

MASTER

Back to school!

should companies educate their customers?

Fokkens, S.A.

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Back To School! Should Companies Educate Their Customers?

By

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In partial fulfilment of the requirements for the degree of

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Abstract

The increased number of retailers and product manufacturers that discover customer education as a means to offer product augmentation to their customers gave rise to this study. A quantitative study was performed to review the effectiveness of the proposed customer education – satisfaction relation and its underlying mechanisms. Based on the analysis of a sample of 567 customers from a Dutch retailer in multipurpose GPS-devices, conclusions were drawn.

The most important conclusion is that customer education increases both retailer and product satisfaction through perceived product augmentation. No solid support for either rejecting or confirming learning outcomes (skills, knowledge and affect) as another underlying mechanism could be found.

The most important contribution to the literature is the quantitative support for the existence of the customer education – satisfaction relation concerning consumer electronics. For managers of both the retailer and the product brand a collaborative arrangement to organize customer education is advised since both profit from the outcomes. Future researchers are encouraged to apply this study to a more general sample of the population and for more common household electronics.

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Steven Fokkens

Executive summary

Lately, commercial producers and retailers of high-tech consumer products have ‘rediscovered’ customer education or “*the process by which companies systematically share their knowledge and skills with external customers to foster the development of positive customer attitudes*” (Honebein, 1997, p. 8) as a means to augment their products. Instead of solely offering the product, these companies try to offer an experience in order to differentiate their products. So instead of providing a product manual with a smartphone, customers get 24/7 online support for whatever problem they might encounter.

Although customer satisfaction is considered the most important driver for customer education (e.g. Oumlil & Williams, 2000), specific research on the this topic concerning tangible consumer goods is lacking (e.g. Challagalla, Venkatesh, & Kohli, 2009). Therefore, the aim of this paper is twofold; firstly, it is aimed at providing quantitative support for the assumed positive effect of customer education on customer satisfaction. Second, the underlying structures of this relation will be reviewed as well as where the potential satisfaction is projected at; the product or the retailer.

Theory and hypotheses development

Customer satisfaction is, as an increaser of overall firm performance (Anderson, Fornell, & Lehmann, 1994) one of the most important drivers for customer education (e.g. Honebein, 1997; Oumlil & Williams, 2000). Customer education is thought to create a favorable attitude towards both the product and the company (McNeal, 1978). Apart from satisfaction, some further examples of the hypothesized results of customer education are; customer loyalty (e.g. Bell & Eisingerich, 2007; Hennig-Thurau, 2000), increased customer trust (Eisingerich & Bell, 2008), reduced complaints (Honebein, 1997) and positive word-of-mouth (Honebein, 1997)

In order to test the proposed relations, a conceptual model is defined which can be used to analyse the effect of customer education on customer satisfaction. The conceptual model is based on a combination of the multidimensional view on learning outcomes of Kraiger et al. (1993), combined with part of Olivers’ (1993) satisfaction model. Since it is decided to focus on the post-purchase effects of customer education, disconfirmation of expectations is excluded from Olivers’ (1993) model and only the affect – satisfaction relation is included. Further, an equity based satisfaction transaction between retailer satisfaction and product satisfaction was included based on the study by Oliver and Swan (1989). The amount of product usage and perceived company effort were included based on the literature review.

It is argued that customer education increases product satisfaction through increased learning outcomes (skills, knowledge and affect) and the amount of product usage. Further, retailer satisfaction is thought to increase based on higher perceived company effort which is caused by

customer education. Finally two moderating factors; self-efficacy and personal innovativeness were added which are thought to decrease the effect of customer education on its intended outcomes

Method

Based on the conceptual model a measurement instrument was designed. The questions were adopted from prior research when possible. This questionnaire was sent to customers of WayPoint, a Dutch retailer that sells multipurpose GPS-devices and offers an extensive range of educational facilities. This company was chosen since the devices they sell are fairly complex. The questionnaire led to 567 usable responses. The model was tested using Partial Least Squares (PLS), a specific Structural Equation Modelling (SEM) estimation technique that was chosen since it is relatively robust to violations of regression assumptions.

Results

After deletion of cases with missing values and outliers, the dataset was further analyzed. The data showed no common method bias but the normality assumption was not met; a majority of the variables were significantly skewed. Multicollinearity was not an issue however due to very high cross loadings between the latent variables, the discriminant validity is questionable.

From the thirteen hypotheses, 10 showed to be significant. Customer education showed to have a strong effect on perceived company effort and subsequently on retailer satisfaction. Further a strong transaction of satisfaction was measured from retailer satisfaction to product satisfaction. Concerning the learning outcomes, very small predictive effects were measured; customer education showed to be positively related to knowledge, skills and emotional attachment. Only the latter two also showed a subsequent effect on product satisfaction which was also very small. The amount of product usage was found to be weakly predicted by emotional attachment and product skills but did not have an effect on product satisfaction. Both moderators showed no significant influence on the model.

These results justified two post-hoc analyses. Since the effect of customer education on the three learning outcomes was very weak, it was tested whether they would remain significant when a direct effect was added to the model. The effects became insignificant after the inclusion of the direct effect. Further both perceived company effort and retailer satisfaction showed to be partial mediators. In a second test, the model was tested for multi-group moderation. Both low versus high age and low versus high level of education showed to be significantly moderating the perceived company effort – retailer satisfaction relation.

Discussion

First of all, the limitations which are involved in this study should be mentioned. The sample consists of relatively old (more than 50% is over 60 years of age) male (95%) respondents from which the majority has a higher education (53%). This being said, the results can be useful for retailers and manufacturers of high involvement, niche-products like these GPS-devices. Stating that implementing various forms of customer education would have similar results for retailers of complex products that are used by the majority of the population (e.g. mobile phones) would be ill advised without further research. This being said, several interesting findings are worth mentioning.

The most important finding is that the results of this paper provide quantitative support for the hypothesis that customer education increases satisfaction in the B2C market for complex tangible products. No solid proof has been found that the learning outcomes act as an explaining mechanism. The results indicate that customer education should be seen as a product augmentation that leads to higher product satisfaction through increased satisfaction with the retailer and perceived effort.

Managers of retail stores that sell consumer electronics should seriously consider adopting customer education if they want to increase the level of satisfaction among their customers. Another argument for implementing customer education is distinguishing themselves from their competitors, including web shops which gain an increasing market share and are less focussed on personal attention. Since the retailer and also the manufacturer of the products (in terms of increased product satisfaction) profit from customer education both should look for ways of collaboration. For a product manufacturer, collaboration could improve the way its products are explained and sold. This way, some of the satisfaction due to the product - service augmentation could be projected on the brand of the product as well which can improve brand loyalty.

The most important implications for future research are to check if the results hold up for e.g. customers who purchased mobile phones or other more ordinary household electronics. If such a study would be performed, it would further be well advised to modify and more extensively pre-test the used questionnaire to ensure discriminant validity of the measurement items. In addition, a change in the research design would be advised in order to test whether the learning outcomes as an explaining mechanism for the customer education – satisfaction relation should be rejected or confirmed.

Table of contents

| | |
|--|-----------|
| ABSTRACT | 3 |
| ACKNOWLEDGEMENTS | 4 |
| EXECUTIVE SUMMARY | 5 |
| LIST OF FIGURES AND TABLES | 10 |
| 1 INTRODUCTION | 11 |
| 2 THEORY AND HYPOTHESES DEVELOPMENT | 12 |
| 2.1 LITERATURE REVIEW..... | 12 |
| 2.1.1 <i>Customer education</i> | 12 |
| 2.1.2 <i>Customer satisfaction</i> | 14 |
| 2.1.3 <i>Learning outcomes</i> | 17 |
| 2.2 CONCEPTUAL MODEL AND HYPOTHESES DEVELOPMENT..... | 17 |
| 2.2.1 <i>Customer education and learning outcomes</i> | 19 |
| 2.2.2 <i>Product usage</i> | 21 |
| 2.2.3 <i>Personal innovativeness and self-efficacy</i> | 22 |
| 3 METHOD | 23 |
| 3.1 DATA SAMPLE..... | 23 |
| 3.2 MEASUREMENT INSTRUMENT..... | 24 |
| 3.2.1 <i>Latent constructs</i> | 25 |
| 3.3 DATA COLLECTION..... | 26 |
| 3.4 METHOD OF ANALYSIS..... | 26 |
| 4 RESULTS | 28 |
| 4.1 SAMPLE- AND DATA CHARACTERISTICS..... | 28 |
| 4.1.1 <i>Outliers and missing data</i> | 29 |
| 4.1.2 <i>Multivariate assumptions and common method bias</i> | 29 |
| 4.2 MEASUREMENT MODEL..... | 30 |
| 4.2.1 <i>Construct reliability – and validity, discriminant validity and multicollinearity</i> | 30 |
| 4.2.2 <i>Analysis of the structural model</i> | 31 |
| 4.2.3 <i>Moderators</i> | 32 |
| 4.2.4 <i>Control variables</i> | 32 |
| 4.3 POST-HOC ANALYSIS..... | 33 |
| 4.3.1 <i>Use of education</i> | 34 |
| 4.3.2 <i>Controlling for mediation</i> | 34 |
| 4.3.3 <i>Multi-group moderation</i> | 35 |
| 5 DISCUSSION | 37 |
| 5.1 CONCLUSION..... | 37 |

| | | |
|----------|--|-----------|
| 5.1.1 | <i>Extended model</i> | 39 |
| 5.2 | THEORETICAL IMPLICATIONS | 40 |
| 5.3 | MANAGERIAL IMPLICATIONS | 40 |
| 5.4 | LIMITATIONS AND RECOMMENDATIONS FOR FURTHER RESEARCH | 41 |
| 6 | REFERENCES | 42 |
| | APPENDIX I: MEASUREMENT INSTRUMENT | 49 |
| | APPENDIX II: QUESTIONNAIRE | 52 |
| | APPENDIX III: MANIPULATION DATA SAMPLE | 57 |
| | APPENDIX IV: OUTLIERS AND NORMALITY | 60 |
| | APPENDIX V: CROSS LOADINGS | 62 |
| | APPENDIX IV: CONTROL VARIABLES | 64 |

List of figures and tables

| | |
|--|----|
| Figure 1: Conceptual model..... | 17 |
| Figure 2: Construction conceptual model..... | 18 |
| Figure 3: Significant results of the structural model analysis..... | 37 |
| Figure 4: Alternative model..... | 39 |
| | |
| Table 1: Descriptive statistics..... | 28 |
| Table 2: Measurement properties..... | 30 |
| Table 3: Correlation matrix latent variables..... | 31 |
| Table 4: Test results of the hypotheses..... | 31 |
| Table 5: Moderating variable results..... | 32 |
| Table 6: Significant effects of the control variables..... | 33 |
| Table 7: Significant effects of passive and active customer education..... | 34 |
| Table 8: Mediating effects..... | 35 |
| Table 9: Multi-group moderation effects..... | 36 |
| Table 10: Measurement instrument..... | 49 |
| Table 11: Coding of the device value variable..... | 58 |
| Table 12: Coding of categorical variables..... | 59 |
| Table 13: Recoding of product usage..... | 59 |
| Table 14: Categorization of variables..... | 59 |
| Table 15: Outliers..... | 60 |
| Table 16: Skewness and kurtosis..... | 61 |
| Table 17: Initial cross-loadings..... | 62 |
| Table 18: Cross-loadings after deleted items..... | 63 |
| Table 19: Significant effects of the control variables..... | 64 |

1 Introduction

A free photography course that comes with the purchase of a new digital camera and a 'smartphone crew' which offers help with e.g. installing an e-mail account on a new smartphone. These are just a few examples of one of the more recent trends in consumer marketing; customer education.

The concept of educating consumers is not new, educational programs organized by non-profit organizations like public schools (McNeal, 1978), governments and consumer associations (Bloom, 1976) are in existence for a few decades and are aimed at helping the consumer to acquire the skills and knowledge needed to function in the fast changing marketplace (e.g. Fast, Vosburgh, & Frisbee, 1989).

Lately however, commercial producers and retailers of high-tech consumer products have 'rediscovered' education as a means to augment their products. Instead of solely offering the product, these companies try to offer an experience in order to differentiate their products. So instead of providing a product manual with a smartphone, customers get 24/7 online support for whatever problem they might encounter. The increasing number of different communication-channels that have emerged over the last years adds to this phenomenon since it makes communication with customers easier. Apart from 'traditional' education initiatives (e.g. workshops and product demonstrations) a variety of new initiatives are introduced (e.g. online instruction videos or an 'answer within one hour' policy for questions via Twitter). Not only do these educational facilities increase product value for the customer, these initiatives are also thought to increase customer satisfaction (e.g. Honebein, 1997).

To what extent education exerts influence on customer satisfaction is however, unknown. In a study on financial services, Bell and Eisengerich (2007) show that consumers develop a more positive attitude towards the service provider when they exactly know how their service works but this effect has not yet been studied for tangible products. So although customer satisfaction is considered the most important driver for customer education (e.g. Oumlil & Williams, 2000), specific research on the this topic concerning tangible consumer goods is lacking (e.g. Challagalla, Venkatesh, & Kohli, 2009). The aim of this paper is twofold; firstly, it is aimed at providing quantitative support for the assumed positive effect of customer education on customer satisfaction. Second, the underlying structures of this relation will be reviewed as well as where the potential satisfaction is projected at; the product or the retailer.

This study provides scholarly insights by addressing the previously mentioned literature gap. For managers, the most important result is quantitative support for the potential value of customer education, i.e.; should they do it or not? Second, a valuable distinction is made between the provider of the education and the manufacturer of the product. These results give insight into which company 'benefits' most from the education in terms of increased projected satisfaction; the retailer (or service provider) or the manufacturer of the product.

This paper will start with a summary of the extant literature on customer education. Further topics that are discussed are customer satisfaction and learning outcomes due to education. Based on the aforementioned theory, a structural model is constructed that is considered a fitting representation of the underlying structures of the customer education – satisfaction relation. Arguments and theoretical foundations for the model are provided and result in the research hypotheses that will be covered in this paper. Second, the research method is covered. The design of the questionnaire is discussed as well as the method of data collection. Afterwards a justification will be given for the method that was used to process the collected data.

The subsequent paragraph contains the results of this study. After the validation of the data characteristics the fit of the structural model is assessed. The results of several moderating influences and control variables on the study are also discussed. The final section provides a summarization of the most important findings and discusses the theoretical and managerial implications of this study. Further, the limitations are provided and recommendations are given for further research.

2 Theory and hypotheses development

This chapter presents the summarized results of a literature review on customer education and the concepts that were relevant for constructing the conceptual model that can be used for analysing the relation between customer education and customer satisfaction. First, the extant theory on customer education, customer satisfaction and learning outcomes is discussed. Subsequently, the conceptual model is presented and the accompanying hypotheses are developed.

2.1 Literature review

Randolph's (2009) guidelines for writing a literature review were applied. The focus of this study was on both research outcomes and theories. The goal of this study was to integrate the concept of customer education into a combination of the paradigms of customer satisfaction and learning outcomes. A purposive sample of the extant research was taken and was processed in a conceptually organized review. In order to assess the quality of the literature which was used for this review, the Harzing forty-fifth edition (1 april 2012) journal quality list was used, combined with the number of citations of the specific article.

2.1.1 Customer education

Customer education, or "*the process by which companies systematically share their knowledge and skills with external customers to foster the development of positive customer attitudes*" (Honebein, 1997, p. 8) covers a wide array of topics, from user manuals up to product specific workshops. Some more examples are; product instructions, advertisements, seminars, press releases, hands-

on training, telephone support, multimedia and web pages (Honebein, 1997). Further, education can be passive (e.g FAQ's) or active (e.g. an expert user forum) (Khalifa & Shen, 2005).

The extant literature has identified several reasons for setting up one or more of these educational facilities. Customer satisfaction (for a more extensive review see; 2.1.2) is, as an increaser of overall firm performance (Anderson et al., 1994) one of the most important drivers for customer education (e.g. Honebein, 1997; Oumlil & Williams, 2000). Customer education is thought to create a favourable attitude towards both the product and the company (McNeal, 1978). Apart from satisfaction, some further examples of the hypothesized results of customer education are; customer loyalty (e.g. Bell & Eisingerich, 2007; Hennig-Thurau, 2000), increased customer trust (Eisingerich & Bell, 2008), reduced complaints (Honebein, 1997) and positive word-of-mouth (Honebein, 1997).

Honebein (1997) demonstrates (apart from the previously mentioned marketing forces) two more categories of driving forces for implementing customer education; legal and operational. Customer education driven by legal forces encompass warnings and instructions on a product to prevent liability suits due to misuse of the product, but also specific labelling (e.g. the leaflet enclosed in drug packages) in order to comply with government or industry regulations. Operational forces include cost reduction (a help-desk is expensive, so educated customers who do not need to make use of it are more profitable) and increased effectiveness by teaching customers how to do business with you.

Despite these potentially beneficial results several restraining forces exist. The idea lives that education is simply not the companies' responsibility and the assumption that customers need education in a postmodern world is questioned (Burton, 2002). This is underlined by Challagalla, Venkatesh and Kohli (2009) who state that privacy is a concern when customers are being approached proactively. Perceived routinized (or 'mechanical') communication can lead to negative outcomes instead of positive. However, companies are also hesitant because of high implementation costs and uncertain return on investments (Honebein, 1997). Moreover, in the services industry, companies are reticent to educate their customers for the possibility of losing them due to a decrease in perceived switching costs (Bell & Eisingerich, 2007).

Apart from commercial customer education, non-commercial initiatives exist, organized by non-profit organizations like public schools (McNeal, 1978), governments and consumer associations (Bloom, 1976). These programs are aimed at helping the consumer to acquire the skills and knowledge needed to function in the fast changing marketplace (Fast et al., 1989; Langrehr & Mason, 1977). Mostly these are distinguished by the use of the term 'consumer education' instead of customer education, however the terms have been used interchangeably (Oumlil & Williams, 2000).

In conclusion, customer education is mainly seen as a concept with positive outcomes where customer satisfaction is seen as the main driver. Negative effects are primarily thought to exist

in the services industry, however no evidence has been found accordingly. On the contrary, Bell and Eisengerich (2007) show that despite the expectation that increased levels of expertise due to education lead to a higher switching rates, these customers remain loyal to their service provider.

