
Intentions of Physicians to use Wikis for Professionalization

A study of perceptions

Master Thesis Educational Design and Consultancy

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Abstract

The growing amount of medical knowledge is reason to explore new methods for knowledge management in healthcare. Wikis are a promising technology for this purpose, because they allow professionals to share information with each other. In this thesis the intentions of physicians towards using wikis for their professionalization are studied. The Technology Acceptance Model (TAM) proposes several determinants of behavioral intention (Venkatesh & Bala, 2008). An adapted version of the TAM3 survey about wiki perceptions was completed by 71 physicians ($N = 71$). Mann-Whitney U tests and Kruskal-Wallis tests were conducted to compare results between age groups, genders, working experiences and functions. Spearman correlations and a multiple regression analysis were used to find the strongest predictors of behavioral intention, perceived usefulness and ease of use. Results showed physicians' intentions towards wiki use for sharing knowledge with other professionals were mostly neutral. Between groups only perceptions of usefulness between junior physicians and medical specialists differed significantly. Only perceived usefulness was found to be a unique significant predictor for behavioral intention. Perceived usefulness was significantly predicted by ease of use and job relevance. External control and enjoyment, moderated by experience, predicted ease of use. The results of this study indicate which factors deserve most attention when designing or choosing wikis for learning. Recommendations for future research include the investigation of adaptations of the TAM3 model so it fits modern technologies better.

Keywords: social media, wikis, knowledge creation, knowledge management, healthcare organizations, physicians.

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Introduction

Years ago, the internet opened new doors for distance communication developments. Nowadays smartphones and tablets are standard tools for exchanging all types of information with others. It is possible to reach almost every person at any place and time, enabling global instant information exchange. This exchange can be facilitated by means of applications such as social media. Social media can be defined as web-based technologies that allow creation, adaption and exchange of user-generated content (Kaplan & Haenlein, 2010; Kietzmann, Hermkens, McCarthy, & Silvestre, 2011). Users of these applications retrieve, contribute to and explore content created by other users (McGowan et al., 2012). Social media are currently used for knowledge collaboration in diverse community settings: within organizations (Majchrzak, Cherbakov, & Ives, 2009 in Wagner, Vollmar & Wagner, 2014), across organizational boundaries (Fuchs & Schreier, 2011) or in open collectives such as online communities (Faraj, Jarvenpaa, & Majchrzak, 2011; Gulati, Puranam, & Tushman, 2012).

The Netherlands is a leading country when it comes to growing awareness of benefits of using social media in healthcare (Van De Belt, Berben, Samsom, Engelen, & Schoonhoven, 2012). Medical organizations appreciate the possibility they offer for creating stronger connections between the different disciplines of healthcare (Bacigalupe, 2011). Also, McGowan et al. (2012) point out that the amount of information required for medical practice is growing exponentially and it can be hard for physicians to manage and consume all of the available material. It is not possible anymore for an individual to stay completely up-to-date. Social media tools like wikis can help physicians keep track of new developments in the field and participate in collaborative group projects. Medical employees find wikis the most useful type of social media for improving their practice and are most willing to use these tools (McGowan et al., 2012). Wikis therefore have the most potential of social media tools to be adopted by physicians. In this study, wikis are defined as “a collaboratively created and iteratively improved set of web pages, together with the software that manages the web pages” (Wagner, 2004, p. 265). Sometimes wikis are referred to as digital encyclopedias.

Despite these benefits, many physicians and hospitals are still somewhat reluctant to adopt wikis as a source of information for practice (Eysenbach, 2008; Overberg et al., 2010). They feel they

need to invest time and effort they do not have (Holtzblatt, Damianos & Weiss, 2010; Kuznetsov, 2006; Standing & Kiniti, 2011) and the technology does not provide credit for the amount of work they put into them. Sometimes they dislike sharing unfinished work, do not want to learn to use a new tool or do not want others to edit content they created (Holtzblatt et al, 2010). Finally, wikis are sometimes regarded as unreliable sources of information. Hasty et al. (2014) even warn physicians not to use wikis for work because they found articles on the public wiki website Wikipedia contain many errors compared to peer-reviewed sources. However, in this study it is assumed this issue does not need to be a real problem if physicians treat the information they find critically. Additionally, it is possible to add a procedure of peer-review to a wiki website.

Theoretical and practical values of this study

In this study, physicians' current attitudes towards using wikis for information exchange with other professionals are explored. In the previous section it has been made clear several other researchers have touched this subject (e.g. Eysenbach, 2008; Overberg et al., 2010), but these existing studies focus on social media use in general (e.g. McGowan et al., 2012), or only test positive or negative factors (Holtzblatt et al, 2010). This causes a degree of superficiality in the findings, considering wikis or attitudes as a whole are not investigated. Wagner et al. (2014) also suggest the need to investigate utility perceptions of social media in professional learning environments. A study of perceptions of wiki use for professionalization with just physicians as participants has not yet been conducted.

To measure these perceptions, an adapted version of the third Technology Acceptance Model (TAM3) survey will be used. This model will be explained in more detail in the theoretical background section of this thesis. This study adds information to the TAM3 knowledge base about the fit of this model to the context of physicians and wikis. In practice, the results can support the design or decision-making processes when medical organizations wish to adopt wikis. Designers of digital learning materials will have more information about the factors they need to address if they want to make wikis appeal more to their target group.

Theoretical background

Knowledge creation

Knowledge is part of the collaborative human capital of an organization (Ranft & Lord, 2000). Therefore it can account for a better quality of services and products and improvement and innovation capabilities (Basadur & Gelade, 2006). In healthcare, this means a better care for patients. The many different kinds of knowledge within the organization change continuously. Knowledge can be found in written sources, routines, processes, practices and norms (Davenport & Prusak, 1998). To make all these types part of the human capital, personal tacit knowledge needs to be converted into explicit knowledge. Explicit knowledge will eventually become internalized knowledge when social exchange within and between organizations in a network takes place (Burt, 2000). When knowledge is incorporated into the organizational system it can be accessed when necessary (Nonaka, Von Krogh, & Voelpel, 2006). Nonaka and Takeuchi (1995) propose a four-phased strategy for managing the knowledge creation process: socialization, externalization, internalization and combination. In the first phase, socialization, an interactive environment in which tacit knowledge can be shared is built. In this interactive environment, experiences and mental models can be shared. Then externalization takes place: tacit knowledge is turned into explicit knowledge by means of metaphors, analogies or sketches (Nonaka, Umemoto & Senoo, 1996). This phase is followed by the combination phase in which explicit knowledge is linked to explicit knowledge between people. By combining explicit knowledge, new theories and insights can emerge. The last phase, internalization, is about changing explicit knowledge to tacit knowledge. After internalization, the cycle of knowledge creation starts again by the socialization of the newly acquired knowledge (Nonaka & Takeuchi, 1995).

Nonaka and Takeuchi (1995) state that a role for information technology in the process of knowledge creation can mainly be found in the combination phase, because editability and recombability foster the exchange and combination of knowledge. Editability is the process of modifying and revising content to make it fit new situations. Recombability is the expansion of existing knowledge so integration into the organization is simplified. In wikis both editability and recombability are present.

Surprisingly, a point of criticism towards using social media to enhance knowledge creation comes from the organizations who value their knowledge capital themselves. Many of these organizations feel their organizational boundaries and competitive advantage are crossed when employees start sharing their knowledge with others in this way (Von Krogh, 2012). However, the implementation must not be discarded just because of these fears. Social media like wikis can be adjusted to fit the knowledge strategy of the organization (Von Krogh, 2012). An example is to only allow registered employees to view and alter content.

