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From monocontextual to multicontextual transfer: Organizational determinants of the intention to transfer generic information literacy competences to multiple contexts

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Abstract

An important goal of educational designers is to achieve long-term transfer of learning that is the learner's application of newly acquired competencies. Extensive research during more than a century shows that especially in formal educational settings this fundamental aspect of education often occurs poorly or not at all, leading to what is called a Transfer Problem. To address this transfer problem, the present study examines intentions to transfer learning to multiple contexts; this focus on multiple transfer contexts extends previous research focusing on a single transfer context, typically the workplace. The present study aimed to estimate the influence of five organizational variables (peer support, supervisor support, opportunity to use, openness to change, and feedback) on pre-training intention to transfer prospective learning in two different transfer contexts: study and work. Participants were 303 students at an open university starting a digital course in information literacy. The model was tested using structural equation modelling. The results indicated that before starting the course supervisor support and feedback were considered the strongest predictors of intention to transfer new learning in both the study and the work contexts. This research is amongst the first in the training literature to address multicontextuality and examines intentions to transfer generic competences to the two transfer contexts study and work within one single study.

Keywords: transfer of learning; training; intention to transfer; information literacy

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1. Introduction

It is widely accepted that transfer of learning - the application of what has been learned in new situations - is essential to all forms of education or organizational training. However, for over a century ample research in disciplines like human resource development (HRD), psychology, and education shows that transfer is not self-evident. How fluently and unconsciously it might occur in daily life, it often seems to take place sparsely or not at all in formal educational settings (Ford, Yelon, & Billington, 2011; Haskell, 2001; Katsioloudes, 2015). The aim of this study is to offer means to enhance transfer of learning and to contribute to solving this so-called Transfer Problem (Baldwin & Ford, 1988; Haskell, 2001) by complementing previous research in various ways.

1.1 Monocontextual and multicontextual transfer

In previous studies transfer is typically investigated within one single context, predominantly education or work. This monocontextual perspective is, amongst others, expressed in the various definitions of transfer. The focus on only one single context however does not always reflect reality, for example when it concerns training of generic competences that are meant for, or can be applied in, multiple contexts, like information literacy, in which the participants were going to be trained, In various educational settings there is a strong emphasis on, or desire for, the application of newly gained generic competences not only in the student's formal study context but also in their current or prospective work context. Also the growing emphasis on lifelong learning encourages the education of more generic multicontextual competences that can be applied not only in an educational study context but also in work and private life. When educational designers are aware of these various contexts and gain insight in their specific features, they are better able to design programmes that are attuned to the students' needs and realities. This might include showing recognizable examples of aspects of intended transfer contexts that encourage or hamper the application of new learning. Or facilitating discussions amongst students on how to use or how to tackle these conditions in their specific situation, which in turn might boost their self-efficacy and self-confidence when transferring new learning.

The present study investigated the factors that already before the course influenced the participants' intention to transfer these widely applicable competences to multiple contexts, more specifically to both their study and work contexts.

1.2 Intention to transfer

The best way to measure the influence of specific variables on the transfer process would be to relate them directly to actual transfer, although there are different opinions on the what, how, and when of this assessment. At this we endorse the viewpoint that a priori actual learning must have taken place before it can be transferred. However, specific circumstances might not allow to actually measuring transfer. This might relate to the kind of skills that are involved (Blume, Ford, Baldwin, & Huang, 2010). A so-called closed skill that can only be executed in one specific way, like pressing a button at a specific moment, is relatively easy to monitor. This becomes more difficult with so-called open skills, like critically evaluating information that can be applied in various ways depending on the context and the creativity of the learner.

Furthermore, information literacy, the set of skills that respondents in this study were about to learn, is considered to be a complex higher-order cognitive skill (Brand-Gruwel, Wopereis, & Vermetten, 2005; Reece, 2007). The application of information literate behaviour like formulating an adequate information question, efficiently and effectively using information sources and critically evaluating, synthesising and applying information is therefore mainly a conscious and intentional process, especially when it involves information literacy novices.

Also, the relative autonomy of the student might inhibit the actual measurement of transfer. It will be easier to measure transfer from a person whose behaviour is closely monitored by peers or supervisors than from a person who works relatively autonomous. Aforementioned circumstances apply to the present study, making it difficult to actually measure transfer. We therefore have focussed on the students' intention to transfer learning and variables that might influence this intention.