2.1.2 Customer satisfaction

The customer satisfaction literature encompasses a variety of underlying theories and paradigms which have been developed over the years. Satisfaction, or “the consumer’s fulfillment response ... is a judgment that a product or service feature, or the product or service itself, provided (or is providing) a pleasurable level of consumption-related fulfillment, including levels of under- or over fulfillment” (Oliver, 1997, p. 13). Because customer satisfaction is seen as the most important driver for implementing a customer education strategy (Honebein, 1997; Oumlil & Williams, 2000) an overview is given of the most important theories and paradigms.

2.1.2.1 Comparison standards paradigm

One of the most influencing theories in the satisfaction literature is the comparison standards paradigm (Fournier & Mick, 1999). This paradigm states that consumers hold pre-consumption product standards and assess products or services based on the comparison between these standards and the perceived performance. The comparison standards paradigm is based on the expectancy disconfirmation theory (Oliver, 1980) which states that performance (or net benefits) expectancies are important predictors for product or service satisfaction. Positively disconfirmed (exceeding expectations) and confirmed expectations are found to predict high and moderate satisfaction whereas negatively disconfirmed (worse than expected) expectations cause dissatisfaction. The expectancy disconfirmation theory focusses on attribute performance expectancies but many other attributes of a product or service are susceptible to confirmation/disconfirmation of expectations like expected complexity (Fournier & Mick, 1999), needs, quality, equity and regret (Oliver, 1997).

Several scholars have made a connection between comparison standards based satisfaction and prior-to-purchase customer education. However, measuring disconfirmation of expectations is subject to severe limitations when assessing on hindsight (Appleton-Knapp & Krentler, 2006). Because of the limitations involved in a study with single point of measure and a longitudinal study with multiple points of measure did not fit the timeline, it was decided to focus purely on the effects of post-purchase education. Nevertheless, for the sake of completeness a short overview of the aforementioned literature on this subject is given.

Pre-purchase customer education (e.g. attending a demonstration or reading expert reviews before purchasing a product) can influence prior-to-purchase expectations and affect the product choice decision (Oumlil & Williams, 2000). Product choices are often made, based on product specifications which are easily comparable (Hsee, Yang, Gu, & Chen, 2009). When doing

so, consumers tend to prefer a higher spec product (e.g. a 16MP camera over a 12MP camera) even though this usually involves higher pricing and does not affect the desired functionality (Hsee et al., 2009). So, somehow consumers try to make well-reasoned buying decisions but fail to make rational projections of future usage when choosing a product (Mick & Fournier, 1998). The fact that product preferences tend to shift over time (Thompson, Hamilton, & Rust, 2005) makes it even harder for consumers to choose the right product. Thompson et al (2005) found that consumers assign more weight to product capability than to usability before purchase. During the usage, the emphasis shifts towards usability and capability becomes less important. In other words, in the pre-purchase phase a high number of features makes a product attractive while during the usage phase exactly the same features can lead to disutility or “feature fatigue” and thereby to dissatisfaction (Thompson et al., 2005). Furthermore, the decision to pay extra for more capabilities that are eventually never used can be experienced as a regrettable mistake causing discontent as well (Meyer, Zhao, & Han, 2008).

Several studies have addressed this issue by looking into possible solutions to somehow diminish this gap between pre- and post-purchase product preferences. Hamilton & Thompson (2007) show that indirect experiences (e.g. reading product descriptions) triggers a high level mental construal that results in more focus on the desirability of a product whereas direct experience with a product (e.g. by trying it) triggers a low level mental construal that results in more focus on feasibility. This implicates that e.g. product trials could be used to let people experience using the product, and thereby change the focus from capability to usability. Product trials also focus the attention on a single product (separate evaluation), whereas consumers normally tend to compare different products to one another. When doing the latter, quantitative differences become more important, which increases the chance of a shift in preferences towards product capability (Hsee & Zhang, 2004). Product trials can however not be considered the Holy Grail for preventing shifts in product preferences. Hsee, Yang, Gu & Chen (2009) found that even when consumers can directly experience a product, they are still influenced by the products’ specifications, even by specifications that are self-generated or carry no information for the consumer.

Wood and Moreau (2006) found that for inexperienced users, positively disconfirmed complexity expectations (‘not as bad as expected’) due to product demonstrations lead to positive emotions and thereby, more positive product evaluations. However, this effect was no longer significant when they performed a second study where they used a discontinuously innovative product. An important limitation of this study was that an experimental setting (forced adoption) with students was used. Since voluntariness of use is a moderating factor in the user acceptance theory (Venkatesh, Morris, Davis, & Davis, 2003), the outcomes could have been different when voluntary adoption had been used.

2.1.2.2 Affect and ambivalence

Whereas satisfaction through confirmation of expectations is based on cognitive perspectives, another important predictor of satisfaction is the more subjective consumers affect state, based on emotions (Oliver, 1993). These two distinct components (cognitive and affective) each have their own influence on the post purchase satisfaction judgments (Oliver, 1993).

Furthermore, consumers are more likely to form their post purchase satisfaction expression based on attribute level instead of on the product level (Gardial, Clemons, Woodruff, Schumann, & Burns, 1994). Based on this theory of separate evaluation of different attributes, the concept of ambivalence was defined which criticizes overall 'one item' satisfaction measurements and emphasized the ambivalent nature of satisfaction (Olsen, Wilcox, & Olsson, 2005). If for example the food in a restaurant was really good but the service awful, the consumer can experience mixed feelings of both satisfaction and dissatisfaction at the same time. Ambivalent consumers were found to be less satisfied than non-ambivalent consumers and usually express their satisfaction by filing midpoint responses on an attitude scale (Olsen et al., 2005).

In order to capture both the cognitive and the affective stages of satisfaction Oliver (1993) expanded the expectancy disconfirmation model by merging affect, disconfirmation and attribute-based satisfaction into an overarching model. Wood & Moreau (2006) later found that an overlap exists between affect and disconfirmation of expectations; disconfirmation influences satisfaction through emotions. With their E³-model they show that customers experience positive emotions when being confronted with confirmed or positively disconfirmed complexity expectations, leading to satisfaction. Negatively disconfirmed complexity expectations led to negative emotions and dissatisfaction.

2.1.2.3 Dynamics of satisfaction

A critique on the current satisfaction paradigms is that nearly all satisfaction research has adopted the view that satisfaction is a construct that emerges from a trial-like amount of product use. However, satisfaction is susceptible to change over time due to evolving customer experience (Anderson et al., 1994). In other words, satisfaction does not level out to a final value after a certain amount of time. Instead, it is argued that numerous elements (e.g. emotions or social influences) exist that constantly exert influence on satisfaction judgments (Fournier & Mick, 1999). This can affect satisfaction both positively and negatively, depending on the context.

Fournier and Mick (1999) contribute to the literature by conceptualizing satisfaction as a more holistic, dynamic and context dependent process. Instead of identifying satisfaction as a single transaction, or an evaluative judgement following a purchase transaction, they argue that satisfaction is more of a dynamic process that alters over time due to changes in customer experience and social dimensions like emotions. This indicates that in order to improve measures of 'overall' satisfaction multiple measurement over time are required.

2.1.3 Learning outcomes

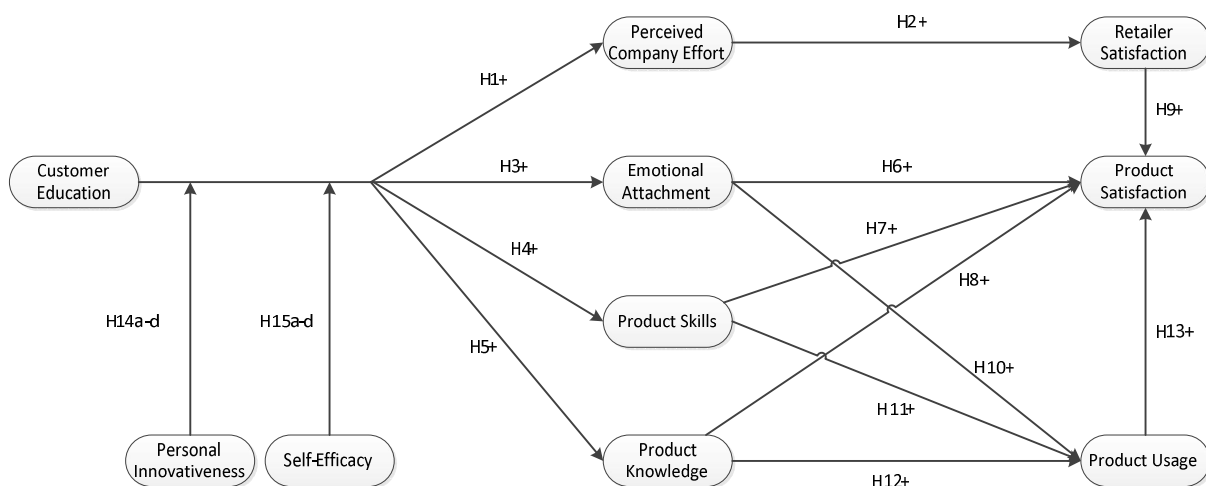
Although research shows that customer education can be a direct predictor for satisfaction due to perceived service augmentation and partnership building (Bell & Eisingerich, 2007), many other concepts are related to education and satisfaction. In their study on customer education for financial services, Bell & Eisingerich (2007) show that education increases the customers' service related knowledge (or customer expertise). Another study indicates that product skills, or the ability to use the full range of product features positively influences product satisfaction (Hennig-Thurau, 2000)).

In order to conceptualize these additional concepts, a parallel is drawn on the theory of learning outcomes. The current paradigm on learning theory (Kraiger et al., 1993) states that knowledge, skills and attitude are integrated into one comprehensive concept of learning. Applied more specifically to customer education, learning aims at increasing cognitive (e.g. knowledge on a products' capabilities), skills based (e.g. knowledge on how to use a product) and affective (e.g. attitude towards the product) knowledge.

2.2 Conceptual model and hypotheses development

The literature overview in the previous section discussed the existing theory on customer education, as well as the known paradigms on learning outcomes and customer satisfaction. In this chapter, argumentation will be provided for the construction of the conceptual model (Figure 1) which can be used to analyse the effect of customer education on customer satisfaction. The specific relations between the concepts that form the model and the derived research hypotheses are discussed hereafter.

Figure 1: Conceptual model

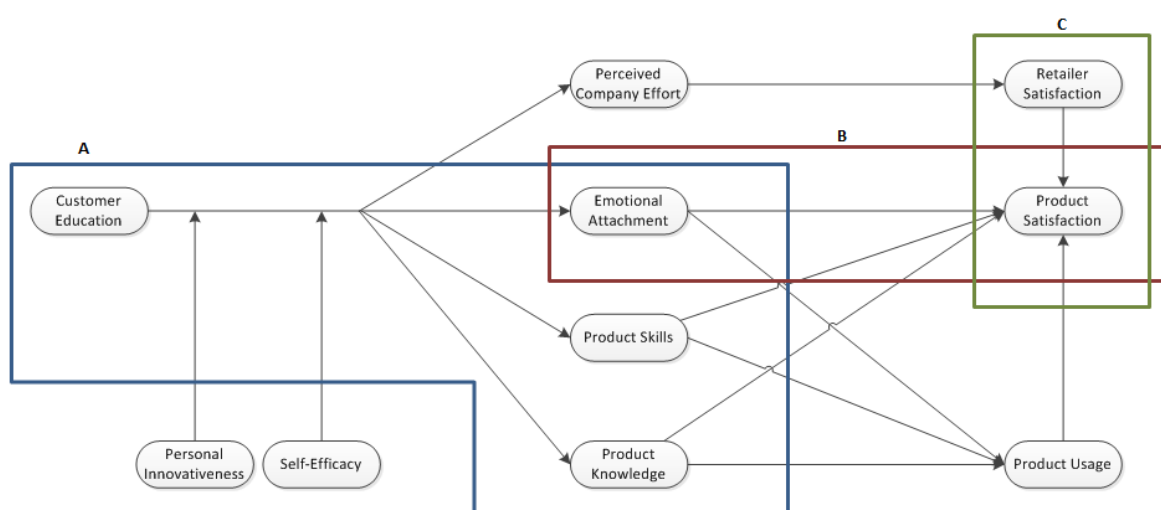


The conceptual model is based on the framework on learning outcomes of Kraiger et al. (1993), combined with part of Olivers' (1993) satisfaction model (see: Figure 2; A and B). The multidimensional view on learning outcomes of Kraiger et al. (1993) (Represented by A in:

Figure 2) was adopted since it is commonly accepted as the most comprehensive model for evaluating training efforts (Salas & Cannon-Bowers, 2001). In addition, many studies on customer education show direct effects of customer education on one or more of these learning outcomes (skills, knowledge and affect) (e.g. Bell & Eisingerich, 2007).

Since the literature on customer satisfaction is more diversified (Fournier & Mick, 1999), several requirements were set in order to select the most relevant satisfaction model. The model had to measure satisfaction on an individual level (Anderson et al., 1994) in order to differentiate between learning of individuals. Second, a post-use measurement instrument was required since the effect of learning and usage takes time and therefore the hypothesized subsequent effect on satisfaction as well.

Figure 2: Construction of the conceptual model



A: Learning outcomes (Kraiger et al., 1993)

B: Part of Oliver's (1993) satisfaction model

C: Derived from Oliver and Swan (1989)

Since the literature review indicates that education can have an influence on both cognitive and affective consumer assessments, which are both predecessors for satisfaction the framework on customer satisfaction of Oliver (1993) was integrated. In this model, which meets the requirements for inclusion the traditional disconfirmation theory is expanded with the consumers' affective state. A limitation for adopting the model unaltered is the inclusion of the disconfirmation paradigm.

As noted in 2.1.2.1, the disconfirmation of expectations theory is one of the most influential theories in the satisfaction literature. However, measuring the concept of disconfirmation is done by reviewing expectations on forehand and satisfaction after a period of use. Although several studies (e.g. McKinney, Yoon, & Zahedi, 2002) have proven that disconfirmation as a construct can be measured post-purchase, severe limitations are involved when doing so. Appleton-Knapp and Krentler (2006) showed that recollections of expectations were colored by satisfaction when a satisfaction evaluation is done at the same time. This effect, known as the

hindsight bias (Fischhoff, 1975) is shown to affect recollections of predictions on many different subjects. For this reason as well as timely limitations for this study that exclude multiple measures in time, the disconfirmation of expectations theory is not suitable for the current study. Since it is decided to focus on the post-purchase effects of customer education, disconfirmation of expectations is excluded from the model and only the affect – satisfaction relation is included (Represented by B in: Figure 2). This will both narrow the scope of the research and diminish the hindsight bias effect (Fischhoff, 1975).

Further, a distinction in customer satisfaction has been made between satisfaction with the product and satisfaction with the retailer, or for the present study; the customer education provider. In their study, Oliver and Swan (1989) found a positive relation between equity-based merchant satisfaction and product satisfaction. Important predictors for satisfaction based on ‘equity’ (or the perceived ‘fairness’ of the merchant towards the customer) are for example the level of service received and price levels (Huppertz, Arenson, & Evans, 1978). This transaction of satisfaction with the merchant towards product satisfaction is included based on the study of Oliver and Swan (1989) (Represented by C in: Figure 2).

After merging the two models and adding the retailer/product – satisfaction distinction, ‘product usage’ and ‘perceived company effort’ were added to the model as concepts. Two moderating concepts, ‘personal innovativeness’ and ‘self-efficacy’ were also included. Further, a slight modification was performed by replacing affect for ‘emotional attachment’ which is defined as an emotion-laden target-specific bond between a person and a specific object (Thomson, MacInnis, & Whan Park, 2005). This alteration was included because the DES-II (Differential Emotions Scale) (Izard, 1977) is considered too extensive (30 questions for 10 items) for the current study with an increased chance for respondent fatigue. The following section will provide the theoretical outline for these inclusions and will discuss the hypothesized relations between the concepts.

2.2.1 Customer education and learning outcomes

Most studies (e.g. Honebein, 1997; Oumlil & Williams, 2000) focus on the direct relation between customer education and customer satisfaction. Bell and Eisingerich (2007) state that customers might be more satisfied with their service provider when the provider offers education. More explicitly, they argue that this is due to the extra effort a company is willing to make for its customers. In other words, customers are thought to be more satisfied with the provider of the education because they value the extra effort the company is willing to make for its customers. The latter concept is integrated into the model as perceived company effort and leads to the following hypotheses:

H1: Customer education will increase the perceived company effort

H2: An increase in perceived company effort increases retailer satisfaction

In parallel of the hypothesized effect of education on satisfaction with the retailer, learning how to use a product is thought to increase satisfaction with the product itself. Kochkin (1999) for example, found a strong relation between the time spent on counseling new customers and customer satisfaction for users of hearing instruments (i.e. the more time spent on education, the higher the level of satisfaction with the product). Since this study is focused on further exploring this relation, a parallel is drawn on the literature of learning outcomes. Kraiger et al. (1993) state that learning increases three types of knowledge; cognitive, skills-based and affective knowledge. This is in line with findings within the customer education literature. Learning more about a product involves spending time reading about it or using it which is shown to affect e.g. emotions (Wood & Moreau, 2006) and is thought to increase attachment towards the product or:

H3: Customer education will increase the customers' emotional attachment towards the product

Whereas affective knowledge is emotional in nature, customer education is also thought to increase skills-based knowledge (Hennig-Thurau, 2000). Receiving education and thereby practicing with the use of a device will likely lead to increased product skills. In other words, a certain task with the device will take less time and effort due to better training so the following is suggested:

H4: Customer education will increase the customers' product skills

Apart from skills-based knowledge, customer education is also thought to increase cognitive product related knowledge. Bell and Eisingerich (2007) found that customer education leads to increased in-depth knowledge among the customers about the financial service they used. Since education increased content related knowledge about financial services it is argued that education concerning a specific product will also increase product related knowledge, or:

H5: Customer education will increase the customers' product knowledge

In sequence of these hypotheses, it is thought that these resulting effects of customer education on learning outcomes (H2-H5) will further lead to an increase in product satisfaction. Wood and Moreau (2006) showed that positive emotions lead to more positive product evaluation. Therefore, the following is suggested:

H6: Increased emotional attachment towards the product will lead to higher product satisfaction

Hennig-Thurau (2000) emphasized the importance of strategic communication of customer skills (through e.g. product-specific training) for increasing relationship quality. In his quantitative study on consumer electronics, he hypothesized that “an increase in customer skills will increase the customers’ satisfaction with the product and (ceteris paribus) his or her product-related perception of quality” (2000, p. 66). Since consumers who do not know how to use their product tend to be dissatisfied with it (Kochkin, 1999; Thompson et al., 2005), educated customers could be more satisfied with their product, simply because they know how it works and suffer less from frustrations so:

H7: Increased product related skills will lead to higher product satisfaction

In addition to product skills, product related knowledge is also thought to increase product satisfaction. Customers who are more aware of what their products’ capabilities are and how it performs compared to similar products are thought to be more satisfied with it:

H8: Increased product related knowledge will lead to higher product satisfaction

In their study, Oliver and Swan (1989) found that satisfaction with a car dealer was positively related to satisfaction with the car itself. Although research towards the underlying mechanisms of this relation is lacking it is thought to be caused by an equity-induced exchange of satisfaction towards the product (Oliver & Swan, 1989). In this case, satisfaction with the dealer (or retailer) due to perceived fairness of the way the customer was treated is thought to translate towards the product. For the present study, this relation is hypothesized as follows:

H9: Increased retailer satisfaction will lead to increased product satisfaction

2.2.2 Product usage

A closely related concept to both the learning outcomes and customer satisfaction is the amount of (product) usage. Compeau and Higgins (1995) for example, show that individuals with a higher affect towards computer usage, will also make more use of them. In short, if people like to work with a product they will make more use of it, so:

H10: Increased emotional attachment to the product will lead to more product usage

Mittal & Sawhney (2001) showed that receiving training to increase customer skills, has a large effect on the consumers' amount of usage. Usage increased substantially compared to other consumers who did not receive training. In addition, a positive feedback loop exists; if the amount of usage increases, consumers develop better skills on the product, which in turn leads to more usage again (Mittal & Sawhney, 2001). A similar effect is thought to occur for product related knowledge so the following two relations are suggested:

H11: Increased product related skills will lead to more product usage

H12: Increased product related knowledge will lead to more product usage

The amount of usage is further shown to be a predictor for customer satisfaction (Downing, 1999; Shih & Venkatesh, 2004). In addition, Bolton and Lemon (1999) find usage to be an antecedent for satisfaction, but not directly. Usage is captured in their concept of payment equity, which is "the customer's changing evaluation of the fairness of the level of economic benefits derived from usage in relation to the level of economic costs" (Bolton & Lemon, 1999, p. 172). So in their concept increased usage can lead to satisfaction, but only when the customer has the idea that he is using the service enough (or more), given what he pays for it. Since customers who make more use of their products tend to be more satisfied with it, the following is hypothesized:

H13: Increased product usage will lead to higher product satisfaction

In conclusion, there are indications that a pathway exists where customer education leads to increased product or service related skills, knowledge and affect. These learning effects are subsequently thought to increase usage and thereby product satisfaction.

