The effect of autobiographical reflection with the use of persuasive technology on the professional identity of social work students

Master Thesis

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Abstract

The multiplicity and dynamic nature of communities and careers require a new and strong professional identity (PI) for healthcare providers, as they have to deal with being in multiple communities and have to learn how they can support their clients in becoming more autonomous. Therefore universities have to teach theoretical knowledge and have to prepare students for the working world. Reflection can be a key process in the development of a PI. Critical reflection can teach students to reflect with nuances, with perspective changes which gives them a focus on their own qualities as a starting professional. Another method for learning to reflect critically and a way to discover the own qualities as a professional is autobiographical reflection, which is about personal experience and analyzing what shaped the individual's life.

The goal of the study was to examine the effect of critical and autobiographical reflection on the PI of social work students and also to analyze the effect of the use of persuasive technology in the reflection course. A randomized trial was conducted with three conditions in the social work study program of a Dutch university of applied sciences. Condition 1 consists of critical reflection with online homework assignments, condition 2 teaches critical reflection in combination with autobiographical reflection with online homework assignments and condition 3 consists of critical and autobiographical reflection in combination with persuasive technology with online homework assignments supported with persuasive technology. Seven different questionnaires were used to examine the PI, and other outcomes, namely: career reflection; internal locus of control; learning motivation; choice certainty; drop out threat and the personal involvement inventory. There were 17 classes with approximately 16 students in each class. 244 second year social work students participated in the study, the mean age was 21 years and as usual in social work classes, more women than men participated in this study. Results showed that the students in both methods, critical reflection alone and critical reflection in combination with autobiographical reflection, showed the same development regarding their PI. Over time from the pre to the post measurement, despite of the three conditions, the social work students strengthened their PI and got more certain about their study choice. The students did not become more motivated about their study, did not reflect more over time, did not reduce the risk to stop studying and also did not strengthen their internal locus of control over time. Additionally, autobiographical reflection in combination with critical reflection made social work students more affectively, but not more cognitively involved in the personal development lessons than the critical reflection course alone. Persuasive technology seems to have no influence on the personal involvement of the social work students. This research adds knowledge about a new study program for social work students, as the combination of critical reflection, autobiographical reflection and persuasive technology is relatively new in this field. Further research is necessary to analyze whether the higher PI scores of the students during the reflection course are definitely due to the reflection courses or whether just studying makes the PI scores stronger. Critical reflection in combination with autobiographical reflection can be a new and attractive way to prepare students for the multiplicity and dynamic nature of communities and careers.

Keywords: Professional Identity; Social work students; Critical reflection; Autobiographical reflection; Persuasive technology

Introduction

Professional identity of social work students

According to Erikson's theory, the most important development task for young people is identity formation. Their main task is to find their own place in the society. Erikson also stressed that identity formation is a lifelong development process (Erikson, 1959). For many people their job or career constitutes an important part of that identity. Young people have to decide which job they choose, if and what they are going to study or which vocational education they want to follow. By choosing a job for themselves they make a decision regarding a part of their identity. This professional identity (PI) "*is understood as the definition that an individual makes about him or herself in terms of the work he or she does*" (Molinero & Pereira, 2013, p. 1605). This PI will develop during the study of the vocational education. For students a strong PI is important, as they have to deal with changing job environments and with the pressure of the world of work continues (Trede, Macklin & Bridges, 2012). Trede, Macklin and Bridges (2012) argue that collaborative, dialogic learning from practice enables and facilitates the development of a strong PI. Trede et al (2012) also stressed the dynamic transformative nature of PI development, personal sense-making and student participation. Therefore the role of universities on the one hand is to teach theoretical and formal knowledge and on the other hand to prepare students to deal with the pressure of the world of work continues (Trede et al, 2012). The goal of this thesis is to analyze the effect of critical and autobiographical reflection on the PI of social work students and to examine the effect of persuasive technology in the autobiographical reflection course.

This last-mentioned definition of PI corresponds to the definition of Kelchtermans (2009) who did research about the PI of teachers, as he stated that for a development of a strong PI, the teacher's beliefs and representations about himself are important influencing factors. He expands this definition by stating that self-understanding is a never ending process and therefore the PI of teachers is not a stable concept, but also develops over time. Additionally to his definition of PI, Kelchtermans (1994, 2009) distinguished five components of the PI. Those five components are self-image, self-esteem, task perception, job motivation and future perspective.

Different to Kelchtermans five components of the PI, in their research Kuijpers and Meijers (2009) found important influencing factors of the PI. They did research on study career guidance in higher professional education involving several educational courses and they did research on the factors that influence the PI. However, as distinguished from the more theoretical task conception Kuijpers and Meijers (2009) found that gaining work

experience has a positive influence on the development of a professional image and the concrete career planning of students. Active participating and employee participation are also important practical influencing factors which can enhance study and work motivation. There exist several additional career competences which might have an influence on the PI of beginning professionals. Those consist of career reflection, work exploration, career management and networking, internal locus of control, employment identity, drop out threat, practical orientation and demand orientation, learning motivation and choice certainty (Kuijpers & Meijers, 2009).

Based on the research of Kuijpers and Meijers (2009), the current study has focused on following influencing factors on PI: career reflection, internal locus of control, learning motivation, choice certainty and dropout threat. Career reflection is about focusing on a personal experience in combination with different feelings and is about giving meaning to an experience, the behavior of oneself and that of others. Reflection can also be an instrument to learn how to act in future situations and how to focus on possible improvements for one's future actions (Trede et al., 2012; Mittendorff, 2014). Internal locus of control describes the degree of coherence between the own actions and the outcomes thereof. A person has an internal locus of control if he/she attributes success or failure to his/her personal effort. Also, people with an internal locus of control feel responsible for their own behavior and they will expect that their behavior has an influence on their career (Kuijpers & Meijers, 2009). Learning motivation describes how motivated students are and how gladly they spend their time studying or doing other things like meeting friends. Choice certainty indicates how certain students are about their study choice and how positive they are about their future job. Drop out threat describes how certain students are about finishing their study or if they want to stop studying and do something else, like working (Kuijpers & Meijers, 2009).

Kuijpers and Meijers (2009) did research on the PI from various courses, like care and welfare, technology, economy, education and agricultural education. The students mainly were from the second and third academic year with a mean age of 21. They found that the participants had a weak developed PI. Kuijpers and Meijers (2009) also found that the participants slightly reflected more than the scale average and that the participants had a strong internal locus of control. The participants seemed to be moderately motivated about their study. Further, the participants seemed to be really sure about their study choice. And the participants hardly seemed to consider stopping their study.

Meijers, Kuijpers and Gundy (2013) also found that career competencies, which consist of: career reflection, career shaping (proactive behavior that influences the course of

one's career) and networking (interactive behavior to maintain contacts on the internal and external job market), positively contributed to learning motivation and experienced fit of choice. Career identity positively contributed to career outcomes. Meijers, Kuijpers and Gundy (2013) also found that students who judge their career as pro-active appear to have confidence in their future career (career identity), they are more motivated for learning and choose learning tasks that match their capacities and motivation. Career identity explained the variance of scores relating to learning motivation and the fit of choices that students make. Students who have a career identity feel more committed to their study specifically to make choices that match their capacities (Meijers, Kuijpers and Gundy, 2013).

According to Meijers and Kuijpers (2014) and Trede et al (2012) the curriculum that students receive is important for the development of a strong PI. Meijers and Kuijpers (2014) found that career competencies are related to career identity, learning motivation, certainty of career choice and drop out threat. A negative relationship between career reflection and career identity as well as certainty of career choice, and the positive relation with drop-out threat is found (Meijers and Kuijpers, 2014). They also found that the learning environment contributes to these variables. The results showed that "students who participate in a practice-based and inquiry-based curriculum, and who have helping conversations about their study with their teachers, feel more motivated for learning, are more certain of their career choice and are less likely to quit their study" (Meijers and Kuijpers, 2014, p. 295). The way of teaching seems to matter, therefore this study has the goal to make more research about how teaching can strengthen the PI of students. The factors of Kuijpers and Meijers and of Kelchtermans are important for the development of a strong PI.