The concept intention is sometimes used interchangeably with motivation (Foxon, 1994) or as a dimension of motivation (Gegenfurtner, 2013). In the present study we adopt a phrase perspective and consider motivation and intention to be different concepts and consecutive steps within a motivational process continuum (Al-Eisa, Furayyan, & Alhemoud, 2009; Quesada-Pallarès, & Gegenfurtner, 2015). According to Ajzen (1991) intentions ”capture the motivational factors that influence a behavior" (p. 181). Intrinsic and extrinsic motives tell us more about the *why* of a specific behaviour while intention is the resulting commitment, propensity or willingness to actually transfer or apply it. (Hutchins, Nimon, Bates, & Holton, 2013). Some established behavioural theories including the Goal-Setting Theory of Locke and Latham (1990), Triandis' Theory of Interpersonal Behaviour (1980), and Ajzen's social psychological Theory of Planned Behavior acknowledge the role of intentions as important and reliable predictor of behaviour. This is, amongst others, confirmed by an extensive meta-analysis by Sheeran (2002). Ajzen (1991), who considers behavioural change the result of behavioural intention, defines intentions as "indications of how hard people are willing to try, how much of an effort they are planning to exert, in order to perform the behavior. As a general rule, the stronger the intention to engage in a behavior, the more likely should be its performance" (p. 181). Gollwitzer (1993), who extended the research on intentions by differentiating between goal intentions and their successive situation-specific implementation intentions, considered intention to be "the best predictor of behaviour since it is a commitment to achieve respective outcomes and performance of relevant behaviour" (p. 145).

In their review article Cheng and Hampson (2008) concluded that existing transfer models that put an emphasis on the trainee's intention to transfer were missing. And according to Hutchins and colleagues (2013) only little research exists on the relationship between various transfer factors and intention to transfer. The present study aimed at expanding the knowledge on intention to transfer by investigating the influence of five organizational factors described below that are considered to be antecedents of transfer: peer support, supervisor support, opportunity to use, openness to change, and feedback. This might provide instructional designers with additional tools to enhance transfer of learning.

1.3 Organizational factors

Based on a comprehensive literature review Baldwin and Ford (1988) defined three domains of variables that are important to the transfer process: (a) trainee characteristics, (b) training design, and (c) work-environment. In the literature the latter is also referred to as transfer environment, organizational environment, situational factors or constraints, or transfer climate, where the last refers to "components of the work environment that are specifically and intentionally directed at the transfer of training" (Nijman, 2004, p. 19). Many studies affirm that components of the transfer climate will directly or indirectly influence the application of what has been learned (Ajzen & Madden, 1986; Egan 2004; Facteau, Dobbins, Russell, Ladd, & Kudisch, 1995; Ford, Quinones, Sego, & Sorra, 1992; Horner, 2008; Hutchins & Burke, 2007; Kontoghiorghes, 2004; Lim & Johnson, 2006; Rouiller & Goldstein, 1993; Smith-Jentsch, Salas, & Brannick, 2001; Tracey, Tannenbaum, & Kavanagh, 1995). These studies have identified a broad spectrum of aspects of the transfer environment that may support or inhibit the transfer of learning. Rouiller and Goldstein (1993) conceptualised transfer climate as "those situations and consequences that either inhibit or help to facilitate the transfer of what has been learned in training into the job situation" (p. 379). They identified situational cues like manager goals, peer support, available facilities, and the opportunity to practice, and consequences like positive or negative feedback and sanctions from both managers and peers when applying acquired skills after training. Other factors that are mentioned in the literature are, amongst others, performance coaching, strategic link, accountability, openness to change, differentiated work environments, performance coaching, post-training goals setting, relapse prevention training, workplace design features, level of job autonomy and workload (Aguinis & Kraiger, 2009; Baldwin & Ford, 1988; Baldwin & Huang, 2010; Bates, Holton, & Hatala, 2012; Blume, Ford, Burke & Hutchins, 2007; De Rijdt, Stes, Vleuten, & Dochy, 2013; Grossman & Salas, 2011; Hutchins et al., 2013; Nijman, 2004).

