

About Well-considered Decisions, Favorable Alternatives and Sudden Ideas: A Qualitative Research to Identify Beliefs that Influence Women to Study Information Systems in Germany

Caroline Oehlhorn, Sven Laumer, and Christian Maier

University of Bamberg, Germany
{caroline.oehlhorn,sven.laumer,christian.maier}@uni-bamberg.de

Abstract. Our research reveals motivational beliefs that influenced the decision to study information systems of female students in Germany. We apply a qualitative methodology in form of narrative interviews and interviewed 21 female students at a German university. On the basis of the theory of planned behavior, our results expose that a range of different beliefs exist which influenced the women's decision. We are able to expand the results of previous studies to the German context regarding especially normative beliefs, alternate choices or prior experiences dealing with information technology. In addition, we also uncover a couple of new beliefs that had not been revealed before.

Keywords: Women and IT, IS enrollments, study subject selection, theory of planned behavior.

1 Introduction

Recent articles coined the phrase *War for Internet Talent* [1] reflecting that the competition of well-educated information systems (IS) professionals reached a new level. Among others, recent statistics reveal that organizations cannot fill their information technology (IT) vacancies [2]. In line with that, top managers consider the education of IS professionals as one of the major issues [3]. As particularly women are underrepresented in the IT profession, institutions established plenty of women-specific programs, such as *Mädchen und Technik* (German for 'Girls and Technology') or *Girls Day*, to motivate women to study IS. Such programs were necessary as women and men base their decision on different aspects [4, 5].

From a theoretical perspective, the reasons why women focus a career within the field of IT are a well-discussed topic within IS research so far [6, 7]. Nevertheless, there exists also a wide range of reasons that seem to prevent women from doing so [8–13]. Respectively to the choice of studying IS, these include nonexistent interest, missing familiarity with IS or the perception of insufficient computer skills [10].

On closer consideration of the situation in Germany, we notice a slight increase regarding the number of enrollments in IS study programs of young women. Since

13th International Conference on Wirtschaftsinformatik,
February 12-15, 2017, St. Gallen, Switzerland

Oehlhorn, C.; Laumer, S.; Maier, C. (2017): About Well-considered Decisions, Favorable Alternatives and Sudden Ideas: A Qualitative Research to Identify Beliefs that Influence Women to Study Information Systems in Germany, in Leimeister, J.M.; Brenner, W. (Hrsg.): Proceedings der 13. Internationalen Tagung Wirtschaftsinformatik (WI 2017), St. Gallen, S. 365-379

1998, the number of German women studying IS has been quintupled until today, whereas the percentage of women increased slowly from 12.8% to 17.8% [14].

A further increase in this context is desired by both, business and society. To sustainably support this process, it might not be enough to solely implement measures, but also investigating possible causes. As a first step into this direction, we want to detect the women's reasons that motivate them to matriculate into IS study programs. Only few research aims to identify motivational factors for studying IS, although previous research calls up to explore this topic in detail [15]. We, therefore, propose the following research question:

Which beliefs motivate women in Germany to study information systems?

In order to answer this research question properly, we conducted narrative interviews with 21 female students from a German university that offers two IS bachelor and three IS master degree programs. As the decision to study IS is usually planned and consciously made, our research orientates towards the theory of planned behavior (TPB). The structure of our paper is as follows: firstly, we explain the theoretical background focusing TPB and previous research related to IS studies. Next, we illustrate the applied methodology in section three and present our results in section four. The results are discussed in section five followed by a short conclusion.

2 Theoretical Background

As we want to elaborate the motivations that drive women to decide for studies in the field information systems today, the status quo of related existing literature will be presented first. The decision to study a certain subject is a planned and conscious decision [16–18]. Therefore, we refer to TPB as the theoretical foundation to explain the conscious decision studying IS. In the following subsections, we reveal theoretical essentials about TPB and decisions for academic studies among students seen from an IS-related perspective.

2.1 Theory of Planned Behavior

TPB is a frequently used theory within leading IS research [19, 20] that explains human behavior connecting beliefs and behavior. According to TPB, a person's behavior and previous intentions can be predicted by personal and environmental factors named attitude towards this certain behavior, subjective norm and perceived behavior control (PBC) [18]. TPB proposes that behavior is influenced by behavioral intention, which is influenced by the subjective norm regarding this behavior, the attitude toward this behavior, and perceived behavioral control (PBC) in turn. Subjective norm is related to social pressures a person is confronted with when deciding whether to perform a certain behavior or not. The attitude toward this behavior is defined as the person's propensity toward the behavior in relation to the expected consequences. PBC is seen as the person's perception of the difficulty of performing this behavior. TPB is useful to

address our research question as it predicts intentions and behaviors very accurately [21].