The PI of social work students

The PI of social work students has been in the interest of recent research. The PI of social work students is influenced by personal experience, perception, professional education and socialization (Sims, 2011). Sims (2011) found that joint training had led to a merging of professional knowledge and illustrates how the singular knowledge bases of professions can be deconstructed, opening up the possibility for new, integrated knowledge in the field of learning disability. Pullen and Crête (2016) also found that for the process of PI development it is necessary to integrate the disciplinary foundations with personal experience so it becomes coherent for the students, but also that ally ship is important for that process. Pullen and Crête (2016) also argued that this could be done by matching young professionals with more experienced social workers through a mentorship program to ensure regular supervision.

Through this method the students professional autonomy can grow and the students obtain feedback from significant colleagues. Additionally social work education plays an important role in the development of a PI, through tutorship programs and assessments that focus on personal introspection the PI of social work students can be strengthened. This way, the social work students acquire formal knowledge and also learn to make sense of the knowledge in relation to personal narrative and values, so they can achieve a greater sense of coherence between their personal and professional identities (Pullen & Crête, 2016).

During their education the students have to learn how to deal with this shift in their profession and how they can support their clients in becoming more autonomous (Trede et al., 2012). Trede et al. (2012) also found that identity formation is about fitting oneself into a largely pre-established identity. This task is becoming more difficult, because the places to which the individual may gain access are changing fast and can hardly serve as a target for life projects. Building a PI has become problematic, because what counts as making up an identity has become more flexible. Therefore students need to be adaptable and mobile in the changing employment market. Students must always be on the lookout for shifts and continually search for the best way forward (Trede et al., 2012). It has been shown that there are two variables that have a direct influence on the PI of social work students: Satisfaction with supervision and the strength of one's personal values (Shlomo, Levy & Itzhaky, 2012).

Current research showed that it is necessary to change and to improve the education of especially social work students to strengthen the PI of social work students (Pullen & Crête, 2016; Sims, 2011; Kloppenburg, van Bommel & de Jonge, 2017). According to Kloppenburg et al. (2017) a change in the educational content for social work students is necessary, because of recent substantial changes in society and social policy. Additionally a great urgency was established with regard to the adaption of the study programs, including a higher level of knowledge. Experts agreed about the definition of the knowledge base and about the design requirements: practice-based, science-based, usable and sustainable. Additionally Kloppenburg et al. (2017) stressed that it is important for social work practice that workers are able to switch between perspectives. Only then social workers will be able to develop an integral picture of social reality and to develop a critical stance toward prevailing frameworks like public opinion, political rhetoric, or governmental policy (Kloppenburg et al., 2017). Spector-Mersel (2017, p. 286) stated that social workers "*are expected to routinely explore their interventions, expanding their awareness of themselves as positioned in social, cultural, and professional contexts*". Social workers need reflection and self-regulation skills to manage personal values and maintain professionalism in practice situations (Council on

Social Work Education, 2015). The last three sources indicate the function of critical reflection and autobiographical reflection. During critical reflection and autobiographical reflection lessons, the integration of students' personal values and their critical opinion at macro level as a result of a meaningful situation in practice takes place. Identity formation then is in the service of professionalization and may then lead to a strengthening of the PI.

Reflection

Reflection can be an important process in the PI construction. In higher education reflection also is an important part of the learning goals for students (Trede et al., 2012). There are a lot of different definitions for reflection, but a review has proven that there exist certain similarities (Trede et al., 2012). According to Trede et al. (2012) all definitions agree that reflection is always focusing on a personal experience in combination with different feelings. These, whether nice or unpleasant, have to do with the own identity and motivation, therefore feelings are an important part for the reflection process. This process is about giving meaning to an experience, the behavior of oneself and that of others. According to Mittendorff (2014) reflection must also be an instrument to learn how to act in future situations and how to focus on possible improvements for one's future actions. The goal of reflection is to create new insights or action plans and also to lead to new attitudes or new insights about oneself and the environment (Mittendorff, 2014). Reflection can be a useful tool to link practice to theory, to become aware of one's own learning processes and to gain insight into the consequences of one's own professional behavior.

In their review Trede et al. (2012) found that reflection is a key process for PI development and an important mediator between experience and identity. This is also in line with Mittendorff (2014), as she stated that in our current time where jobs are becoming increasingly uncertain it is requested that employees are able to reflect on themselves and their motives and ambitions. Further research on the effect of reflection on the PI has shown that reflection is an important part for all higher education students to develop and to strengthen personal values and the PI (Trede et al., 2012). Through reflection it is possible that students achieve a higher level of abstraction in their thinking processes (Benammar, 2005). Additionally, reflection exercises during the education of student teachers support their reflective skills and can have a positive impact on their PI development. "*Through reflection, student teachers observe and evaluate their experiences and thoughts and conceptualize them in order to increase awareness of their feelings, beliefs and assumptions and to discern an analytic viewpoint of their experiences*" (Körkkö, Kyrö-Ämmälä & Turunen, 2016, p.199).

Reflection can be a useful tool to strengthen the PI and personal values of students. Through reinforcing the reflection skills, students can achieve a higher level of abstraction in their thinking process, which is also useful to manage personal values and maintain professionalism and students can learn to create new insights or action plans, new attitudes about oneself and the environment (Trede et al., 2012; Körkkö, Kyrö-Ämmälä & Turunen, 2016; Council on Social Work Education, 2015; Benammar, 2005; Mittendorff, 2014).

Critical reflection

Critical reflection is an important part in education, not just reflection. According to Korthagen (2005) critical reflection focuses on the personal qualities of a person. Critical reflection on meaningful situations can improve behavior and focus on the qualities and possibilities of students via the 'onion-model' of Dilts (1990). Through the use of the 'onion-model' students can broaden their competence based thinking. The model contains different layers of factors on which one can reflect, which are: The environment, the behavior in the situation, the own skills and beliefs, the identity of one self and the personal involvement. The main goal is to equally take all 6 layers into account during the reflection process. The inner levels should determine the way a professional functions on the outer levels and vice versa (Korthagen & Vasalos, 2005).

According to Alsina et al. (2017) four levels of reflection can be distinguished. Through the use of the Rubric for Narrative Reflection Assessment (NARRA) students can learn the variances of the four different reflection levels and encourage them through education to achieve the highest level of reflection. The first level is the most elementary level of reflection that applies to a basic description of a situation and a weak identification of feelings and attitudes. The fourth level is the highest reflection level and includes critical thinking along with the reconstruction or transformation of prior knowledge (Alsina et al., 2017). The reflection method NARRA considers both assessment and instruction in four main categories: focus of reflection, the initial belief system, inquiry about focus of reflection (through questions and hypotheses) and rebuilding the belief system to empower new goals and new actions in order transform prior knowledge (Alsina et al., 2017). A reflection report written on the basis of the NARRA comprises four different parts: the situation, activity or experience that triggers the reflection, prior concepts and beliefs, inquiry and focusing and transformation. Thereby the basic level of reflection produces a description of the focus of reflection and an identification of some feelings and attitudes about this focus, while the upper

levels lead to critical thinking, along with the transformation of prior knowledge (Alsina et al., 2017).

Autobiographical reflection

In comparison to critical reflection autobiographical reflection is about personal experience and analyzing what shaped the individuals life in a way that is personally meaningful. Through this approach the personal motivation and involvement in learning of students can be increased (Moenandar & Huisman, 2015; Spector-Mersel, 2017; Janssens & Deventer, 2010; Lengelle, Meijers, Poell & Post, 2013). Today, according to Moenandar and Huisman (2015), a professional is expected to make responsible decisions regarding his or her own development. Students are thus expected to constantly monitor their own personal and professional progress. Therefore autobiographical reflection could be a new method, as it takes personal experience as its starting point and thereby allows students to tell their own stories rather than confine them to a one-size-fits-all model of personal growth and development (Moenandar & Huisman, 2015). Autobiographical reflection can be a supportive tool, as it can give more insight into the processes and decisions of the past that shaped the individual's life and led up onto its current state (Spector-Mersel, 2017). Janssens and Deventer (2010) illustrated that through autobiographical reflection, students were able to find more meaning by combining scientific theory with their personal experiences. This is also in line with the research of Lengelle et al. (2013), because they also emphasized that autobiographical writing enables students to usefully contribute to society in a way that is personally meaningful to them. This inductive approach can lead to a higher personal motivation and more involvement in learning, but it is important that the process is accompanied by an expert, for example a teacher, who can advise and guide the students (Janssens & Deventer, 2010).