The support factors that have been used in this study have been derived from review studies (Baldwin & Ford, 1988; Blume et al., 2010; Cheng & Hampson, 2008; Ford & Weissbein, 1997; Ling & Yusof, 2017; Merriam & Leahy, 2005; Salas & Cannon-Bowers, 2001; Tonhäuser & Büker, 2016) and from the Learning Transfer System Inventory (LTSI) by Holton and colleagues (Bates et al., 2012; Holton, Bates, & Ruona, 2000). In his Theory of Planned Behavior (1991) Ajzen considers intentions to be a strong predictor of behaviour and acknowledges the relevance of how "important others" like teachers, colleagues, and supervisors whose approval we desire, feel about our behaviour. This subjective norm or "perceived social

pressure to engage or not engage in a specific behaviour" (Ajzen, 1991, p. 188) is based on perceived expectations or normative beliefs of these important others and their resulting support or disapproval. In this study we focus on the factors peer support, supervisor support, opportunity to use, openness to change, and feedback; each is described in turn.

Peer and supervisor support

A well-established or even critical direct or mediating predictor of transfer is the support trainees receive when they apply what they have learned (Aguinis, 2009; Baldwin & Ford, 1988; Blume et al., 2010; Burke & Hutchins, 2007; Grossman, 2011; Nijman, 2004; Smith-Jentsch et al., 2001; Tracey et al., 1995). Although not always clearly conceptualized (Govaerts & Dochy, 2014), in our study support is defined as the reinforcement of the use of newly acquired knowledge, skills and attitudes, in this case during the students' study or on their job. Support may be provided in various manners at a managerial level by creating an innovative, open organizational atmosphere, but also at a more personal level by supervisors, peers, subordinates, and even friends or family. The expression of social support before, during or after an intervention can be manifold. Peer support focuses more on the actual application of new learning by offering assistance, coaching, encouragement, and feedback. Supervisors additionally can offer support by setting proximal and distal learning goals, by behavioural modelling, discussing training content and by actual involvement in a course or training itself (Nijman, Nijhof, Wognum, & Veldkamp, 2006; Russ-Eft, 2002). In our study support refers to encouragement and positive appreciation of the application of new learning by both peers and supervisors.

Although at first glance it might seem obvious that people will be more inclined to use what they have learned when they are supported when doing so, previous studies show a more differentiated picture. Some studies show no or a non-significant impact of peer or supervisor support on transfer (Chiaburu & Marinova, 2005; Den Ouden, 1992; Homklin, Takahashi, & Techakanont, 2014; Nijman et al., 2006; Van der Klink, Gielen, & Nauta, 2001; Velada et al., 2007). Others report indirect effects of support on transfer via mediating factors like trainee's self-efficacy (Mathieu, Martineau, & Tannenbaum, 1993), mastery goal orientation, motivation to transfer (Chiaburu, Van Dam, & Hutchins, 2010; Kontoghiorghes, 2004; Massenberg, Spurk, & Kauffeld, 2015; Seyler, Holton, Bates, Burnett, & Carvalho,1998; Tracey, Hinkin, Tannenbaum, & Mathieu, 2001) or intention to transfer (Den Ouden, 1992; Hoekstra, 1998). The ultimate effect of support on the transfer of learning may depend on aspects like the cultural or organizational context (Holton, Chen, & Naquin, 2003), timing, or the extend to which trainees identify themselves with the supportive persons (Pidd, 2004) and may be different for peer and for supervisor support. Especially to adult learners, the participants in this study, managerial and peer support seem to be crucial to transfer (Merriam & Leahy, 2005).

The aforementioned mixed results justify further research in order to clarify the role of peer and supervisor support in the transfer process. In the present study we have used assessments of social support by 'peers' and 'supervisors' in two contexts: study and work. In the study context fellow students fulfilled the role of peers and lecturers the role of supervisors; in the work context colleagues fulfilled the role peers and superiors the role of supervisors.

Opportunity to use

Opportunity to use refers to "the extent to which a trainee is provided with or actively obtains work experiences relevant to the tasks for which he or she was trained" (Ford et al., 1992, p. 512). Providing trainees with the time, resources, facilities, and tasks to practice and rehearse their newly gained competences is considered to be a strong or even critical predictor of transfer of learning (Ford et al., 1992, Lim & Johnson, 2002, Wexley & Latham, 1991). Putting it differently, in their extensive literature review Burke and Hutchins (2007) concluded that the absence of opportunity to use was rated the biggest obstacle to transfer. Broad and Newstrom (1992) found the lack of reinforcement the most significant of nine transfer barriers. It might not be surprising that there is a strong relationship between the opportunity to practice and the support or reinforcement offered by peers (Russ-Eft, 2002) and supervisors (Ford et al, 1992). Previous research and models show that opportunity to use does not only enhance transfer of learning directly (Baldwin & Ford, 1988; Holten, 2005) but also indirectly, for example via the mediating variable motivation (Cheng & Hampson, 2008; Massenberg, Schulte, & Kauffeld, 2016; Seyler et al., 1998).