In its expanded version that we apply to our research, the three influential factors within the TPB model are based on antecedent beliefs: behavioral beliefs affect the attitude, normative beliefs affect subjective norm, and control beliefs influence PBC [18]. Behavioral beliefs are individual beliefs of a person that address the related consequences of a certain behavior. Normative beliefs reflect beliefs of other people from the social environment that a person perceives regarding this particular behavior and control beliefs balance factors that influence the individual's feasibility of performing this behavior.

Referring to previous research that focuses on individual beliefs to explain behavioral choices concerning career issues [5, 10, 17, 22], we consider TPB as a proper theoretical base to examine our research question.

2.2 Previous Research

Previous research reveals a range of different factors that influence US students to study IS as major or to pursue an IT profession [23, 24]. Among others, certain factors show a significant impact on students' motivation to study IS: general interest, job-related and experiential beliefs, content-related and control beliefs, social impact and attitude in general [5, 8, 17, 23, 25–27]. Nonetheless, these results are limited in two ways. First, a comprehensive study that explains why women start studying IS does not exist yet as previous research only focusses particular beliefs. And second, previous research concentrated solely on US students [5, 10, 17]. However, these results cannot be applied for the decision of women who plan to study in Germany. While students in the US are more likely motivated to study out of reasons regarding wealth (to earn a high salary) and social status [28], students in Germany do so with regard to their perceived talents and personal development [29]. In addition, the educational systems of Germany and other European countries vary significantly from those in the US: students in the US start their academic studies attending some general and preparatory courses before choosing their major, students in Germany decide for their discipline of study before registering at a university in turn.

In this context, research also shows that these motivational factors differ by gender [4, 5]. Men, for example, are more motivated due to factors in the work itself. Women, by contrast, are more attracted by factors around the job such as job security or flexible working hours. As the demand for more women in the IT profession is still unabated, research also looks at the reasons why women are less attracted by the field of IS [8–13], suggests and analyzes countermeasures [12, 30]. As already mentioned, previous literature predominantly investigated the situation at numerous US universities, where the context differs due to the fact that the US university system distinguished from the German system. Furthermore, students in the US intend to study majors with regard to their expected wealth (to earn more money) and social status [28]. By contrast, students in Germany more likely focus on their perceived talents and personal development [29]. It is hitherto unresolved if the same factors that affect the decision towards study majors in the US are fully transferable for the decision of study subjects in Germany.

3 Methodology

We use a qualitative methodology by conducting interviews in the special form of narratives with 21 female students from a German university to reveal crucial beliefs based on TPB.

We chose narratives as a qualitative methodology for our research since narratives in their original form – a series of events in a specific order [31] – approximate the process that we aim to retrieve from the interviewees. The narrative approach¹ intends to conduct open-ended interviews that focus on the interviewees' previous experiences. As these experiences are mandatory to tell a story in the form of narratives, we focus on female students who have already decided to study IS. Some demographic information about the interviewees is depicted in Table 1. This procedure ensures that the interviewees possess the necessary experience to answer our interview questions. Furthermore, the narrative approach has been successfully applied to IS research to uncover and survey qualitative data at an early stage of research [32].

Initially, the call for participation was posted within the university's internal e-learning system and on the faculty's Facebook page in July 2016. Those students who answered the call for participation were invited to the chair's laboratory to take the interview. The interviews were recorded anonymously on tape with the agreement of each participant. According to the procedure of narratives, the interview started with some preliminary remarks that aim to encourage the participants to tell about their motivations, experiences, and thoughts before they decided to study IS. During their report, the interviewees were not interrupted to not interfere their process of self-reflection. When the interviewees finished, the interviewers asked additional questions to enlarge upon certain points if required.

All interviews were conducted during the month of July and lasted between 10 and 25 minutes. Afterwards, the interviews were transcribed verbatim and coded following qualitative coding procedures by using both descriptive and interpretative coding techniques [33].