According to Bohlmeijer and Westerhof (2010) autobiographical reflection is important for the personal development during the entire lifetime. The process of remembering is an important part during the autobiographical reflection and follows three different goals. The first one is related to the social and cultural function of remembering, in order to share memories with other people and for not forgetting those experiences. Shared memories strengthen the sense of community and transfer knowledge and experiences. The second goal of remembering is to save problem solving strategies – without autobiographic memory humans would not be able to relate their past experiences to current situations. The third goal of remembering is identity formation. Individuals form their personal identity by

connecting certain phases and experiences of their past and forming a narration which leads them to their personality. These three goals are included in the method for autobiographical writing and reflection 'The stories we live by' from Bohlmeijer and Westerhof (2010).

Persuasive technology and the blended learning method

It may be possible that autobiographical reflection and critical reflection within higher education can be improved with the use of persuasive technology within the context of online learning or blended learning. Persuasive technology can be defined as "*technology that aims to reinforce, change, shape or influence behavior and attitudes by being compelling and without being coercive or deceptive*" (van Gemert-Pijnen, Kelders, Kip & Sanderman, 2018, p. 339). The effectiveness of interventions can be enhanced through the use of eHealth technology, as web-based interventions for the early treatment of depressive symptoms have shown (Van Gemert-Pijnen, Kelders & Bohlmeijer, 2014). Technology is persuasive when there is an increased interactivity and engagement of users, through modern information and communication technologies. Those technologies have opened up many opportunities to influence behavior. They may increase adherence (using an intervention as intended) and user engagement or can be effective in improving health and well-being. Examples of persuasive technology are personalization by providing a picture of the user and self-monitoring as the user can see his progress (van Gemert-Pijnen, Kelders, Kip & Sanderman, 2018).

Woltering, Herrler, Spitzer and Spreckelsen (2009) found that if online learning and face-to-face classes are systematically combined, the student's motivation and satisfaction can be enhanced and problems with changing quality of tutors can be overcome. This combination can result in a blended learning scenario (Woltering, Herrler, Spitzer and Spreckelsen, 2009). Persuasive technology in combination with blended learning therefore has potential in the educational field, as it can encourage student's engagement with their learning. The use of persuasive technology in combination with blended learning is relatively new in the educational field (Engelbertink, Kelders, Woudt-Mittendorff & Westerhof, under review).

Research questions

In conclusion critical reflection and autobiographical reflection can possibly be an effective method to strengthen the PI of social work students. The goal of this study is to analyze the effect of critical and autobiographical reflection on the PI of social work students. Results should show if autobiographical reflection could be an alternative method to meet the new requirements of the educational field of social work students and thereby possibly strengthen

the PI of the students more than critical reflection alone. Another goal of the study is to examine the effect of the use of persuasive technology in the reflection course with autobiographical reflection, to see if persuasive technology can possibly increase the effectiveness of the reflection courses. Based on that the two central research questions are:

1. How effective is a blended learning course autobiographical reflection in combination with critical reflection on the professional identity of social work students in comparison with critical reflection alone, in stimulating the professional identity of social work students, their reflection skills, their internal locus of control, their learning motivation, their certainty of choice and in reducing the drop out threat of the students?
2. To what extent does persuasive technology contribute to the personal involvement of students during a blended learning course in comparison with the reflection course without persuasive technology?

Method

Setting

A change is made in the Saxion's social work study program since 2017 to analyze the effect of autobiographical reflection on the PI of social work students. During this new course more attention is paid to the strengthening of their PI. Because of that the blended learning course is developed with the two methods autobiographical and critical reflection. This study is part of the PhD research by Engelbertink (2015-2019) about the effect of autobiographical reflection on the PI of social work students. Saxion's Social Work study program is working on this by teaching reflection skills. Critical reflection is offered in a blended course, which focuses on the skills of the new reflective professional. Additionally autobiographical reflection is offered, where students learn to reflect from their own life story to strengthen their PI. A blended learning course is developed to have a more interactive way of learning and persuasive technology is added to increase this. The blended learning course was developed in a codesign process after a design study (Engelbertink, Kelders, Woudt-Mittendorff & Westerhof, under review). The used techniques of the online element of the course can be found in the appendix 1.

Design

The study is a randomized study with three different conditions and three measurement moments, including one pre measurement, one post measurement and follow up measurement. The first condition teaches critical reflection with online homework assignments aimed at critical reflection, the second condition teaches critical reflection and autobiographical reflection with online modules with homework assignments focused on autobiographical reflection and the third condition also teaches critical reflection and autobiographical reflection and includes persuasive technology in the online module with online homework assignments supported with persuasive technology. The pre measurement sample answered the survey in week 8 of January 2018. The post measurement sample answered the survey in week 7 and 14 of May 2018. The sample of the follow up measurement answered the survey in week 2 of July 2018, at this moment the students have completed all the lessons of the year.

All three conditions receive eight face to face classes (table 1). The first condition only teaches critical reflection and students have to make four online homework exercises which focus on the reflection of the professional practice. The second condition consists of critical reflection in combination with autobiographical reflection and also includes four online homework exercises which focus on writing their autobiography and reflection on it. The third condition includes the same content as condition 2 only the online module is developed using persuasive technology. A total of 17 different classes are distributed to the different conditions. This was determined after teachers could indicate whether they wanted to give the autobiographical lessons. There were also teachers who wanted to give autobiographical lessons but were included in condition 1, because there was too much interest. Condition 3 is randomly assigned through drawing by lot among teachers who wanted to give autobiography lessons. 8 classes are taught by condition one, 4 classes are taught by condition two and 5 classes are taught by condition three. The different conditions are taught by 15 different teachers.

The didactic method for the second year social work students consists of critical reflection, autobiographical reflection in combination with persuasive technology. The purpose of this study is the same as from Korthagen (2005), through critical reflection the students should learn to discover their qualities and possibilities. The reflection courses should result in higher reflection levels and also should lead to an awareness or a strengthening of the own identity and the PI. Autobiographical reflection is taught by the method ‘Tell your story’ from Engelbertink, Wijering, Bohlmeijer and Westerhof (2019). The

method was developed to help social work students to develop and strengthen their PI. This method is based on the method 'The story we live by' and has the target group of older people with mildly depressive symptoms and has the goal to promote personal growth and handling difficult events. In different chapters individuals write down their biography, which reaches from the young years and family up to adolescence and adulthood, work and care and love and friendships and also include one subject of choice. It also includes wellbeing exercises and creative imagination (Bohlmeijer and Westerhof, 2010). The target group of the method 'Tell your story' are students and the goal is focused on identity formation and professional identity formation and teaches students to reflect with nuances and with perspective changes and is supplemented with the reflection on the PI of the social work students. These nuances and perspective changes are in accordance with critical reflection. Also the theory about PI of Kelchtermans (2009) is used in the blended learning method. The students are asked to reflect on the five components, self-image, self-esteem, task definition, work motivation and future perspective.

Table 1

Overview of study conditions

	Groups	N	Lessons structure	Assignments
Condition 1	8	87	8 lessons NARRA	4 online assignments connected to NARRA (or PI)
Condition 2	4	46	4 lessons NARRA + 4 lessons Autobiographical reflection	4 online assignments connected to autobiographical reflection (or identity and PI) without persuasive technology
Condition 3	5	54	4 lessons NARRA + 4 lessons Autobiographical reflection	4 online assignments connected to autobiographical reflection (or identity and PI) with persuasive technology

Participants

Descriptive analyses were made to analyze the characteristics of the participants. Analyses showed that in all measure moments and in all conditions more women than men participated in the study. The mean age in all measure moments was about 21 years with small differences in the separate conditions.