Implementing wikis

Besides the named advantages of using wikis in the combination phase, there are more reasons that can lead up to the implementation of wikis into an organization. Kaplan and Haenlein (2010) describe wikis as impersonal collaborative projects with indirect communication possibilities. There are a low amounts of intimacy and immediacy, media richness, self-presentation and self-closure. This is beneficial for professional learning, because it means the focus is on learning and not on developing an image online. Other possible reasons for implementation are the facilitation of interaction, possibilities to build a competitive advantage by creating knowledge assets and managing knowledge resources and new behaviors (Wagner et al., 2014).

Challenging aspects of the use of wikis within an organization regard data ownership and security, distortion of information and adoption. It takes time to learn how to use wikis, which can be frustrating for physicians (Bacigalupe, 2011). Digital skills need to be learned, former ways need to be adapted and a culture needs to be transformed. Standing and Kiniti (2011) provide some insight in problems that arise when wikis are being implemented. They point towards the main issues of lack of a specific reason and strategy for implementation, lack of management support, insecurity about quality control, the absence of a culture of knowledge sharing and collaborative learning, failure to integrate the technology into work practice, unclear or absent guidelines and policies for the use of wikis and difficulties with usability and accessibility. When these issues are taken into account before the actual implementation, factors of success are provided (Standing & Kiniti, 2011). When zooming in on the need for a culture of knowledge sharing and collaborative learning, it is important employees

feel motivated to share knowledge and collaborate by using wikis (Standing & Kiniti, 2011). To explore if such a culture is present, the Technology Acceptance Model (TAM) can be used.

Technology Acceptance Model

The Technology Acceptance Model (TAM) is a model which can partly predict wiki use behavior. It includes factors related to the intention to adopt them (Venkatesh & Bala, 2008). Since Davis (1989) presented the first version of this model it has been tested, confirmed and expanded numerous times in different technology contexts (e.g. Park, Nam, & Cha, 2012; Pikkarainen, Pikkarainen, Karjaluoto, & Pahlila, 2004; Venkatesh & Bala, 2008; Wu & Wang, 2005). Studies like these constantly add new determinants to the model. Currently this has led to a third version: TAM3 (see Figure 1). The TAM3 model shows how two independent variables predict the *behavioral intention* a person has towards using a specific technology. These two variables are *perceived usefulness* and *perceived ease of use* (Venkatesh & Bala, 2008). Both of these variables in turn depend on several underlying independent variables. The TAM3 model can therefore be considered as a model with three parts: behavioral intention and predictors, perceived usefulness and predictors and perceived ease of use and predictors. In the following paragraphs, each of the variables will be described briefly.

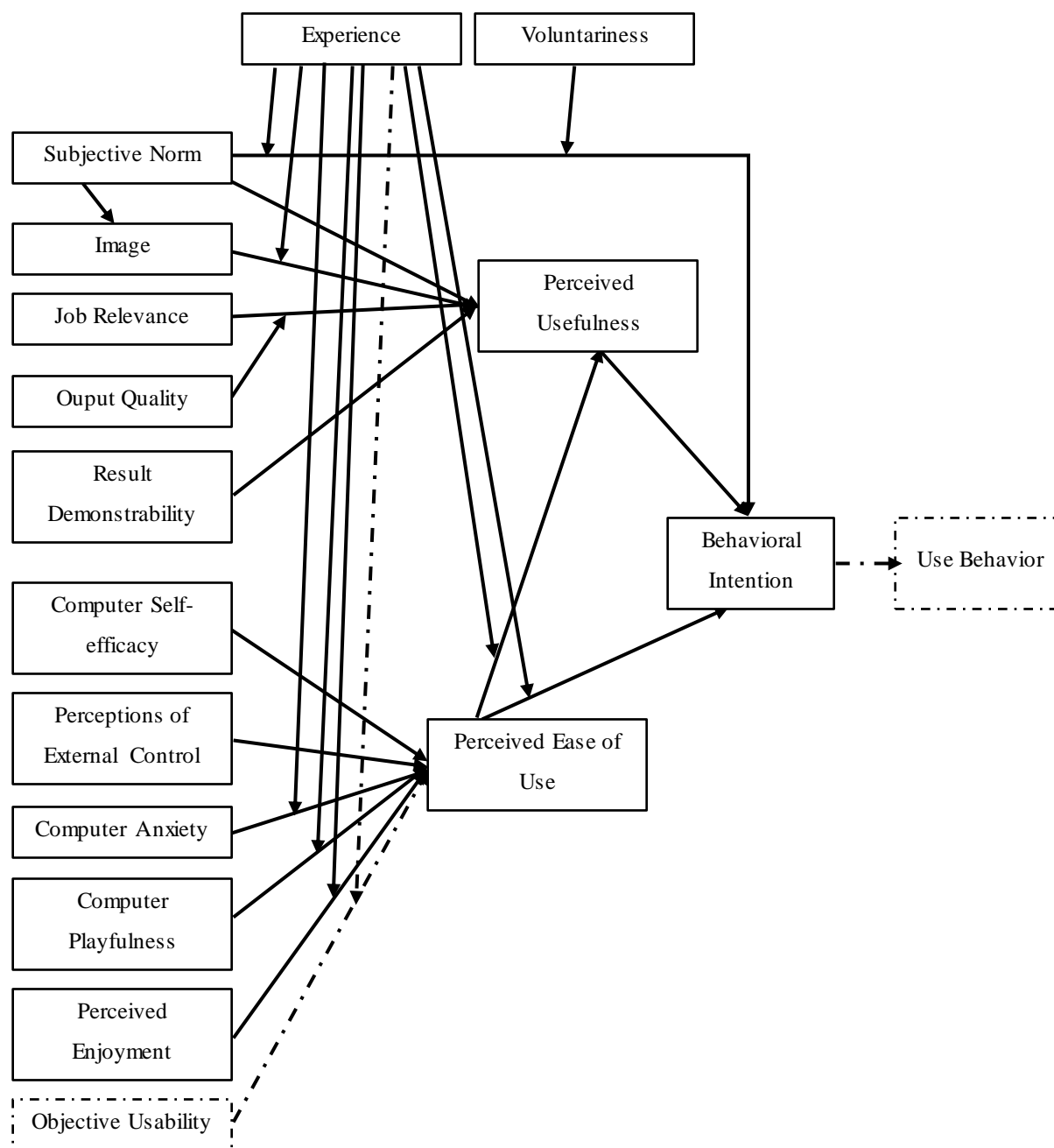


Figure 1. Schematic representation of the factors found to influence use behavior according to the TAM3 model. The arrows represent correlations between variables, bold arrows emerging from experience, voluntariness and output qualities represent moderation effects. Dotted lines represent variables, correlations and moderation effects proposed by the TAM3 model, but not measured by this study. Adapted from “Technology Acceptance Model3 and a Research Agenda on Interventions,” by V. Venkatesh and H. Bala, 2008, *Decision Sciences*, 39(2), p. 280.