In the first step, we searched for mentioned beliefs that obviously influenced the decision to study IS within the transcripts. For this purpose, we used a coding scheme that we adjusted to already proved beliefs of TPB obtained from thematically related literature [5, 10, 17]. Further lines and paragraphs, which did not match any existing beliefs withal, were separately coded and shown. Next, each of these newly identified beliefs was examined in its individual case. We searched for similarities and coherencies between those beliefs and grouped them into common categories referring to existing literature wherever possible. These categories were then associated with the three respective factors of TPB (behavioral, normative and control beliefs). To ensure an unambiguous assignment of the indicated beliefs and group categorization, coding was first done by all authors separately, and together at a later point in time.

¹ For more information about performing narrative approaches see [32].

Table 1. The interviewees' demographics

<i>Participant</i>	<i>Age</i>	<i>Study semester, intended degree</i>	<i>Participant</i>	<i>Age</i>	<i>Study semester, intended degree</i>
P 1	25	3, master	P 12	23	7, bachelor
P 2	26	4, master	P 13	25	7, bachelor
P 3	22	6, bachelor	P 14	22	1, bachelor
P 4	23	7, bachelor	P 15	22	1, bachelor
P 5	25	8, bachelor	P 16	19	1, bachelor
P 6	22	7, bachelor	P 17	24	7, bachelor
P 7	24	1, master	P 18	21	4, bachelor
P 8	24	2, master	P 19	23	8, bachelor
P 9	25	2, master	P 20	22	8, bachelor
P 10	21	4, bachelor	P 21	25	3, bachelor
P 11	21	1, bachelor			

4 Results

The outcomes of the interviews are shown in this section clustered by the different beliefs according to TPB (see Figure 2). As TPB is not tied to this issue, we examine this context aiming to reveal why women study IS (behavior). This is influenced by the intention to study IS which is affected by subjective norm, the attitude toward studying IS and the PBC toward studying IS in turn. By analyzing the conducted interviews, we want to point out which beliefs act as main drivers for these.

In each section, we give examples of statements that were narrated during the interviews. As we are not able to present all statements in this section, we included a comprehensive table (Table 2) in the appendix.

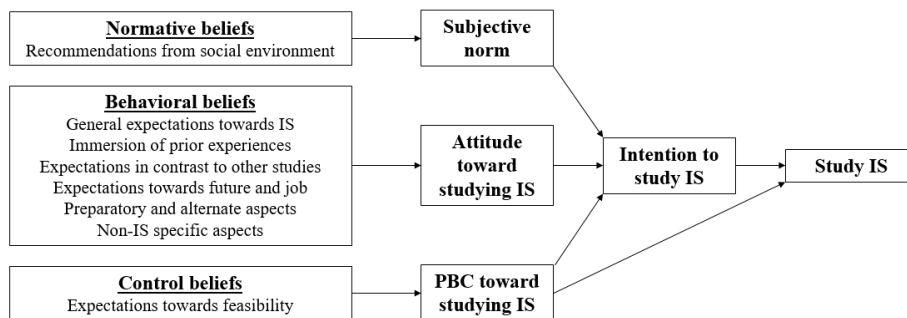


Figure 1. Results clustered by normative, behavioral and control beliefs based on TPB [18]

4.1 Normative Beliefs

As described in section 2.1, persons form normative beliefs based on the beliefs of other people from their social environment [18]. Following previous research [5, 17], we

interpret those beliefs as normative beliefs when the influence of another person, who for example studies the same subject or gives recommendations, on the own behavior is recognizable. We especially notice normative beliefs in form of recommendations from the interviewees' social environment that called the students' attention towards IS or motivated them to enroll in IS studies. The mentioned social environment includes family members, friends, and persons in the university environment such as enrolled students, professors or members of the student council. Among all statements, we recognize that **recommendations from family members and friends** occurred predominantly.

As I said, I started with business administration, but this was some kind of temporary solution. Later, I met a friend at the university who studied information systems and she really raved about her studies with all the trimmings. So, I just went to one professor to get more information, and hereinafter, I decided to study the same. [P7]

I spoke to my brother who studies mechatronics where informatics is also included. He showed and explained me a lot and I was able to try some stuff. That was kind of funny. [P9]

4.2 Behavioral Beliefs

Behavioral beliefs are a person's individual beliefs that refer to the consequences of a particular behavior [18]. We expound those beliefs as behavioral beliefs when these are connected to aspects which can be seen as consequences of the decision for IS studies. The quantity of statements that belong to the category of behavioral beliefs was enormous and substantially widespread. We therefore clustered those into several subcategories that rely on different expectations or consequences related to an enrollment in IS study programs: expectations towards the study subject in general, in contrast to other study programs, or towards the own future and job possibilities as well as immersions of prior experiences with IT, IS studies as an alternative or preparatory study program, but also beliefs that cannot be related directly to the study subject.