Each of the 17 classes consists of approximately 16 students. The students studied at a Dutch university of applied sciences in the east of the Netherlands. 244 second year social work students participated in the study. There was one class with 8 students, the rest of the

classes each contained 12 to 17 students. The response of the pre measurement in January 2018 was 77%. Their mean age was 21 (min. age 17 – max. 30, SD 2.3) and 85% were female. In the post measurement in May 2018, 167 students participated in the study with a response rate of 75.6%. Their mean age was 21, too (SD 2.3) and over 80% were female. In the follow up measurement in July 2018 76 students participated in the study with a response rate of 34.4%. Their mean age was 21.5 (SD 2.3), over 80% were female (Table 2). Between the three conditions no differences were found in relation to gender and age, in all conditions more women than men participated and the mean age was about 21 years.

Table 2

Characteristics of the three measure moments and the three conditions

Sample	**N (response %)**	**Gender**	**Mean age (SD)**
Pre measurement January	187 (77%)	85.0% female 15.0% male	21 (SD 2.2)
Condition 1	118 76 (79.31%)	75 (47.2%) female 12 (42.9%) male	21.09 (SD 2.13)
Condition 2	58 46 (79.31%)	41 (25.8%) female 5 (17.9%) male	20.98 (SD 2.51)
Condition 3	68 54 (79.41%)	43 (27.0%) female 11 (39.3%) male	20.81 (SD 2.17)
Post measurement May	167 (75.6%)	83.8% female 16.2% male	21 (SD 2.3)
Condition 1	107 71 (66.35%)	62 (33.3%) female 9 (44.3%) male	21.42 (SD 2.38)
Condition 2	54 44 (81.48 %)	37 (26.4%) female 6 (22.2%) male	21.37 (SD 2.5)
Condition 3	60 53 (88.33%)	41 (29.3%) female 12 (29.3%) male	21.25 (SD 1.93)
Follow up Measurement July	76 (34.4%)	86.8% female 13.2% male	21.5 (SD 2.3)
Condition 1	107 37 (34.57%)	33 (50%) female 4 (40%) male	21.59 (SD 2.45)
Condition 2	54 19 (35.18%)	16 (24.2%) female 3 (30%) male	20.63 (SD 2.29)

Condition 3	60 20 (33.33%)	17 (25.8%) female 3 (30%) male	22 (SD 2.0)

Procedure

The survey is collected via Qualtrics. Several questionnaires were asked to examine the PI, the learning motivation and the use of persuasive technology. Participants needed on average 10-15 minutes to fill in the questionnaires. For the questionnaire during the post measurement participants needed on average 20 minutes, because other questionnaires which are used in a larger study are added. At the beginning of the questionnaires each participant was asked about his or her student number, his or her gender and age, and in which class they participated. Student participation was voluntary, informed consent was provided and students answered the questions anonymously. The study was approved by the Ethical Committee of the University of Twente.

Materials

Professional identity

To analyze whether the PI of the participants has changed, the social work students had to answer several questions about their PI. One scale about PI was asked based on the questions of Kuijpers and Meijers (2009). The questionnaire about PI included 10 items and asked the students in which extent they could identify with their study and with the job they will have later. The response scale ranged from 1 = strongly disagree to 4 = strongly agree. Sample items are: 'My heart goes out to the work that I want to do later', or 'I have discovered what kind of work really suits me'. Cronbach's alpha at the pre measurement was .85, at the post measurement .82 and at the follow up measurement .88. The scores were calculated by computing an average score for all answers. A high score indicated that the participants have a strong PI, a low score indicated a low PI of the participants.

Career Reflection

Reflection on the career was measured using the scale Career Reflection of Kuijpers, Meijers and Gundry (2011). This scale includes 10 items and focuses on reflective behavior over positive and negative things during their study and later in their career and also about talents and skills. The response scale ranging from 1 = strongly disagree to 4 = strongly agree. Sample items are 'I find out what I find good and bad in life', or 'I am looking for what I find important about my work'. Cronbach's alpha at the pre measurement was .84, at the post measurement .80 and at the follow up measurement .85. The scores are calculated by

computing an average score for all answers. A high score indicated that the social work students reflect a lot about their study of career and a low score indicated that they do not reflect much.

Internal Locus of Control

Internal locus of control was measured using the scale of Kuijpers & Meijers (2009). The scale includes 6 items with a response scale ranging from 1 = strongly disagree to 4 = strongly agree. Sample items are: 'I have full control over what happens to me' or 'By working hard, I can later become what I want'. Cronbach's alpha at the pre measurement was .78, at the post measurement .78 and at the follow up measurement .83. The scores are calculated by computing an average score for all answers. A high score means that the participants have a strong internal locus of control: they feel responsible for their own behavior and attribute their success or failure to their own effort. A low score indicates a low internal locus of control, which means they attribute success or failure to the circumstances and not their own personal effort.

Learning motivation

Learning motivation was measured using the scale of Kuijpers & Meijers (2009). The scale measured how motivated the students were, how gladly they spend their time studying or doing other things like meeting friends. This scale includes 10 items with a response scale from 1 = strongly disagree to 4 = strongly agree. Sample items are: 'On this course it is hard for me to get started for my studies' or 'I am often busy with this course'. Cronbach's alpha at the pre measurement was .82, at the post measurement .86 and at the follow up measurement .83. The scores were calculated by computing an average score for all answers. A high score indicated the social work students were very motivated about their study and a low score that they were not very motivated and that they spent their time doing other things.

Choice Certainty

Choice certainty was measured using the scale of Kuijpers & Meijers (2009). The scale focuses on how certain students were about their study choice and how positive they were about their future job. The scale included 5 items with a response scale from 1 = Yes very much to 6 = Certainly not (in the pre measurement from 1 = Certainly to 6 = Certainly not). Sample items are 'Are you uncertain about choosing this course?' and 'This course gives you the feeling that you can see your future with confidence and optimism?. Cronbach's alpha at

the pre measurement was .85, at the post measurement .87 and at the follow up measurement .80. The scores are calculated by computing an average score for all answers. A high score indicated that the social work students were very sure about their study choice, a low score indicated they were unsure about their study choice.

Drop out threat

Drop out threat was measured using the scale of Kuijpers & Meijers (2009). The scale should indicate how certain students were about finishing their study or if they will stop studying and do something else, like working. The scale includes 4 items with a response scale from 1 = strongly disagree to 4 = strongly agree. Sample items are: 'I'm going to quit this course' and 'Possibly I will switch to another course'. Cronbach's alpha at the pre measurement was .71, at the post measurement .75 and at the follow up measurement .70. The scores were calculated by computing an average score for all answers. A high score indicated the participants considered to stop their study, a low score meant that they were certain to finish their study.

Personal Involvement Inventory

Persuasive technology is used in condition 3. To analyze if persuasive technology increases the effectiveness of the autobiographical course 10 questions of the Personal Involvement Inventory (PII) were asked during the post and follow up measurement. The PII has been applied to the lessons of the course that was studied. The personal development (POW) lessons were the starting point, because the students of all three conditions recognized the blended learning course in this way. It focused on what the students thought of the autobiographical reflection course and how effective they thought it was. The scale measures involvement and contains two subscales: cognitive and affective involvement. The scale includes 10 items with a response scale from 1 = strongly disagree to 7 = strongly agree. Sample items are: 'For me the content of the POW lesson is boring/ interesting' and 'The content of the POW lessons is for me worthless/valuable'. Cronbach's alpha for the subscale cognitive involvement at the post measurement was .86 and at the follow measurement .93. Cronbach's alpha for the subscale affective involvement at the post measurement was .89 and at the follow measurement .91. The scores were calculated by computing an average score for all answers. A high score indicated that the participants were cognitively and affectively involved in the autobiographical reflection course, a low score indicates that they were not cognitively and affectively involved.

Data Analysis

SPSS statistics was used to analyze the data. First, univariate analyses of variance (ANOVA) were conducted to examine possible differences between the three measure moments and the three different conditions, to compare the participants scores of PI, career reflection, internal locus of control, learning motivation, choice certainty, drop out threat and personal involvement inventory of the participants in condition 1 with condition 2 and with condition 3 in each of the measure moments. The dependent variables are respectively the different conditions and the independent variables the scores of the questionnaires. And second, several repeated measure analyses were done to analyze possible difference over time with the three different conditions as between-subject factor.

