economie & Management
☐ Instituut Educatie & Communicatie
☐ Instituut Zorg & Welzijn

5d. Bij welke afdeling (of opleiding) bent u werkzaam binnen het instituut?

.....

5e. Wat is uw aanstelling in fte?

Vul een getal tussen 0,0 en 1,0 in. Gebruik een komma voor een decimaal.

Als uw hoofdtaak niet-onderwijzend is, geef dan een schatting van uw lesgevende taken in fte.

.....

5f. Hoeveel jaren ervaring heeft u als docent?

Rond af naar hele jaren.

.....

De vragenlijst is hiermee klaar. Uw input en die van andere respondenten worden door de onderzoeker gebruikt om te kijken welke overwegingen er leven binnen de NHL Hogeschool. De meest genoemde antwoorden op open vragen worden gebundeld en opgenomen in een vragenlijst voor alle docenten. De resterende antwoorden worden bij wijze van pilot geanalyseerd om de interne consistentie te meten. Voor de nieuwe vragenlijst voor docenten zult u over enige tijd opnieuw een uitnodiging ontvangen. Ik hoop van harte dat u ook hieraan uw medewerking wilt verlenen. Als u nog aanvullende opmerkingen wilt maken, kunt u deze hieronder kwijt.

Heeft u nog aanvullende opmerkingen?

.....

Hartelijk dank voor uw tijd en uw medewerking!

Astrid van Twillert (onderzoeker)

Vervolg A

Helaas, de vragenlijst kan niet worden voortgezet

U heeft aangegeven dat u niet goed begrepen heeft over welk soort Web 2.0-toepassingen dit onderzoek gaat, of uw beeld hiervan is niet optimaal. Het zou fijn zijn als zoveel mogelijk docenten de vragenlijst in kunnen vullen, dus als iets niet duidelijk is, geef ik graag een toelichting, zodat u alsnog verder kunt gaan. Laat in dat geval uw naam en e-mailadres en/of telefoonnummer achter, samen met een eventuele opmerking.

Laat hier desgewenst uw contactgegevens of een opmerking of vraag achter:

.....

Vervolg B

Helaas, de vragenlijst kan niet worden voortgezet

U heeft aangegeven dat u geen didactische beslissingen neemt of niet zelf (mede)verantwoordelijk bent voor het arrangeren van onderwijs. Het zou fijn zijn als zoveel mogelijk docenten de vragenlijst in kunnen vullen, dus als iets niet duidelijk is, geef ik graag een toelichting, zodat u alsnog verder kunt gaan. Laat in dat geval uw naam en e-mailadres en/of telefoonnummer achter, samen met een eventuele opmerking.

Laat hier desgewenst uw contactgegevens of een opmerking of vraag achter:

.....

Vervolg C

Ik neem contact met u op.

Het zou fijn zijn als zoveel mogelijk docenten de vragenlijst in kunnen vullen. Als iets niet duidelijk is, geef ik als onderzoeker graag een toelichting, zodat u alsnog verder kunt gaan.

Vul hier uw contactgegevens (naam en e-mailadres/telefoonnummer) in, met eventuele opmerkingen van uw kant.

Contactgegevens en opmerkingen:

.....

Appendix B Online Questionnaire Main Study (in Dutch)

De vragen in deze vragenlijst gaan over de inzet van bepaalde Web 2.0-toepassingen in het onderwijs, namelijk die toepassingen waarmee docenten willen bereiken dat studenten zelf kennis verwerven door middel van interactie en samenwerking. Het is voor het onderzoek van groot belang dat u precies weet wat hiermee wel en niet bedoeld wordt. Lees daarom de volgende toelichting eerst goed door.

Wat is Web 2.0-technologie?

In de vorige eeuw was het internet voornamelijk een informatiebron: een 'leesweb'. Sinds het begin van deze eeuw maakt internettechnologie het steeds meer mogelijk interactief bezig te zijn en zelf dingen te delen via internet. Denk aan Facebook, Youtube, Twitter, forums en wiki's zoals Wikipedia. Het internet is dus getransformeerd van 'lees-Web' naar een 'lees-schrijf-Web'. Het wordt aangeduid met Web 2.0 om het generatieverschil duidelijk te maken.

Web 2.0-technologieën bieden allerlei mogelijkheden voor het onderwijs. Er zijn al meer dan 200 Web-gebaseerde toepassingen bekend in het onderwijs.