2.2.3 Personal innovativeness and self-efficacy

In the literature review, it is stated that customer education influences product skills, knowledge and affect, which eventually influences product satisfaction. There are however some important factors influencing these relations; an experienced smartphone user will probably figure out its successor faster than a first time user. The customer education - satisfaction relation is moderated by both customer (e.g. experience with similar products) and product (e.g. performance, number of features) characteristics (Bell & Eisingerich, 2007; Burton, 2002; Challagalla et al., 2009). Since the focus of this paper is on complex consumer electronics, the model does not include product characteristics.

In order to differentiate between the personalities of the respondents, two concepts were adopted; personal innovativeness and self-efficacy. Personal innovativeness has been defined in different ways, but for the current study the view of Agarwal and Prasad (1998) is adopted.

Since general personal innovativeness has a very low predictive power for adoption decisions (Flynn & Goldsmith, 1993) Agarwal and Prasad (1998) specified a domain-specific (i.e. information technology) concept of personal innovativeness as “*the willingness of an individual to try out a new information technology*” (Agarwal & Prasad, 1998, p. 206).

Self-efficacy or “*the belief that one has the capability to perform a particular behavior*” (Compeau & Higgins, 1995, p. 189) is found to be closely related to behavior concerning the use of e.g. computers. Some examples are emotional responses and actual performance attainments with respect to a certain behavior (Compeau & Higgins, 1995). Because of the overlap of these behavioral responses and the learning outcomes, self-efficacy is added to the model.

In conclusion, the potential influence of education is thought to differ per person. Someone who is more ‘tech-savvy’ than others is probably less affected by education since he/she already has comparable knowledge or experience (e.g. Bell & Eisingerich, 2007). Hence, the following influences are suggested:

H13a-d: Personal innovativeness negatively moderates the relation between customer education and perceived company effort, affect, skills and knowledge

H14a-d: Self-efficacy negatively moderates the relation between customer education and perceived company effort, affect, skills and knowledge

The model that is discussed in this section should give a suitable representation of the customer education – satisfaction relation. In the next section, the methodology is discussed that is used to empirically research the original problem statement and the resulting research hypotheses.

3 Method

The structural model that was hypothesized in the previous section is tested using a web-survey. This survey was taken among a sample of customers from WayPoint, a Dutch company that sells multipurpose GPS-devices and offers an extensive range of educational facilities. This company was chosen since the devices they sell are fairly complex. These GPS-devices and the accompanying software have a very extensive number of features and applications so a certain learning curve is involved before the consumer is able to make full use of the desired capabilities. The following paragraphs will discuss the data sample, the design of the measurement instrument, the method of data collection and finally the method that was used to analyse the data.

3.1 Data Sample

A sample of consumers who own a multipurpose GPS device were questioned using a web-survey. A ‘multipurpose GPS device’ is defined as a device which offers consumers the possibility

to install different maps (e.g. maps with topographic details for hiking purposes) and offers extensive routing options (e.g. creating/downloading a motorcycle trail). Owners of 'ordinary' GPS systems used for A-to-B transportation are excluded from participation since these devices mainly know a single usage function (i.e. entering the destination address and subsequently following the routing instructions). For the latter reason, a limited amount of learning is involved. A control question in the beginning of the questionnaire was added to verify that respondents actually owned such a device. A second control question was added in order to ensure the device has been taken to use. The respondents were asked if they owned it for at least one month. If either of the control questions were answered negatively, the questionnaire was aborted.

3.2 Measurement instrument

In order to retain construct validity (Hair, Black, Babin, Anderson, & Tatham, 2010), proven measurement items are adopted from the extant literature where possible. The constructs and the proposed accompanying measurement items that need more extensive explanation are discussed below. Since the list of questions is quite extensive, all items that are measured using a likert-scale have a 5-point distribution in order to make answering easier for respondents. Previous studies (e.g. Dawes, 2012) have shown insignificant differences between 5- and 7-point likert scale measurements.

Many customers are enthusiasts and own multiple devices. Therefore they were asked whether they own just one or multiple devices. All questions had to be answered based on the latest acquired device. These GPS devices are inextricably linked to the accompanying software, which can be used to download/create routes, add or remove specific maps (e.g. a map with geographical details for hiking purposes). However, the use of the software is not obligatory for limited functionality use. In that case, only a one-time installation procedure is involved (which can also be done in the store or by friends/relatives). Therefore, respondents were asked if they have either used the software never before, just once at installation or multiple times.

In order to verify the fit of the questionnaire to the conceptual model, it was assessed by two assistant professors of the Eindhoven University of Technology. Further, seven WayPoint customers were asked to pre-test the Dutch questionnaire in order to identify potential indistinct questions. After the latter test, some small changes were made; 'Outdoor GPS device' was changed to 'Outdoor and motorcycle GPS device' since the concept was not fully clear to the respondents. Finally, the after-market instruction booklet was added to the pre-defined list of educational facilities.

The following paragraph discusses all the latent constructs. Argumentation is provided for either adopting existing measurement items or for its design when no existing measurement scale was available.

3.2.1 Latent constructs

Customer education - For assessing customer education as a construct, the scale from Bell and Eisengerich (2007) is adopted. This 4-item construct is slightly modified to fit the current study since the original focus was on financial services education by an advisor.

Emotional attachment – Emotional attachment is tested using the 10-item scale (4 for affection, 3 for passion and 3 for connection) that was developed by Thomson et al. (2005). In this question, respondents were asked to rate to which extent the specific emotions described their feelings towards their product.

Satisfaction-Although the validity of the construct of overall satisfaction is discussed (Olsen et al., 2005) an overall measurement will be used. Since the purpose of this study is not to measure specific satisfaction but to explore the hypothesized relative increase due to customer education this method is considered appropriate. The measure will be split in overall satisfaction towards the retailer and overall satisfaction with the product. Both items were assessed with the 3-item scale that was designed by Hennig-Thurau, Gwinner, & Gremler, (2002). In addition a control question ('I would recommend this product/WayPoint to other people') was added. These questions will be put in the beginning of the questionnaire to prevent correlation with other items (Peterson & Wilson, 1992).

Product skills- To measure the level of product specific skills, Hennig-Thureau (2000) asked consumers to rate their skills per product feature which resulted in a 38 and 41 item (VCR and digital camera) measurement scale. Thompson et al. (1994) on the other hand, included just one item ("overall rating of my PC skills") and added a 'length of use' measure item to cope with limitations concerning self-reported skills assessment. For this study, a 5-item scale is designed which contains the item of Thompson et al. (1994) and is expanded with four items that include statements about skills concerning the most important features of the devices and the software. 'Length of use' was added as a control variable.

Product knowledge - Knowledge on the products capabilities will be assessed using a self-rated scale for measuring subjective knowledge (Flynn & Goldsmith, 1999). The measures that originally asked for general knowledge ("I know pretty much about GPS devices") are modified to assess product specific knowledge ("I know pretty much about the capabilities of my device and the accompanying software"). Although self-reported measures have been combined with specific questions to test the respondents' knowledge objectively (e.g. provide a definition for specific motorcycle terms like fuel injection) (e.g. Alba & Hutchinson, 1987; Mitchell & Dacin, 1996), Mitchell and Dacin (1996) found that both subjective (self-reported) and objective (knowledge tests) measures are highly correlated. Therefore only the subjective, five-item measure will be adopted for this study.

Personal innovativeness – For measuring this item, the scale of Agarwal and Prasad (1998) was adopted that tests personal innovativeness concerning new information

technologies. Some of the questions were slightly modified in order to cover new technological products instead of information technology.

Self-efficacy – Self-efficacy was tested using Spreitzer’s (1995) scale of job competence which was modified to test for self-assessed competence of handling new technological products.

Control variables – Several control variables are measured; age, gender, length of customer relation, level of education, whether a respondents owns or had owned more previous devices, place of purchase and to what extent respondent made use of the different education services.

3.3 Data collection

The questionnaire was first published on the 13th of august on the WayPoint user forum and one day later on the homepage of their website as a news item. Simultaneously with the publication on the website, facebook- and twitter-announcements were made. Both actions resulted in a total of 66 completed responses at the 21st of august. On the 22nd of august, a newsletter with (among other items) a link to the questionnaire was sent out to the WayPoint customer database (WayPoint customers or other interested people who subscribed for the newsletter, either at a purchase or online). Until the questionnaire was closed (on the 1st of September) this led to a total of 617 completed questionnaires.

As an incentive to complete the questionnaire a €10,- discount on a WayPoint workshop of choice was offered to respondents who would complete the questionnaire. A code that could be used to collect this discount was displayed on the last page of the questionnaire. The customer database consists of 30.000 e-mail addresses, so the response rate was about 2%. This percentage is an estimation since some respondents might have still started the questionnaire based on the publication on the forum or website.

The manipulation of the original dataset is described in Appendix III: Manipulation data sample. The questionnaire was started 841 times, 617 of these respondents completed the questionnaire. Three respondents were deleted since they said “no” to the question on whether they had an outdoor- or motorcycle GPS system and still continued the questionnaire. Eight respondents were deleted from the sample since their device did not meet the inclusion criteria. Deletion of the latter mentioned respondents and listwise deletion that was applied to cases with missing values (see: 4.1.1) led to a dataset of 567 usable respondents.

3.4 Method of analysis

The original output data was first processed using IBM SPSS 21 and Microsoft Excel 2010. Assessment of the data and model validity was performed using test procedures from Hair et al. (2010) and cut-off values were adopted accordingly. Harman’s one factor test was used to test for common method bias.

For analyzing the structural model, Structural Equation Modeling (SEM) is used. With SEM, first the reliability of the measurement items (how well they reflect the latent variable) and the model is tested. Subsequently the significance and the predictive value of the hypothesized relations are examined. SEM analysis are either performed using the covariance based approach (Maximum Likelihood Estimation (MLE) techniques) or the less known variance-based approach (Partial Least Squares (PLS)) (Hair et al., 2010). Both methods have their advantages and disadvantages but no 'clear cut winner' can be defined (Hair et al., 2010). PLS is capable of attaining results for very small sample sizes whereas for SEM a sample size of 200 is considered the minimum (e.g. Haenlein & Kaplan, 2004; Hair et al., 2010). Furthermore, PLS is more robust to violations of regression assumptions and poor measurement. Since the sample size is large and the data meets most regression assumptions (see: 4.1) the analysis was performed using both estimation techniques in order to select the most appropriate method. AMOS 20 was used for ML-estimation and SmartPLS 2.0 for PLS. Running the model in AMOS appeared to be not possible, likely because the majority of the data is significantly skewed (see: 4.1). Although the impact of non-normality is said to diminish with a sample size larger than 200 (Hair et al., 2010), chances are that this will lead to an inflated chi-square statistic (Jackson, Arthur, & Purc-Stephenson, 2009) which explains the issue that AMOS had with the data. PLS is commonly accepted as an alternative estimation technique when data fails to meet the normality assumption (e.g. Grewal, Cote, & Baumgartner, 2004; Haenlein & Kaplan, 2004), therefore the analysis is performed using PLS.

A 1000-resample bootstrapping procedure was used to test whether the predicted relations were significant. Bootstrapping resamples the sample with random replacements from the original data resulting in an approximation of the significance of the estimated effect sizes (Hair et al., 2010). The effect was considered significant when the possibility of detecting a false effect was below 0,05. Concerning explained variance of the relation (R^2), values of 0,25, 0,50 and 0,75 are considered small medium and large (Hair et al., 2010).

The indicator approach (Henseler & Fassott, 2010) was used to assess the hypothesized moderating effects. The indicator is computed by multiplying the (standardized) indicator values and was considered significantly moderating the relation when being below the 0,05 level.

Dummy variables were generated for categorical variables with more than two categories. Root transformation was applied to Product Usage (fourth root) since this variable was significantly skewed with a long tail. This scale variable was subsequently transformed into an ordinal variable with a five point scale. The variables age, length of use, customer relation length, level of education and device value were treated as ordinal variables, some of them after categorization. Finally, two formative constructs were created; 'use of active education' and 'use of passive education'. Active (or interactive) customer education encompasses help in a WayPoint shop,

usage of the forum and usage of the telephone- and email helpdesk. Passive (or non-interactive) customer education incorporates the product manual, the aftermarket instruction booklet, the instruction videos and use of the FAQ section on the website. Whether or not customers attended a workshop was treated as a separate control variable since it is not an ordinal variable. For a complete overview of the recoding schemes see Appendix III: Manipulation data sample.

4 Results

This section discusses the results of the analysis. First the data sample characteristics are analysed and subsequently assessed for outliers and missing data. After the examination of the multivariate assumptions, the structural model is tested and the results are provided. Initially the model is tested without moderators, secondly the moderators are added and the effect of the control variables is assessed. Finally a post-hoc analysis is performed to test for multi-group moderation and mediation.

4.1 Sample- and data characteristics

In Table 1 the descriptive statistics of the data sample (N = 567) can be found.

Table 1: Descriptive statistics

| Variable | | Frequency | Percentage [%] |
|---------------------------------|-----------|-----------|----------------|
| Gender | Male | 538 | 94,9 |
| | Female | 29 | 5,1 |
| Age | 15-25 | 3 | 0,5 |
| | 26-35 | 7 | 1,2 |
| | 36-45 | 28 | 4,9 |
| | 46-55 | 129 | 22,8 |
| | 56-65 | 265 | 46,7 |
| | 66-75 | 131 | 23,1 |
| | 75+ | 4 | 0,7 |
| Education | None | 6 | 1,1 |
| | Other | 17 | 3,0 |
| | Primary | 15 | 2,6 |
| | VMBO/MBO1 | 100 | 17,6 |
| | HAVO/VWO | 42 | 7,4 |
| | MBO2-4 | 92 | 16,2 |
| | HBO | 230 | 40,6 |
| Customer Relation Length | WO | 65 | 11,5 |
| | 0-12 | 111 | 19,6 |
| | 13-24 | 77 | 13,6 |
| | 25-36 | 80 | 14,1 |
| | 37-48 | 58 | 10,2 |
| | 49-60 | 92 | 16,2 |
| | 61-72 | 35 | 6,2 |
| Length of Use | 72+ | 114 | 20,1 |
| | 0-12 | 138 | 24,3 |
| | 13-24 | 120 | 21,2 |
| | 25-36 | 116 | 20,5 |
| | 37-48 | 69 | 12,2 |
| | 49-60 | 64 | 11,3 |
| | 60+ | 60 | 10,6 |

Note: Statistics of the final sample (N=567)

Although the sample can be seen as a good representation of the WayPoint customer base, this cannot be said about the representation of the Dutch population. The vast majority of the sample is male and 93% of the sample is between 46 and 75 years of age. Furthermore, 52% of the sample has a higher education.

4.1.1 Outliers and missing data

The data was visually assessed for univariate outliers using boxplots. Based on the sample size, the threshold for outlier detection is ± 4 times the standard deviation (Hair et al., 2010). The variables PU (Product Usage), LU (Length of use), CRL (Customer relation length) and AGE (Age) were reviewed (see Appendix IV: Outliers and normality for a detailed examination of the outliers). Twenty-one outliers were found which were identified as procedural errors and were deleted. Other outliers were considered extraordinary observations which were plausible and therefore retained. Multivariate outliers were detected using the Mahalanobis distance, calculated with all 43 items that form the structural model. Due to the sample size, a cut-of value of 4 (Hair et al., 2010) for the D^2/df measure was taken. The highest value found was 3,25 so no multivariate outliers were detected.

SPSS was used to search for missing data. Since answering the questions was compulsory for continuing the questionnaire, the missing data is limited to the variables LU (Length of use; 3,3%), CRL (Customer relation length; 2,0%) and AGE (Age; 1,3%). Despite the compulsory answering requirement, all four items on RS (Retailer Satisfaction) showed 0,3% of missing data. Apparently two respondents somehow skipped this page in the questionnaire. Using SPSS, Little's MCAR test was performed and was shown non-significant (0,908). Since none of the data was missing in a nonrandom order or exceeded 10%, listwise deletion was applied. When data is missing completely at random, this is the most common approach (Jackson et al., 2009) and this still leaves a large enough data sample. 567 respondents remain in the dataset after deleting these cases.