Openness to change

In our so-called information or knowledge based societies knowledge is developed in an ever increasing pace. Consequently, for individuals and organizations alike it is important to stay up-to-date with the latest developments. Renowned organizations like the UNESCO, the European Commission, and the World Bank emphasise the importance of lifelong learning. Openness to change reflects an innovative, continuous-learning culture that embraces and supports new developments at various levels. It encourages members to apply newly gained knowledge, skills, and behaviours in order to improve individual and, as a result, organizational performance. It's also one of the training-general or environmental constructs in the Learning Transfer System Inventory by Holten and colleagues, although formulated as 'resistance to change' and defined as 'the extent to which prevailing group norms are perceived by individuals to resist or discourage the use of skills and knowledge required in training.' (Holton et al., 2000, p. 346). Openness to change can be expressed at an individual level by peers and supervisors, within a team or group, and also at a more general organizational level for example by communicating values and norms that emphasise the importance of continuous learning and innovation, by offering training programmes and by facilitating the development and exchange of knowledge. In the present study we refer to openness at a team and a more general organizational level asking, for example, whether or not respondents experienced an open atmosphere that enables changes in the ways things are normally done. Previous studies have identified a direct relationship between openness to change and transfer of learning (Gilpin-Jackson & Bushe, 2007; Katsioloudes, 2015).

Feedback

The Oxford Dictionary (2018) defines feedback as 'information about the reaction to a product, a person's performance of a task etc. which is used as a basis for improvement'. Performance feedback, often merged with performance coaching, has been examined extensively and is generally considered to be an important direct or mediating predictor of both learning and transfer (Clarke, 2002; Reinhold et al., 2018; Rouiller & Goldstein 1993, Smith-Jentsch et al., 2001; Van den Bossche, Segers, & Jansen, 2010; Velada, Caetano, Michel, Lyons, & Kavanagh, 2007). Some studies however did find a mixed (Alvero, Bucklin, & Austin, 2001; Gabelica, Van den Bossche, Segers, & Gijselaers, 2012), no or even a negative (Lim & Johnson, 2002) effect of feedback on transfer. In their description of characteristics of a positive transfer climate Rouiller and Goldstein (1993) mention feedback as a consequence that, together with various situational cues, influences the transfer process. Feedback is also an essential aspect in instructional systems design, for example in Gagné's Conditions of Learning (1970), and in learning theories like Bandura's Social Learning Theory (1977). Interestingly, it is often considered to be an important expression of both supervisor and peer support (Lim & Johnson, 2002). One can make a distinction between positive or negative, intrinsic or extrinsic, and process or performance feedback at various moments in time, with different frequencies and related to various aspects of the task performance. In the present study feedback is considered to be a one-dimensional social support construct related to performance. According to Hutchins and colleagues (2013) only few studies have investigated the relationship between feedback and intention and also Van den Bossche et al. (2010) conclude that feedback has received relatively little attention in transfer research.

1.4 Research Question and Hypotheses

To support the design of educational interventions that enhance transfer of learning to multiple contexts, this study aimed at estimating the extent to which peer support, supervisor support, opportunity to use, openness to change, and feedback predict intention to transfer. As a novel contribution to the literature on transfer of training, the present study compares two different transfer contexts: Study and Work. We hypothesized positive relationships of peer support (Hypothesis 1), supervisor support (Hypothesis 2), opportunity to use (Hypothesis 3), openness to change (Hypothesis 4), and feedback (Hypothesis 5) on intention to transfer. Due to a lack of previous research addressing multiple transfer contexts, however, no hypotheses were generated whether these relationships were stronger in Study or Work transfer contexts. Figure 1 presents the hypothesized model structure.