Perceived usefulness is the degree to which someone sees wikis as useful tools for their working life. This is determined by perceptions of ease of use, *subjective norm*, *image*, *job relevance* and *result demonstrability*. The definition of ease of use is elaborated in the next paragraph. Subjective norm is “the degree to which an individual perceives that most people who are important to him think he should or should not use the system” (Venkatesh & Bala, 2008, p. 277) and is positively related to perceived usefulness: the more someone feels using the system is the norm, the more useful the technology will be considered. This effect is moderated by voluntariness. If people feel the use of wikis at work is voluntary, subjective norm is a less important influencer of usefulness perception (Venkatesh & Davis, 2000). The term image regards the way someone believes the use of wikis will improve their rank in the social system at work (Moore & Benbasat, 1991). If using wiki's is perceived to contribute to a better professional reputation at work, people are more motivated to use them. Job relevance tells how appropriate someone finds use of the technology for work purposes (Venkatesh & Davis, 2000). Job relevance influences perceived usefulness positively. This correlation is influenced by thoughts about output quality. The output quality is “the degree to which an individual believes that the system performs his or her job tasks well” (Venkatesh & Davis, 2000, p. 277). If output quality is regarded to be of a high level, the stronger job relevance will influence perceptions of usefulness. Lastly the result demonstrability is the concreteness of the results of wiki use (Moore & Benbasat, 1991). The perception of result demonstrability influences perceived usefulness positively.

Perceived ease of use is the degree to which wikis are perceived as easy to handle by the user. This is determined by *computer self-efficacy*, perceptions of *external control*, *computer playfulness*, *perceived enjoyment* and *objective usability*. Computer self-efficacy can be defined as the perception someone has about their own abilities to use the computer (Compeau & Higgins, 1995). It is positively correlated to perceptions of ease of use. When people feel they know how to use the computer, they also feel they wikis are easy to handle. The perception of external control is defined by the availability of the necessary resources to use wikis (Venkatesh, Morris, Davis, & Davis, 2003). If resources are available, this will positively influence feelings of ease of use. Computer anxiety is determined by feelings of fear when someone might need to use a computer to fulfill a task

(Venkatesh, 2000 in Venkatesh & Bala, 2008). If someone feels anxious towards using a computer, they will not feel wikis are ease to use. Therefore there is a negative correlation between computer anxiety and perceptions of ease of use. Computer playfulness is the degree to which someone's use of a computer is spontaneous (Webster & Martocchio, 1992). This includes feelings of concentration, curiosity and enjoyment triggered by the technology (Wang, Wu, & Wang, 2009). Perceived enjoyment is the degree to which the use of wikis is perceived as enjoyable by the user, not taking into account any performance consequences (Venkatesh, 2000 in Venkatesh & Bala, 2008). Both perceived enjoyment and computer playfulness are positively correlated to perceived ease of use. Objective usability is an objective measure of effort needed to finish a task (Venkatesh, 2000 in Venkatesh & Bala, 2008). In this study, this variable will not be taken into account as it is not possible to measure it given the time and resources.

As shown in Figure 1, the experience a user has with the technological system moderates several given correlations. The explanation provided by Venkatesh and Bala (2008) for this is that people adjust their perceptions when they become more experienced with the system.

As stated before, the TAM model is a model in development. Various studies of technology adoption and longitudinal studies have confirmed the influence of the variables on use behavior or are aimed towards adding factors to the existing model (e.g. Behrend, Wiebe, London & Johnson, 2010; Ifenthaler & Schweinbenz, 2013; Verkasalo et al., 2010). Besides the numerous validations of the model there are also some points of criticism. Goodhue (2007) for instance points out how the model does not consider if the technology fits the task because it only relies on individual perceptions. While it is good to not only rely on results of the TAM but also take into account underlying mechanisms, this problem is not an issue in this study as the technology fit was examined by relating the theory of knowledge creation to the possibilities of wikis. Another named problem is the lack of research underlying the constructs of perceived ease of use and perceived usefulness (Bagozzi, 2007). In this study, the proposed correlations by the TAM3 model will be tested in the context of healthcare so they will not just be taken for the truth.

Research questions

The named advantages of using wikis for knowledge creation and the lack of existing research of physicians' wiki perceptions have led to the following main question of research for this thesis:

How do physicians feel about using wikis for their professionalization?

To find an answer to this question, three smaller sub-questions and related hypotheses were formulated:

1. What perceptions of voluntariness, subjective norm, image, job relevance, output quality, result demonstrability, computer self-efficacy, external control, computer anxiety, enjoyment, usefulness and ease of use do physicians have about wiki's in the context of sharing knowledge with other physicians?

In earlier research, McGowan et al. (2012) used the first version of the TAM to investigate physicians' perceptions of using social media in general to share knowledge. They found 30% of the physicians thought social media were essential, beneficial and delivered high quality output. About 60% of the participants thought using social media would improve the quality of patient care and their work effectivity. It is expected the results of this study will show the same numbers for wikis. There are no comparative studies to derive hypotheses from for other correlations of the TAM3 model.

2. How do physicians perceptions of usefulness, ease of use and behavioral intention differ between age groups, genders, amount of working experience and function?

It is hypothesized perceptions between age groups and genders do not influence the proposed factors for wiki acceptance, no significant differences were found for social media in general (Cooper et al., 2012; McGowan et al, 2012). No earlier research of different perceptions between junior physicians and specialists and working experience was found.

3. Which of the proposed TAM3 factors affect their behavioral intention the strongest?

The hypotheses for this sub-question were based upon the correlations proposed by the original TAM3 model (Venkatesh & Bala, 2008). The model states behavioral intention is positively correlated with perceived ease of use, perceived usefulness and subjective norm. Perceived usefulness was hypothesized to be positively correlated to perceptions of image, job relevance, result demonstrability and subjective norm. Subjective norm would also effect image and job relevance would be correlated to output quality. Perceived ease of use was expected to positively correlate to computer self-efficacy, external control, computer playfulness and perceived enjoyment. Computer anxiety was expected to be negatively correlated to perceived ease of use. Moderation effects were hypothesized to be found for experience and voluntariness. Experience was expected to moderate the effects of subjective norm on behavioral intention and perceived usefulness, computer anxiety on perceived ease of use, computer playfulness on perceived ease of use, perceived enjoyment on perceived ease of use and perceived ease of use on perceived usefulness and behavioral intention. Voluntariness was expected to moderate the correlation between subjective norm and behavioral intention.

Method

Design

The research questions were answered by conducting a quantitative study. Physicians from a Dutch hospital and general practitioners were asked to complete an online adapted version of the TAM3 survey to measure their behavioral intention towards the use of wiki's for sharing knowledge with other professionals. The results were analyzed by comparing means and conducting correlational and multiple regression analyses.

Participants

A total of 71 physicians completed the survey ($N = 71$). 61 participants were working at the St. Antonius Hospital, including 30 junior physicians and 31 medical specialists. Five junior physicians and five physicians were working at different healthcare organizations.

The group of medical specialists included 18 men and 18 women. They were all between 33 and 62 years ($M = 46.69$, $SD = 8.67$) and had been working in their specialization for a minimum of one year and a maximum of 37 years ($M = 14.54$, $SD = 10.01$). The group of junior physicians included 12 men and 23 women, all between 23 and 34 years old ($M = 28.38$, $SD = 2.94$). They were working in their position between zero and nine years ($M = 1.99$, $SD = 2.06$).