4.1.2 Multivariate assumptions and common method bias

Four multivariate assumptions can be checked regarding the data (Hair et al., 2010); normality, linearity, homoscedasticity and absence of correlated errors. The assumption of normally distributed data was not met; 50 out of 57 variables were significantly skewed and 40 out of 57 were either significantly leptokurtic or platykurtic (see Appendix IV: Outliers and normality for the corresponding data). Fortunately PLS is more robust for this violation than ML estimation (Hair et al., 2010).

Since heteroscedasticity is often the result of non-normally distributed data (Hair et al., 2010), the assumption of homoscedasticity was not checked. The assumption of linearity can be checked by assessing every relation between latent constructs one by one. Due to the amount of variables in the structural model this would be a very extensive process. For this reason it was

not considered pragmatic to check this assumption, neither did any of the authors of the studies that were examined by Schreiber et al (2006). The assumption of absence of correlated errors is applicable to observations between groups and time series data (Hair et al., 2010). Since this study does not include either of them, this assumption was not checked.

Common method bias was checked using Harman’s one factor test. An un-rotated factor analysis was performed using SPSS which was restricted to extract only a single factor. The first factor explained 28,43 of the variance. Since no more than half of the variance is explained by a single factor, it can be assumed that common method bias is not present (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003).

4.2 Measurement model

4.2.1 Construct reliability – and validity, discriminant validity and multicollinearity

Using factor loadings, cross loadings and Cronbach’s alpha, construct reliability was assessed. In Appendix V: Cross loadings the initial table of factor- and cross loadings can be found. Most factor loadings exceeded 0,70 except for Personal Innovativeness3 (0,544), Product knowledge2 (0,535) and Product Skills4 (0,666). These items were removed from the sample which still leaves three or more items per latent variable and can therefore be justified.

Unfortunately, a severe amount of cross loadings can be found. The deletion of Product Knowledge1 and Retailer Satisfaction2 was justifiable. However, this still leaves a high number of cross loadings. Three out of four items of Customer Education load very high (>0,70) on the Perceived Company Effort construct, all three items of Perceived Company Effort load very high on Customer Education and three out of four items of Product Satisfaction load too high on Customer education. Deletion of these items would lead to the exclusion of constructs from the initial model which is not justifiable in a confirmatory factor analysis (Jackson et al., 2009; Schreiber et al., 2006).

Table 2: Measurement properties

| | Cronbach's Alpha | Composite Reliability | AVE | VIF | R ² | R ^{2*} |
|--------------------------|---------------------|--------------------------|------|------|----------------|-----------------|
| Customer Education | 0,92 | 0,95 | 0,81 | 4,88 | - | - |
| Emotional attachment | 0,94 | 0,95 | 0,66 | 1,11 | 0,06 | 0,06 |
| Perceived Company Effort | 0,93 | 0,95 | 0,87 | 4,29 | 0,76 | 0,76 |
| Personal innovativeness | 0,83 | 0,88 | 0,71 | 1,80 | - | - |
| Product Knowledge | 0,79 | 0,88 | 0,71 | 2,00 | 0,02 | 0,32 |
| Product Satisfaction | 0,96 | 0,97 | 0,89 | 2,57 | 0,51 | 0,51 |
| Product Skills | 0,87 | 0,91 | 0,71 | 1,98 | 0,04 | 0,28 |
| Product Usage | - | - | - | 1,10 | 0,07 | 0,07 |
| Retailer satisfaction | 0,96 | 0,98 | 0,93 | 2,45 | 0,49 | 0,49 |
| Self-Efficacy | 0,94 | 0,96 | 0,90 | 2,07 | - | - |

Note: After deletion of the items based on the initial cross loadings

*: Including direct effects of moderating variables

Further analysis (see Table 2) showed that both Cronbach’s Alpha and composite reliability for all latent variables are above 0,7 which is good. The Average Variance Extracted (AVE) should be

above 0,50 (meaning that more than half of the variance in the latent variable is explained by the items) which it is for all cases (Hair et al., 2010). The Variance Inflation Factor (VIF) remains below 5, indicating that multicollinearity should not cause problems (Hair et al., 2010).

As a result of the high cross loadings, the discriminant validity (correlation of the measurement items with other latent variables) is on the edge of acceptable limits. The square root of the AVE should be 'larger' (Hair et al., 2010) or 'much larger' (Gefen & Straub, 2005) than the correlation between the latent constructs. The data meets this criterion, but barely, as can be seen in Table 3.

Table 3: Correlation matrix latent variables

| | CE | EA | PCE | PI | PK | PS | PSK | PU | RS | SE |
|-----|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| CE | 0,90 | - | - | - | - | - | - | - | - | - |
| EA | 0,24 | 0,81 | - | - | - | - | - | - | - | - |
| PCE | 0,87 | 0,22 | 0,93 | - | - | - | - | - | - | - |
| PI | 0,06 | 0,03 | 0,07 | 0,84 | - | - | - | - | - | - |
| PK | 0,13 | 0,10 | 0,14 | 0,43 | 0,84 | - | - | - | - | - |
| PS | 0,74 | 0,21 | 0,68 | 0,01 | 0,08 | 0,94 | - | - | - | - |
| PSK | 0,20 | 0,21 | 0,20 | 0,39 | 0,64 | 0,21 | 0,84 | - | - | - |
| PU | 0,03 | 0,11 | 0,06 | 0,07 | 0,13 | 0,02 | 0,16 | 1,00 | - | - |
| RS | 0,71 | 0,14 | 0,70 | 0,04 | 0,11 | 0,70 | 0,16 | 0,04 | 0,96 | - |
| SE | 0,05 | 0,04 | 0,04 | 0,64 | 0,53 | 0,04 | 0,49 | 0,00 | 0,06 | 0,95 |

Note: The bold items represent the square root of the AVE measures

4.2.2 Analysis of the structural model

For the analysis of the structural model, the standardized effect sizes and their level of significance were assessed. First the base model is assessed; afterwards the moderating and control variables are analyzed. For an overview of the significance level and the effect sizes of the hypothesized relations see Table 4. Ten out of thirteen assumptions were found to be significant, the remaining three effects were not significant at the 0,05 level. The R² values (explained variance of the dependent variables) are shown in Table 2.

Table 4: Test results of the hypotheses

| Hypothesis | Relation | Standardized effect size | t-Value | Supported |
|------------|--|--------------------------|---------|-----------|
| H1 (+) | Customer Education > Perceived Company Effort | 0,87 | 57,10** | Yes |
| H2 (+) | Perceived Company Effort > Retailer Satisfaction | 0,70 | 19,56** | Yes |
| H3 (+) | Customer Education > Emotional Attachment | 0,23 | 5,12** | Yes |
| H4 (+) | Customer Education > Product Skills | 0,21 | 4,42** | Yes |
| H5 (+) | Customer Education > Product Knowledge | 0,13 | 3,01** | Yes |
| H6 (+) | Emotional Attachment > Product Satisfaction | 0,10 | 2,77** | Yes |
| H7 (+) | Product Skills > Product Satisfaction | 0,14 | 3,14** | Yes |
| H8 (+) | Product Knowledge > Product Satisfaction | -0,08 | 1,53 | No |
| H9 (+) | Retailer Satisfaction > Product Satisfaction | 0,67 | 16,85** | Yes |
| H10 (+) | Emotional Attachment > Product Usage | 0,13 | 2,74** | Yes |
| H11 (+) | Product Skills > Product Usage | 0,12 | 2,40* | Yes |
| H12 (+) | Product Knowledge > Product Usage | 0,11 | 1,89 | No |
| H13 (+) | Product Usage > Product Satisfaction | -0,02 | 0,34 | No |

*P<0,05. **P<0,01 (two-tailed)

Customers who experienced more customer education showed to have a much higher degree of perceived company effort. Subsequently, customers who perceived the effort the company put in

them as high were also much more satisfied with the company than customers who perceived the effort to be low.

Education further shows to positively influence the three hypothesized learning outcomes with mediate effect sizes, the predictive ability of education in these case however was very weak (R^2 : 0,02 – 0,06). Similar findings concern the effect of the learning outcomes on product satisfaction; the effect sizes of emotional attachment and product skills are mediate and significant. However, given the small effect sizes compared to the effect of retailer satisfaction on product satisfaction these items only contribute to a very minor extent to the predictive value of the model concerning product satisfaction.

4.2.3 Moderators

The hypothesized moderating effects were tested using interaction terms. Although no moderating variables were found to have a significant effect, both personal innovativeness and self-efficacy have a strong direct effect on product skills and product knowledge (see: Table 5). So customers who are more innovative and efficacious also have higher product skills and knowledge. Nevertheless, hypotheses 14 and 15 are rejected since these personal characteristics do not moderate the relations as assumed. Note that effect sizes of adding the moderators (f^2) were left out of the table since these were negligible and non-significant.

Table 5: Moderating variable results

| Relation | Ex./inc. moderator effect | Direct Effect | | | Direct effect moderator | | Interaction effect | |
|--|---------------------------|---------------|---------------------------|---------|--------------------------|---------|--------------------------|---------|
| | | R^2 | Standardize d effect size | T-value | Standardized effect size | T-value | Standardized effect size | T-value |
| PI > (Customer Education > Perceived Company Effort) | Excluding | 0,76 | 0,87 | 58,06** | 0,03 | 1,05 | | |
| | Including | 0,76 | 0,86 | 49,17** | 0,03 | 0,95 | -0,05 | 0,95 |
| PI > (Customer Education > Emotional Attachment) | Excluding | 0,06 | 0,23 | 5,06** | 0,07 | 1,26 | | |
| | Including | 0,07 | 0,22 | 4,88** | 0,07 | 1,19 | -0,08 | 0,70 |
| PI > (Customer Education > Product Skills) | Excluding | 0,28 | 0,20 | 4,67** | 0,14 | 2,74** | | |
| | Including | 0,29 | 0,17 | 4,63** | 0,14 | 2,71** | -0,00 | 0,00 |
| PI > (Customer Education > Product Knowledge) | Excluding | 0,32 | 0,13 | 3,31** | 0,17 | 3,96** | | |
| | Including | 0,32 | 0,10 | 2,89** | 0,17 | 3,75** | -0,03 | 0,41 |
| SE > (Customer Education > Perceived Company Effort) | Excluding | 0,76 | 0,87 | 58,06** | -0,02 | 0,69 | | |
| | Including | 0,76 | 0,86 | 49,17** | 0,00 | 0,67 | 0,01 | 0,14 |
| SE > (Customer Education > Emotional Attachment) | Excluding | 0,06 | 0,23 | 5,06** | -0,02 | 0,31 | | |
| | Including | 0,07 | 0,22 | 4,88** | -0,03 | 0,45 | -0,03 | 0,44 |
| SE > (Customer Education > Product Skills) | Excluding | 0,28 | 0,20 | 4,67** | 0,40 | 8,20** | | |
| | Including | 0,29 | 0,17 | 4,63** | 0,39 | 7,88** | -0,07 | 1,55 |
| SE > (Customer Education > Product Knowledge) | Excluding | 0,32 | 0,13 | 3,31** | 0,42 | 9,25** | | |
| | Including | 0,32 | 0,10 | 2,89** | 0,41 | 8,52** | -0,01 | 0,24 |

PI: Personal Innovativeness, SE: Self-Efficacy

* $P < 0,05$. ** $P < 0,01$ (two-tailed)

4.2.4 Control variables

All control variables were tested in the path model. Since the assessed number of relations is extensive, only the significant effects with a standardized effect size $< -0,15$ and $> 0,15$ are shown in Table 6. A more extensive overview with all significant effects can be found in Appendix VI: Control variables. Customers with low self-efficacy are older, make more use of help from others

or in the WayPoint store and the product manual. They also account for higher usage of the helpdesk and participate more often in workshops. Customers with higher levels of self-efficacy make more use of the forum and the FAQ section on the website, have a higher level of education and are more likely to own more devices. Further, they are also more likely to purchase the product elsewhere.

Table 6: Significant effects of the control variables

| Relation | Standardized effect size | T-Value |
|---|--------------------------|---------|
| Age > Self-Efficacy | -0,25 | 6,64** |
| Help and/or guidance from others > Self-Efficacy | -0,21 | 4,71** |
| Help and/or guidance from others > Personal Innovativeness | -0,18 | 4,14** |
| Usage of WayPoint instruction videos > Emotional Attachment | 0,18 | 4,35** |
| Forum usage > Self-Efficacy | 0,21 | 5,18** |
| Forum usage > Personal Innovativeness | 0,29 | 7,35** |
| Forum usage > Product Skills | 0,17 | 4,87** |
| Usage of FAQ on WayPoint website > Personal Innovativeness | 0,16 | 3,71** |
| Workshop > Self-Efficacy | -0,18 | 4,19** |
| Customer Relation Length > Product Knowledge | 0,19 | 5,62** |
| Customer Relation Length > Product Skills | 0,18 | 5,10** |
| Level of Education > Self-Efficacy | 0,22 | 5,14** |
| Level of Education > Emotional Attachment | -0,21 | 5,43** |
| Multiple Devices > Personal Innovativeness | 0,16 | 4,14** |
| Software Usage 'more than once' > Self-Efficacy | 0,32 | 7,15** |
| Software Usage 'more than once' > Customer Education | 0,16 | 3,32** |
| Software Usage 'more than once' > Personal Innovativeness | 0,23 | 5,57** |
| Software Usage 'more than once' > Product Skills | 0,23 | 5,38** |
| Software Usage 'more than once' > PU | 0,20 | 4,94** |

* $P < 0,05$. ** $P < 0,01$ (two-tailed)

Help in the store, the instruction videos, the forum, the helpdesk, the FAQ's and workshop attendance are all positively related to customer education. Older customers make more use of customer education, people with a higher level of education less, as well respondents who bought the product elsewhere.

Respondents who make more use of the product manual have lower self-efficacy and have less product knowledge. The length of the relation with the company is positively related to the use of customer education, product skills and knowledge. Customers with a longer relation to the company also show higher levels in personal innovativeness.

Customers who are less satisfied with their product make more use of help in the shop, the forum and both the email and telephone helpdesk. Only people who bought the product elsewhere showed a relation with retailer satisfaction; they were less satisfied. Customers with a more expensive device tend to make slightly more use of customer education.

4.3 Post-hoc analysis

Although the analysis of the structural model indicates the existence of ten causal relations, several hypothesized effects were found to be insignificant or had a very weak predictive value. These results provide arguments for a post-hoc analysis. In SEM however, post-hoc analyses are not commonly seen as acceptable since its confirmatory (instead of exploratory) nature. Adding and/or removing paths and latent variables to or from the original model is compared to eating

salted peanuts: “One is never enough” (Ullman & Bentler, 2001, p. 750). Other authors (e.g. Schreiber et al., 2006) consider it justifiable when model modifications are founded in theory and when modification test results are provided to justify model improvement. Nevertheless they too, stress that post-hoc analysis shift the confirmatory nature of the study towards exploratory. Since the majority of the hypotheses are either insignificant or have a very small effect size and the assumption of discriminant validity is questionable, it is considered justifiable to perform a post-hoc analysis. First the use of active and passive education is examined as a control variable. Second, Sobel’s test for mediation is performed to check whether the initial results hold up if direct relations are added. Finally several multi-group moderation tests are performed.

4.3.1 Use of education

Both the formative constructs (use of passive and active education, see: 3.4) were assessed as control variables. Although both active and passive education shows a positive relation to customer education, the relation is a bit stronger for active education. Active education is also positively related to product skills, product usage and emotional attachment. Passive education is only significantly related to the latter.

Table 7: Significant effects of passive and active customer education

| Relation | Standardized effect size | T-Value |
|--|--------------------------|---------|
| Use of Active Education > Customer Education | 0,14 | 3,13** |
| Use of Active Education > Perceived Company Effort | 0,05 | 2,73** |
| Use of Active Education > Emotional Attachment | 0,16 | 3,79** |
| Use of Active Education > Product Usage | 0,11 | 2,66** |
| Use of Active Education > Product Skills | 0,12 | 2,90** |
| Use of Passive Education > Customer Education | 0,11 | 2,36* |
| Use of Passive Education > Emotional Attachment | 0,17 | 3,96** |

* $P < 0,05$. ** $P < 0,01$ (two-tailed)

4.3.2 Controlling for mediation

In order to provide extra argumentation for the validity of the significant indirect effects between customer education and both retailer and product satisfaction, these relations were tested for mediation. Using Sobel’s test¹ (Sobel, 1982) for mediation, it was assessed whether the indirect effects remain intact when a direct relation is added between customer education and both product and retailer satisfaction. Perceived company effort, emotional attachment and product skills were tested for mediation. Since the other variables showed non-significant relations, these were not included. The results can be found in Table 8.

¹Formula for calculating mediator variable significance (or: Sobel-test) (Sobel, 1982)

$$z = \frac{ab}{\sqrt{(b^2SE_a^2) + (a^2SE_b^2)}}$$

Table 8: Mediating effects

| Direct effect | Mediating variable | Ex./inc. mediating effect | Direct effect | | | Mediating effect | | |
|---|--------------------|---------------------------|----------------|--------------|-------------------|------------------|---------------|--------|
| | | | R ² | Effect size | T-value | Effect Size A | Effect Size B | z |
| Customer Education > Retailer Satisfaction | PCE | Excluding Including | 0,51 0,54 | 0,71 0,42 | 19,98** 6,07** | 0,87 | 0,34 | 4,83** |
| Customer Education > Product Satisfaction | EA | Excluding Including | 0,60 0,60 | 0,49 0,47 | 8,19** 7,24** | 0,23 | 0,04 | 1,30 |
| Customer Education > Product Satisfaction | PSK | Excluding Including | 0,60 0,60 | 0,49 0,47 | 8,19** 7,24** | 0,21 | 0,05 | 1,59 |
| Perceived Company Effort > Product Satisfaction | RS | Excluding Including | 0,55 0,60 | 0,17 0,05 | 2,53* 0,78 | 0,70 | 0,34 | 4,68** |
| Customer Education > Product Satisfaction | RS | Excluding Including | 0,54 0,60 | 0,74 0,49 | 23,93** 7,83** | 0,42 | 0,35 | 3,84** |

* $P < 0,05$. ** $P < 0,01$ (two-tailed)

PCE: Perceived customer education, EA: Emotional attachment, PSK: Product skills, RS: Retailer satisfaction

The results show that perceived company effort is significantly mediating the customer education - retailer satisfaction relation. Further, a strong decrease in the direct effect of customer education on retailer satisfaction can be seen when perceived company effort is added as a mediator. Thus, perceived company effort is partially mediating this relation.