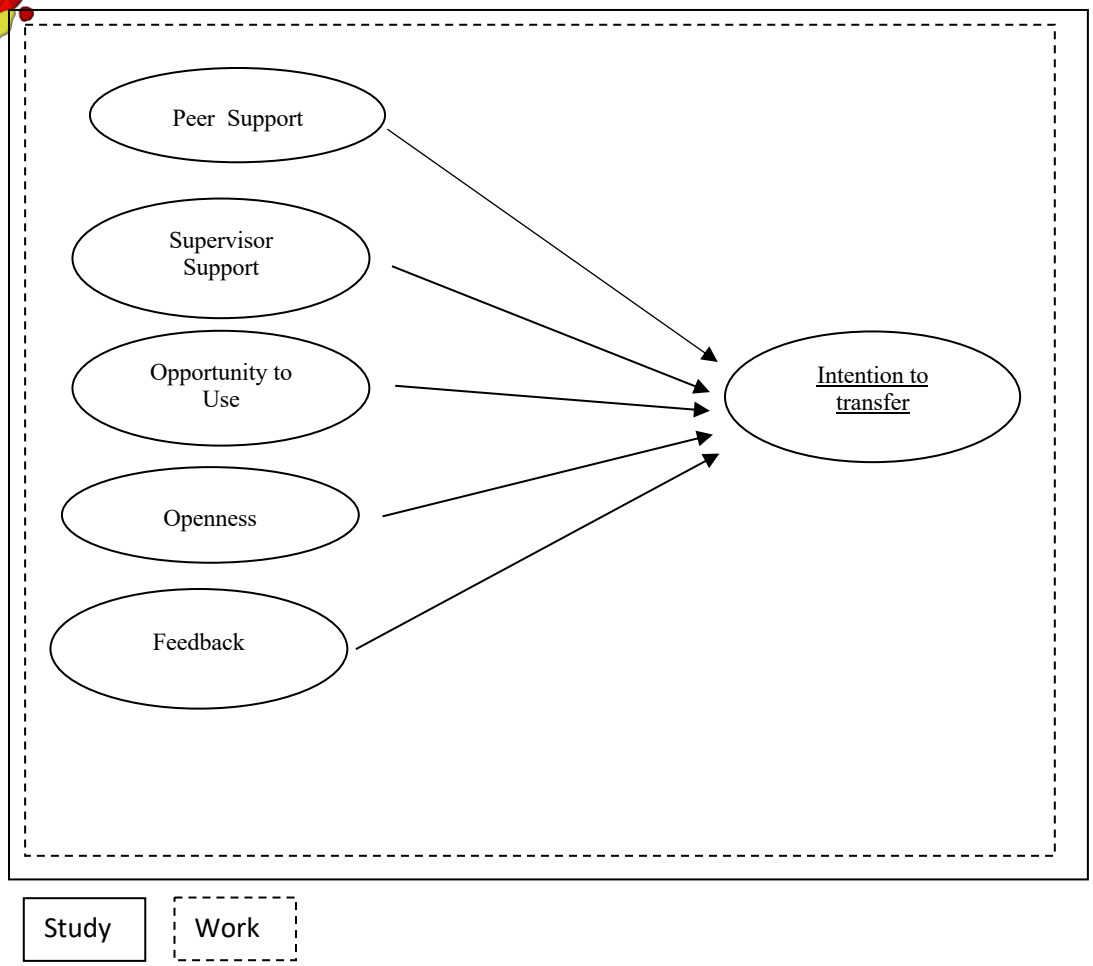

Figure 1. Hypothesized relationships in the transfer contexts Study and Work.

2. Methods

2.1 Participants

Participants in this study were 303 adult students of the premaster Learning Sciences at the Open University of the Netherlands. Most students were in their first year of study. Beside their study at the Open University students mainly worked as a teacher or tutor in primary and secondary education, higher education, and training. Table 1 presents the demographic characteristics of the sample, including gender, age, years of work experience, and work type.

Table 1

Demographic Characteristics of the Study Participants

Variable	Frequency	Percentage
Gender		
Female	235	77.56
Male	68	22.44
Age		
≤ 25 years	53	17.49
26-35 years	102	33.66
36-45 years	86	28.38
46-55 years	51	16.83
56-65 years	11	3.63
Work experience		
< 2 years	52	17.16
2-5 years	57	18.81
6-10 years	85	28.05
> 10 years	109	35.97
Work type		
Permanent position	230	75.91
Temporary position	39	12.87
Temporary employment agency	14	4.62
Freelancer	11	3.63
Voluntary work	9	2.97

Note. Total sample size is $N = 303$.