Instrument

The instrument used was an adapted version of the TAM3 survey (see Appendix A), derived from the study of Venkatesh & Bala (2008). The survey contained 53 items. Items 1, 2, 3, 4, 6 and 7 were added to the original TAM3 survey to ask participants about their general characteristics like gender and function. Item 5 asked about the amount of experience with the system. This item was adapted to contain the options *never*, *a few times a year*, *a few times a month*, *a few times a week* and *a few times a day*, because the original item suggested people would use the system at least every day. This was not expected for wikis. Perceptions of ease of use, usefulness, behavioral intention, voluntariness, subjective norm, image, job relevance, output quality, result demonstrability, external control, computer anxiety, computer playfulness and perceived enjoyment were measured by 45 statements with a 7-point Likert scale ranging from *completely agree* to *completely disagree*. Each of the scales contained 3 or 4 items. The variable computer self-efficacy was measured by a 4-point Guttman-scale asking participants to tick all the options that applied to them when learning new computer applications, like *I could do this when there is nobody around to tell me what to do*. The original TAM3 survey also included a Guttman-scale for computer playfulness, but in this study this scale was replaced by a 7-point 3-item scale (Moon & Kim, 2001; Wang et al., 2009) because of comprehension reasons.

The original language of the survey was English, therefore the survey was translated in Dutch and re-translated into English by a peer to see if the translation was conducted correctly. A pilot group of five physicians tested the survey to see if the items were comprehensible for the target group, resulting in a better specification of the term *wikis* and the context of sharing knowledge.

It was not possible to conduct a factor analysis based on the full sample to see if the same theoretical factorial structure of the survey would be found. The Bartlett's test for sphericity was significant ($p < .000$, $df = 9.46$) indicating equal variances, but the Kaiser-Meyer-Olkin-value of .4 did not meet the minimum requirement of .6 for an adequate factor analysis (Tabachnick & Fidell, 2013 in Pallant, 2013). Therefore the theoretical TAM3 structure of factors was assumed for further analysis. The reliability of the scales was determined by calculating Cronbach's α (see Table 1). The initial reliability analysis showed an insufficient reliability value for the scale of external control, Cronbach's $\alpha = .60$. The item *I have control over wikis* was deleted from this scale because it was suspected to not be specific enough, which raised the value of Cronbach's α to .73. All scales had a Cronbach's α of at least .73, which can be interpreted as a good reliability when using the following rules of thumb: $\alpha \geq .9$ excellent, $\alpha \geq .8$ good, $\alpha \geq .7$ acceptable, $\alpha \geq .6$ questionable, $\alpha \geq .5$ poor and $\alpha < .5$ unacceptable (George and Mallery, 2003 in Gliem & Gliem, 2003).

Table 1

Cronbach's α Values of the Measurement Scales

Scale	Cronbach's α
Ease of Use	.74
Usefulness	.90
Job Relevance	.88
Output Quality	.86
Result Demonstration	.80
External Control	.73
Perceived Enjoyment	.90
Computer Anxiety	.90
Computer Playfulness	.80
Voluntariness	.80
Subjective Norm	.84
Image	.90
Behavioral Intention	.86

Procedure

Several hospitals were approached by e-mail to participate in this study. One hospital, the St. Antonius Hospital, took part. About twenty other participants were approached through the social network of the researcher. An email containing a short description of the purpose of the research, the estimated time for completion (10 minutes), confidentiality and anonymity assurance, an internal recommendation and a link to the online survey was sent to a group of 920 physicians. There was a two week time limit to fill out the survey. 71 physicians returned the survey ($N = 71$), the response rate was therefore about 8%.

Analysis

The results were quantitatively analyzed by using SPSS. All items were considered to be of ordinal level of measurement, except for gender and function which were nominal. Several items were reversely scored to correct for their negative formulation. A mean score for each scale consisting of more than one item was computed to gain a total score for each variable while correcting for the different amount of items between scales.

To explore perceptions, mean scores for each perception variable were compared. To find out if there were any significantly different perceptions of ease of use, usefulness and behavioral intention for different genders and functions, Mann-Whitney U tests were conducted as gender and function are variables of nominal measurement scale. Differences between perceptions of physicians from different age groups and years of working experience were analyzed by Kruskal-Wallis tests, as the data was not normally distributed. To determine what factors influence behavioral intention, Spearman correlations were calculated and a multiple regression analysis was conducted. A Spearman correlation was chosen because the variables were not normally distributed and experience and computer self-efficacy were ordinal. The level of significance was set to 95%.

Results

The results of this study are ordered by sub-question in this section. Together these results answer the main question regarding the intentions physicians have towards using wikis for their

professionalization. First, descriptive statistics regarding the use of wikis and perceptions physicians have about sharing knowledge with them are provided. This is followed by an analysis of differences between groups. Finally the results of a multiple regression analysis are presented.

Use and perceptions

Frequencies and means were retrieved to find out how often physicians use wikis and how they feel about using them for the purpose of knowledge sharing. More than half of the physicians reported to sometimes use wikis for work-related issues or private matters (see Table 2), 48% did this at least several times a week. 27% of the physicians said they never use wikis. Physicians use wikis only passively: 60% just reads information pages from others and only 4% adapts existing pages. No physicians reported to start new wiki pages.

Table 2

Reported Frequencies and Types of Wiki Use at Home and at the Workplace (N = 71)

Characteristic	<i>n</i>	%
Frequency of wiki use		
Several times a day	5	7
Several times a week	29	41
Several times a month	12	17
Several times a year	6	9
Never	19	27
Type of use		
Adds new pages	0	0
Reads, uses and adapts existing information pages	3	4
Reads and uses information pages	43	61
Does not use wikis	19	27
Unknown/missing	6	9

To interpret the total scores for perceptions, a range was determined based on the 7-point Likert scale: $M = 1.00 - 2.49$ very negative, $M = 2.50 - 3.49$ slightly negative, $M = 3.50 - 4.49$ neutral, $M = 4.50 - 5.49$ slightly positive and $M = 5.50 - 7.00$ very positive. As computer self-efficacy was

measured on a 4-point scale, a different set of labels was used: $M = 1.00 - 2.24$ negative, $M = 2.25 - 2.74$ neutral and $M = 2.75 - 4.00$ positive.

Physicians felt neutral about job relevance, output quality, result demonstrability and enjoyment. Perceptions of ease of use, usefulness, external control, computer playfulness and behavioral intention were slightly positive. Physicians' perceptions of voluntariness and computer-self-efficacy were very positive. Slightly negative scores were found for perceptions of subjective norm and image. Computer anxiety was perceived as very negative, which means physicians strongly did not feel anxious of computers. In Table 3, means and standard deviation values are presented. Some data was missing as not all participants answered all the questions. People who did not use wikis sometimes skipped questions. In the conclusion section, this issue is addressed.

Table 3

Perceptions of Physicians towards the Use of Computers and Wikis

Indicator	<i>n</i>	<i>M</i>	<i>Mdn</i>	<i>SD</i>	Range
Perceived Ease of Use	62	4.83	5.00	1.00	1.75–7.00
Perceived Usefulness	61	4.58	4.50	0.85	2.25–7.00
Job Relevance	61	3.92	4.00	1.18	1.67–6.33
Output Quality	61	4.17	4.00	1.13	2.00–6.00
Result Demonstrability	62	4.00	4.00	0.93	1.00–5.75
External Control	62	4.98	5.00	0.92	2.33–6.67
Perceived Enjoyment	61	4.42	4.00	1.06	1.00–7.00
Computer Anxiety	63	1.69	1.00	1.05	1.00–5.00
Computer Playfulness	62	4.62	4.33	1.00	2.33–7.00
Voluntariness	62	5.88	6.33	1.19	2.67–7.00
Subjective Norm	62	3.07	3.13	1.15	1.00–6.00
Image	62	2.80	3.00	1.30	1.00–6.00
Behavioral Intention	63	4.57	4.33	1.08	1.00–6.33
Computer Self-efficacy ^b	71	2.93	3.00	1.16	1.00–4.00

^aContains items that were negatively formulated and reversed. ^bAll variables were measured on a 7-point Likert scale, except for Computer Self-efficacy which was measured on a 4-point Guttman scale.