No mediation effect was found for both emotional attachment and product skills although the direct effect that was added to the model was strongly significant. Moreover, the addition of the direct effect diminished the effect of both variables on product satisfaction to non-significant values. In other words, the already very small effect of customer education on product satisfaction through increased emotional attachment and product skills is further weakened (to below the significance level) when adding the direct relation.

Further, a mediation test was performed for retailer satisfaction on a potential direct effect of perceived company effort on product satisfaction. This mediating effect was found to be significant. The inclusion of retailer satisfaction as a mediator led to a decrease of the direct effect to below the significance level. Thus, retailer satisfaction fully mediates the perceived company effort – product satisfaction relation. This provides more support for not including this relation in the original model. Since adding the direct effect of customer education on product satisfaction shows to affect the model outcomes, another mediation test was performed on the relation using retailer satisfaction as a mediator. The results show that retailer satisfaction is partially mediating the customer education – product satisfaction relation.

4.3.3 Multi-group moderation

Since some of the control variables have significant relations with latent variables in the construct, the model is tested for multi-group moderation. Whereas normal moderation (e.g. age moderates the relation between perceived company effort and retailer satisfaction) involves ordinal or scale measures, multi-group moderation can detect moderating effects for groups (e.g. whether the relation between perceived company effort and retailer satisfaction is stronger or weaker for people with a higher education). Multi-group moderation is tested by running the

model twice in SmartPLS, using two different datasets for the two different groups. Changes in effect size and explained variance are manually assessed. When the results indicate a large difference, Chin's (1998) equation² is used to calculate the level of significance for the moderating effect. The effect size (f^2) of the moderating effect was calculated using Cohen's formula³ and is considered small (0,02), medium (0,15) or large (>0,35) Cohen (1988). Note that unlike e.g. the indicator approach (Henseler & Fassott, 2010) the assessment of multi-group moderation is not based on interaction terms and therefore not suitable for creating interaction plots (Henseler & Chin, 2010). Therefore assessment of the results is based on the effect size (f^2) and significance of the moderating effect.

The effect was assessed for differences between age (≤ 61 , N=275 and > 61 , N=292), between customers who bought their device somewhere else (N=64) and with WayPoint (N=503), for customers with a higher education (N = 295) compared to those with a lower level of education (N = 272) and for customers who made little use of education (N = 267) compared to the group that made the most use of it (N=300). The split level for age (61 years) was chosen to create two approximately equal groups. A similar strategy was used to split the groups for the amount of education usage, based on a variable that was created by merging both the use of all passive and active educational facilities.

Table 9: Multi-group moderation effects

| Group | Size | Relation | f^2 | R^2 | Effect size | T-Value | T-value moderating effect |
|-------------------------|------|--|-------|-------|-------------|---------|---------------------------|
| Age ≤ 61 | 275 | Perceived company effort > Retailer satisfaction | 0,21 | 0,58 | 0,76 | 26,45** | 2,74** |
| Age > 61 | 292 | Perceived company effort > Retailer satisfaction | -0,09 | 0,44 | 0,66 | 17,21** | |
| Level of education low | 272 | Perceived company effort > Retailer satisfaction | 0,24 | 0,59 | 0,77 | 23,72** | 2,29* |
| level of education high | 295 | Perceived company effort > Retailer satisfaction | -0,12 | 0,42 | 0,65 | 16,31** | |

* $P < 0,05$. ** $P < 0,01$ (two-tailed)

The only significant moderating effects that were found were on the perceived company effort – retailer satisfaction relation. The results show that both age and level of education have a mediate effect on this relation. For the younger group of customers, the effect of perceived

²Formula for calculating the t-value for significance of multi-group moderation (Chin, 1998)

$$t = \frac{Path_{sample_1} - Path_{sample_2}}{\sqrt{\left[\frac{(m-1)^2}{(m+n-2)} * S.E.^2_{sample1} + \frac{(n-1)^2}{(m+n-2)} * S.E.^2_{sample2} \right]} * \left[\sqrt{\frac{1}{m} + \frac{1}{n}} \right]}$$

³Formula for calculating the moderator effect size f^2 (Cohen, 1988)

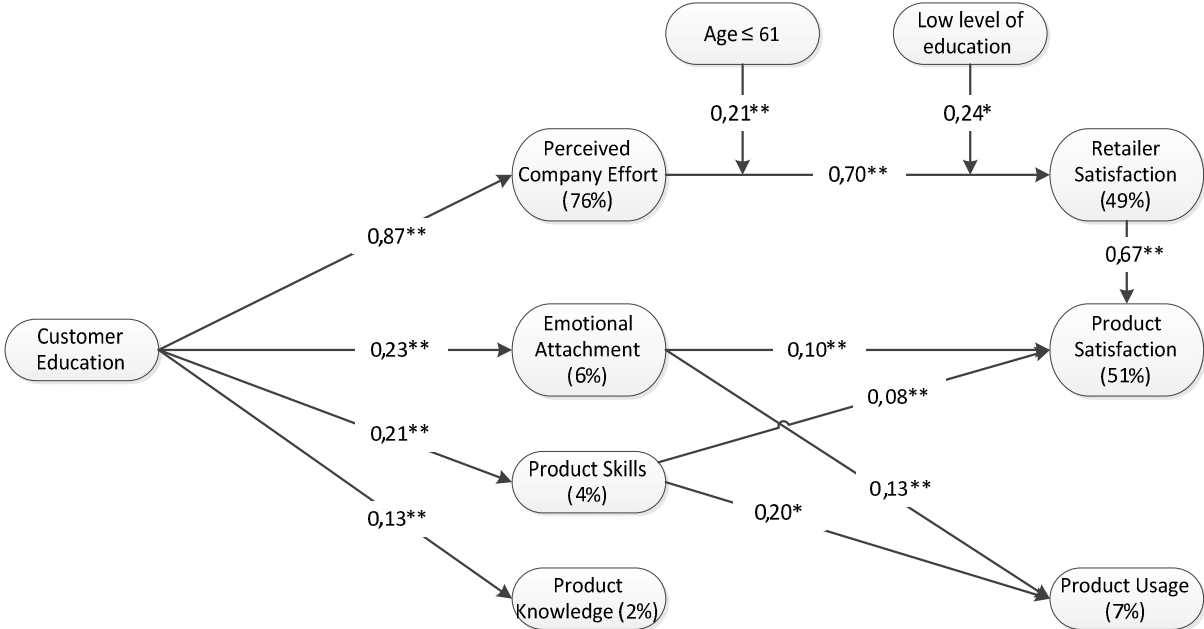
$$f^2 = \frac{R^2_{AB} - R^2_A}{1 - R^2_{AB}}$$

company effort on retailer satisfaction is stronger than for the older group of customers. Further, the explained variance on retailer satisfaction based on perceived company effort is also stronger for customers with a lower level of education. No multi-group moderation effects were found for other two groups; WayPoint customer (yes versus no) and high versus low usage of customer education.

5 Discussion

This section discusses the results of the study. Both theoretical and managerial implications are derived from the results. Further, the limitations of the current study and the recommendations for further research are discussed. Figure 3 shows the significant results of the assessment of the structural model.

Figure 3: Significant results of the structural model analysis



Values on the lines are the standardized effects sizes, *: meaning that the effect is significant on the 0,05 level, **: meaning that the effect is significant on the 0,01 level. Values between brackets represent the percentage of variance explained (R^2). Note that some of the effect sizes can slightly differ from the first analysis since the non-significant relations are deleted.

5.1 Conclusion

In this article, the author aimed at filling the literature gap concerning quantitative support for indications that customer education positively affects customer satisfaction concerning complex consumer products. A SEM analysis was performed on a sample of 567 consumers who own a multipurpose GPS device to test the structural model that was extracted from the extant literature. The results are discussed in this paragraph.

As a general conclusion, it can be stated that customer education does increase customer satisfaction. The results show that the effect that is known to exist in the services industry (Bell & Eisingerich, 2007) is also present in the B2C market for complex tangible products; consumers value the effort a company makes by providing means in order to help them to learn how to use their products.

However, this conclusion asks for several attenuating and more elaborate remarks. The results show that customer education has a very large effect on perceived company effort and subsequently on retailer satisfaction. Customer education also leads to higher product satisfaction but this is mainly through increased satisfaction with the retailer and not skills, knowledge and emotional attachment as was hypothesized.

The hypothesized effects of customer education on learning outcomes and subsequently product satisfaction were significant, but very small. It could be argued that the effects are larger in reality because PLS is known to underestimate path coefficients (Henseler & Fassott, 2010) but on the other hand, larger sample sizes also increase the chance of retrieving significant results (Hair et al., 2010). Furthermore, the effect of the learning outcomes on product satisfaction drops below the significance level when a direct relation is added to the model. In short, the study barely supports the indirect effects of the learning outcomes as a mechanism that predicts satisfaction due to customer education.

An explanation for these findings could be that for the current study customer education was defined as the extent to which the retailer informs the customer about and explains everything related to the product. The fact that customers perceive a high level of educational services does not mean they also use it a lot which could explain the absence of the hypothesized effect. This could also explain why self-efficacy and personal innovativeness, the initially hypothesized moderators were non-significant. On the other hand, a multi-group moderation test did not show significant differences between high and low users of customer education.

Another possible explanation can be found in the design of the knowledge and skills questions. These items were designed to assess the knowledge and skills on the full range of capabilities of the devices. Many customers only use a selection of the functionality and are not interested in knowing all the other functions. So although they could make much use of education in order to do what they want with the device, they could still have 'limited' knowledge and skills by the definition of the questionnaire design.

A third possible reason can be found in the distinction between the current study and previous studies which did show a positive effect on one of the learning outcomes. Most of the mentioned studies in the literature review involve the effectiveness of a single type of education like e.g. product demonstrations (Wood & Moreau, 2006) whereas the current study uses a construct that represents customer education as a concept and includes many different services. In short; given the previous considerations and the limitations of the study (see: 5.4) no decisive answer

can be given concerning the learning outcomes as an explaining mechanism for customer education.

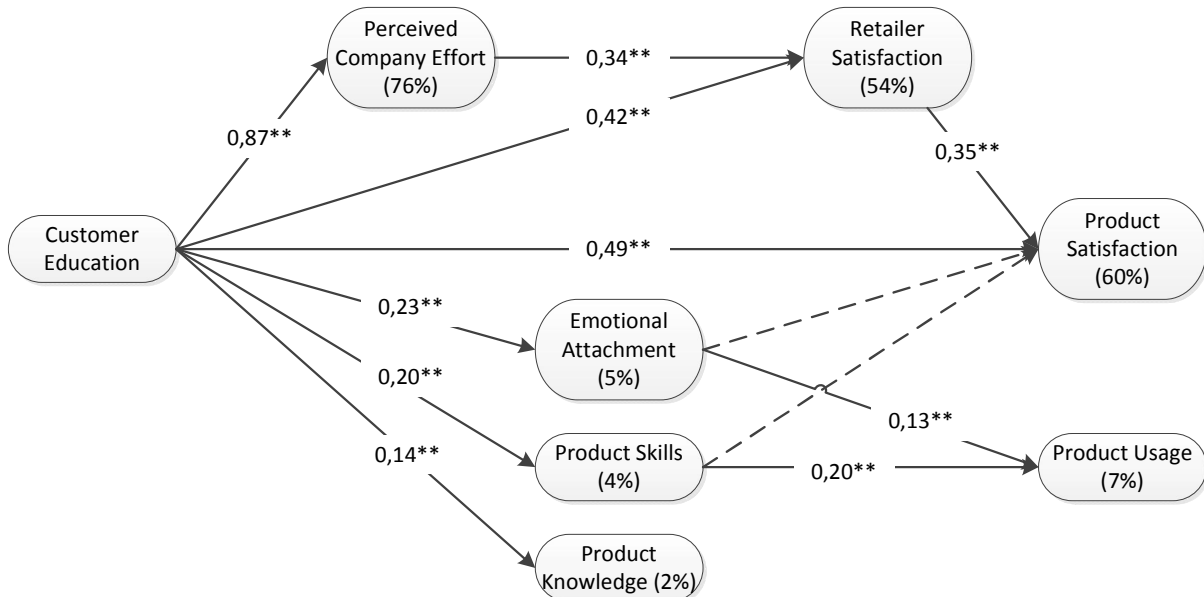
A post-hoc analysis showed that the perceived company effort – retailer satisfaction relation was moderated through age groups. The effect of perceived company effort on retailer satisfaction was much stronger for customers under the age of 61. This could indicate that younger people do not expect companies to put that much effort into them what would explain their significantly higher retailer satisfaction due to positively disconfirmed expectations (Oliver, 1980).

Finally a remark can be made concerning the relative effectiveness of several educational facilities; help and/or guidance in a store, online instruction videos, the user forum, the FAQ section on the website, the telephone helpdesk and workshops were all positively related to customer education, indicating that a mix of active and passive educational facilities might be considered the best practice.

5.1.1 Extended model

Based on these results (that the effect on the learning outcomes is not very strong, probably due to the research design) and the post-hoc analysis, an extended model is proposed (Figure 4). Although this does shift the focus from confirmatory to a more exploratory research, it is the authors' opinion that the results of the post-hoc analysis cannot be neglected and therefore the original model was expanded with direct relations between customer education and satisfaction.

Figure 4: Alternative model



Values on the lines are the standardized effects sizes, *: meaning that the effect is significant on the 0,05 level, **: meaning that the effect is significant on the 0,01 level. Values between brackets represent the percentage of variance explained (R^2). The dashed lines represent the deleted relations from the original model, which were deleted due to insignificance.

The model shows the partial mediating effects of perceived company effort and retailer satisfaction on the direct effects that were found in the post-hoc analysis. No effect was found

from perceived company effort on product satisfaction; this relation is fully mediated through retailer satisfaction.

5.2 Theoretical implications

The target of this study was to provide quantitative support for the relation between customer education and customer satisfaction concerning complex consumer goods. Since this topic had not yet been addressed in the extant literature, the main contribution of this study was to provide further understanding of the effectiveness of customer education as a consumer marketing tool.

The most important finding is that the results of this paper provide quantitative support for the hypothesis that customer education increases satisfaction in the B2C market for complex tangible products. Although being covered in the context of B2B services (e.g. Bell & Eisingerich, 2007), this topic had not yet been addressed for the B2C market and is thus a contribution to the extant literature. In line with earlier studies (e.g. Oliver & Swan, 1989) a transaction of satisfaction with the retailer towards the product was found. Although this is not a new concept, it had not yet been included in customer education – based satisfaction research. In addition, personal traits like self-efficacy were not found to significantly affect the results of customer education, but age did. Presumably through disconfirmation of expectations, the ‘younger’ (i.e. ≤ 61 years) group of customers was much more satisfied with the retailer due to the effort the company put in providing them with education.

Another contribution to the literature can be found in the underlying mechanisms. Although learning outcomes like skills, knowledge and affect are slightly increased by customer education, no convincing evidence could be found regarding their subsequent effect on customer satisfaction. The results do indicate that the underlying mechanism of the customer education concept in its present form (i.e. every means of providing customers with the skills and knowledge to utilize their products) should be sought in perceived product/service augmentation and not necessarily in increasing the consumers’ specific product related knowledge and skills.

5.3 Managerial implications

Several managerial contributions can be drawn from this study. Based on the results, several recommendations are given that managers of retail stores and product brands should take into account when looking for ways to increase customer satisfaction and loyalty.

First of all, the results show that customer education pays off, both in terms of increased retailer and product satisfaction. This means that managers of retail stores that sell consumer electronics should seriously consider adopting customer education if they want to increase the level of satisfaction among their customers. Another argument for implementing customer education is distinguishing themselves from their competitors, including web shops which gain

an increasing market share and are less focussed on personal attention. Although the results do not provide strong support for which type of education is more effective, presumably a combination of both passive and active education is advisable. Naturally, implementing (more) customer education involves the use of resources so it is important to monitor the return on investments in terms of increased customer satisfaction and subsequent loyalty (Oliver, 1999).

Since the retailer and also the manufacturer of the products (in terms of increased product satisfaction) profit from customer education both should look for ways of collaboration. Managers of retailers should ask product suppliers for a contribution (e.g. purchase discounts or combined financing of educational facilities) in the investments they make on customer education by using the argumentation that this will increase satisfaction, and thus loyalty (e.g. Oliver, 1999) with their products.

Managers of product brands should also proactively engage in these collaborations. A retailer which supports its own customer education program is fully independent in the way it explains and promotes the products they sell. For a product manufacturer, collaboration could improve the way its products are explained and sold. Further, it would also send a positive signal to the consumer of the retailer (it's not just the retailer; we also put effort into explaining you how to get the best out of your product). This way, some of the satisfaction due to the product - service augmentation could be projected on the brand of the product as well which can improve brand loyalty.

5.4 Limitations and recommendations for further research

Several limitations are associated with the findings of this study, the most important being the sample characteristics. First of all, the response rate (2%) was low. However, this can be attributed to the fact that the link with the questionnaire was sent combined with other items in a newsletter. Therefore, only people who read the newsletter could find the questionnaire and no reminder was sent. Nevertheless, the sample size is very large and is considered a good representation of the population of the WayPoint customers. Despite this fact, these customers are usually enthusiasts who practice their hobbies using their devices. Therefore, the sample is not a very good representation for the general population.

The sample consists of relatively old (more than 50% is over 60 years of age) male (95%) respondents from which the majority has a higher education (53%). For this reason no analysis of gender differences could be performed and the lack of respondents under the age of 50 results in serious limitations concerning the generalizability of the results towards younger consumers. This being said, the results can be useful for retailers and manufacturers of high involvement, niche-products like these GPS-devices. Stating that implementing various forms of customer education would have similar results for retailers of complex products that are used by the majority of the population (e.g. mobile phones) would be ill advised without further research.

Another limitation can be found in the data sample. The data does not meet the normality assumption although attenuating arguments are that satisfaction measures often tend to be skewed towards the positive side (Peterson & Wilson, 1992) and that PLS is relatively robust to this violation (Jackson et al., 2009). The discriminant validity of the latent constructs is more of an issue since this is on the edge of what can be considered acceptable. The measures of customer education, perceived company effort, retailer satisfaction and product satisfaction carry very high cross-loadings indicating the measurement of similar constructs. Therefore, the results should be approached with caution.

Although to the opinion of the author, the results indicate a positive effect of customer education on both product- and retailer satisfaction it would greatly benefit the robustness of the results when a similar study would be performed on a more general sample of the population. It would be very interesting to see if the results hold up for e.g. customers who purchased mobile phones or other more ordinary household electronics. If such a study would be performed, it would further be well advised to modify and more extensively pre-test the used questionnaire to ensure discriminant validity of the measurement items. In addition, a change in the research design would be advised in order to test whether the learning outcomes as an explaining mechanism for the customer education – satisfaction relation should be rejected or confirmed.