General Expectations Towards IS. Previous research indicates that students fuel different expectations that can be related to the study subject itself such as the study contents or the composition of scientific fields [5, 10]. The interviewees within our research mentioned that they initially had different expectations on their enrollment in IS studies. They looked forward to the widespread range of topics, the composition of courses or the interdisciplinary field of the study subject for example. Others aimed to satisfy their genuine interest about IT, wished "to learn IT" or viewed the studies as a possibility of further education or even as an experiment.

Information systems is exciting related to its possible applications. I wanted to accept a new challenge after graduation from school and within information systems, I saw the best possibilities to improve myself. [P5]

Information systems offers a multifarious topic area, human-computer interaction, programming, media informatics for example. Hence, I thought, maybe I did not know all the different areas, and I wanted to try out if this is something for me. [P19]

I neither had economy at school nor informatics. But I was always a fan of: 'Let's do something new.' (...) I was really uneducated at the technical level as I never had a connection to it. But I was always interested. (...) I even had difficulties dropping subjects in school, and in this context, information systems is interesting as it combines two very different disciplines. [P8]

Immersion of Prior Experiences. Gaining first experiences, for example in form of introducing practices or even internships, in a certain subject has an evident influence on the career choice of young people [34]. Consequently, a couple of students already had first experiences with IT. They wanted to expand or deepen their knowledge with enrolling in IS studies. Other interviewees report that they had ease or fun learning IT at school.

I lived in the Silicon Valley as an au pair girl and had the perfect insight into this world and these themes in a way and I was deeply interested in this. Back home, I found this study program and it immediately appealed to me. [P21]

I actually had not that many expectations, because I did not know at all what is going to happen. All I knew, was that these two subjects (N.B.: Economy and computer science) are fun, and I hoped that it would still be fun. [P10]

I already had information systems and economy in school, and this was really fun to me. Information systems at school was more theory-loaded, I mean, we never did programming. We rather did modeling and this was quite cool. [P18]

Expectations in Contrast to Other Studies. Today, students are able to decide between a multitude of different study programs. Some programs are attended by plenty of students and can be described as almost overcrowded, whether other programs are allocated to niche areas with a manageable number of students. In this context, prior research shows findings revealing that students also decide for IS studies because they expect different circumstances from doing so in contrast to other study programs [5]. Within our research, the interviewees frequently mentioned statements that covered comparisons of IS with other study subjects such as business administration or informatics. Those comparisons referred to beliefs that other study programs are overrun with students or are not enough challenging (especially business administration) and in turn, some other studies would be too difficult for them to complete (especially informatics).

It's the whole direction of information systems, also how it is acknowledged within the economy and what I'm able to do with it. Because... When I think about this

bachelor in business administration, I have to say, I never liked it. Let us just put it in this way: this is just mainstream. [P14]

Well, I first studied business administration (...). On the one hand, a lot of people study business administration. (...) IT is an issue where many people think it is all about programming and you have to do a lot of math and this is kind of scaring. But I think information systems shows that IT is so much more than just programming in the meantime. (...) We just knew, that we would have more possibilities...and that enterprises would come up to us. And that the supervision is so much different with the result that I think I personally would be able to learn more. [P13]

I ended up with information systems because I was searching for a study program that also included some IT components. But after I made some inquiries, I knew that computer science is really IT-loaded and you have to do lots of programming sometimes. Programming at school was not that much fun and therefore, I wanted something that also included some components of business administration. [P18]

Expectations Towards Future and Job. The choice of a study program is often a career decision at once. Students do not only choose their study subject for the next years, but set a path in the direction of career. Thus, students predominantly have different expectations towards their future career or certain jobs in mind when they think about enrolling in a study program [5, 17]. This corresponds to our results as the most often mentioned statements (see Table 2) of the interviewees refer to beliefs that are linked to their personal future. This shows that the students had already their lives after their studies in mind before they enrolled. Some already had specific perceptions how IS studies would affect their career or which (job) opportunities would be offered to them in the future.