Differences between groups

To compare perceptions between different genders and function groups, non-parametric Mann-Whitney U tests were conducted. Since gender and function were both categorical variables with two groups, behavioral intention, ease of use and usefulness were continuous variables, the samples were random and the observations were independent, all necessary assumptions were met. The level of significance was tested two-tailed.

For perceptions of behavioral intention, the Mann-Whitney U test did not show any significant differences between men ($Mdn = 4.33$) and women ($Mdn = 4.33$), $U = 473.50$, $z = -.18$, $p = .86$, $r = .02$. Also, no differences were found between junior physicians ($Mdn = 4.83$) and medical specialists ($Mdn = 4.17$), $U = 459.50$, $z = -.29$, $p = .77$, $r = .04$. Perceptions of ease of use did not differ significantly between men ($Mdn = 4.75$) and women ($Mdn = 5.00$), $U = 443.50$, $z = -.41$, $p = .68$, $r = .05$. Perceptions of junior physicians ($Mdn = 5.00$) and medical specialists ($Mdn = 4.50$) also did not differ significantly, $U = 340.50$, $z = -1.79$, $p = .07$, $r = .23$. However, perceptions of usefulness were significantly different between junior physicians ($Mdn = 4.75$) and medical specialists ($Mdn = 4.25$), $U = 311.50$, $z = -2.07$, $p = .04$, $r = .27$, the specialists feeling a bit more negative. The effect can be considered small according to Cohen's criteria of $r = .1$ small effect, $r = .3$ medium effect and $r = .5$ large effect (Cohen, 1988 in Pallant, 2013). Between men ($Mdn = 4.50$) and women ($Mdn = 4.50$), no significant difference was found, $U = 424.50$, $z = -.45$, $p = .65$, $r = .06$.

Perceptions between different age groups and years of working experience were analyzed by means of Kruskal-Wallis tests. For every 10 years of age or experience, there was a group (e.g. 20-30 years, 30-40 years). The assumptions for Kruskal-Wallis tests were met, as there were random samples and independent observations.

The Kruskal-Wallis test showed no significant difference between behavioral intentions from people of different ages, $H(4) = .61$, $p = .96$. There was also no significant difference for behavioral intention between people with different amounts of working experience, $H(3) = .83$, $p = .84$. No significant differences between perceptions of usefulness were found for age, $H(4) = 4.67$, $p = .32$ and working experience, $H(3) = 3.44$, $p = .33$. Lastly there were no significant differences between

perceptions of ease of use for different age groups, $H(4) = 6.41, p = .32$ and working experience, $H(3) = 3.42, p = .33$.

Factors influencing behavioural intention

In order to find out which factors predict physicians intentions towards using wiki's the most, Spearman correlations and a multiple regression analysis were conducted. Assumptions of monotonic relationships between variables were met. Effect sizes were interpreted using the Cohen's standard (1988) of $r_s = .10 - .29$ indicating a small effect, $r_s = .30 - .49$ indicating a medium effect and $r_s = .50 - 1.00$ indicating a large effect (Cohen, 1988 in Pallant, 2013). The level of significance was tested one-tailed because of the directional hypotheses.

Behavioral intention was found to be correlated positively with a large effect with perceived ease of use ($r_s = .44, p < .001$) and perceived usefulness ($r_s = .63, p < .001$). A medium effect was found for subjective norm ($r_s = .21, p < .05$) and experience ($r_s = .42, p < .001$). Voluntariness was correlated to intention with a small effect, $r_s = .24, p < .05$. Most independent variables were also correlated to each other. See Table 4 for the corresponding correlation matrix.

Perceived usefulness correlated positively and with a large effect size to perceived ease of use ($r_s = .53, p < .01$) and job relevance ($r_s = .59, p < .01$). Medium effects were found for subjective norm ($r_s = .34, p < .01$), output quality ($r_s = .45, p < .01$), result demonstrability ($r_s = .43, p < .01$) and experience ($r_s = .44, p < .01$). Small effects were found for image ($r_s = .23, p < .05$) and voluntariness ($r_s = .63, p > .05$), the effect for voluntariness was not significant. For perceived usefulness, most independent variables correlated with each other too. In Table 5 the correlation matrix for perceived usefulness can be found.

Perceived ease of use correlated positively and with large effect sizes with external control ($r_s = .60, p < .01$), perceived enjoyment ($r_s = .59, p < .01$) and experience ($r_s = .56, p < .01$). Computer playfulness ($r_s = .40, p < .01$) and voluntariness ($r_s = .47, p < .01$) were correlated to perceived ease of use with a medium effect. A negative correlation was found between perceived ease

of use and computer anxiety ($r_s = -.16, p > .05$, but this was a small effect and not significant).

Independent variables correlated with each other again. See Table 6 for the correlation matrix.

Table 4

Spearman Correlations between Factors of Behavioral Intention

Variable	PU	PEU	BI	SN	EXP	VOL
PU	1					
PEU	.53***	1				
BI	.63***	.44***	1			
SN	.34**	.09	.21*	1		
EXP	.44***	.56***	.28*	.03	1	
VOL	.19	.47***	.24*	-.46***	.42***	1

Note. PU = perceived usefulness; PEU = perceived ease of use; BI = behavioral intention, SN = subjective norm; EXP = experience with wikis; VOL = voluntariness. Significance levels are one-tailed.

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

Table 5

Spearman Correlations between Factors of Perceived Usefulness

Variable	PU	PEU	SN	IM	JR	OQ	RD	EXP	VOL
PU	1								
PEU	.53**	1							
SN	.34**	.09	1						
IM	.23*	-.20	.47**	1					
JR	.59**	.21	.37**	.41**	1				
OQ	.45**	.37**	.31**	.16	.59**	1			
RD	.43**	.33**	.20	.05	.32**	.21	1		
EXP	.44**	.56**	.03	-.14	.28*	.18	.29*	1	
VOL	.19	.47**	-.46**	-.28*	-.13	.10	.05	.42**	1

Note. PU = perceived usefulness; PEU = perceived ease of use; SN = subjective norm; IM = image; JR = job relevance; OQ = output quality; RD = result demonstrability; EXP = experience with wikis; VOL = voluntariness. Significance levels are one-tailed.

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

Table 6

Spearman Correlations between Factors of Perceived Ease of Use.

Variable	PEU	CSE	EC	CA	CP	PE	EXP	VOL
PEU	1							
CSE	.08	1						
EC	.60**	.05	1					
CA	-.16	-.14	-.27*	1				
CP	.40**	.08	.42**	-.06	1			
PE	.59**	-.02	.24*	-.04	.62**	1		
EXP	.56**	.10	.56**	-.25*	.36**	.32**	1	
VOL	.47**	-.08	.45**	-.25*	.26*	.38**	.42**	1

Note. PEU = perceived ease of use; CSE = computer self-efficacy; EC = external control; CA = computer anxiety; CP = computer playfulness; PE= perceived enjoyment; EXP = experience with wikis; VOL = voluntariness. Significance levels are one-tailed.

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

A multiple regression was conducted to find out which factors of the TAM3 model predict behavioral intention, ease of use and usefulness the best. Separate regression models were used for the three constructs, so the assumption of singularity was not violated. No correlations $r > .9$ were found between independent variables, tolerance values were all above .23 and variance inflation factors were all below 4.5, which means the assumptions of multicollinearity were met (Pallant, 2013). Normality, linearity and homoscedasticity were assessed by viewing normality and scatter plots for standardized residuals. One case was deleted because it was an influential outlier for the model of perceived ease of use (Cook's $D = 1.88$).