Future studies would also benefit from a comparison between different companies, e.g. with a control group that bought a product from a web shop. Also the influence of age and gender on the effectiveness of customer education could be further examined, especially since these are shown to moderate the satisfaction – loyalty relation (Mittal & Kamakura, 2001).

Another interesting area to discover would be the willingness of customers to pay extra for customer education. Due to web-shops and price comparison sites, comparing prices of products becomes increasingly easy. The question is whether customers are willing to pay a higher price for a product if they can rely on all sorts of educational facilities. Maybe certain customers are willing to pay more for a product when they can buy it in a physical store, the question is whether this effect would also apply to less high-involvement products like these GPS devices.

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Appendix I: Measurement instrument

Table 10: Measurement instrument

| Construct: | Code + Number: | Measurement Question [adopted from] |
|-------------------------------------|----------------|---|
| Customer education | CE1 | WayPoint keeps me very well informed about what is going on with my device and related services. [(Bell & Eisingerich, 2007)] |
| | CE2 | WayPoint explains GPS-devices and its software in a meaningful way. [(Bell & Eisingerich, 2007)] |
| | CE3 | WayPoint always offers me as much information as I Need. [(Bell & Eisingerich, 2007)] |
| | CE4 | WayPoint always explains to me the pros and cons of the product that is recommended to me. [(Bell & Eisingerich, 2007)] |
| Retailer satisfaction | RS1 | My choice to buy a product at WayPoint was a wise one [(Hennig-Thurau et al., 2002)] |
| | RS2 | Overall I am satisfied with WayPoint [(Hennig-Thurau et al., 2002)] |
| | RS3 | I think I did the right thing when I decided to buy a product at WayPoint [(Hennig-Thurau et al., 2002)] |
| | RS4 | I would recommend WayPoint to other people [control question] |
| Product satisfaction | PS1 | My choice to buy this device was a wise one [(Hennig-Thurau et al., 2002)] |
| | PS2 | Overall I am satisfied with my device [(Hennig-Thurau et al., 2002)] |
| | PS3 | I think I did the right thing when I decided to buy this device [(Hennig-Thurau et al., 2002)] |
| | PS4 | I would recommend my device to other people [control question] |
| Perceived Company Effort | PCE1 | WayPoint is doing everything to provide me with the necessary tools and information to learn how to operate my device and the software. |
| | PCE2 | WayPoint employees always go the extra mile to help me out if I have a question or need information |
| | PCE3 | WayPoint really cares about its customers and does everything in its power to show this |
| Emotional Attachment to the Product | | Describe the extent to which the following words describe your typical feelings towards the product: [(Thomson et al., 2005)] |
| | EA1 | Affectionate |
| | EA2 | Friendly |
| | EA3 | Loved |
| | EA4 | Peaceful |
| | EA5 | Passionate |
| | EA6 | Delighted |
| | EA7 | Captivated |
| | EA8 | Connected |
| | EA9 | Bonded |
| | EA10 | Attached |
| Product usage | PU | On average, how much time per week do you spend on average using your device? (in hours) [(Venkatesh & Davis, 2000)] |
| Product Skills | PSK1 | Overall rating of my skills concerning my device [(Thompson et al., 1994)]. |

| | | |
|---------------------------------|------|--|
| | PSK2 | I can add or remove complete maps, or selected areas to or from my device without any problem |
| | PSK3 | I have no problems at all when creating routes or tracks and modifying existing (downloaded) routes or tracks. |
| | PSK4 | It takes me a lot of effort to get the device to do what I want it to do (e.g. load a route, fill in a destination, apply the right routing settings etc). (reverse score) |
| | PSK5 | I master every aspect of the software (e.g. Mapsource, Basecamp, Training Centre) that came with my device. |
| Length of use | LU | The length of time I have used my Device (in years/months) [(Thompson et al., 1994)]. |
| Product Knowledge | PK1 | I know pretty much about the capabilities of my device and the accompanying software (e.g. Mapsource, Basecamp, Training Centre) [0,93 in (Flynn & Goldsmith, 1999)]. |
| | PK2 | I do not feel very knowledgeable about my GPS device and the accompanying software [0,93 in (Flynn & Goldsmith, 1999)]. |
| | PK3 | Among my circle of friends, I'm one of the "experts" on the capabilities of GPS devices and the accompanying software [0,93 in (Flynn & Goldsmith, 1999)]. |
| | PK4 | Compared to most other people, I know less about my GPS device and the accompanying software [0,93 in (Flynn & Goldsmith, 1999)]. |
| | PK5 | When it comes to the capabilities of my GPS device and its accompanying software, I really don't know a lot [0,93 in (Flynn & Goldsmith, 1999)]. |
| Moderating variables | | |
| Personal Innovativeness | PI1 | If I heard about a new type of technology I would look for ways to experiment with it. [(Agarwal & Prasad, 1998)] |
| | PI2 | Among my peers, I am usually the first to try out new technologies [(Agarwal & Prasad, 1998)] |
| | PI3 | In general, I am hesitant to try out new technologies [(Agarwal & Prasad, 1998)] |
| | PI4 | I like to experiment with new technologies [(Agarwal & Prasad, 1998)] |
| Self efficacy | SE1 | I am confident about my ability to operate a technological product that is new to me [based on (Spreitzer, 1995)] |
| | SE2 | I am self-assured about my capabilities when I have to perform a task with a technological product that is new to me [based on (Spreitzer, 1995)] |
| | SE3 | I possess all the skills necessary to quickly start operating a technological product that is new to me [based on (Spreitzer, 1995)] |
| Control variables: | | |
| | | To what extent did you make use of the following sources: |
| | CE5a | Help and/or guidance in a WayPoint store |
| | CE5b | Help and/or guidance from friends, family or other relatives |
| | CE5c | Online instruction videos from WayPoint |
| | CE5d | The WayPoint forum |
| | CE5e | The product manual |
| | CE5f | The 'GPS-wijzer' (An instruction booklet written by an external party, sold at WayPoint') |
| | CE5g | The FAQ section on the WayPoint website |
| | CE5h | The telephone helpdesk |
| | CE5i | The email help desk |
| Workshop | CE6 | Did you participate in one of the WayPoint workshops? |
| Customer Relation Lenght | CRL | How long ago did you made your first purchase at WayPoint? |
| Age | AGE | What is your age? |

| | | |
|---|-----|--|
| Gender | GEN | What is your gender? |
| What is your level of education? | EDU | What is the level of your education: LBO, MAVO, VMBO, MBO-1, HAVO, VWO, MBO2-4, HBO, WO |
| Questions added for WayPoint: | | |
| | | Which device do you own? (choose from drop down menu) |
| | | For which purposes do you use your device? (choose from drop-down menu with additional open field) |
| | | Did you buy the device in one of our stores, our web shop, on an exhibition (e.g. motorbeurs, fiets&wandel beurs) or somewhere else? |
| | | I am capable of doing everything I would like to do with my device and the software |

Appendix II: Questionnaire

This appendix contains the questionnaire which is a Dutch translation of the measurement instrument. All questions are introduced with a short explanation in Dutch. Comments between squared brackets are intended for the designer of the survey and were not included in the questionnaire. Questions that are marked with 'WP' are added on behalf of WayPoint.

List of abbreviations: **CQ**: Control question, **GQ**: General question, **LU**: Length of use, **WP**: WayPoint, **RS**: Retailer satisfaction, **PS**: Product satisfaction, **CE**: Customer education, **PCE**: Perceived company effort, **EA**: Emotional attachment, **PU**: Product usage, **PS**: Product skills, **PK**: Product knowledge, **PI**: Personal innovativeness, **SI**: Self-efficacy, **CRL**: Customer relation length, **AGE**: Age, **GEN**: Gender, **EDU**: Education

Start of the questionnaire

Welkom bij de WayPoint enquête. Deze enquête gaat over de services die WayPoint biedt en over de ervaringen die klanten met deze services en hun product(en) hebben. De enquête is gericht op gebruikers van 'outdoor'- en motor GPS toestellen die het toestel minimaal 1 maand in hun bezit hebben.

'Outdoor' GPS toestellen zijn alle water- en schokbestendige Garmin, Magellan en Mio toestellen alsook andere merken. Enkele voorbeelden: de Oregon-serie, de Edge-serie, de GPSMAP-serie, de Montana-serie, de Forerunner-serie en de Nuvi 510 en 550.

Uitgezonderd zijn de toestellen die specifiek bedoeld zijn voor auto-navigatie zoals de Nuvi-serie* en de Dezl-serie. (*Met uitzondering van de Nuvi 510 en 550)

Motor GPS Toestellen zijn bijvoorbeeld de Zumo-serie en de TomTom Rider serie maar ook de Garmin Montana, Quest, en streetpilot series.

CQ1. *Bent u in het bezit van een 'outdoor'- of motor-GPS toestel? (Zie bovenstaande uitleg)*

- Ja (1)
- Nee (2) → Einde enquête: "U valt helaas buiten de doelgroep van deze enquête, hartelijk dank voor uw medewerking. U kunt de enquête nu afsluiten."

GQ1. *Heeft u meerdere 'outdoor' GPS toestellen? (Zie bovenstaande uitleg)*

- Nee (1) → [Questionnaire follows route 1]
- Ja (2) → [Questionnaire follows route 2]

Route 1

LUa. *Hoe lang hebt u het toestel al in gebruik?*

- Minder dan 1 maand (1) → Einde enquête: "U valt helaas buiten de doelgroep van deze enquête, hartelijk dank voor uw medewerking. U kunt de enquête nu afsluiten."
- Meer dan 1 maand, geef aan hoe veel maanden [Open invulmogelijk] (2)

QC2. *Waar hebt u het toestel gekocht?*

- WayPoint winkel, snelbalie.gps.nl (WayPoint webwinkel), motor of fiets- en wandelbeurs, elders; namelijk...[open invulveld]. [1 antwoord mogelijk]

GQ3a. *Welke toestel heeft u?*

- Kies uit volledige lijst met huidige en niet meer leverbare toestellen die aangevinkt kunnen worden [Slechts 1 optie mogelijk]

Route 2

Let op, lees onderstaande instructie goed door:

U hebt aangegeven meerdere toestellen te bezitten, neemt u bij het invullen van de enquête het toestel in uw hoofd wat u **het laatst** heb aangekocht **mits het niet minder dan 1 maand geleden is**. Wanneer dit het geval is dient u de vragen te beantwoorden **op basis van het voorlaatst aangekochte toestel**.

LUB. *Hoe lang hebt u het toestel al in gebruik?*

- Antwoord in maanden [open invulmogelijkheid]

GQ2. *Waar hebt u het toestel gekocht?*

- WayPoint winkel, snelbalie.gps.nl (WayPoint webwinkel), motor of fiets- en wandelbeurs, elders; namelijk...[open invulveld]. [1 antwoord mogelijk]

GQ3b. *Om wat voor toestel gaat het?*

- Kies uit volledige lijst met huidige en niet meer leverbare toestellen die aangevinkt kunnen worden [Slechts 1 optie mogelijk]

WP1. *Welke toestellen heeft u nog meer? [WP]*

- Kies uit volledige lijst met huidige en niet meer leverbare toestellen die aangevinkt kunnen worden [meerdere opties mogelijk]

Collective questionnaire continues

De volgende stellingen gaan over uw tevredenheid met het toestel en met WayPoint, geef aan in hoeverre u het eens bent met de volgende stellingen: [5-point likert scale: totally disagree - totally agree]

RS1. *Het was een wijze beslissing om een product bij WayPoint te kopen*

RS2. *Ik ben tevreden over WayPoint*

RS3. *Ik denk dat ik er goed aan heb gedaan toen ik besloot een product bij WayPoint te kopen*

RS4. *Ik zou WayPoint aan anderen aanbevelen*

PS1. *Het was een wijze beslissing om dit toestel te kopen*

PS2. *Ik ben tevreden met mijn toestel*

PS3. *Ik denk dat ik er goed aan heb gedaan toen ik besloot dit toestel te kopen*

PS4. *Ik zou dit toestel aan anderen aanbevelen*

De volgende stellingen gaan over de services die WayPoint biedt. Geef aan in hoeverre u het eens bent met de volgende stellingen: [5-point likert scale: totally disagree - totally agree]

CE1. *WayPoint houdt mij goed op de hoogte van wat er speelt rond mijn toestel en de hieraan gerelateerde services*

CE2. *WayPoint legt GPS toestellen en de bijbehorende software op een zinvolle manier uit*

CE3. *WayPoint geeft me altijd zoveel informatie als ik nodig heb*

CE4. *WayPoint legt altijd de voor- en nadelen uit van hun producten*

PCE1. WayPoint doet er alles aan om mij van de nodige handvatten en informatie te voorzien die ik nodig heb om te leren hoe mijn toestel en de software werken

PCE2. WayPoint medewerkers zijn altijd bereid om nét wat verder te gaan om me te helpen als ik een vraag heb

PCE3. WayPoint geeft veel om zijn klanten en doet er alles aan om dat te laten blijken

WayPoint biedt een aantal mogelijkheden om meer over uw toestel en de werking er van te weten te komen. Ook zijn er andere bronnen van informatie over de producten en hun werking. Geef aan hoe vaak u van de volgende bronnen gebruik hebt gemaakt: [5-point likert scale: never – very often]

CE5a. Uitleg en/of hulp in een WayPoint winkel

CE5b. Uitleg en/of hulp van anderen (vrienden, familie, collega's etc.)

CE5c. Instructie filmpjes van WayPoint (tv.gps.nl)

CE5d. Het WayPoint forum (forum.gps.nl)

CE5e. De handleiding van mijn toestel

CE5f. De GPS-wijzer door F.J. Reitsma en J. Verbeek (Het boekje dat bij WayPoint verkocht wordt)

CE7g. Veel gestelde vragen (FAQ's, bijvoorbeeld de 'outdoor'- en 'zumo-infopagina') op de website myWayPoint.nl

CE8h. Telefonische WayPoint helpdesk

CE8i. Vragen aan WayPoint via e-mail

CE6. *Heeft u wel eens een workshop gevolgd bij WayPoint?*

- Ja (1)
- Nee (2)

CE7. Zijn er andere bronnen die u geraadpleegd heeft om meer te weten te komen over uw toestel en/of de werking er van? (niet verplicht) [open invulveld]

Geef aan in welke mate de volgende woorden uw gevoelens ten opzichte van uw product beschrijven:

[5-point likert scale: very poor – very good]

EA1. *Hartelijk*

EA2. *Vriendelijk*

EA3. *Geliefd*

EA4. *Rustig*

EA5. *Gepassioneerd*

EA6. *Blij*

EA7. *Gefascineerd*

EA8. *Verbonden*

EA9. Gebonden

EA10. Gehecht

De volgende vragen gaan over het gebruik van uw toestel:

GQ4. *In hoeverre maakt u gebruik (of heeft u gebruik gemaakt) van software die bij het toestel gebruikt kan worden? (Bijvoorbeeld: Mapsource, Basecamp, Webupdater of Training Center.)***[WP]**

- Nooit (1)
- Eenmaal bij ingebruikname van mijn toestel (2)
- Meer dan eens (3)

PU1. *Wanneer gebruikt u uw toestel normaal gesproken?*

- Op vakantie, doordeweeks, in het weekend, in de lente, in de zomer, in de herfst, in de winter (meerdere antwoorden mogelijk)

PU2. *Hoeveel uur per week besteedt u gemiddeld aan het gebruik van uw toestel?*

- Antwoord In uren

WP2. *Waar gebruikt u uw toestel voor? (meerdere antwoorden mogelijk)***[WP]**

- Fietsen, wandelen, motorrijden, autorijden, wielrennen, mountainbiken, off-road rijden (auto of motor), hardlopen, Anders namelijk: [open invulveld]

De volgende stellingen gaan over het gemak waarmee u uw toestel bediend. Geef aan in hoeverre deze stellingen op u van toepassing zijn: [5-point likert scale: totally disagree - totally agree]

PSK1. *Mijn algemene vaardigheden met betrekking tot het gebruik van mijn toestel zijn zeer goed*

PSK2. *Ik kan complete kaarten of geselecteerde delen daarvan naar believen op mijn toestel zetten of daarvan verwijderen zonder enig probleem*

PSK3. *Het kost mij geen enkele moeite routes of tracks te maken of bestaande (gedownload) routes of tracks aan te passen*

PSK4. *Het kost mij erg veel moeite het apparaat te laten doen wat ik wil. (Bijvoorbeeld: een route laden, een bestemming in voeren of de juiste instellingen toepassen)* [Reversed]

PSK5. *Ik beheers alle aspecten van de software die bij mijn toestel hoort (Bijvoorbeeld: Mapsource, Basecamp of Training Center)*

WP3. *Alle functies van mijn toestel en de software die ik wil kunnen gebruiken beheers ik ook daadwerkelijk.***[WP]**

De volgende stellingen gaan over uw kennis met betrekking tot uw toestel en de bijbehorende software. Met de 'bijbehorende software' wordt bijvoorbeeld Mapsource, Basecamp of Training Center bedoeld. Geef aan in hoeverre deze stellingen op u van toepassing zijn: [5-point likert scale: totally disagree - totally agree]

PK1. *Ik weet behoorlijk veel over de mogelijkheden van mijn toestel en de bijbehorende software.*

PK2. *Ik voel mij niet goed geïnformeerd over mijn toestel en de bijbehorende software.* [Reversed]

PK3. *Binnen mijn vrienden- en kennissenkring ben ik een van de 'experts' op het gebied van GPS-toestellen en de bijbehorende software.*

PK4. *Vergeleken met de meeste andere mensen, weet ik minder over mijn toestel en de bijbehorende software.* [Reversed]

PK5. *Met betrekking tot de mogelijkheden van mijn toestel en de bijbehorende software weet ik niet echt veel.* [Reversed]

De volgende stellingen gaan over uw houding ten opzichte van nieuwe technieken/ontwikkelingen. **Deze vragen zijn algemeen van aard, en gaan niet over WayPoint of GPS-toestellen.** Geef aan in hoeverre deze stellingen op u van toepassing zijn: [5-point likert scale: totally disagree - totally agree]

PI1. *Wanneer ik zou horen over een nieuw type technologie zou ik zoeken naar een manier om hiermee te experimenteren*

PI2. *Onder mijn kennissen ben ik meestal de eerste die nieuwe technologieën uit probeert*

PI3. *Over het algemeen ben ik huiverig om nieuwe technologieën uit te proberen*[Reversed]

PI4. *Ik vind het leuk om te experimenteren met nieuwe technologieën*

SE1. *Ik heb alle vertrouwen in mijn vermogen tot het bedienen van een nieuw technologisch product*

SE2. *Ik ben zelfverzekerd over mijn capaciteiten wanneer ik een taak met een nieuw technologisch product moet volbrengen*

SE3. *Ik bezit alle vaardigheden die nodig zijn om snel met een nieuw technologisch product aan de slag te kunnen*

Tot slot nog enkele algemene vragen

CRL. *Hoe lang geleden hebt u uw eerste aankoop bij WayPoint gedaan?*

- [Antwoord in jaren en maanden]

GEN. *Ik ben een:*

- Man (1)
- Vrouw (2)

AGE. *Wat is uw geboortjaar?*

- [open invulmogelijkheid]

EDU. *Wat is het niveau van uw hoogst genoten of huidige opleiding?*

- Geen (1)
- Primair onderwijs of vergelijkbaar (2)
- VMBO/MBO1 of vergelijkbaar (3)
- HAVO/VWO of vergelijkbaar (4)
- MBO 2-4 of vergelijkbaar (5)
- HBO of vergelijkbaar (6)
- WO of vergelijkbaar (7)
- Anders, namelijk: [open veld] (8)

WP4. Als u nog suggesties of opmerkingen voor ons heeft kunt u deze hier in vullen: **[WP]**

- [Open invul vak, niet verplicht voor voortgang]

Namens WayPoint wil ik u hartelijk danken voor het invullen van deze enquête!