Results

Research question 1

To answer the first research question: 'How effective is a blended learning course autobiographical reflection in combination with critical reflection on the professional identity of social work students in comparison with critical reflection alone, in stimulating the professional identity of social work students, their reflection skills, their internal locus of control, their learning motivation, their certainty of choice and in reducing the drop out threat of the students?' several analyses were conducted.

The analyses indicate that the participants in this study had a weak developed PI, as the mean score of all measure moments and conditions ranged from 2.68 to 2.82 on a scale of 1-4. In all three measure moments the participants seem to slightly reflect more than the scale average (mean range from 2.69 to 2.93 with a scale average of 2.5). They also seem to have a strong internal locus of control during all three measure moments (mean range from 2.93 to 3.20 on a scale from 1-4). The participants seem to be moderately motivated about their study (mean score of 2.57 to 2.81 on a scale of 1-4). In the pre measurement participants seem not very sure about their study (mean score of 2.23 to 2.36 on a scale of 1-6), but in the post and follow up measurement the participants seem to be very sure about their career choice (mean score of 4.47 to 4.97). This indicates that throughout the study year participants became more certain about their study choice. And in all three measure moments the participants hardly seem to consider stopping their study (mean score of 1.09 to 1.25 on a scale of 1-4) (table 3).

Table 3

Results questionnaires Means and Standard deviations

Scale	Pre measurement Mean (Std.)	Post Measurement Mean (Std.)	Follow up measurement Mean (Std.)
PI			
Condition 1	2.72 (.52)	2.74 (.48)	2.71 (.56)
Condition 2	2.65 (.58)	2.79 (.56)	2.82 (.67)
Condition 3	2.68 (.43)	2.76 (.47)	2.82 (.57)
Career reflection			
Condition 1	2.79 (.52)	2.81 (.89)	2.69 (.58)
Condition 2	2.92 (.45)	2.91 (.82)	2.93 (.43)
Condition 3	2.81 (.52)	2.80 (.81)	2.82 (.37)
Internal Locus of control			
Condition 1	3.09 (.48)	3.07 (.48)	2.93 (.48)
Condition 2	3.17 (.53)	3.20 (.53)	3.21 (53)
Condition 3	3.07 (.54)	3.02 (.48)	2.98 (.48)
Learning motivation			
Condition 1	2.81 (.48)	2.74 (.60)	2.71 (.51)
Condition 2	2.73 (.54)	2.80 (.47)	2.71 (.62)
Condition 3	2.64 (.51)	2.57 (.50)	2.69 (.46)
Choice certainty			
Condition 1	2.23 (.79)	4.75 (.89)	4.84 (72)
Condition 2	2.36 (.94)	4.97 (.82)	4.92 (.88)
Condition 3	2.34 (.88)	4.59 (.81)	4.47 (.75)
Drop out threat			
Condition 1	1.25 (.46)	1.19 (.41)	1.22 (.59)
Condition 2	1.21 (.33)	1.16 (.29)	1.09 (.15)
Condition 3	1.20 (.30)	1.19 (.41)	1.19 (.21)

Univariate analyses of variance (ANOVA) were conducted to examine possible differences between the three measure moments and the three different conditions, consisting of condition 1: critical reflection, condition 2: critical reflection in combination with autobiographical reflection without persuasive technology and condition 3: critical reflection in combination with autobiographical reflection with persuasive technology.

The pre measurement, the post measurement and the follow up measurement univariate analyses of variance (ANOVA) showed no significant differences between the three conditions in relation to the scales of the PI and career reflection of the participants (Appendix 2, Appendix 3, Appendix 4). Analyses also showed no significant differences between the three conditions in relation to the scales of internal locus of control, learning motivation, choice certainty and dropout threat (Appendix 2, Appendix 3, Appendix 4).

Repeated measures ANOVA

Several one-way repeated measured analysis (ANOVA) were conducted to evaluate the null hypothesis that there is no change in the development of the participants PI-, career reflection-, internal locus of control-, learning motivation-, choice certainty-, drop out threat-, PII affective involvement- and PII cognitive involvement scores for the three conditions. There were two different one-way repeated measure analyses conducted to analyze the differences between the pre and post measurement and between the pre and follow up measurement, because not all participants filled the questionnaire in each measure moment in. In the comparison between pre and post measurement were in condition 1 n = 60 participants, in condition 2 n = 32 and in condition 3 n = 44. In the comparison between the pre and follow up measurement were in condition 1 n = 30 participants, in condition 2 n = 16 and in condition 3 n = 17. To analyze whether the conditions had an effect over time, the conditions were added as between-subject factor.

Pre and post measurement

The results of the ANOVA indicated a significant time effect for the PI scores, Wilk's Lambda = .92, F = 11.20, p = <.01**. Thus, there is significant evidence to reject the null hypothesis. Follow up comparisons indicated that the PI scores of the pre measurement differ significantly from the post measurement scores. There was a significant increase of the PI scores over time, suggesting that participation in all reflection courses increased participants' PI scores over time. However, results showed no significant differences across time between the conditions for the PI scores of the participants, Wilk's Lambda = .99, F = .73, p = .48 (table 4).

Results indicate no significant time effect for the career reflection scores, Wilk's Lambda = .20, F = .43, p = .51, suggesting that participating in the reflection courses did not lead to more reflection. Further analyses support this result as further analyses showed no significant differences across time between the conditions for the career reflection scores, Wilk's Lambda = .99, F = .13, p = .88 (table 4).

Results indicate no significant time effect for the internal locus of control scores, Wilk's Lambda = .99, F = .56, p = .57, suggesting that participating in the reflection courses did not lead to a higher internal locus of control. Further analyses also showed no significant differences across time between the conditions for the internal locus of control scores, Wilk's Lambda = .99, F = .56, p = .57 (table 4).

Results indicate no significant time effect for the learning motivation scores, Wilk's Lambda = .99, F = 1.45, p = .23, suggesting that participating in the reflection courses did not increase participants learning motivation. Further analyses showed no significant differences across time between the conditions for the learning motivation scores, Wilk's Lambda = .99, F = .54, p = .58 (table 4).

The results of the ANOVA indicated a significant time effect for the choice certainty scores, Wilk's Lambda = .30, F = 315.52, p = <.01**. There was a significant increase of the choice certainty scores over time, suggesting that participation in the reflection courses increased participants' choice certainty scores over time. Results showed a significant difference across time between the conditions for the choice certainty scores of the participants, Wilk's Lambda = .96, F = 2.99, p = .05* (table 4). Condition 3 differ significantly from condition 1 and condition 2.

Results indicate no significant time effect for the drop out threat scores, Wilk's Lambda = .99, F = .53, p = .47, suggesting that participating in the reflection courses did not change the participants drop out threat. Further analyses also showed no significant differences across time between the conditions for the drop out threat scores, Wilk's Lambda = .99, F = .06, p = .94 (table 4).

Table 4

Results of the repeated measures ANOVA of the pre- and post measurement

	Condition 1 **Mean (Std.)**	**Condition 2** **Mean (Std.)**	**Condition 3** **Mean (Std.)**	**Total**
PI				
Pre measurement	2.65 (.53)	2.61 (.61)	2.60 (.53)	2.62 (.55) **
Post measurement	2.75 (.48)	2.79 (.57)	2.70 (.45)	2.74 (.49) **
Career reflection				
Pre measurement	2.78 (.53)	2.89 (.44)	2.78 (.54)	2..80 (.51)
Post measurement	2.80 (.40)	2.90 (.55)	2.83 (.45)	2.83 (.45)
Internal locus of control				
Pre measurement	3.05 (.47)	3.18 (.52)	3.06 (.56)	3.09 (.51)
Post measurement	3.08 (.45)	3.18 (.55)	3.01 (.51)	3.08 (.50)
Learning motivation				
Pre measurement	2.82 (.51)	2.81 (.50)	2.65 (.52)	2.76 (.52)
Post measurement	2.73 (.61)	2.81 (.51)	2.61 (.50)	2.71 (.56)
Choice certainty				
Pre measurement	2.26 (.74)	2.21 (.98)	2.55 (.87)*	2.34 (.85) **
Post measurement	4.83 (.89)	4.98 (.90)	4.51 (.84)	4.76 (.89) **

Drop out threat				
Pre measurement	1.24 (.41)	1.16 (.28)	1.22 (.30)	1.21 (.35)
Post measurement	1.20 (.44)	1.13 (.21)	1.20 (.45)	1.18 (.40)

Note. *P <.05; ** p < .01

Pre and follow up measurement

The results of the ANOVA indicated a significant time effect for the PI scores, Wilk's Lambda = .81, F = 14.14, p = <.01**. Thus, there is significant evidence to reject the null hypothesis. Follow up comparisons indicated that the PI scores of the pre measurement differ significantly from the follow up measurement scores. There was a significant increase of the PI scores over time, suggesting that participation in the reflection courses increased participants' PI scores over time. However, results showed no significant differences across time between the conditions for the PI scores of the participants, Wilk's Lambda = .97, F = 1.05, p = .36 (table 5).