The model of behavioral intention as proposed by the TAM3 model explained 38% of variance in behavioral intention, 59% of variance in perceived usefulness and 52% of variance in perceived ease of use (see Table 7). Significant contributions to the model of behavioral intention were only made by perceived usefulness ($\beta = .49, p = .00$). For perceived usefulness, perceived ease of use ($\beta = .44, p = .00$) and job relevance ($\beta = .37, p = .00$) predicted a significant amount of variance. Perceived ease of use was significantly predicted by external control ($\beta = .42, p = .00$) and enjoyment ($\beta = .74, p$

= .00). Also, a significant interaction effect between perceived enjoyment and experience was found ($\beta = -.29, p = .04$).

Table 7

Multiple Regression Models predicting Behavioral Intention, Ease of Use and Usefulness

Variables	<i>B</i>	<i>SE B</i>	β	<i>p</i>	<i>R</i> ²
Model Behavioral Intention					.38
Constant	0.91	0.77		.24	
PU	0.62	0.17	.49	.00	
PEU	0.15	0.14	.14	.28	
SN	0.02	0.12	.02	.84	
SN*VOL	-0.11	0.12	-.11	.33	
SN*EXP	0.10	0.09	.12	.31	
PEU*EXP	-0.05	0.11	-.05	.67	
Model Perceived Usefulness					.59
Constant	0.90	0.54		.11	
RD	0.14	0.09	.15	.13	
IM	0.12	0.08	.19	.11	
PEU	0.37	0.08	.44	.00	
SN	-0.01	0.09	-.01	.92	
JR	0.27	0.08	.37	.00	
OQ*JR	-0.06	0.07	-.09	.37	
SN*EXP	0.09	0.07	.15	.15	
PEU*EXP	0.02	0.08	.02	.81	
Model Perceived Ease of Use					.52
Constant	-0.42	.83		.62	
CSE	0.16	.09	.19	.06	
EC	0.45	.13	.42	.00	
CA	0.07	.10	.07	.48	
CP	-0.20	.20	-.20	.33	
PE	0.77	.18	.74	.00	
CP*EXP	-0.05	.14	-.05	.75	
CA*EXP	0.00	.07	.01	.96	
PE*EXP	-0.34	.17	-.29	.04	

Note. PU = perceived usefulness; PEU = perceived ease of use; SN = subjective norm; RD = result demonstrability; IM = image; JR = job relevance; OQ = output quality; CSE = computer self-efficacy; EC = external control; CA = computer anxiety; CP = computer playfulness; PE = perceived enjoyment; EXP = experience with wikis; VOL = voluntariness.

Conclusion and discussion

The purpose of this thesis was to find out how physicians feel about using wikis for their professionalization. The TAM3 was used as a framework to find out how they perceived usefulness and ease of use and to define which factors predict behavioral intention the most. It was found physicians were largely familiar with the technology of wikis, as most of them used them at work or at home. Their use was generally passive: physicians mostly only read information posted by others.

Physicians reported positive perceptions of ease of use, external control and voluntariness regarding wikis. Their computer self-efficacy was high. Perceptions of computer anxiety and image were negative. Perceptions of job relevance, output quality, result demonstrability and enjoyment were neutral, just like the reported behavioral intention to use wikis for sharing knowledge in professional settings. This implies there is no substantial resistance against the implementation of wikis, but also no real enthusiasm.

No differences in perceptions of usefulness, ease of use and behavioral intentions were found between men and women, different age groups and different amounts of working experience. These results were in line with earlier research by McGowan et al. (2012), who concluded the adoption of social media was not influenced by age or gender. However, perceptions of usefulness did differ significantly between junior physicians and specialists. Junior physicians felt slightly more positive about the usefulness of wiki's. This might be explained by differences between tasks performed by junior physicians and medical specialists at work. Junior physicians might focus more on study tasks and spend a larger amount of time learning on the web.

Not all hypotheses stated about the underlying mechanism of behavioral intention could be confirmed. For behavioral intention only perceived usefulness was found to be significantly correlated, while perceived ease of use and subjective norm were expected to be as well (Venkatesh & Bala, 2008). This suggests physicians feel the added value of a technology to their work is most important when deciding to adopt it, possibly taking usability for granted. Holden and Karsh (2010) found ease of use unlikely to directly affect behavioral intention too. They stated technology that is hard to use will probably not be perceived as very useful. Perceived usefulness might not seem a significantly strong predictor for behavioral intention directly, but it was found to be a strong

significant predictor for perceived usefulness. This confirmed the hypothesis. Job relevance was also found to be a strong significant predictor, but this correlation was not influenced by output quality as hypothesized. Correlations between usefulness and image, subjective norm and result demonstrability were not significant, so this hypothesis was not confirmed either. Physicians did not feel it is important for wikis to boost their reputation or that they can explain to others what benefits are. Wikis seem to be useful on a more personal level. This might also be the reason why subjective norm did not correlate with perceived usefulness. Holden and Karsh (2010) noted different results might occur when subjective norm and image are interpreted in terms of organizational culture instead of personal bonds (e.g. *my supervisor thinks I should use wikis*).

Predictors for perceived ease of use confirmed in this study were perceptions of external control and enjoyment. Physicians found wikis easy to use when they are compatible with the systems in use and fun. Computer anxiety was not correlated to perceived ease of use at all, while it was expected to correlate negatively. This different outcome is reasonable since most physicians need to use computers at work all the time and are therefore used to them. It was a constant factor with a lack of variance and no predictive power. Bacigalupe (2011) earlier described how the continuous development of virtual communication is a reason to be cautious when applying existing models, because these might not fit the present-day technology use. It is therefore proposed to delete computer anxiety from the TAM3 model when it is used in the context of a working environment where people are expected to use computers frequently.

The hypothesized moderation effects of experience with the system, voluntariness and output quality could not be confirmed in this study, except for an interaction effect between experience and perceived enjoyment. The found effect implies that an experienced user finds it less important if the system provides enjoyment for ease of use.

Research limitations

This was a research of perceptions where no actual wiki use was measured. This means only subjective data was gathered. In the TAM3, objective use is a factor of perceived ease of use. Therefore the correlation coefficients regarding perceived ease of use might be over- or

underestimated. Furthermore, this study was based on the assumption behavioral intention was correlated to actual adoption. This correlation was not investigated within the study. Another point of attention needs to go out to survey translation. As the English language sometimes offers more terms than Dutch, some items overlapped more in Dutch than they did in English. This has possibly stimulated participants to fill in same results for all questions of scale. Also, many participants in the study who did not actually use wikis skipped the questions about perceptions. Possibly they felt they did not know wikis well enough to say how they feel about them. Multiple hospitals were asked to participate, but only one hospital took part on a great scale. Results might have differed if other health organizations with other cultures of learning would have contributed. The results of this study can therefore not be generalized to the entire population of physicians. Furthermore, completing the questionnaire was voluntary. It is possible physicians who felt negative towards wikis or people who are unfamiliar with wikis did not want to spend time filling it out. The positive attitudes might therefore be overestimated.