Op welke Web 2.0-toepassingen heeft dit onderzoek betrekking?

Dit onderzoek gaat over het inzetten van Web 2.0-toepassingen in het onderwijs die het mogelijk maken om studenten *zél*f kennis te laten construeren in dialoog of in samenwerking met elkaar. Bij kennisconstructie ziet de docent het leren als een onderzoeksproces van de student. De student krijgt ruimte om actief en zelfstandig, in samenwerking met anderen, kennis te verwerven door het vinden van oplossingen. Samengevat gaat het hier dus om drie zaken:

1. kennisconstructie door studenten (actief en diep leren door zelf betekenis te geven);
2. door middel van interactie (dialoog en samenwerking);
3. Web 2.0-toepassingen die helpen om dit mogelijk te maken.

Let op: hier tegenover staat kennisoverdracht, waarbij de docent kennis in stappen overdraagt aan studenten en bepaalt wat er wanneer geleerd wordt. Het inzetten van Web 2.0-toepassingen om kennis over te dragen is *niet* waar dit onderzoek om gaat. Het gaat dus *niet* om het online beschikbaar stellen van een digitaal college of een kennisclip.

Welke voorbeelden zijn er zoal?

Er zijn allerlei Web 2.0-toepassingen die u tijdens deze vragenlijst in gedachten kunt houden. Om een beeld te schetsen, volgen hieronder enkele voorbeelden van de bedoelde Web 2.0-toepassingen die bij de NHL Hogeschool gebruikt worden.

- Samenwerken in Google Drive (Google docs, Google sites etc.)
 - Blogs en groepsblogs met reactiemogelijkheden
 - Wiki's
 - Facebook en andere online community's
 - Video's online delen en becommentariëren
 - Forums
 - Digital storytelling
 - Online mindmapping
 - GroepsWhatsapp
 - Google classroom
 - Twitter
 - Online 3D-modeling tools
 - Skype
-

Beantwoord nu eerst twee controlevragen.

Controlevraag 1

Kunt u de beide onderstaande stellingen bevestigen?

- A. Ik heb begrepen dat dit onderzoek gaat over Web 2.0-toepassingen in het onderwijs die het mogelijk maken om studenten in dialoog of in samenwerking met elkaar zélf kennis te laten construeren.
- B. Ik heb een goed beeld van voorbeelden van deze Web 2.0-toepassingen.
- ☐ Ja
- ☐ Nee <ga verder naar 'Vervolg A'>
- ☐ Ik heb hierover vragen, neem contact met mij op <ga verder naar 'Vervolg C'>
-

Controlevraag 2

Voor het onderzoek is het belangrijk dat u als docent zelf onderwijs arrangeert. Dit houdt in dat u zelf didactische beslissingen neemt over uw lessen, de werkvormen etc.

Wanneer u zelf geen onderwijs arrangeert, bijvoorbeeld wanneer u alleen een rol heeft als coach, vult u dan 'nee' in bij de onderstaande controlevraag.

Arrangeert u als docent zelf onderwijs en bent u (mede-) verantwoordelijk voor uw lessen en didactiek?

- ☐ Ja
- ☐ Nee <ga verder naar 'Vervolg B'>
- ☐ Ik heb hierover vragen, neem contact met mij op <ga verder naar 'Vervolg C'>
-

De vragenlijst begint hierna. Deze bestaat uit ca. 65 vragen of stellingen waarover u op een 7-puntsschaal uw mening dient weer te geven. Ook zijn er enkele demografische vragen. Er zijn geen goede of slechte antwoorden mogelijk. De onderzoeker is slechts op zoek naar uw persoonlijke mening.

Stelt u zich bij de gehele vragenlijst voor dat u in de komende 12 maanden Web 2.0-toepassingen inzet in uw onderwijs met als doel studenten zelf kennis te laten construeren door middel van dialoog en samenwerking (interactie).

Uw antwoorden worden geheel anoniem verwerkt.

U kunt uw beeldinstellingen het best instellen op 100 procent op uw laptop of computer. Met een tablet of telefoon kunt u deze vragenlijst invullen, alleen zult u dan meer moeten scrollen van links naar rechts.

De vragenlijst start als u klikt op 'Volgende'. Met het starten ervan geeft u aan dat u toestemming geeft aan de onderzoeker om de door u verstrekte gegevens geanonimiseerd te gebruiken voor het onderzoek en de rapportage ervan.