Results indicate no significant time effect for the career reflection scores, Wilk's Lambda = .99, F = .78, p = .38, suggesting that participating in the reflection courses did not lead to more reflection. Further analyses support this result as further results showed no significant differences across time between the conditions for the career reflection scores, Wilk's Lambda = .98, F = .67, p = .52 (table 5).

Results indicate no significant time effect for the internal locus of control scores, Wilk's Lambda = .96, F = 2.45, p = .12, suggesting that participating in the reflection courses did not lead to a higher internal locus of control. Further analyses also showed no significant differences across time between the conditions for the internal locus of control scores, Wilk's Lambda = .99, F = .15, p = .86 (table 5).

Results indicate a significant time effect for the learning motivation scores, Wilk's Lambda = .93, F = 4.40, p = <.05*, suggesting that in the follow up measurement participants are less motivated than during the pre-measurement. Further analyses showed no significant differences across time between the conditions for the learning motivation scores, Wilk's Lambda = .98, F = .52, p = .60 (table 5).

The results of the ANOVA indicated a significant time effect for the choice certainty scores, Wilk's Lambda = .33, F = 123.10, p = <.01**. There was a significant increase of the choice certainty scores over time, suggesting that participation in the reflection courses increased participants' choice certainty scores over time. Results showed no significant differences across time between the conditions for the choice certainty scores of the participants, Wilk's Lambda = .98, F = .65, p = .53 (table 5).

Results indicate a significant time effect for the drop out threat scores, Wilk's Lambda = .85, F = 10.25, p = <.01**, suggesting that participating in the reflection courses decrease participants drop out threat. Further analyses showed no significant differences across time between the conditions for the drop out threat scores, Wilk's Lambda = .99, F = .16, p = .86 (table 5).

Table 5

Results of the repeated measures ANOVA of the pre and follow up measurement

	Condition 1	**Condition 2**	**Condition 3**	**Total**
	Mean (Std.)	**Mean (Std.)**	**Mean (Std.)**	
PI				
Pre measurement	2.63 (.61)	2.54 (.69)	2.48 (.55)	2.57 (.61) **
Follow up measurement	2.74 (.57)	2.78 (.72)	2.76 (.60)	2.76 (.60) **
Career reflection				
Pre measurement	2.70 (.56)	2.98 (.48)	2.66 (.61)	2.75 (.55)
Follow up measurement	2.72 (.47)	2.91 (.47)	2.79 (.38)	2.79 (.46)
Internal locus of control				
Pre measurement	3.01 (.46)	3.29 (.54)	3.02 (.69)	3.08 (.55)
Follow up measurement	2.89 (.56)	3.19 (.67)	2.79 (.64)	2.70 (.56)
Learning motivation				
Pre measurement	2.79 (.46)	2.77 (.53)	2.83 (.46)	2.80 (.47) *
Follow up measurement	2.74 (.56)	2.69 (.67)	2.66 (.49)	2.70 (.56) *
Choice certainty				
Pre measurement	2.27 (.85)	2.55 (1.09)	2.64 (.98)	2.44 (.95) **
Follow up measurement	4.90 (.74)	4.89 (.93)	4.73 (.77)	4.85 (.79) **
Drop out threat				
Pre measurement	1.30 (.45)	1.25 (.33)	1.26 (.39)	1.28 (.40) **
Follow up measurement	1.18 (.40)	1.08 (.40)	1.10 (.22)	1.13 (.31) **

*P <.05; ** p < .01

Research question 2

The second research question was 'To what extent does persuasive technology contribute to the personal involvement of students during a blended learning course in comparison with the reflection course without persuasive technology?', to answer this question several analyses were conducted. The means and standard deviations of the PII questionnaire can be found in table 4. The participants in condition 1 seem to be less affective involved during the reflection courses during the post and follow up measurement, but the participants in condition 2 and

condition 3 seem to be more involved in comparison to condition 1. The participants also seem to be moderately cognitive involved in the reflection courses (table 6).

Table 6

Means and Standard deviations of the PII questionnaire

Scale	Post Measurement Mean (Std.)	Follow up measurement Mean (Std.)
PII Affective involvement		
Condition 1	3.42 (.87)	3.96 (1.21)
Condition 2	4.11 (.96)**	4.62 (1.02)
Condition 3	3.89 (.81)**	4.07 (1.12)
PII Cognitive Involvement		
Condition 1	4.16 (1.04)	4.39 (1.29)
Condition 2	5.05 (1.04)**	5.12 (1.03)
Condition 3	4.62 (1.02)	4.32 (1.21)

*P <.05; **p < .01

Results of the univariate analyses of variance (ANOVA) showed significant differences for the post measurement between the three conditions concerning the blended learning course (POW lessons), as for the affective involvement scale: F (2,166) = 9.38, p = <.01**. Post hoc comparisons using the Bonferroni test indicated that the mean score of condition 2 differed significantly from the mean score of condition 1. Additionally the mean score of condition 3 also differed significantly from condition 1, p = <.01**. In sum, the students who followed the autobiographical lesson (condition 2 and 3) scored higher on the affective involvement scale than students of the critical reflection lessons (condition 1), this applies to measuring moment 2 (post measurement).

Also significant differences were found for the cognitive involvement scale: F (2,164) = 9.57, p = <.01**. Post hoc comparisons using the Bonferroni test indicated that the mean score of condition 2 differed significantly from the mean score of condition 1. However, the mean score of condition 3 did not differ significantly from the mean score of condition 1. Therefore, the students who followed the autobiographical lessons (condition 2) scored higher on cognitive involvement than students of the critical reflection (condition 1). However, the students who followed autobiographical lessons with persuasive technology (condition 3) did not score higher on cognitive involvement than students of the critical reflection lessons.

The follow up measurement univariate analyses of variance (ANOVA) indicated no significant differences between the three conditions in relation to the evaluation of the POW

lessons for both subscales. Affective involvement scale: F (2,75) = 2.17, p= 0.12. Likewise no significant differences were found for the cognitive involvement scale: F (2,75) = 2.75, P = 0.97. In sum, in the follow up measurement the students who followed the autobiographical lessons (condition 2 and 3) did not score higher on the PII scale than students who followed the critical reflection lessons (condition 1).

Repeated measures ANOVA

Results indicate a significant time effect for the PPI affective involvement scores, Wilk's Lambda = .90, F = 7.06, p = .01. Follow up comparisons indicate that the affective involvement scores of the post measurement differ significantly from the follow up measurement scores. There was a significant increase in the affective involvement scores over time, suggesting that participating in the reflection courses increase the affective involvement of the participants. Further analyses showed no significant differences across time between the conditions for the affective involvement scores, Wilk's Lambda = .99, F = .52, p = .59 (table 7).

Results indicate no significant time effect for the PPI cognitive involvement scores, Wilk's Lambda = .99, F = .08, p = .78, suggesting that participating in the reflection course did not increase the cognitive involvement of the social work students. Further analyses also showed no significant differences across time between the conditions for the affective involvement scores, Wilk's Lambda = .97, F = .93, p = .40 (table 7).