Implications for practice

Based on the findings of this research it can be concluded physicians are mostly neutral about using wikis for their professionalization and most physicians are already familiar with the technology of wikis. In order to keep a wiki running it is important participants are also stimulated to contribute to the wikis by writing new pages and make changes to existing pages (Kaplan & Haenlein, 2010). If organizations want to stimulate physicians to use wikis, they should focus on the strongest predictors for behavioral intention: it should be clear what the added value of using wikis for their work is, resources need to be available and the wiki should be designed in a way it is pleasant to use. A note here is that the practice of work physicians face is always subject to change. Standards of health are set by medical professionals themselves and are constantly being adapted to fit new patient needs (KNMG, 2013). The definition of the added value of wikis in practice therefore is too. Because social media like wikis foster communication between professionals, they also in turn induce new standards and patient needs. Another point of attention are those whose perceptions are outside the mean range. People who feel very positive about using wikis for work could possibly be regarded as leaders for

raising awareness of the benefits of wikis within their organization. Moreover, it must be remembered that wikis can be stimulated but using them should be voluntary in order to be most effective. The predictors of wiki use discussed in this study can be implemented in designs of wikis aimed at physicians in order to change negative attitudes into positive ones.

Implications for future research

To gain more insight into the perceptions of physicians, it is recommended more qualitative research is conducted. Physicians could be asked for reasons behind their perceptions. It might also be interesting to investigate this matter on a larger scale. Regarding the TAM3 model, it would be useful to investigate the factors computer anxiety and computer playfulness in more depth. In this research a different scale had to be used for computer playfulness, as the original scale did not match the language of professionals very well. Computer anxiety becomes rare in the modern technological working environment. Considering the great influences of job relevance and perceived enjoyment that were found, there should be a focus on the extension of the TAM3 model with more specific items in the context of healthcare. As Bagozzi (2007) puts it, it is necessary to find the deeper explanation behind TAM3 variables instead of just trying to add more variables to explain more variance. What exactly makes a physician feel a technology is relevant or enjoyable?

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Appendix A – Survey

Deze vragenlijst maakt deel uit van een masterthesis Onderwijskunde waarin de intentie van artsen om wiki's te gebruiken bij hun professionalisering wordt onderzocht.

Wiki's kunnen de uitwisseling van kennis tussen artsen ondersteunen. Met dit onderzoek wordt in kaart gebracht hoe artsen in de praktijk denken over deze toepassing. Er worden enkele indicatoren gemeten voor bereidheid tot het gebruik van wiki's bij kennisdeling. De resultaten kunnen als input dienen bij het maken van beslissingen over het inzetten van wiki's voor sociaal leren.

Eerst worden 7 algemene vragen gesteld. Daarna volgen 45 stellingen en een meerkeuzevraag.

Het invullen van de vragenlijst duurt ongeveer 10 minuten. Uw antwoorden worden anoniem en vertrouwelijk verwerkt. Door deze vragenlijst in te vullen, geeft u tevens toestemming om deze gegevens binnen dit onderzoek te gebruiken.

Hartelijk dank voor uw medewerking!

Natasha van Rooij, masterstudente Onderwijskunde Universiteit Utrecht

Algemeen

Eerst worden 7 algemene vragen gesteld.

Definitie 'wiki':

Een wiki is een webpagina waarop u samen met andere professionals nieuwe informatie kunt toevoegen en bestaande teksten kunt bewerken. Daardoor is sprake van één gezamenlijke informatietekst per onderwerp. De onderwerpen zijn gestructureerd op de website zodat deze makkelijk kunnen worden gevonden. Wiki's kunnen openbaar zijn of alleen toegankelijk met een account. Soms wordt gebruik gemaakt van een vorm van peerfeedback alvorens wijzigingen definitief worden doorgevoerd. Een voorbeeld van een wiki is <http://www.wikipedia.com/>.

1. Wat is uw geslacht?

- Man
- Vrouw

2. Wat is uw leeftijd?

3. Wat is uw huidige medische specialisatie?

4. Hoelang bent u al werkzaam in deze specialisatie?

5. Hoe vaak gebruikt u wiki's (zowel werkgerelateerd als niet werkgerelateerd)?

- Een paar keer per dag.
- Een paar keer per week.
- Een paar keer per maand.
- Een paar keer per jaar.
- Nooit.

6. Indien u wiki's gebruikt, welke wiki gebruikt u dan het meest om kennis met andere professionals uit te wisselen?

7. Indien u wiki's gebruikt bij uw werk, op welke manier doet u dit dan? Meerdere antwoorden zijn mogelijk.

- Ik lees en gebruik de informatie van anderen.
- Ik pas informatie van anderen aan.
- Ik voeg zelf nieuwe onderwerpen toe.
- Ik gebruik geen wiki's.

verbetert mijn werkeffectiviteit.

8. Ik vind het gebruik van wiki's bij kennisuitwisseling nuttig bij mijn werk.

Relevantie

	Helemaal mee oneens	Behoorlijk mee oneens	Een beetje mee oneens	Niet mee eens / niet mee oneens	Een beetje mee eens	Behoorlijk mee eens	Helemaal mee eens
9. Bij mijn werk is het belangrijk om wiki's te gebruiken bij kennisuitwisseling.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. Bij mijn werk is het relevant om wiki's te gebruiken bij kennisuitwisseling.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. Wiki's zijn een toepasselijk middel voor het uitwisselen van kennis binnen mijn werkveld.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Kwaliteit van de informatie

	Helemaal mee oneens	Behoorlijk mee oneens	Een beetje mee oneens	Niet mee eens / niet mee oneens	Een beetje mee eens	Behoorlijk mee eens	Helemaal mee eens
12. De kwaliteit van de informatie die ik verkrijg uit wiki's is hoog.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13. Ik heb geen problemen met de kwaliteit van de informatie die ik verkrijg uit wiki's.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14. De informatie die ik uit wiki's kan verkrijgen is uitstekend.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Demonstratie van resultaten

	Helemaal mee oneens	Behoorlijk mee oneens	Een beetje mee oneens	Niet mee eens / niet mee oneens	Een beetje mee eens	Behoorlijk mee eens	Helemaal mee eens
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15. Ik vind het makkelijk om anderen uit te leggen wat de resultaten van het gebruik van wiki's bij kennisuitwisseling zijn.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16. Ik denk dat ik de consequenties van het gebruik van wiki's bij kennisuitwisseling goed aan anderen uit kan leggen.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17. Het is voor mij duidelijk wat de uitkomsten van het gebruik van wiki's bij kennisuitwisseling zijn.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18. Ik vind het moeilijk om uit te leggen waarom het gebruik van wiki's bij kennisuitwisseling wel of niet voordelig zou kunnen zijn.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Controle

	Helemaal mee oneens	Behoorlijk mee oneens	Een beetje mee oneens	Niet mee eens / niet mee oneens	Een beetje mee eens	Behoorlijk mee eens	Helemaal mee eens
19. Ik heb de controle over wiki's.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
20. Ik beschik over de middelen die ik nodig heb om wiki's te gebruiken.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
21. Wanneer ik de mogelijkheden, kansen en kennis krijg die nodig zijn om wiki's te gebruiken, vind ik het gemakkelijk om wiki's te gebruiken.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
22. Wiki's kunnen niet samen worden gebruikt met de andere systemen die ik gebruik.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Plezier

Helemaal mee oneens	Behoorlijk mee oneens	Een beetje mee oneens	Niet mee eens / niet mee oneens	Een beetje mee eens	Behoorlijk mee eens	Helemaal mee eens
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Zelfeffectiviteit

46. Wanneer ik nieuwe computerprogramma's zou moeten gebruiken om een taak te voltooien, zou ik dit kunnen wanneer... (Selecteer alle antwoorden die op u van toepassing zijn.)