De vragenlijst

Hoe waarschijnlijk vindt u de gegeven aanvullingen op de onderstaande zin, en in welke mate vindt u dit goed of slecht?

1. Als ik de komende 12 maanden Web 2.0-toepassingen inzet om studenten zélf kennis te laten construeren door middel van interactie, heeft dat tot gevolg...

	Hoe waarschijnlijk vindt u dit?...		In welke mate vindt u dit goed of slecht?
a. ... dat ikzelf en mijn studenten nieuwe vaardigheden moeten aanleren en daarin blijvend moeten ontwikkelen.	zeer onwaarschijnlijk	zeer waarschijnlijk	slecht 1-2-3-4-5-6-7 goed
b. ... dat interactie en samenwerking tussen studenten wordt bevorderd.	zeer onwaarschijnlijk	zeer waarschijnlijk	slecht 1-2-3-4-5-6-7 goed
c. ... dat communicatie gemakkelijker, sneller en toegankelijker wordt.	zeer onwaarschijnlijk	zeer waarschijnlijk	slecht 1-2-3-4-5-6-7 goed
d. ... dat het onderwijs meer tijd- en plaatsonafhankelijk wordt.	zeer onwaarschijnlijk	zeer waarschijnlijk	slecht 1-2-3-4-5-6-7 goed
e. ... dat communicatie onpersoonlijker en beperkter wordt.	zeer onwaarschijnlijk	zeer waarschijnlijk	slecht 1-2-3-4-5-6-7 goed
f. ... dat actief, betrokken en zelfgestuurd leren wordt bevorderd.	zeer onwaarschijnlijk	zeer waarschijnlijk	slecht 1-2-3-4-5-6-7 goed
g. ... dat ik meer tijd kwijt ben aan dit onderwijs.	zeer onwaarschijnlijk	zeer waarschijnlijk	slecht 1-2-3-4-5-6-7 goed
h. ... dat er ongewenste effecten zijn op het leren (bijv. ontwikkeling van incorrecte kennis, minder kritisch en oppervlakkiger leren, veel afleiding, etc.)	zeer onwaarschijnlijk	zeer waarschijnlijk	slecht 1-2-3-4-5-6-7 goed
i. ... dat ik hiermee aansprekend onderwijs aanbiedt dat aansluit bij de leefwereld van de studenten.	zeer onwaarschijnlijk	zeer waarschijnlijk	slecht 1-2-3-4-5-6-7 goed

2. Hoe waarschijnlijk is het volgens u dat onderstaande personen vinden dat u de komende 12 maanden Web 2.0-toepassingen zou moeten inzetten in uw onderwijs om studenten zélf kennis te laten construeren door middel van interactie?

	Hoe waarschijnlijk vindt u dit?...	
a. Mijn studenten	zeer onwaarschijnlijk	zeer waarschijnlijk
b. Collega-docenten binnen mijn afdeling	zeer onwaarschijnlijk	zeer waarschijnlijk
c. Collega-docenten buiten mijn afdeling	zeer onwaarschijnlijk	zeer waarschijnlijk

	zeer	zeer
d. Mijn leidinggevende	onwaarschijnlijk 1-2-3-4-5-6-7	waarschijnlijk

3. In hoeverre bent u het eens met onderstaande stellingen?

a. Als het gaat om mijn onderwijs, wil ik doen wat <i>mijn studenten</i> vinden dat ik zou moeten doen.	geheel mee oneens 1-2-3-4-5-6-7	geheel mee eens
b. Als het gaat om mijn onderwijs, wil ik doen wat <i>mijn collega-docenten binnen mijn afdeling</i> vinden dat ik zou moeten doen.	geheel mee oneens 1-2-3-4-5-6-7	geheel mee eens
c. Als het gaat om mijn onderwijs, wil ik doen wat <i>mijn collega-docenten buiten mijn afdeling</i> vinden dat ik zou moeten doen.	geheel mee oneens 1-2-3-4-5-6-7	geheel mee eens
d. Als het gaat om mijn onderwijs, wil ik doen wat <i>mijn leidinggevende</i> vindt dat ik zou moeten doen.	geheel mee oneens 1-2-3-4-5-6-7	geheel mee eens