2.2 Training Program and Procedure

The training program students were about to take was a web-based course on *Information Literacy for Social Scientists* (4,3 ECTS, equal to 120 hours of study), which was mandatory for students to prepare them for their studies (Wopereis, Frerejean, & Brand-Gruwel, 2015, 2016). The course was designed according to the Four-Component Instructional Design (4C/ID) model (Van Merriënboer & Kirschner, 2018). During the course students work on five authentic tasks with varying support and reported on their task solution steps by means of a process worksheet (Brand-Gruwel, Wopereis, & Walraven, 2009). Students are then provided with feedback on their performance. An example task is: 'Imagine you are a teacher in primary education and you want to know more about how to stimulate and support collaborative learning amongst your students. Study four information sources using the checklist 'Critical Reading' and write a short essay (600 words) in which you answer your research questions and critically reflect on them.' Provided with information about the course content but before the course had actually started, students completed a survey instrument that was embedded in the electronic learning environment and integrated in the course curriculum as Task 0. Beforehand they received instructions on how to complete the instrument and were assured that their responses were used confidentially for research purposes only.

2.3 Measures

The measures were collected with a multi-item questionnaire that was administered as a web-based online survey. A Likert-type 7-point response format was used for all scales, ranging from 1 = "do not agree at all" to 7 = "totally agree". The independent variables were peer support, supervisor support, opportunity to use, openness to change, and feedback. The dependent variable was intention to transfer. To afford comparability, the number of variables was identical in the two transfer contexts Study and Work. Appendix 1 presents all scales. Table 2 shows the number of items, the reliability coefficient (Cronbach's Alpha), and a sample item per scale.

Table 2
Number of Items, Reliability Estimates, and Example Items of All Scales

Scales	Items	α	Example
Dependent variable			
Intention to Transfer	3 (study) 3 (work)	.77 (study) .95 (work)	I intend to apply the newly gained competences in my work
Independent variables			
Peer Support	3 (study) 3 (work)	.90 (study) .89 (work)	I expect that my fellow students will support me in applying the newly gained competences
Supervisor Support	3 (study) 3 (work)	.89 (study) .85 (work)	I expect that my lecturers will support me in applying the newly gained competences
Opportunity to Use	3 (study) 3 (work)	.81 (study) .77(work)	I expect to get sufficient opportunities to practice the newly gained competences in my work
Openness	3 (study) 3 (work)	.80 (study) .79 (work)	There is an open atmosphere that enables changes in the way things are normally done
Feedback	3 (study) 3 (work)	.92 (study) .95 (work)	After the course I expect to receive feedback on how well I am applying my newly gained competences from my supervisors

2.4 Analysis

Initial data screening (Cf. Kline, 2015) at item level revealed univariate and multivariate normality, linearity, and heteroscedasticity of the data. Missing values were missing at random and treated with EM imputation (Allison, 2003). There were no multivariate outlying cases.

In order to examine the structure of the items related to intention to transfer we first conducted several exploratory factor analyses (ML, Oblimin). These analyses were performed separately for the study and work contexts. Of the initial item pools several items were removed, until an unambiguous 'simple structure' emerged (Cf. Thurstone, 1947).

These factor analyses suggested a five-factor structure, but the items about 'opportunity to use' displayed substantial secondary loadings, in both contexts, blurring the picture of a 'simple' structure. Therefore, we eventually decided to discard all these items from the final model. In the Discussion section we will elaborate on this in more detail.

Tables 3 and 4 present the final (exploratory) five-factor solution, disclosing the same five factors in both transfer contexts. The quality and utility of this model is supported by the amount of variance explained in both contexts: 79.42 % (study context) and 83.27 % (work context) of the data.

Table 3
Factor Loadings of all Scales in the Transfer contexts Study and Work

	Transfer Context: Study					*Transfer Context: Work*				
	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Peer Support	**.881**	-.026	-.018	-.023	.027	**.875**	-.043	-.023	.041	-.024
	.971	-.037	.002	.009	-.024	**.872**	-.063	.014	.137	.038
	.727	.122	.029	.024	.006	**.723**	.248	.008	-.110	-.058
Supervisor Support	.027	**.855**	.044	-.017	-.003	-.036	**.720**	-.015	.064	.009
	.080	**.759**	-.049	.029	.080	.260	**.649**	.034	.069	-.020
	-.047	**.903**	-.013	.002	-.032	-.012	**.880**	-.003	.001	-.039
Feedback	-.004	.040	**.821**	.060	-052	-.053	.071	**.839**	-.021	.023
	.052	-.053	**.687**	.005	-.007	-.011	-.068	**.668**	.056	-.011
	-.049	.014	**.772**	-.064	.069	.057	.011	**.755**	-.050	-.009
Openness	-.026	-.005	-.046	**.915**	.011	.068	-.005	-.043	**.832**	-.036
	.036	-.011	.050	**.850**	.005	-.011	.056	-.012	**.919**	-.022
	-.008	.023	-.006	**.932**	.013	-.008	.029	.042	**.940**	.019
Intention to Transfer	.012	-.002	-.039	.094	**.718**	-.018	.001	.009	.004	**-.950**
	-.069	.033	.045	.032	**.627**	.004	.029	.005	.019	**-.889**
	.070	-.011	-.006	-.079	**.853**	.005	-.037	-.012	-.007	**-.939**