Appendix III: Manipulation data sample

The original dataset was first explored using Microsoft Excel. The original column titles which were by default the original questions were replaced by the coding scheme specified in Appendix I: Measurement instrument. Further, all answers were recoded into their accompanying values from 1 to 5 (see: Appendix II) since the answer-output was in text-form. The items PSK4, PK2, PK4, PK5 and PI3 were reversed since these were reverse coded in the sample. In the original output data, every respondent was given the time and date of completion of the questionnaire. However, since some respondents completed the questionnaire at exactly the same time, they were given a unique code (1 for the first respondent, 2 for the second and so on) to be able to make a distinction between individuals and to assure that the chronological order of completion could be retained if necessary. Items WP1-4 were deleted from the dataset as well as item PU1.

Using filtering techniques, all respondents that failed to complete the questionnaire were deleted from the original dataset. Three respondents who answered “no” to the question on whether they had an outdoor- or motorcycle GPS system (item CQ) but still continued the questionnaire were deleted from the sample. Hereafter, the item CQ was deleted from the dataset. The item LUa was displayed in the data as ‘more than 1 month; specify how many months; ...’. For this item, the text was deleted so only a number (the number of months) would remain. Unfortunately, for this type of question Obsurvey did not offer the possibility to allow only numbers as a response which led to a variety of responses. Several responses like “since 2009”, “since May 2011” and “4 years” were manually recalculated into the number of months. “Since 2009” was recalculated as “Since July 1st 2009”, “3 – 4 years” was recalculated as 3,5 years and 1,25 months was changed to 1 month. Other responses that were found were: “many years”, “many months” and “over a year”. These responses were deleted and treated as missing data along with ten respondents who left this item blank.

The device-checklist was assessed on devices that were filled in on the ‘my device is not on the list, but I have an’ answer option. Some respondents had overlooked their model and manually filled it in, these values were recoded. Four owners of specific car-navigation systems (a Garmin Nuvi 2595LMT, a Garmin Nuvi 3597LMT and a Garmin Nuvi 765T (2x)) were found. These respondents were deleted from the sample since these devices do not offer the functionality for which the questionnaire was designed. For the same reason, the four respondents who indicated to own a Garmin Forerunner 10, Forerunner 310xt, Forerunner 410 and Foretrex 301 were deleted from the sample.

Several of the respondents had answered the “level of education question” using the “other; namely...” answer option but their answers still fit into one of the standard options. These responses were manually recoded; “LTS (6x)” was changed to “VMBO/MBO1 of vergelijkbaar”,

“MTS (3x)” was changed to “MBO 2-4 of vergelijkbaar”, “B Eng AD” and “hoge school” were changed to “HBO of vergelijkbaar” and “Universiteit” was changed to “WO of vergelijkbaar”.

Based on the type of device, an extra variable was added; device value. Prices were determined based on the latest consumer prices at WayPoint. Since prices decrease over time and tend to differ between retailers every device was categorised in price categories since exact purchase prices are not retraceable. The following categories were defined (in Euros); ‘0-200’, ‘201-300’, ‘301 – 400’, ‘401-500’, ‘501-600’, ‘600 and higher’. Since there are no devices below €100,-, and hardly any above €600,- these categories were chosen. The results can be found in Table 11.

Table 11: Coding of the device value variable

| Device | Device value (in Euros) | Category |
|--|-------------------------|----------|
| Garmin Colorado 300 / 400 | 301-400 | 3 |
| Garmin Dakota 10 | 0-200 | 1 |
| Garmin Dakota 20 | 201-300 | 2 |
| Garmin Edge 605 | 201-301 | 2 |
| Garmin Edge 705 | 201-302 | 2 |
| Garmin Edge 800 | 301-400 | 3 |
| Garmin Edge 810 | 401-500 | 4 |
| Garmin eTrex 10 | 0-200 | 1 |
| Garmin eTrex 20 | 0-200 | 1 |
| Garmin eTrex 30 | 201-300 | 2 |
| Garmin eTrex Legend (H/C/Cx/HCx) | 201-300 | 2 |
| Garmin eTrex Vista (C/Cx/H/HCx) | 0-200 | 1 |
| Garmin GPSMAP 60 (Cx/CSx) | 201-300 | 2 |
| Garmin GPSMAP 62 | 201-300 | 2 |
| Garmin GPSMAP 62s | 301-400 | 3 |
| Garmin GPSMAP 62st | 301-400 | 3 |
| Garmin GPSMAP 62sc | 301-400 | 3 |
| Garmin GPSMAP 62stc | 301-400 | 3 |
| Garmin Montana 600 | 301-400 | 3 |
| Garmin Montana 650 | 401-500 | 4 |
| Garmin Montana 650t | 501-600 | 5 |
| Garmin Nuvi 510 | 201-300 | 2 |
| Garmin Nuvi 550 | 201-300 | 2 |
| Garmin Oregon 200 / 300 | 201-300 | 2 |
| Garmin Oregon 400 | 201-300 | 2 |
| Garmin Oregon 400t | 301-400 | 3 |
| Garmin Oregon 450 | 201-300 | 2 |
| Garmin Oregon 450t | 301-400 | 3 |
| Garmin Oregon 550 | 301-400 | 3 |
| Garmin Oregon 550t | 301-400 | 3 |
| Garmin Oregon 600 | 301-400 | 3 |
| Garmin Oregon 600t | 301-400 | 3 |
| Garmin Oregon 650 | 301-400 | 3 |
| Garmin Oregon 650t | 401-500 | 4 |
| Garmin StreetPilot 2610/20 / 2720 / 2820 | 600 + | 6 |
| Garmin Zumo 210 | 201-300 | 2 |
| Garmin Zumo 220 | 301-400 | 3 |
| Garmin Zumo 350LM | 401-500 | 4 |
| Garmin Zumo 500 | 501-600 | 5 |
| Garmin Zumo 550 | 501-600 | 5 |
| Garmin Zumo 660 | 501-600 | 5 |
| Garmin GPSMAP 276/278 | 600 + | 6 |
| Garmin QUEST 1 | 501-600 | 5 |
| Garmin GPSMAP 78s | 301-400 | 3 |
| Mio Cyclo 300 | 201-300 | 2 |
| TomTom Rider Breedbeeld | 301-400 | 3 |
| TomTom Urban Rider (Plus) | 201-300 | 2 |

The table below shows the coding of dummy variables and the accompanying categories:

Table 12: Coding of categorical variables

| Variable: | Dummy variables | | |
|-------------------------------|-----------------|------------|-----------|
| GEN (gender) | GEN | | |
| Male (1) | 1 | | |
| Female (2) | 0 | | |
| GQ1 (Multiple devices yes/no) | GQ1 | | |
| Yes (1) | 1 | | |
| No (2) | 0 | | |
| CE6 (Workshop yes/no) | CE6 | | |
| Yes (1) | 1 | | |
| No (2) | 0 | | |
| GQ4 (Software usage) | GQ4_Dummy1 | GQ4_Dummy2 | |
| Never (1) | 0 | 0 | |
| Once (2) | 0 | 1 | |
| More than once (3) | 1 | 0 | |
| PP (Place of Purchase) | PP_Dummy1 | PP_Dummy2 | PP_Dummy3 |
| WayPoint store (1) | 1 | 0 | 0 |
| WayPoint webshop (2) | 0 | 1 | 0 |
| WayPoint stand exposition (3) | 0 | 0 | 0 |
| Elsewhere (4) | 0 | 0 | 1 |

Table 13 shows the categorized values for the variable product usage after the root transformation.

Table 13: Recoding of product usage

| Product usage* | | |
|----------------|-------------|-------------|
| Value | Lower bound | Upper bound |
| 1 | 0,00 | 0,79 |
| 2 | 0,79 | 1,18 |
| 3 | 1,18 | 1,56 |
| 4 | 1,56 | 1,95 |
| 5 | 1,95 | >1,95 |
| Mean | | 1,37 |
| Std. Deviation | | 0,39 |
| Minimum | | 0,00 |
| Maximum | | 2,51 |

*: After fourth root transformation

Table 14 shows the categorization of the variables length of use and customer relation length.

Table 14: Categorization of variables

| Length of use | | | Customer relation length | | |
|---------------|-------------|-------------|--------------------------|-------------|-------------|
| Value | Lower bound | Upper bound | Value | Lower bound | Upper bound |
| 1 | 0 | 12 | 1 | 0 | 12 |
| 2 | 12 | 24 | 2 | 12 | 24 |
| 3 | 24 | 36 | 3 | 24 | 36 |
| 4 | 36 | 48 | 4 | 36 | 48 |
| 5 | 48 | 60 | 5 | 48 | 60 |
| 6 | 60 | >60 | 6 | 60 | 72 |
| | | | 7 | 72 | >72 |

Appendix IV: Outliers and normality

The dataset was examined for outliers. In Table 15, the procedural errors (Hair et al., 2010) can be found. All of these are deleted and treated as missing values. Eight cases for the variable AGE were present where the respondents probably made a typo (e.g. ID 226), failed to read the question thoroughly (e.g. ID 632) or refused to answer (e.g., respondent with ID126 indicated in the EDU question that he did not want to answer these questions).

Since the first GPS systems were imported and sold in the year 2000 by the founders of WayPoint, customer relationship length (CRL) values of over 13,5 years (i.e. 162 months) are considered procedural errors. Since that was the moment on which the very first devices appeared on the market the cut-off value for length of use (LU) is treated same wise. Therefore 192 months of usage is considered a procedural error as well.

Table 15: Outliers

| Procedural errors | | |
|-------------------|-------------------------------|-------|
| Respondent ID | Variable | Value |
| 233 | AGE: Age | 6 |
| 632 | AGE: Age | 73 |
| 316 | AGE: Age | 1346 |
| 760 | AGE: Age | 1900 |
| 126 | AGE: Age | 2013 |
| 226 | AGE: Age | 16952 |
| 645 | AGE: Age | 19556 |
| 671 | AGE: Age | 19961 |
| 414 | CRL: Customer relation length | .36 |
| 364 | CRL: Customer relation length | 180 |
| 440 | CRL: Customer relation length | 192 |
| 439 | CRL: Customer relation length | 200 |
| 302 | CRL: Customer relation length | 240 |
| 18 | CRL: Customer relation length | 240 |
| 244 | CRL: Customer relation length | 273 |
| 273 | CRL: Customer relation length | 288 |
| 154 | CRL: Customer relation length | 700 |
| 315 | CRL: Customer relation length | 1958 |
| 647 | CRL: Customer relation length | 2006 |
| 645 | CRL: Customer relation length | 2008 |
| 440 | LU: Length of use | 192 |

After deletion of the procedural errors, the data was examined for other outliers that exceeded 4 times (+/-) the standard deviation. Several extraordinary observations were found. CRL values of 160 months (once) and 156 months (3 times) were high but not impossible as well as values of 0 months (no WayPoint customers). For LU (Length of Use) 144 months was the highest value (followed by 5 times 120 months). Four respondents indicated a weekly use of 40 hours of their device, followed by 36 hours (once) and 30 hours (twice). Although being high, this usage level is plausible (e.g. for people who are professional drivers and use their device also on the road). All of these values are considered plausible and are therefore retained as extraordinary observations.

Table 16: Skewness and kurtosis

| | Skewness | Z-skewness | Kurtosis | Z-skewness |
|---------------------------|----------|------------|----------|------------|
| , | -1,81 | -17,61 | 2,01 | 9,79 |
| Retailer Satisfaction2 | -2,02 | -19,63 | 2,72 | 13,20 |
| Retailer Satisfaction3 | -1,87 | -18,13 | 2,21 | 10,76 |
| Retailer Satisfaction4 | -2,10 | -20,37 | 2,96 | 14,36 |
| Product Satisfaction1 | -1,96 | -19,01 | 2,67 | 12,95 |
| Product Satisfaction2 | -1,70 | -16,52 | 1,72 | 8,36 |
| Product Satisfaction3 | -1,85 | -17,98 | 2,24 | 10,90 |
| Product Satisfaction4 | -1,31 | -12,70 | 0,52 | 2,52 |
| Customer Education1 | -1,06 | -10,27 | 0,12 | 0,56 |
| Customer Education2 | -1,57 | -15,25 | 1,40 | 6,80 |
| Customer Education3 | -1,44 | -14,00 | 1,18 | 5,75 |
| Customer Education4 | -1,20 | -11,68 | 0,63 | 3,04 |
| Perceived Company Effort1 | -1,12 | -10,87 | 0,26 | 1,28 |
| Perceived Company Effort2 | -1,49 | -14,51 | 1,19 | 5,76 |
| Perceived Company Effort3 | -1,46 | -14,17 | 1,20 | 5,84 |
| Emotional Attachment1 | -0,95 | -9,24 | 0,70 | 3,42 |
| Emotional Attachment2 | -1,15 | -11,19 | 1,16 | 5,65 |
| Emotional Attachment3 | -1,00 | -9,70 | 1,05 | 5,11 |
| Emotional Attachment4 | -0,96 | -9,30 | 0,93 | 4,50 |
| Emotional Attachment5 | -0,63 | -6,16 | 0,07 | 0,32 |
| Emotional Attachment6 | -0,96 | -9,34 | 0,92 | 4,45 |
| Emotional Attachment7 | -0,97 | -9,47 | 0,88 | 4,30 |
| Emotional Attachment8 | -0,85 | -8,26 | 0,70 | 3,40 |
| Emotional Attachment9 | -0,49 | -4,78 | -0,21 | -1,04 |
| Emotional Attachment10 | -0,86 | -8,36 | 0,50 | 2,44 |
| Product Skills1 | -0,92 | -8,98 | 0,40 | 1,95 |
| Product Skills2 | -0,84 | -8,19 | -0,58 | -2,80 |
| Product Skills3 | -0,63 | -6,14 | -0,89 | -4,32 |
| Product Skills4 | -0,85 | -8,25 | -0,59 | -2,89 |
| Product Skills5 | -0,33 | -3,19 | -0,97 | -4,73 |
| Product Knowledge1 | -0,66 | -6,45 | -0,24 | -1,15 |
| Product Knowledge2 | -0,43 | -4,21 | -1,10 | -5,34 |
| Product Knowledge3 | -0,26 | -2,54 | -0,90 | -4,36 |
| Product Knowledge4 | -0,64 | -6,23 | -0,48 | -2,31 |
| Product Knowledge5 | -0,73 | -7,07 | -0,61 | -2,96 |
| Personal Innovativeness1 | -0,43 | -4,14 | -0,63 | -3,08 |
| Personal Innovativeness2 | -0,20 | -1,92 | -0,99 | -4,83 |
| Personal Innovativeness3 | -0,80 | -7,75 | -0,45 | -2,20 |
| Personal Innovativeness4 | -0,60 | -5,82 | -0,68 | -3,31 |
| Self-Efficacy1 | -0,70 | -6,77 | -0,10 | -0,47 |
| Self-Efficacy2 | -0,51 | -4,93 | -0,43 | -2,09 |
| Self-Efficacy3 | -0,34 | -3,32 | -0,73 | -3,56 |
| Product Usage* | -0,11 | -1,07 | 9,89 | 48,07 |
| Customer Relation Length | 0,79 | 7,65 | 0,11 | 0,54 |
| Age | -0,86 | -8,33 | 1,51 | 7,32 |
| Level of Education | -0,57 | -5,52 | -0,44 | -2,15 |
| Length of Use | 0,96 | 9,32 | 1,19 | 5,77 |
| Device Value | -0,13 | -1,28 | -1,33 | -6,45 |
| Customer Education 5a | -0,01 | -0,12 | -0,16 | -0,79 |
| Customer Education 5b | 0,45 | 4,37 | -0,61 | -2,95 |
| Customer Education 5c | -0,42 | -4,04 | -0,27 | -1,32 |
| Customer Education 5d | -0,07 | -0,70 | -0,82 | -4,00 |
| Customer Education 5e | -0,08 | -0,75 | -0,48 | -2,31 |
| Customer Education 5f | 1,49 | 14,46 | 0,76 | 3,70 |
| Customer Education 5g | 0,23 | 2,27 | -0,88 | -4,29 |
| Customer Education 5h | 1,16 | 11,30 | 0,69 | 3,34 |
| Customer Education 5i | 1,14 | 11,04 | 0,78 | 3,81 |

*: After fourth root transformation

$$z\text{-values were calculated using these equations: } Z_{kurtosis} = \frac{kurtosis}{\sqrt{\frac{24}{N}}} \quad Z_{skewness} = \frac{skewness}{\sqrt{\frac{6}{N}}}$$

The highlighted items exceed either +/- 2,58, indicating skewness or kurtosis with a significance level of 0,01

(Hair et al., 2010)