You just have a positive feeling, if you can say: 'Well, cool, even if I go through with this, I'll get a job and because this is a thematically widespread study program, I would also be able to choose completely free what I am going to do.' [P11]

My cousin works as an IT business engineer and I just asked him what he is doing there. He just said in a platitudinous way: 'Well, I am sitting between a computer scientist and a business economist, and I explain to the computer scientist what the business economist wants to have.' That sounded pretty cool, especially because informatics was really easy for me to learn at school. [P1]

Preparatory and Alternate Aspects. Not all students are able to study their preferred study program from the start. Some programs require excellent grades at school or existing knowledge for example. And equally, some jobs are only allocated to candidates when they studied a certain subject in advance. So, students also consider study programs with respect to their existing and target-aimed opportunities [35]. In other cases, the interviewees told that they chose IS studies with regard to further purposes. Some students preferred other study programs and IS was just an alternative choice. For others, studying IS is a preparatory measure as it presents a mandatory qualification for specific master studies or desired careers that they already had in mind.

I initially planned to study medical engineering, but these programs only start in winter semesters. So, I examined possibilities at my hometown's university if there is something offered that would be preparatory for this. I found information systems and planned to do this for one semester with the opportunity to change later. [P16]

When studying IS, we have also the possibility to dabble in other areas and that was really interesting for me, because I was always interested in psychological studies. But my graduation grade was not good enough to enroll in psychology. So, this was also a nice opportunity to try psychology tentatively. [P19]

Since I was 15 years old, I know that I want to work in the gaming industry. There are people who do the programming, and there are people who do the management. And that is what I want to do. But to end up in this industry, you need a sort of special master, in gaming or something like that. And for doing a gaming master, you need a bachelor in computer science or just information systems. [P17]

Non-IS Specific Aspects. Whereas most beliefs can be associated with the study program itself, some interviewees also argued reasons that show no direct connection to IS studies. For example, some students were searching for study programs in a specific city or chose IS due to admission requirements. A couple of interviewees also reported that enrolling in IS was some kind of spontaneous or intuitive decision.

So at that time, I decided to study information systems kind of spontaneously. I always wanted to do something with business and first, I considered math or business mathematics. But it did not really appeal to me and I considered information systems in the short term instead. (...) I knew that I liked math and everyone told me, if I liked math, I should orient towards a technical direction and so, the decision resulted in information systems. [P12]

As I absolutely wanted to study in this city, and this study subject was a new offer at the university, I just applied there. In addition, the university over there sent off promises really early and that is why I did not apply elsewhere. [P1]

4.3 Control Beliefs

Fundamental research indicates control beliefs as factors that weigh a person's own feasibility of performing a behavior [18]. Prior research also understands the students' perceived feasibility of accomplishing a study subject as a control belief [17]. **Expectations towards the feasibility** of IS studies were often mentioned by the interviewees which is why we interpret those as control beliefs. Some students justified their choice based on good grades at school, existing knowledge or thorough information about the study program. In contrast to that, other interviewees believed that any study subject would be connected to obstacles anyway or they were going to learn everything during their studies and would not need any preparatory knowledge.

I really had no plan what to study. This sounds kind of haughtily, but I had good marks in all subjects at school. So, regarding my marks, it did not matter and it was not recognizable that anything was particularly suitable for me. [P6]

At that time, I completely reoriented and searched for mathematical study subjects, because math always suited more to me than languages, although I always had fun with that. (...) I thought that, in the worst case, I could not lose anything, because I also study business and I would have the opportunity to switch to economics or business administration. [P11]

I had no previous knowledge or anything. Except for one year at school, we did nothing in this area. Just some Word, but nothing 'IT-like'. That is why did not want to purely do computer science. Then, I found information systems that contains an imaginable scope of IT that would be possible for me. [P4]

When considering only the name, you can draw conclusions, if you are able to handle it or not. So, I informed a bit using the homepage and looked, if this would be feasible or if it would be lots of programming. [P2]

5 Discussion

Our research aim was to identify beliefs that motivate German women to start an IS study program. Existing literature shows that there is a wide range of different reasons why students-to-be choose IS or not, and how these differ by gender [5, 8, 17, 24]. However, these studies expose this phenomenon focusing only on US universities. As our research aims to uncover the beliefs of German students, we conducted narrative interviews with 21 female participants from a German university that offers several IS study programs. The completion of our research allows us to give a number of theoretical contributions and practical implications. Additionally, possible limitations of the current study are explained.