Table 7

Results of the Repeated measures ANOVA of the pre and follow up measurement of the PII questionnaire

	Condition 1 Mean (Std.)	**Condition 2 Mean (Std.)**	**Condition 3 Mean (Std.)**	**Total**
Affective involvement				
Post measurement	3.54 (.75)	4.22 (.91)	3.94 (1.03)	3.83 (.91)
Follow up measurement	4.05 (1.12)	4.54 (.99)	4.15 (1.17)	4.21 (1.11)
Cognitive involvement				
Post measurement	4.30 (1.07)	5.11 (1.05)	4.57 (1.07)	4.59 (1.10)
Follow up measurement	4.46 (1.23)	5.07 (1.04)	4.35 (1.22)	4.59 (1.20)

Discussion

The goal of the study was to analyze the effect of critical and autobiographical reflection on the PI of social work students. The study also examined the effect of the use of persuasive technology in the reflection course.

Research question 1

The first research question of this study was 'How effective is a blended learning course autobiographical reflection in combination with critical reflection on the professional identity of social work students in comparison with critical reflection alone, in stimulating the professional identity of social work students, their reflection skills, their internal locus of control, their learning motivation, their certainty of choice and in reducing the drop out threat of the students?'. Over time no differences between the conditions were found. Both methods, critical reflection alone and critical reflection in combination with autobiographical reflection, are equally effective. Results showed that the social work students were able to strengthen their PI, were more motivated about their study, became more certain about their study choice and also reduced the risk to stop studying by following the reflection course. The students did not reflect more and did not strengthen their internal locus of control over time.

Regarding the scores of career reflection, no differences were found between the three measure moments. This means that the social work students in all measure moments reflected about the same amount. It would be interesting to see if the level of reflection has increased after the interventions, even though the research shows that the social work students did not reflect more often after taking the blended learning course. The question if the level of reflection is deepened is being measured in another sub study linked to the doctoral research by Engelbertink (in preparation) measured through the levels of reflection of Kember and Leung (Lethbridge, Andrusyszyn, Iwasiw, Laschinger & Fernando, 2013).

The learning motivation of the students increased during the follow up measurement, but not during the post measurement, which makes the motivation of the students a challenge for the teachers to motivate students even more during the lessons. More research among various years of social work education would be interesting to see if motivation differs per academic year, but also to examine to what extent the motivation depends on the teachers.

Results also indicate significant changes over time in relation to the drop out threat scale, as the social work students significantly decreased their drop out threat from the pre measurement in comparison to the follow up measurement. A reason therefore could be that at the end of the year the students no longer doubt their studies. Another possibility is that the students who did have doubts did not participate in the study, because there was considerable outage in the study. It is not certain that this result is due to the blended learning course, further research should be needed by adding a condition that does not receive a reflection course.

Previous research showed that critical reflection and autobiographical reflection can have a positive impact on the development of a strong PI of higher education students (Trede et al., 2012; Korthagen & Vasalos, 2005; Moenandar & Huisman, 2015; Lengelle et al., 2013). The results of this study showed no difference between critical reflection alone versus critical reflection in combination with autobiographical reflection in relation to PI, career reflection, internal locus of control, learning motivation, choice certainty and dropout threat. Further research is needed to clarify this result. Results showed improvements in PI scores, but further research is needed to find out if the improved PI scores is due to the reflection courses or because the students are progressing further in their studies. Another explanation for the improved PI scores can be time, as it could be possible that the PI scores of the social work students increase with time throughout the study year anyway, regardless of the reflection courses. Further research should show whether the improved PI scores are due to the reflection courses or only due to time, by adding a condition without any reflection course.

Analyses indicate that the social work students in this study have a weak developed PI, which is in line with the research of Kuijpers and Meijers (2009), as they found similar scores of the participants for the PI. In our study the social work students hardly seem to consider stopping their study and the social work students seem to be moderately motivated about their study. These results are similar to the results of Kuijpers and Meijers (2009). However, not in line with the research of Kuijpers and Meijers (2009) are the results of the choice certainty scale. In the pre-measurement the social work students do not seem very sure about their study, but in the post and follow measurement they seem to be very sure about their career choice. This indicates that throughout the study year the social work students in our study got more certain about their study choice. The last results are again similar to the results of Kuijpers and Meijers (2009). An alternative explanation for these results could be the age of the social work students, as previous research showed that the older the students, the more they reflect (Kuijpers & Meijers, 2009). In this research the mean age was about 21 years, similar to the mean age of the social work students by the study from Kuijpers and Meijers (2009). If the students were older, they would probably reflect more on their career. This could lead to higher scores on career reflection, which could lead to a stronger PI, too.

Results showed that the social work students could strengthen their PI, their learning motivation, their choice certainty and reduce their dropout threat. No changes were found in the amount of reflection and the students did not change their internal locus of control. Additionally no differences were found between the conditions, this could be due to the role of the teacher or that they differ in their teaching method.

Research question 2

The second research question was 'To what extent does persuasive technology contribute to the personal involvement of students during a blended learning course in comparison with the reflection course without persuasive technology?'. In the post measurement results showed that condition 2 and 3 scored higher on the affective involvement scale compared to condition 1. However, only condition 2 scored higher on cognitive involvement than condition 1. These differences in affective and cognitive involvement were not found in the follow up measurement. In practice the results mean that the critical reflection in combination with autobiographical reflection course and also the condition with the added persuasive technology strengthened the (affective) involvement of the social work students, in comparison with the eight lessons with only the critical reflection. However this is not applicable for the cognitive involvement of the social work students. It seems that this result is due to the autobiographical reflection and not due to the persuasive technology. This could be explained by the considerable outage in the study, it could be possible that the questionnaires were mostly filled in by the students who were already involved. In that case persuasive technology could not increase the involvement of these students anymore. Another explanation can be the teaching methods. Maybe the teachers of condition 2 had better methods to clearly teach what cognitive involvement is than the teachers of condition 3. Therefore in further research it would be necessary to agree on an improved method of how to explain why cognitive involvement is necessary.

Results showed significant differences regarding the affective involvement scale, as the social work students seem to be more affectively involved in the follow up measurement. This means that over time, the students were more affectively involved by following the different reflection courses. However, results indicate no significant changes over time for the cognitive involvement scale.

It seems that persuasive technology has no influence on the social work students, but autobiographical reflection makes social work students more affectively involved in the personal development lessons in comparison to critical reflection alone. These results are not in line with previous research, as the results did not support that persuasive technology can increase the personal involvement of the social work students (Van Gemert-Pijnen, Kelkders, Kip & Sanderman, 2018). Adding persuasive technology to the autobiographical reflection does not help to improve the PI and its resources, but the students are more affectively involved due to autobiographical reflection.

Strength, Limitations and Further Research

A strength of this research is that it adds knowledge about a new study program for social work students, as the combination of critical reflection, autobiographical reflection and persuasive technology is relatively new in this field (Engelbertink, Kelders, Woudt-Mittendorff & Westerhof, under review). Through this new study program, this research adds knowledge about the effect of autobiographical reflection on the PI of social work students. Much is known about the effects of reflection on teacher students or other higher education students, but less is known about the effect of both critical and autobiographical reflection on especially social work students (Trede et al., 2012; Körkkö et al., 2016; Shlomo, Levy & Itzhaky, 2012; Spector-Mersel, 2017). This research also adds knowledge about the effect of persuasive technology on the personal involvement of social work students, as less is known about the effect of persuasive technology in the education field (Engelbertink, Kelders, Woudt-Mittendorff & Westerhof, under review). Therefore this study gives first impressions regarding these topics.

A limitation of this study concerns the outages. There were considerable outages in the study, that may have been a selection effect. That means that not all social work students filled in all the questionnaires. This selection effect makes the results look alike, because only the students who were in class in all three measure moments filled in all the questionnaires. This could also be a possible reason why the use of persuasive technology showed no effect.

A second limitation of this study is about the method of how the effect of critical and autobiographical reflection and persuasive technology was examined. The study was based solely on self-reports through questionnaires. To validate these findings in future research, reports from lecturers who are acquainted with the students must be included. Additionally the results of this study can also be linked to the marks of the reflection reports of the social work students to measure their ability to reflect in a different way. Another way to validate these findings in future research could be to ask internship supervisors to rate the PI of the social work students as weak, average or strong and then ask the supervisors why they think this is the case. Additionally during the study it was not observed if the students and teachers have properly followed the protocol. It may be that there have been differences that can partly be explained by persuasive technology, for example if the students have followed the instructions of the online homework assignments correctly (adherence).