4. Hoe waarschijnlijk vindt u het dat onderstaande personen zelf Web 2.0-toepassingen inzetten?

a. Collega-docenten binnen uw afdeling	Helemaal niet 1-2-3-4-5-6-7	Heel graag
b. Collega-docenten buiten uw afdeling	Helemaal niet 1-2-3-4-5-6-7	Heel graag

5. Hoe graag wilt u dan zijn als...?

	zeer	zeer
a. ... collega's binnen uw afdeling?	onwaarschijnlijk 1-2-3-4-5-6-7	waarschijnlijk
	zeer	zeer
b. ... collega's buiten uw afdeling?	onwaarschijnlijk 1-2-3-4-5-6-7	waarschijnlijk

6. Hoe waarschijnlijk vindt u de gegeven aanvullingen op de onderstaande zin?

"De komende 12 maanden..."

	zeer	zeer
a. ... heb ik een gebrek aan tijd.	onwaarschijnlijk 1-2-3-4-5-6-7	waarschijnlijk
b. ... beschik ik over te weinig technische voorzieningen voor het bedoelde onderwijs, zoals hardware (laptop/ tablet), software, stabiele systemen, snelle Wi-Fi etc.	zeer onwaarschijnlijk 1-2-3-4-5-6-7	zeer waarschijnlijk
c. ... heb ik voldoende mogelijkheden tot professionalisering op dit gebied (cursussen, workshops, voorlichting, begeleide zelfstudie etc.)	zeer onwaarschijnlijk 1-2-3-4-5-6-7	zeer waarschijnlijk

d. ... is er deskundige hulp en ondersteuning, bijv. op het gebied van ontwikkeling en implementatie van het bedoelde onderwijs, en op het gebied van ICT.	zeer onwaarschijnlijk	1-2-3-4-5-6-7	zeer waarschijnlijk
e. ...wisselen mijn collega's en ik kennis, ideeën en voorbeelden uit op het gebied van het bedoelde onderwijs.	zeer onwaarschijnlijk	1-2-3-4-5-6-7	zeer waarschijnlijk
f. ...ligt er binnen mijn team een heldere visie, passend beleid en een geschikt onderwijsmodel voor het inzetten van de bedoelde Web 2.0-toepassingen.	zeer onwaarschijnlijk	1-2-3-4-5-6-7	zeer waarschijnlijk
g. ... ben ik ondeskundig in en heb ik te weinig ervaring in het inzetten van Web 2.0-toepassingen in het onderwijs.	zeer onwaarschijnlijk	1-2-3-4-5-6-7	zeer waarschijnlijk

7. In hoeverre zullen de onderstaande factoren u de komende 12 maanden *belemmeren* om Web 2.0-toepassingen in te zetten in uw onderwijs om studenten zélf kennis te laten construeren door middel van interactie?

a. Gebrek aan tijd.	geheel mee oneens	1-2-3-4-5-6-7	geheel mee eens
b. Te weinig technische voorzieningen, zoals hardware (laptop/ tablet), software, stabiele systemen, snelle Wi-Fi etc.	geheel mee oneens	1-2-3-4-5-6-7	geheel mee eens
c. Uw ondeskundigheid in en gebrek aan ervaring in het inzetten van Web 2.0-toepassingen in het onderwijs.	geheel mee oneens	1-2-3-4-5-6-7	geheel mee eens

8. In hoeverre zullen de onderstaande factoren u de komende 12 maanden *helpen* om Web 2.0-toepassingen in te zetten in uw onderwijs om studenten zélf kennis te laten construeren door middel van interactie?

a. Voldoende mogelijkheden tot professionalisering op dit gebied (cursussen, workshops, voorlichting, begeleide zelfstudie etc.)	geheel mee oneens	1-2-3-4-5-6-7	geheel mee eens
b. Deskundige hulp en ondersteuning, bijv. op het gebied van ontwikkeling en implementatie van het bedoelde onderwijs, of op het gebied van ICT.	geheel mee oneens	1-2-3-4-5-6-7	geheel mee eens
c. Onderling uitwisselen van kennis, ideeën en voorbeelden op dit gebied tussen u en uw collega's.	geheel mee oneens	1-2-3-4-5-6-7	geheel mee eens
d. Een heldere visie, passend beleid en een geschikt onderwijsmodel binnen uw team voor het inzetten van de bedoelde Web 2.0-toepassingen.	geheel mee oneens	1-2-3-4-5-6-7	geheel mee eens