5.1 Theoretical contributions

First, we identified several beliefs that led to an enrollment in IS studies by interviewing 21 female students. After identification we defined each belief and grouped them into preceded categories with respect to previous literature (see Table 2). We integrated these categories in the three comprehensive beliefs according to TPB [18] referring to existing research within this issue [5, 10, 17, 23, 25, 27]. Our results show that the interviewees decided for IS studies based on recommendations from the social environment (normative beliefs), their perceived feasibility of the subject (control beliefs) and several behavioral beliefs such expectations towards the subject itself, towards future and job opportunities and in contrast to other study programs or immersions of prior experiences.

Second, we also contribute by confirming that the consideration of beliefs is a proper theoretical base for revealing intentions and behavior of women towards studying IS as previous literature has already shown before [5, 8]. To dissociate from those, which address solely the US university system, we conducted our research at a German university to examine the situation in Germany. Our results correspond with a couple of the already validated beliefs from previous research [5], such as job availability, aptitude, genuine interest and recommendations from the social environment. But we also see categorical differences such as formed normative beliefs out of recommendations, the students' personal and social image being an IS student [5] or negative beliefs concerning their performance in form of anxiety or low computer self-efficacy [8]. As a result, we also obtain the insight that cultural conditions might influence the women's decision to study IS which should be investigated in future research.

Third, we disclosed some other factors that influenced the interviewees' decision, which had not been considered by previous literature in this context before [5, 8, 12, 13, 17]. One is the existence of prior experiences in the field of IT: some students mentioned that they already had IT subjects at school or other impressions, such as internships or insights in IT enterprises, and that these were determinative for their decision for IS studies. Furthermore, the pure interest in the field of IS was part of many students' decision making. Hereby, they mentioned that they had to exert their selves no matter which study programs they would choose or that they would be able to change their subject if they do not like it as already achieved grades could also be credited in other study programs such as business administration. Hereby, a certain serenity becomes apparent that further motivates the students to try IS studies, although some concerns regarding this behavior might exist.

5.2 Practical implications

We can also provide practical implications for universities, employers and other institutions that aim to attract women for an IT career. Our study results unveil that many interviewees perceived an IS study program as feasible after they sought adequate information. Several sources for information were mentioned including statements of IS students, online reports, brochures and others. As a consequence, institutions need

to highlight possible job opportunities within the IT field, different fields of application and other benefits that would be offered to women if they decide to study IS.

On a final note, we would like to make all girls, who are interested in an IS study program, aware that none of the interviewees did regret her decision yet, even if there had been little concerns in advance. By reciting one student, who said *'Actually, it was a gut decision. I did not know for what I let myself in but in the end... well, it just seems to be the right thing'* [P6], we would like to note that a certain (and wise) degree of serenity is not wrong when facing important decisions, especially if these affect the own future. Sometimes it is just about trying something new or succumb to the own interest.

5.3 Limitations

The research on hand is subject to several limitations. Firstly, our study was only conducted at one university in Germany as our research's focus is on the choice of the study subject, not the study location. Nonetheless, we cannot ensure that our results are completely transferable to other universities. We also abandoned to interview participants who decided against an IS study program due to the choice of our methodological approach in form of narratives as it is explained in detail in the third section. In addition, we interviewed only female students as this is done by leading research focusing women issues within the IS field [7, 36].

6 Conclusion

We aimed to answer the research question: "Which beliefs motivate female students in Germany to study information systems?" with our research by applying a qualitative methodology in form of narrative interviews with 21 female students. Our results show that a range of different beliefs influenced the women's decision to study IS. Those exhibit several similarities and differences toward previous studies that have already been conducted at universities in the US.