The strengths and limitations of this study show that critical reflection in combination with autobiographical reflection can be a new method to strengthen the PI of social work students during their education. First further research should analyze whether the higher PI

scores of the students during the reflection course are definitely due to the reflection courses or just studying makes the PI scores stronger. Another implication for further research that teacher and students could be asked how to improve the reflection courses to improve the quality and effectiveness of the course. Meijers and Kuijpers (2014, p.295) stated that "universities are increasingly acknowledging that they have a strong responsibility to guide students not only in their academic growth, but also in their career development". Critical reflection in combination with autobiographical reflection can be a new and attractive way to increase the affective involvement and to prepare students for the multiplicity and dynamic nature of communities and careers.

Conclusion

Recent substantial changes in society and social policy require a new PI for social workers, which can be achieved during the education of social work students. A new way to strengthen the PI of the students can be through autobiographical reflection and critical reflection. This study analyzes how effective autobiographical in combination with critical reflection is and if persuasive technology contributes to the personal involvement of students. Results showed that critical reflection alone and critical reflection in combination with autobiographical reflection, are equally effective. During the reflection courses the social work students could strengthen their PI, learning motivation and choice certainty and could also reduce the risk to stop studying. However, they did not reflect more and did not strengthen their internal locus of control. It seems that persuasive technology has no influence on the students, but autobiographical reflection makes social work students more affectively involved in the personal development lessons in comparison to critical reflection alone. Adding persuasive technology to the autobiographical reflection does not help to improve the PI and its resources, but the students are more affectively involved. Further research should analyze whether the higher PI scores of the students during the reflection course are definitely due to the reflection courses or whether just studying makes the PI scores stronger. Critical reflection in combination with autobiographical reflection can be a new way to prepare students for the individualized society as well as for the labor market.

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Appendix

Appendix 1

The used techniques of the online element of the course

Persuasive Systems Design-model (Oinas- Kukkonen & Harjumaa, 2009)

Persuasive Systems Design- model

Primary Task Support	**Dialogue Support**	**Credibility Support**	**Social Support**
Reduction, Tunneling, Tailoring, Personalization, Self-monitoring, Simulation, Rehearsal.	Praise, Rewards, Reminders, Suggestion, Similarity, Liking, Social role	Trustworthiness, Expertise, Surface credibility, Real-world feel, Authority, Third-party, Verifiability	Social learning, Social comparison, Normative influence, Social facilitation, Cooperation, Competition, Recognition

Primary Task Support and design prototype

1. Primary Task Support		**Design Prototype**
Reduction	Dividing assignments into themes.	Applied
Tunnelling	Guiding students step-by-step through the assignments.	Applied
	Students can't go on with the next theme if they did not finish the previous one.	Applied
Tailoring	Students can choose from assignments or information. Applied: choosing information.	Applied
Personalisation	Computer speaks to students with their own name.	Applied
	Students can design the online course by themselves, for example, choosing their own background photo, adding a motto.	Not applied *due to the software*
Self-monitoring	Students can see their own progress.	Applied
Simulation	Students are reminded during the assignments what these can give them.	Applied
Rehearsal	Methods or techniques come back repeatedly.	Applied

Dialogue Support and design prototype

2. Dialogue Support		**Design Prototype**
Praise	Students receive digital rewards such as compliments, digital awards or applause.	Applied *well dosed*
Rewards	Students see pictures/symbols, like a star, medal, thumb when they complete a part of the online module.	Applied *well dosed*
Reminders	Students receive reminders for making online assignments.	Applied
Suggestions	Students can read tips for making the assignments.	Applied
Similarity	Students can read example stories from former students.	Applied
Liking	The layout is attractive.	Applied
Social role	Students can communicate online with fellow students and teachers.	Not applied *due to the software*

System Credibility Support and design prototype

3. System Credibility Support		Design Prototype
Trustworthiness	The online course exudes reliability and credibility.	Applied
Expertise	The online course exudes expertise and professionalism.	Applied
Surface credibility	The online course must look competent and good at first sight. E.g. information about privacy policy.	Applied
Real-world feel	Information about the author and developer of the method / online course gives the feeling that there is a real world behind the method.	Applied
Authority	Is the method /online module associated with a quality mark? Are there national requirements about the method / online module?	Applied
Third-party endorsements	Is information about the method / online module available via external sources (other websites or other teaching methods)? Controllable? Is the method embedded in another method? Does it link with other methods?	Applied
Verifiability	The sources that the online course uses can be checked.	Applied

Social Support and design prototype

4. Social Support		Design Prototype
Social learning	Students gain insight into what the online course delivers to others (what has it brought them in their development?).	Not applied *due to the software*
Social comparison	Students can view the progress of other students online.	Not applied
Normative influence	Use peer pressure to change behaviour. Show a graph of students who have completed their homework every week or completely (disadvantage if the majority did not make the assignment, the student thinks: oh they have not finished it yet).	Not applied
Social facilitation	Receive online feedback from fellow students and teachers.	Not applied
Cooperation	Collaborate with fellow students in the online course.	Not applied *But facilitated in peer group*
Competition	In addition to natural drive to work together, people also have a natural drive to compete with each other. You can compete per class or per subgroup who fully completed the homework in the time that precedes it.	Not applied
Recognition	Example stories of students who have also achieved the behaviour. E.g. by reading *fictive or anonymous* quotes from students who have also completed the teaching method (both focused on autobiographical reflection and focused on persuasive technology).	Not applied

Appendix 2.

Differences in the three conditions in the pre measurement

Scale	F-value	p-value	Mean	Std.
PI	2.30	.80		
Condition 1			2.72	.52
Condition 2			2.65	.58
Condition 3			2.68	.43
Learning	1.98	.14		
motivation			2.81	.48
Condition 1			2.73	.54
Condition 2			2.64	.51
Condition 3				
Internal locus of	.52	.60		
control				
Condition 1			3.09	.48
Condition 2			3.17	.53
Condition 3			3.07	.54
Drop out threat	.40	.67		
Condition 1			1.25	.46
Condition 2			1.21	.33
Condition 3			1.20	.30
Choice certainty	.63	.54		
Condition 1			2.23	.79
Condition 2			2.36	.94
Condition 3			2.34	.88
Career reflection	1.06	.35		
Condition 1				
Condition 2			2.79	.52
Condition 3			2.92	.45
			2.81	.52

Appendix 3.

Differences conditions in post measurement

Scale	F-value	p-value	Mean	Std.
PI	.15	.86		
Condition 1			2.74	.48
Condition 2			2.79	.56
Condition 3			2.76	.47
Learning	2.45	.09		

motivation			2.74	.60
Condition 1			2.80	.47
Condition 2			2.57	.50
Condition 3				
Internal locus of control	1.63	.20		
Condition 1			3.07	.48
Condition 2			3.20	.53
Condition 3			3.02	.48
Drop out threat	.08	.93		
Condition 1			1.19	.41
Condition 2			1.16	.29
Condition 3			1.19	.41
Choice certainty	2.30	.10		
Condition 1			4.75	.89
Condition 2			4.97	.82
Condition 3			4.59	.81
Career reflection	.89	.41		
Condition 1			2.81	.89
Condition 2			2.91	.82
Condition 3			2.80	.81

Appendix 4.

Differences conditions in follow up measurement

Scale	F-value	p-value	Mean	Std.
PI	.12	.89		
Condition 1			2.71	.56
Condition 2			2.82	.67
Condition 3			2.82	.57
Learning motivation	.01	.99		
Condition 1			2.71	.51
Condition 2			2.71	.62
Condition 3			2.69	.46
Internal locus of control	1.88	.16		
Condition 1			2.93	.48
Condition 2			3.21	.53
Condition 3			2.98	.48
Drop out threat	.97	.39		
Condition 1			1.22	.50
Condition 2			1.09	.15

Condition 3			1.10	.21
Choice certainty	.21	.81		
Condition 1			4.84	.72
Condition 2			4.92	.88
Condition 3			4.47	.75
Career reflection	1.51	.23		
Condition 1			2.69	.58
Condition 2			2.93	.43
Condition 3			2.82	.37