9. Vul uw mening over de onderstaande stellingen in.

Bij alle stellingen op deze pagina wordt met "inzetten van Web 2.0-toepassingen" steeds bedoeld:

"inzetten van Web 2.0-toepassingen om studenten zélf kennis te laten construeren door middel van interactie".

a. Inzetten van Web 2.0-toepassingen in de komende 12 maanden vind ik:	onwenselijk	1-2-3-4-5-6-7	wenselijk
b. Inzetten van Web 2.0-toepassingen in de komende 12 maanden vind ik:	verschrikkelijk	1-2-3-4-5-6-7	fantastisch
c. Ik ben van plan Web in de komende 12 maanden 2.0-toepassingen in te zetten.	geheel mee oneens	1-2-3-4-5-6-7	geheel mee eens
d. De meeste mensen die belangrijk voor mij zijn, denken dat ik in de komende 12 maanden Web 2.0-toepassingen in zou moeten zetten.	geheel mee oneens	1-2-3-4-5-6-7	geheel mee eens
e. Ik ben er zeker van dat ik Web 2.0-toepassingen in de komende 12 maanden kan inzetten, als ik dat wil.	geheel mee oneens	1-2-3-4-5-6-7	geheel mee eens
f. Ik heb de intentie in de komende 12 maanden Web 2.0-toepassingen in te zetten.	geheel mee oneens	1-2-3-4-5-6-7	geheel mee eens
g. Als ik Web 2.0-toepassingen in de komende 12 maanden wil inzetten, ben ik in staat moeilijkheden die mij hiertoe belemmeren te overwinnen en problemen op te lossen.	geheel mee oneens	1-2-3-4-5-6-7	geheel mee eens
h. Het is aan mijzelf om in de komende 12 maanden Web 2.0-toepassingen in te zetten.	geheel mee oneens	1-2-3-4-5-6-7	geheel mee eens
i. Ik verwacht in de komende 12 maanden Web 2.0-toepassingen in te zetten.	geheel mee oneens	1-2-3-4-5-6-7	geheel mee eens
j. De meeste docenten zoals ik zetten Web 2.0-toepassingen in.	geheel mee oneens	1-2-3-4-5-6-7	geheel mee eens
k. Ik heb controle over mijn inzetten van Web 2.0-toepassingen in de komende 12 maanden.	geheel mee oneens	1-2-3-4-5-6-7	geheel mee eens
l. Als ik het echt wil, kan ik in de komende 12 maanden Web 2.0-toepassingen inzetten.	geheel mee oneens	1-2-3-4-5-6-7	geheel mee eens
m. Ik ben bereid in de komende 12 maanden Web 2.0-toepassingen in te zetten.	geheel mee oneens	1-2-3-4-5-6-7	geheel mee eens
n. Inzetten van Web 2.0-toepassingen in de komende 12 maanden vind ik:	af te raden	1-2-3-4-5-6-7	te adviseren
o. De meeste mensen wiens mening ik waardeer, keuren het goed dat ik in de komende 12 maanden 2.0-toepassingen inzet.	zeer onwaarschijnlijk	1-2-3-4-5-6-7	zeer waarschijnlijk
p. Inzetten van Web 2.0-toepassingen in de komende 12 maanden vind ik:	onnodig	1-2-3-4-5-6-7	nodig
q. De meeste docenten die ik respecteer en bewonder zullen Web 2.0-toepassingen inzetten.	zeer onwaarschijnlijk	1-2-3-4-5-6-7	zeer waarschijnlijk
r. Inzetten van Web 2.0-toepassingen in de komende 12 maanden vind ik:	slecht	1-2-3-4-5-6-7	goed

10. In hoeverre bent u het eens met onderstaande stellingen over goed docentschap?

a. Studenten moeten eerst zelf oplossingen voor problemen vinden en mijn rol als docent is hen hierin te faciliteren.	geheel mee oneens	1-2-3-4-5-6-7	geheel mee eens
b. Als goede docent behoort ik studenten te voorzien van heldere en correcte informatie en te demonstreren hoe een probleem correct opgelost moet worden.	geheel mee oneens	1-2-3-4-5-6-7	geheel mee eens

11. Geef aan wat uw mening het best omschrijft.

a. Hoe vaak heeft u <i>de afgelopen drie jaren</i> Web 2.0-toepassingen ingezet?	nooit	1-2-3-4-5-6-7	Gemiddeld alle lesdagen binnen mijn aanstelling
b. Hoe vaak zette u <i>de afgelopen periode</i> (periode 3) Web 2.0-toepassingen in?	nooit	1-2-3-4-5-6-7	Gemiddeld alle lesdagen binnen mijn aanstelling

12. Hoeveel dagen heeft u in uw loopbaan als docent besteed aan de onderstaande trainings- en professionaliseringsactiviteiten?