The MRA model of Figure 1 was tested by Structural Equation Modeling (EQS version 6.3). However, instead of a (simple) path model, a so-called 'hybrid MRA model' was examined, which incorporates a measurement model (Cf. CFA factor analysis) as well as direct 'causal' effects (Cf. MRA model) (Kline, 2015). This hybrid model was examined separately, for both contexts (study and work). Five goodness-of-fit indices were used to estimate the extent to which the hypothesized model structure fitted the entered data. These fit indices were X^2 statistics to estimate absolute fit as well as the Comparative Fit Index (CFI), Incremental Fit Index (IFI), the Standardized Root-Mean Square Residual (SRMR), and the Root-Mean Square Error of Approximation (RMSEA) together with its 90% confidence interval to estimate relative fit. We followed recommendations of Hu and Bentler (1999) for cut-off criteria with CFI > 0.95, IFI > 0.95, SRMR < 0.08, and RMSEA < .06 to indicate acceptable model fit.

Table 4
Explained Total Variance of Factors in the Transfer Contexts Study and Work

	Transfer Context					
	Study			*Work*		
Factor	Eigenvalue	% of Variance	Cumulated %	Eigenvalue	% of Variance	Cumulated %
1	4.59	30.58	30.58	5.84	38.91	38.91
2	2.66	17.71	48.28	2.19	14.60	53.51
3	2.19	14.60	62.88	2.08	13.87	67.38
4	1.31	8.74	71.62	1.35	9.01	76.39
5	1.17	7.80	79.42	1.03	6.88	83.27

Note. Extraction method: maximum likelihood. Rotation method: direct Oblimin.

3. Results

The study aimed to estimate the extent to which peer support (Hypothesis 1), supervisor support (Hypothesis 2), openness to change (Hypothesis 4), and feedback (Hypothesis 5) influenced pre-training intention to transfer in the two transfer contexts Study and Work. Table 5 presents the means, standard deviations, reliability estimates, and intercorrelations among all factors.

Table 5
Correlation Matrix of All Variables

	M	SD	1	2	3	4	5	6	7	8	9	10
Transfer Context: Study												
1. Peer Support	3.60	.38	(.90)									
2. Supervisor Support	4.83	.20	.51**	(.89)								
3. Openness	4.41	.59	.04	-.02	(.80)							
4. Feedback	3.10	.16	.04	.34**	-.03	(.92)						
5. Intention to Transfer	5.01	.18	.21**	.47**	.10	.50**	(.77)					
Transfer Context: Work												
6. Peer Support	4.01	.14	.30**	.11*	.05	-.11	-.01	(.89)				
7. Supervisor Support	5.82	.08	.25**	.42**	.10	.03	.12*	.60**	(.85)			
8. Openness	5.55	.12	-.06	-.06	.07	-.08	.05	-.01	-.00	(.79)		
9. Feedback	6.57	.06	.15**	.08	-.02	-.08	-.01	.57**	.48**	-.09	(.94)	
10. Intention to Transfer	6.08	.15	-.03	-.02	.00	-.26**		-.28**	-.38**	.06	-.34**	(.95)

Note. Cronbach's alpha estimates in brackets on the diagonal. * $p < 0.05$, ** $p < 0.01$.

The five-factor model yielded an acceptable fit in both transfer contexts. Table 6 presents the psychometric properties. In the transfer context Study, the X^2 was 99.43 ($df = 80$), CFI = 0.99, IFI = 0.99, SRMR = 0.04, and RMSEA = 0.03 (90 % CI = 0.00, 0.05). In the transfer context Work, the X^2 was 206.39 ($df = 80$), CFI = 0.96, IFI = 0.96, SRMR = 0.04, and RMSEA = 0.07 (90 % CI = 0.06, 0.08). These estimates suggest acceptable model fit that was slightly better for the transfer context Study compared to Work.