- ...er niets of niemand in de buurt is om mij te vertellen wat ik moet doen.
- ...ik alleen de ingebouwde hulpfunctie voor assistentie tot mijn beschikking heb.
- ...iemand mij eerst heeft laten zien hoe ik het programma moet gebruiken.
- ...ik soortgelijke programma's eerder heb gebruikt om eenzelfde taak te voltooien.

Bent u bereid deel te nemen aan een eventueel vervolginterview om uw gegeven antwoorden toe te lichten?

Zo ja, vul uw email-adres in. Deze is alleen zichtbaar voor de onderzoeker.

Wilt u graag een exemplaar van de onderzoeksresultaten ontvangen wanneer het onderzoek is afgerond?

Zo ja, vul uw emailadres in. Deze is alleen zichtbaar voor de onderzoeker.

Bedankt voor uw deelname!

Appendix B – Responses at item-level

Table B1

Descriptive Statistics of Variables for Wiki Perceptions

Indicators	<i>n</i>	<i>M</i>	<i>SD</i>	Range
Ease of use				
1. Ik vind het makkelijk om wiki's te gebruiken.	62	5.40	1.29	1-7
2. Ik vind het makkelijk om met wiki's kennis uit te wisselen met anderen.	62	4.06	1.34	1-7
3. De werking van wiki's is duidelijk en eenvoudig te begrijpen.	62	5.13	1.32	1-7
4. Werken met wiki's vraagt weinig mentale inspanning.	62	4.74	1.38	1-7
Usability				
5. Het gebruik van wiki's bij kennisuitwisseling verbetert mijn werkprestaties.	61	4.72	.90	2-7
6. Het gebruik van wiki's bij kennisuitwisseling verhoogt mijn productiviteit.	61	4.41	1.02	2-7
7. Het gebruik van wiki's bij kennisuitwisseling verbetert mijn werkeffectiviteit.	61	4.49	.99	2-7
8. Ik vind het gebruik van wiki's bij kennisuitwisseling nuttig bij mijn werk.	61	4.70	.96	2-7
Job Relevance				
9. Bij mijn werk is het belangrijk om wiki's te gebruiken bij kennisuitwisseling.	61	3.77	1.37	1-6
10. Bij mijn werk is het relevant om wiki's te gebruiken bij kennisuitwisseling.	61	3.85	1.26	1-6
11. Wiki's zijn een toepasselijk middel voor het uitwisselen van kennis binnen mijn werkveld.	61	4.13	1.31	2-7
Output Quality				
12. De kwaliteit van de informatie die ik verkrijg uit wiki's is hoog.	61	4.18	1.25	1-6
13. Ik heb geen problemen met de kwaliteit van de informatie die ik verkrijg uit wiki's.	61	4.31	1.35	1-6

14. De informatie die ik uit wiki's kan verkrijgen is uitstekend.	61	4.03	1.25	1-6
Result demonstrability				
15. Ik vind het makkelijk om anderen uit te leggen wat de resultaten van het gebruik van wiki's bij kennisuitwisseling zijn.	62	3.94	1.20	1-6
16. Ik denk dat ik de consequenties van het gebruik van wiki's bij kennisuitwisseling goed aan anderen kan uitleggen.	61	4.07	1.15	1-6
17. Het is voor mij duidelijk wat de uitkomsten zijn van het gebruik van wiki's bij kennisuitwisseling.	62	4.03	1.12	1-6
18. Ik vind het moeilijk om uit te leggen waarom het gebruik van wiki's bij kennisuitwisseling wel of niet voordelig zou kunnen zijn. ^a	62	4.03	1.24	1-7
External Control				
19. Ik beschik over de middelen die ik nodig heb om wiki's te gebruiken.	61	4.89	1.08	1-6
20. Wanneer ik de mogelijkheden, kansen en kennis krijg die nodig zijn om wiki's te gebruiken, vind ik het gemakkelijk om wiki's te gebruiken.	62	4.95	.98	2-7
21. Wiki's kunnen niet samen worden gebruikt met de andere systemen die ik gebruik. ^a	62	5.19	1.34	2-7
Enjoyment				
22. Ik vind het leuk om wiki's te gebruiken bij de uitwisseling van kennis.	61	4.41	1.22	1-7
23. Het gebruiken van wiki's is een aangenaam proces.	61	4.54	1.06	1-7
24. Ik heb plezier wanneer ik wiki's gebruik.	61	4.30	1.20	1-7
Computer Anxiety				
25. Ik ben niet bang om computers te gebruiken. ^a	63	1.65	1.14	1-7
26. Ik word nerveus van het werken met computers.	63	1.79	1.39	1-6
27. Ik voel me onbehaaglijk wanneer ik computers moet gebruiken.	63	1.71	1.26	1-6

28. Ik voel me ongemakkelijk wanneer ik computers moet gebruiken.	62	1.61	1.15	1-6
Computer Playfulness				
29. Het gebruiken van wiki's zorgt ervoor dat ik kennisuitwisseling als plezierig ervaar.	62	4.48	1.04	2-7
30. Het gebruik van wiki's prikkelt mijn nieuwsgierigheid.	62	5.00	1.13	3-7
31. Het gebruik van wiki's zorgt ervoor dat ik een onderzoekende houding aanneem.	62	4.37	1.35	1-7
Voluntariness				
32. Als ik wiki's gebruik, doe ik dat vrijwillig.	62	5.85	1.07	4-7
33. Ik hoef van mijn leidinggevende geen wiki's te gebruiken.	62	5.87	1.49	2-7
34. Het gebruik van wiki's is niet verplicht bij kennisuitwisseling voor mijn werk.	61	6.00	1.44	2-7
Subjective Norm				
35. Mijn leidinggevende vindt dat ik wiki's zou moeten gebruiken bij kennisuitwisseling.	62	2.55	1.52	1-6
36. Mijn collega's of andere professionals vinden dat ik wiki's zou moeten gebruiken bij kennisuitwisseling.	62	2.47	1.53	1-6
37. Het management van mijn organisatie is behulpzaam wanneer iemand wiki's wil gebruiken.	62	3.60	1.25	1-6
38. Over het algemeen steunt de organisatie het gebruik van wiki's bij kennisuitwisseling.	62	3.66	1.27	1-6
Image				
39. Mensen in mijn organisatie die wiki's gebruiken voor kennisuitwisseling hebben veel aanzien.	62	3.13	1.31	1-6
40. Mensen die wiki's gebruiken voor kennisuitwisseling hebben in mijn organisatie meer aanzien dan degenen die dit niet doen.	61	2.84	1.46	1-6
41. Het gebruiken van wiki's is een statussymbool binnen mijn organisatie.	62	2.47	1.47	1-6
Intention				

42. Als ik toegang tot wiki's zou hebben, zou ik de intentie hebben om ze te gebruiken voor kennisuitwisseling.	63	4.44	1.24	1-6
43. Als ik toegang tot wiki's zou hebben, voorspel ik dat ik deze ook daadwerkelijk zou gebruiken bij kennisuitwisseling.	62	4.55	1.10	1-6
44. Ik ben van plan om binnen het komende half jaar wiki's te gebruiken bij kennisuitwisseling.	63	4.78	1.36	1-7
Self-efficacy ^b				
45. Wanneer ik nieuwe computerprogramma's zou moeten gebruiken om een taak te volbrengen, zou ik dit kunnen wanneer...	71	2.93	1.16	1-4

^aScores for negatively formulated items are reversed. ^bAll variables were measured on a 7-point Likert scale, except for Computer Self-efficacy which was measured on a 4-point Guttman scale.