Reken elke studiedag, workshop of activiteit mee als een dag. Schat bij online cursussen zelf uw geïnvesteerde dagen. Rond af op hele dagen.

Let op: het doel is niet gespecificeerd. Het hoeft dus niet noodzakelijk te gaan over kennisconstructie of samenwerking.

- a. Dagen met professionaliseringsactiviteiten met als onderwerp het inzetten of toepassen van Web 2.0-toepassingen
.....
- b. Dagen met trainings- en professionaliseringsactiviteiten over willekeurige onderwerpen, waarbij Web 2.0-toepassingen werden toegepast in de didactiek
.....

13. Geef aan wat uw mening het best weergeeft.

a. Ik ervaar de psychische belasting van mijn werk als docent als:	niet belastend 1	licht belastend 2	matig belastend 3	sterk belastend 4
b. Ik ervaar de werkdruk als:	niet belastend 1	licht belastend 2	matig belastend 3	sterk belastend 4

14. Wat is uw geslacht?

- 0 Man
0 Vrouw

15. **Wat is uw leeftijd?**
(rond af naar hele jaren)
.....
16. **Hoeveel jaren ervaring heeft u als docent?**
(rond af naar hele jaren)
.....
17. **Wat is uw aanstelling als docent, in fte?**
(vul een getal in tussen 0,00 en 1,00)
.....
18. **Bij welk instituut bent u voornamelijk werkzaam?**
0 Instituut Techniek
0 Instituut Economie & Management
0 Instituut Educatie & Communicatie
0 Instituut Zorg & Welzijn
0 Anders, namelijk: (licht toe wat uw connectie met NHL Hogeschool is)
19. **U bent bij het einde van de vragenlijst. Als u een opmerking wilt maken, kunt u deze hieronder invullen.**
.....
20. **Wanneer u een kopie wilt krijgen van het uiteindelijke artikel met de resultaten, laat dan uw e-mailadres achter**
.....

Hartelijk dank voor uw tijd en uw medewerking!
Astrid van Twillert (onderzoeker)

Vervolg A

Helaas, de vragenlijst kan niet worden voortgezet.

U heeft aangegeven dat u niet goed begrepen heeft over welk soort Web 2.0-toepassingen dit onderzoek gaat, of uw beeld hiervan is niet optimaal. Een goed begrip van u als respondent is echter noodzakelijk voor het vervolg van het onderzoek.

U kunt klikken op "Vorige" om terug te gaan en de uitleg nogmaals te lezen.

U kunt ook in het invulveld uw contactgegevens achterlaten, samen met een eventuele opmerking. De onderzoeker neemt dan contact met u op om te bespreken wat er niet duidelijk is. Het is voor het onderzoek belangrijk dat zoveel mogelijk NHL-docenten de vragenlijst in kunnen vullen, dus we stellen uw opmerkingen en vragen erg op prijs.

Contactgegevens en opmerkingen:

.....

Vervolg B

Helaas, de vragenlijst kan niet worden voortgezet.

U heeft aangegeven dat u geen didactische beslissingen neemt of niet zelf (mede)verantwoordelijk bent voor het arrangeren van onderwijs.

Het zou fijn zijn als zoveel mogelijk docenten de vragenlijst in kunnen vullen, dus als u twijfelt of als iets niet helemaal duidelijk is, geef ik graag een toelichting, zodat u misschien alsnog verder kunt gaan. Laat in dat geval uw naam en e-mailadres en/of telefoonnummer achter, samen met een eventuele opmerking.

Contactgegevens en opmerkingen:

.....

Vervolg C

Ik neem contact met u op.

Het zou fijn zijn als zoveel mogelijk docenten de vragenlijst in kunnen vullen. Als iets niet duidelijk is, geef ik als onderzoeker graag een toelichting, zodat u wellicht alsnog verder kunt gaan.

Laat hieronder uw contactgegevens achter (telefoonnummer en/of e-mailadres). Een eventuele vraag of opmerking kunt u hieronder ook kwijt.

Contactgegevens en opmerkingen:

.....