References

1. Efrati, A. and Tam, P.-W.: Google battles to keep talent, <http://www.wsj.com/articles/SB10001424052748704804504575606871487743724>
2. van Heur, R.: Fears of software skills shortage in Germany and the Netherlands, <http://www.computerweekly.com/news/4500269840/Fears-of-software-skills-shortage-in-Germany-and-the-Netherlands>
3. Luftman, J.N., Kempaiah, R.M., Rigoni, E.H.: Key issues for IT executives 2008. MIS Quarterly Executive 8 (2009)
4. McKinney, V.R., Wilson, D.D., Brooks, N., O'Leary-Kelly, A., Hardgrave, B.: Women and men in the IT profession. Commun. ACM 51, 81–84 (2008)

5. Zhang, W.: Why IS: Understanding undergraduate students' intentions to choose an information systems major. *Journal of Information Systems Education* 18, 447–458 (2007)
6. Panteli, N.: A community of practice view of intervention programmes. The case of women returning to IT. *Information Systems Journal* 22, 391–405 (2012)
7. Quesenberry, J.L., Trauth, E.M.: The (dis)placement of women in the IT workforce. An investigation of individual career values and organisational interventions. *Information Systems Journal* 22, 457–473 (2012)
8. Roach, D., McGaughey, R.E., Downey, J.P.: Gender within the IT major - a retrospective study of factors that lead students to select an IT major. *IJBIS* 7, 149–165 (2011)
9. Ahuja, M.K.: Women in the information technology profession. A literature review, synthesis and research agenda. *Eur J Inf Syst* 11, 20–34 (2002)
10. Croasdell, D., McLeod, A., Simkin, M.G.: Why don't more women major in information systems? *Info Technology & People* 24, 158–183 (2011)
11. Trauth, E.M., Quesenberry, J.L., Huang, H.: A multicultural analysis of factors influencing career choice for women in the information technology workforce. *Journal of Global Information Management* 16, 1–23 (2008)
12. Clayton, K., Beekhuyzen, J., Nielsen, S.: Now I know what ICT can do for me! *ISJ (Information Systems Journal)* 22, 375–390 (2012)
13. Burke, R.J., Michie, S., Nelson, D.L.: Barriers women face in information technology careers. *Women in Management Review* 21, 10–27 (2006)
14. Statistisches Bundesamt: Studierende nach Nationalität, Geschlecht und Studienfach - Wirtschaftsinformatik, <https://www-genesis.destatis.de/genesis/online/logon?sequenz=tabelleErgebnis&selectionname=21311-0003>
15. Panko, R.R.: IT employment prospects. Beyond the dotcom bubble. *Eur J Inf Syst* 17, 182–197 (2008)
16. Crawley, F.E., Black, C.B.: Causal modeling of secondary science students' intentions to enroll in physics. *J. Res. Sci. Teach.* 29, 585–599 (1992)
17. Heinze, N., Hu, Q.: Why college undergraduates choose IT. A multi-theoretical perspective. *Eur J Inf Syst* 18, 462–475 (2009)
18. Ajzen, I.: The theory of planned behavior. *Organizational Behavior and Human Decision Processes* 50, 179–211 (1991)
19. Mathieson, K.: Predicting user intentions. Comparing the technology acceptance model with the theory of planned behavior. *Information Systems Research* 2, 173–191 (1991)
20. Venkatesh, V., Morris, M.G., Davis, G.B., Davis, F.D.: User acceptance of information technology: Toward a unified view. *MIS Quarterly* 27, 425–478 (2003)
21. Ajzen, I., Madden, T.J.: Prediction of goal-directed behavior. Attitudes, intentions, and perceived behavioral control. *Journal of Experimental Social Psychology* 22, 453–474 (1986)