Appendix V: Cross loadings

Table 17: Initial cross-loadings

| | CE | EA | PCE | PI | PK | PS | PSK | PU | RS | SE |
|------|-------|-------|-------|--------|-------|--------|-------|--------|-------|--------|
| CE1 | 0,844 | 0,224 | 0,683 | 0,025 | 0,173 | 0,584 | 0,158 | -0,009 | 0,544 | 0,034 |
| CE2 | 0,937 | 0,185 | 0,819 | 0,066 | 0,210 | 0,698 | 0,211 | 0,051 | 0,700 | 0,057 |
| CE3 | 0,932 | 0,204 | 0,843 | 0,063 | 0,221 | 0,685 | 0,206 | 0,043 | 0,686 | 0,054 |
| CE4 | 0,891 | 0,240 | 0,776 | 0,053 | 0,181 | 0,682 | 0,207 | 0,028 | 0,643 | 0,047 |
| EA1 | 0,162 | 0,813 | 0,143 | -0,021 | 0,033 | 0,137 | 0,108 | 0,071 | 0,082 | -0,028 |
| EA10 | 0,212 | 0,810 | 0,195 | 0,063 | 0,175 | 0,215 | 0,266 | 0,113 | 0,132 | 0,093 |
| EA2 | 0,206 | 0,809 | 0,204 | -0,038 | 0,062 | 0,170 | 0,111 | 0,058 | 0,118 | -0,012 |
| EA3 | 0,205 | 0,824 | 0,189 | -0,012 | 0,103 | 0,179 | 0,149 | 0,043 | 0,112 | 0,015 |
| EA4 | 0,170 | 0,810 | 0,169 | -0,008 | 0,011 | 0,160 | 0,097 | 0,034 | 0,100 | -0,017 |
| EA5 | 0,163 | 0,822 | 0,152 | 0,073 | 0,081 | 0,102 | 0,140 | 0,153 | 0,072 | 0,008 |
| EA6 | 0,241 | 0,846 | 0,220 | 0,040 | 0,127 | 0,241 | 0,227 | 0,093 | 0,140 | 0,049 |
| EA7 | 0,191 | 0,796 | 0,170 | 0,071 | 0,166 | 0,161 | 0,206 | 0,105 | 0,101 | 0,069 |
| EA8 | 0,197 | 0,852 | 0,202 | 0,064 | 0,139 | 0,175 | 0,242 | 0,124 | 0,130 | 0,064 |
| EA9 | 0,101 | 0,756 | 0,105 | 0,038 | 0,047 | 0,051 | 0,140 | 0,101 | 0,074 | 0,015 |
| PCE1 | 0,828 | 0,248 | 0,910 | 0,093 | 0,229 | 0,611 | 0,243 | 0,051 | 0,625 | 0,067 |
| PCE2 | 0,781 | 0,174 | 0,938 | 0,062 | 0,178 | 0,627 | 0,164 | 0,045 | 0,654 | 0,024 |
| PCE3 | 0,823 | 0,201 | 0,951 | 0,054 | 0,207 | 0,666 | 0,215 | 0,062 | 0,709 | 0,031 |
| PI1 | 0,026 | 0,057 | 0,033 | 0,771 | 0,342 | -0,050 | 0,305 | 0,100 | 0,001 | 0,505 |
| PI2 | 0,020 | 0,096 | 0,014 | 0,794 | 0,391 | -0,034 | 0,333 | 0,098 | 0,000 | 0,577 |
| PI3 | 0,000 | 0,016 | 0,027 | 0,544 | 0,383 | 0,037 | 0,337 | 0,042 | 0,051 | 0,565 |
| PI4 | 0,071 | 0,002 | 0,093 | 0,951 | 0,378 | 0,043 | 0,348 | 0,034 | 0,074 | 0,587 |
| PK1 | 0,190 | 0,127 | 0,167 | 0,436 | 0,828 | 0,144 | 0,715 | 0,086 | 0,125 | 0,559 |
| PK2 | 0,225 | 0,068 | 0,238 | 0,063 | 0,535 | 0,111 | 0,228 | 0,035 | 0,117 | 0,067 |
| PK3 | 0,096 | 0,080 | 0,090 | 0,411 | 0,711 | 0,065 | 0,575 | 0,131 | 0,063 | 0,459 |
| PK4 | 0,101 | 0,061 | 0,097 | 0,324 | 0,768 | 0,052 | 0,499 | 0,149 | 0,083 | 0,444 |
| PK5 | 0,140 | 0,108 | 0,164 | 0,348 | 0,822 | 0,084 | 0,599 | 0,062 | 0,133 | 0,434 |
| PS1 | 0,709 | 0,145 | 0,656 | 0,010 | 0,130 | 0,949 | 0,207 | 0,030 | 0,690 | 0,045 |
| PS2 | 0,714 | 0,209 | 0,660 | 0,012 | 0,124 | 0,949 | 0,211 | 0,001 | 0,664 | 0,054 |
| PS3 | 0,716 | 0,180 | 0,661 | 0,005 | 0,145 | 0,967 | 0,216 | 0,023 | 0,693 | 0,051 |
| PS4 | 0,640 | 0,254 | 0,590 | 0,013 | 0,102 | 0,912 | 0,189 | 0,032 | 0,585 | 0,014 |
| PSK1 | 0,210 | 0,218 | 0,218 | 0,309 | 0,558 | 0,241 | 0,832 | 0,151 | 0,193 | 0,422 |
| PSK2 | 0,135 | 0,113 | 0,152 | 0,357 | 0,533 | 0,167 | 0,812 | 0,135 | 0,094 | 0,436 |
| PSK3 | 0,184 | 0,196 | 0,175 | 0,324 | 0,602 | 0,158 | 0,859 | 0,136 | 0,124 | 0,379 |
| PSK4 | 0,183 | 0,151 | 0,196 | 0,180 | 0,496 | 0,162 | 0,666 | 0,067 | 0,153 | 0,269 |
| PSK5 | 0,123 | 0,153 | 0,108 | 0,355 | 0,664 | 0,093 | 0,786 | 0,115 | 0,109 | 0,419 |
| PU | 0,033 | 0,110 | 0,056 | 0,067 | 0,118 | 0,022 | 0,155 | 1,000 | 0,036 | 0,000 |
| RS1 | 0,670 | 0,150 | 0,651 | 0,035 | 0,135 | 0,662 | 0,181 | 0,048 | 0,949 | 0,066 |
| RS2 | 0,699 | 0,119 | 0,706 | 0,067 | 0,149 | 0,673 | 0,173 | 0,024 | 0,967 | 0,091 |
| RS3 | 0,697 | 0,135 | 0,679 | 0,035 | 0,141 | 0,663 | 0,166 | 0,034 | 0,968 | 0,055 |
| RS4 | 0,691 | 0,118 | 0,697 | 0,057 | 0,146 | 0,686 | 0,163 | 0,035 | 0,963 | 0,055 |
| SE1 | 0,059 | 0,040 | 0,043 | 0,609 | 0,494 | 0,056 | 0,432 | -0,018 | 0,064 | 0,957 |
| SE2 | 0,047 | 0,041 | 0,039 | 0,607 | 0,475 | 0,039 | 0,457 | -0,003 | 0,078 | 0,949 |
| SE3 | 0,044 | 0,023 | 0,041 | 0,615 | 0,530 | 0,027 | 0,502 | 0,026 | 0,057 | 0,941 |

Table 18: Cross-loadings after deleted items

| | CE | EA | PCE | PI | PK | PS | PSK | PU | RS | SE |
|------|-------|-------|-------|--------|--------|--------|-------|--------|--------|--------|
| CE1 | 0,845 | 0,224 | 0,683 | 0,025 | 0,110 | 0,584 | 0,140 | -0,009 | 0,545 | 0,034 |
| CE2 | 0,937 | 0,185 | 0,819 | 0,066 | 0,134 | 0,698 | 0,202 | 0,051 | 0,694 | 0,057 |
| CE3 | 0,932 | 0,204 | 0,843 | 0,063 | 0,143 | 0,685 | 0,188 | 0,043 | 0,678 | 0,054 |
| CE4 | 0,891 | 0,240 | 0,776 | 0,054 | 0,094 | 0,682 | 0,192 | 0,028 | 0,639 | 0,047 |
| EA1 | 0,162 | 0,813 | 0,143 | -0,021 | 0,014 | 0,137 | 0,102 | 0,071 | 0,084 | -0,028 |
| EA10 | 0,212 | 0,810 | 0,195 | 0,063 | 0,164 | 0,215 | 0,250 | 0,113 | 0,134 | 0,093 |
| EA2 | 0,206 | 0,809 | 0,204 | -0,038 | 0,031 | 0,170 | 0,107 | 0,058 | 0,122 | -0,012 |
| EA3 | 0,205 | 0,824 | 0,189 | -0,012 | 0,090 | 0,179 | 0,140 | 0,043 | 0,115 | 0,015 |
| EA4 | 0,170 | 0,810 | 0,169 | -0,008 | -0,012 | 0,160 | 0,089 | 0,034 | 0,101 | -0,017 |
| EA5 | 0,163 | 0,822 | 0,152 | 0,073 | 0,069 | 0,102 | 0,146 | 0,153 | 0,076 | 0,008 |
| EA6 | 0,241 | 0,846 | 0,220 | 0,040 | 0,096 | 0,241 | 0,221 | 0,093 | 0,144 | 0,049 |
| EA7 | 0,191 | 0,796 | 0,170 | 0,071 | 0,129 | 0,161 | 0,198 | 0,105 | 0,107 | 0,069 |
| EA8 | 0,197 | 0,852 | 0,202 | 0,064 | 0,121 | 0,175 | 0,234 | 0,124 | 0,136 | 0,064 |
| EA9 | 0,101 | 0,756 | 0,105 | 0,038 | 0,041 | 0,051 | 0,152 | 0,101 | 0,075 | 0,015 |
| PCE1 | 0,828 | 0,248 | 0,910 | 0,093 | 0,143 | 0,611 | 0,223 | 0,051 | 0,618 | 0,067 |
| PCE2 | 0,781 | 0,174 | 0,938 | 0,062 | 0,109 | 0,627 | 0,149 | 0,045 | 0,641 | 0,024 |
| PCE3 | 0,823 | 0,201 | 0,951 | 0,054 | 0,141 | 0,666 | 0,197 | 0,062 | 0,702 | 0,031 |
| PI1 | 0,026 | 0,057 | 0,033 | 0,771 | 0,348 | -0,050 | 0,319 | 0,100 | -0,003 | 0,505 |
| PI2 | 0,020 | 0,096 | 0,014 | 0,794 | 0,417 | -0,034 | 0,347 | 0,098 | -0,008 | 0,577 |
| PI4 | 0,071 | 0,002 | 0,093 | 0,952 | 0,377 | 0,043 | 0,357 | 0,034 | 0,068 | 0,587 |
| PK3 | 0,096 | 0,080 | 0,090 | 0,411 | 0,795 | 0,065 | 0,572 | 0,131 | 0,064 | 0,459 |
| PK4 | 0,101 | 0,061 | 0,097 | 0,323 | 0,858 | 0,052 | 0,475 | 0,149 | 0,078 | 0,444 |
| PK5 | 0,140 | 0,108 | 0,164 | 0,347 | 0,866 | 0,084 | 0,578 | 0,062 | 0,129 | 0,434 |
| PS1 | 0,709 | 0,145 | 0,656 | 0,009 | 0,080 | 0,949 | 0,202 | 0,030 | 0,693 | 0,045 |
| PS2 | 0,714 | 0,209 | 0,660 | 0,012 | 0,068 | 0,949 | 0,195 | 0,001 | 0,656 | 0,054 |
| PS3 | 0,716 | 0,180 | 0,661 | 0,005 | 0,107 | 0,967 | 0,207 | 0,023 | 0,691 | 0,051 |
| PS4 | 0,640 | 0,254 | 0,590 | 0,013 | 0,044 | 0,912 | 0,182 | 0,032 | 0,584 | 0,014 |
| PSK1 | 0,210 | 0,218 | 0,218 | 0,309 | 0,524 | 0,241 | 0,853 | 0,151 | 0,193 | 0,422 |
| PSK2 | 0,135 | 0,113 | 0,152 | 0,357 | 0,492 | 0,167 | 0,832 | 0,135 | 0,091 | 0,436 |
| PSK3 | 0,184 | 0,196 | 0,175 | 0,323 | 0,562 | 0,158 | 0,873 | 0,136 | 0,120 | 0,379 |
| PSK5 | 0,123 | 0,153 | 0,108 | 0,355 | 0,621 | 0,093 | 0,812 | 0,115 | 0,113 | 0,419 |
| PU | 0,033 | 0,110 | 0,056 | 0,067 | 0,134 | 0,022 | 0,162 | 1,000 | 0,040 | 0,000 |
| RS1 | 0,670 | 0,150 | 0,651 | 0,035 | 0,094 | 0,662 | 0,163 | 0,048 | 0,962 | 0,066 |
| RS3 | 0,697 | 0,135 | 0,679 | 0,035 | 0,106 | 0,663 | 0,158 | 0,034 | 0,975 | 0,055 |
| RS4 | 0,691 | 0,118 | 0,697 | 0,057 | 0,113 | 0,686 | 0,148 | 0,035 | 0,953 | 0,055 |
| SE1 | 0,059 | 0,040 | 0,043 | 0,608 | 0,494 | 0,056 | 0,437 | -0,018 | 0,055 | 0,957 |
| SE2 | 0,047 | 0,041 | 0,039 | 0,606 | 0,479 | 0,039 | 0,462 | -0,003 | 0,072 | 0,949 |
| SE3 | 0,044 | 0,023 | 0,041 | 0,614 | 0,540 | 0,027 | 0,504 | 0,026 | 0,048 | 0,941 |

Appendix VI: Control variables

Table 19: Significant effects of the control variables

| Relation | Standardized effect size | T-Value |
|--|--------------------------|---------|
| Age > Self-Efficacy | -0,25 | 6,64** |
| Age > Customer education | 0,10 | 2,51* |
| Age > Personal Innovativeness | -0,10 | 2,60** |
| Age > Product Skills | 0,10 | 3,13** |
| Age > Product Usage | 0,11 | 2,66** |
| Help and/or guidance in WayPoint shop > Self-Efficacy | -0,12 | 3,07** |
| Help and/or guidance in WayPoint shop > Customer Education | 0,14 | 3,27** |
| Help and/or guidance in WayPoint shop > Emotional Attachment | 0,14 | 3,56** |
| Help and/or guidance in WayPoint shop > Product Satisfaction | -0,07 | 2,10* |
| Help and/or guidance from others > Self-Efficacy | -0,21 | 4,71** |
| Help and/or guidance from others > Personal Innovativeness | -0,18 | 4,14** |
| Help and/or guidance from others > Product Knowledge | -0,11 | 2,88** |
| Usage of WayPoint instruction videos > Customer Education | 0,12 | 2,96** |
| Usage of WayPoint instruction videos > Personal Innovativeness | 0,11 | 2,57* |
| Usage of WayPoint instruction videos > Emotional Attachment | 0,18 | 4,35** |
| Forum usage > Self-Efficacy | 0,21 | 5,18** |
| Forum usage > Customer Education | 0,09 | 2,12* |
| Forum usage > Personal Innovativeness | 0,29 | 7,35** |
| Forum usage > Product Knowledge | 0,13 | 3,61** |
| Forum usage > Product Skills | 0,17 | 4,87** |
| Forum usage > Product Satisfaction | -0,09 | 2,97** |
| Usage of Product manual > Self-Efficacy | -0,08 | 1,99* |
| Usage of Product manual > Product Knowledge | -0,10 | 2,69** |
| Usage of instruction booklet > Emotional Attachment | 0,09 | 1,98* |
| Usage of FAQ on WayPoint website > Self-Efficacy | 0,09 | 2,04* |
| Usage of FAQ on WayPoint website > Customer Education | 0,13 | 3,05** |
| Usage of FAQ on WayPoint website > Personal Innovativeness | 0,16 | 3,71** |
| Usage of FAQ on WayPoint website > Emotional Attachment | 0,11 | 2,73** |
| Usage of telephone helpdesk > Self-Efficacy | -0,12 | 3,02** |
| Usage of telephone helpdesk > Customer Education | 0,09 | 2,07* |
| Usage of telephone helpdesk > Emotional Attachment | 0,13 | 2,97** |
| Usage of telephone helpdesk > Perceived Company Effort | 0,04 | 2,22* |
| Usage of telephone helpdesk > Product Satisfaction | -0,09 | 3,05** |
| Usage of email helpdesk > Perceived Company Effort | 0,04 | 2,05* |
| Usage of email helpdesk > Product Usage | 0,08 | 1,97* |
| Usage of email helpdesk > Product Satisfaction | -0,08 | 2,64** |
| Workshop > Self-Efficacy | -0,18 | 4,19** |
| Workshop > Customer Education | 0,12 | 2,85** |
| Workshop > Emotional Attachment | 0,14 | 3,79** |
| Customer Relation Length > Customer Education | 0,14 | 3,70** |
| Customer Relation Length > Personal Innovativeness | 0,09 | 2,13* |
| Customer Relation Length > Product Knowledge | 0,19 | 5,62** |
| Customer Relation Length > Product Skills | 0,18 | 5,10** |
| Device Value > Customer Education | 0,08 | 1,98* |
| Level of Education > Self-Efficacy | 0,22 | 5,14** |
| Level of Education > Customer Education | -0,10 | 2,55* |
| Level of Education > Personal Innovativeness | 0,13 | 3,15** |
| Level of Education > Emotional Attachment | -0,21 | 5,43** |
| Multiple Devices > Self-Efficacy | 0,12 | 3,04** |
| Multiple Devices > Personal Innovativeness | 0,16 | 4,14** |
| Multiple Devices > Product Knowledge | 0,09 | 2,66* |
| Multiple Devices > Product Skills | 0,13 | 3,69** |
| Multiple Devices > Product Usage | 0,10 | 2,43* |
| Software Usage 'more than once' > Self-Efficacy | 0,32 | 7,15** |
| Software Usage 'more than once' > Customer Education | 0,16 | 3,32** |
| Software Usage 'more than once' > Personal Innovativeness | 0,23 | 5,57** |
| Software Usage 'more than once' > Product Knowledge | 0,14 | 3,20** |
| Software Usage 'more than once' > Product Skills | 0,23 | 5,38** |
| Software Usage 'more than once' > PU | 0,20 | 4,94** |
| Length of Use > Customer Education | 0,12 | 3,13** |
| Length of Use > Product Knowledge | 0,09 | 2,74** |
| Length of Use > Product Skills | 0,08 | 2,29* |
| Purchase elsewhere > Self-Efficacy | 0,09 | 2,17* |
| Purchase elsewhere > Customer Education | -0,08 | 2,02* |
| Purchase elsewhere > Retailer Satisfaction | -0,13 | 3,33** |

* $P < 0,05$. ** $P < 0,01$ (two-tailed)