22. Arnold, J., Loan-Clarke, J., Coombs, C., Wilkinson, A., Park, J., Preston, D.: How well can the theory of planned behavior account for occupational intentions? *Journal of Vocational Behavior* 69, 374–390 (2006)
23. Li, L., Zhang, C., Zheng, G.: Promoting information systems major to undergraduate students - A comprehensive investigation. *Journal of Information Systems Education* 25, 211–219 (2014)
24. Walstrom, K.A., Schambach, T.P., Jones, K.T., Crampton, W.J.: Why are students not majoring in information systems? *Journal of Information Systems Education* 19, 43–54 (2008)
25. Rouibah, K.: Understanding student drivers and obstacles toward MIS major from the perspective of an arab country: The case of Kuwait. *Issues in Information System* 13, 58–71 (2012)
26. Kuechler, W.L., McLeod, A., Simkin, M.G.: Why Don't More Students Major in IS? *Decision Sciences Journal of Innovative Education* 7, 463–488 (2009)
27. Ferratt, T.W., Hall, S.R., Prasad, J., Wynn, Jr., Donald: Choosing management information systems as a major: Understanding the smiFactors for MIS. *Communications of the Association for Information Systems* 27 (2010)
28. Astin, A.W.: The changing American college student: Thirty-year trends, 1966–1996. *The Review of Higher Education* 21, 115–135 (1998)
29. Hachmeister, C.-D., Harde, M.E., Langer, M.F.: Einflussfaktoren der Studienentscheidung. Eine empirische Studie von CHE und Einstieg. CHE, Gütersloh (2007)
30. Adya, M., Kaiser, K.M.: Early determinants of women in the IT workforce. A model of girls' career choices. *Info Technology & People* 18, 230–259 (2005)
31. Bennett, A., Royle, N.: An introduction to literature, criticism and theory. Prentice Hall Europe, London (1999)
32. Schwarz, A., Chin, W.W., Hirschheim, R., Schwarz, C.: Toward a process-based view of information technology acceptance. *J Inf Technol* 29, 73–96 (2014)
33. Myers, M.D.: Qualitative research in business and management. SAGE Publications Ltd, London (2013)
34. Carr, J.C., Sequeira, J.M.: Prior family business exposure as intergenerational influence and entrepreneurial intent. A Theory of Planned Behavior approach. *Journal of Business Research* 60, 1090–1098 (2007)
35. Young, M.R.: Choice-based segmentation as an enrollment management tool. *Journal of Marketing for Higher Education* 12, 69–83 (2003)
36. Trauth, E.M., Quesenberry, J.L., Huang, H.: Retaining women in the U.S. IT workforce. Theorizing the influence of organizational factors. *Eur J Inf Syst* 18, 476–497 (2009)

Appendix

Table 2. Statement overview

<i>Statement</i>	<i>Interviewee #P</i>	<i>Total</i>
Normative beliefs: Recommendations from...[5, 17]		10
...family members	1, 9, 11, 17, 19	5
...friends	1, 3, 5, 7, 11, 13	6
...university members	7, 8	2
Behavioral beliefs		21
<i>Expectations towards IS in general[5, 10]</i>		<i>13</i>
Interdisciplinarity, mixture of courses, widespread topic area	4, 5, 8, 10, 11, 17, 18, 19	8
Satisfaction of genuine interest	2, 5, 8, 10, 17	5
Possibility of personal development	5, 8	2
“Learning IT”, insight into IT	4, 7, 8, 15, 17, 18	6
Experimentation, try something “new”	8, 14, 19, 20	4
<i>Immersion of prior experiences[34]</i>		<i>10</i>
IT at school	1, 5, 10, 17, 18	5
Further experience of the IT world	8, 21	2
Deepen existing knowledge	8, 19	2
Expand/transfer existing knowledge to the IT side	2, 15	2
<i>Expectations towards IS in contrast to other study programs[5]</i>		<i>8</i>
Versatility, better opportunities	2, 9, 11, 13, 14, 20	6
Higher challenging character	7, 9, 13	6
No overrun	13, 14, 15	6
<i>Expectations towards future and job[5, 17]</i>		<i>10</i>
Better/more interesting job opportunities	1, 3, 5, 11, 13, 15, 19, 21	8
Opportunity to help forming the future	2, 13	2
IT is necessary in every job	13, 15, 18	3
<i>Preparatory and alternate aspects[35]</i>		<i>6</i>
Preparation for specific master programs/job positions	6, 14, 15, 17	4
Alternative choice	14, 16, 19	3
<i>Non-IS specific aspects</i>		<i>9</i>
Admission and location specific aspects	1, 2, 14, 16, 18, 20	6
Spontaneous, intuitive decision	6, 8, 12, 14, 16	5
Control beliefs: Expectations towards feasibility based on...[17]		19
...low level of technical contents	4, 7, 11, 13, 18	5
...no required previous knowledge (IT is taught in courses)	3, 4, 14, 15, 19	5
...statements of others	3, 7	2
...beliefs that women are capable to do it	1, 3, 17	3
...beliefs that obstacles will occur in every study program	8, 19	2
...extensive information about IS studies	2, 5, 15, 18	4
...opportunities to change the subject/credit previous grades	5, 7, 9, 11, 13, 14, 20	7
...good grades at school	6, 17	2