Table 6
Goodness-of-Fit Indices of the Structural Models in the Transfer Contexts Study and Work

	Transfer Context	
	Study	*Work*
X^2 (df)	99.43 (80)	206.39 (80)
CFI	0.99	0.96
IFI	0.99	0.96
SRMR	0.04	0.04
RMSEA (90% CI)	0.03 (0.00; 0.05)	0.07 (0.06; 0.08)

Figures 2 and 3 present the model parameter estimates of the structural relations among factors for the transfer contexts Study and Work, respectively. In the transfer context Study, intention to transfer was positively predicted by feedback ($\beta = 0.37$, $p < 0.01$), supervisor support ($\beta = 0.31$, $p < 0.01$), and openness to change ($\beta = 0.10$, $p < 0.05$); the relationship between peer support and intention to transfer ($\beta = 0.04$) was statistically non-significant. In the transfer context Work, intention to transfer was predicted by supervisor support ($\beta = 0.31$, $p < 0.01$) and feedback ($\beta = 0.19$, $p < 0.01$); the relationship of intention to transfer with peer support ($\beta = -0.05$) and openness to change ($\beta = -0.04$) were statistically non-significant.

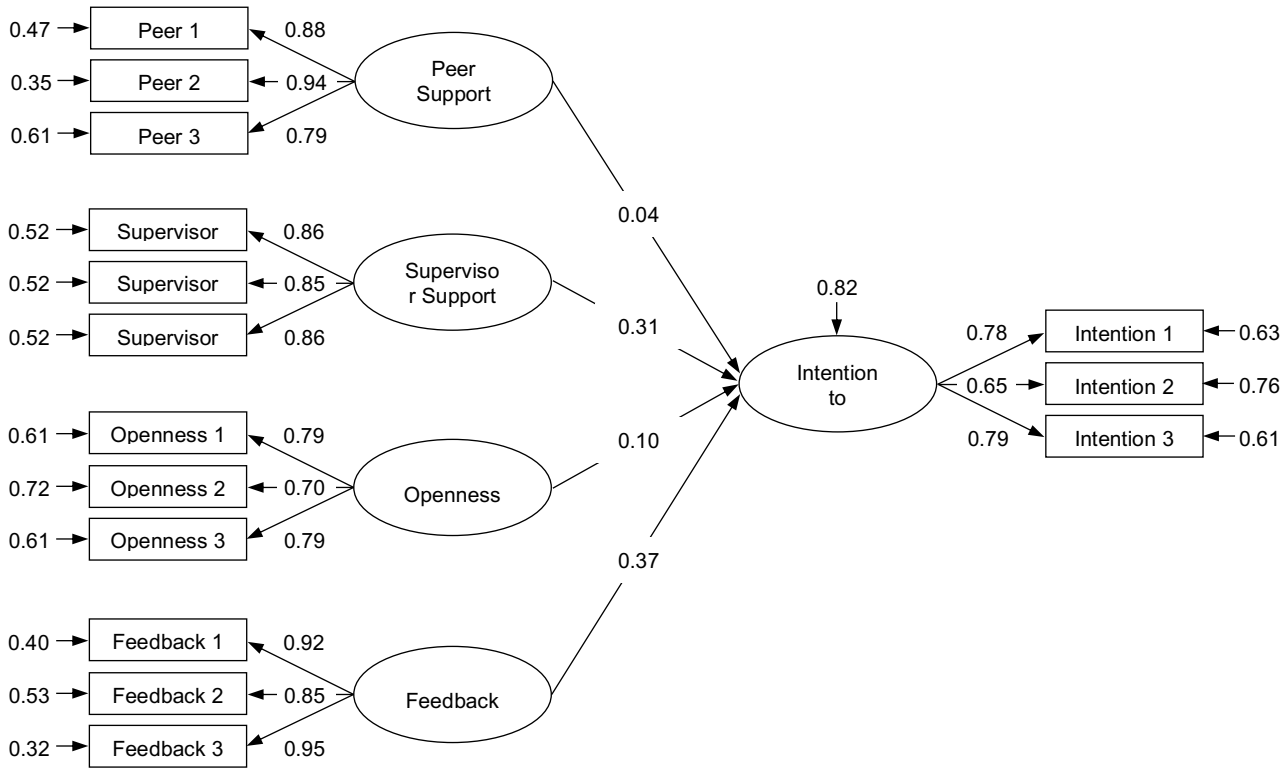

Figure 2. Measurement and structural model parameter estimates of transfer context: Study

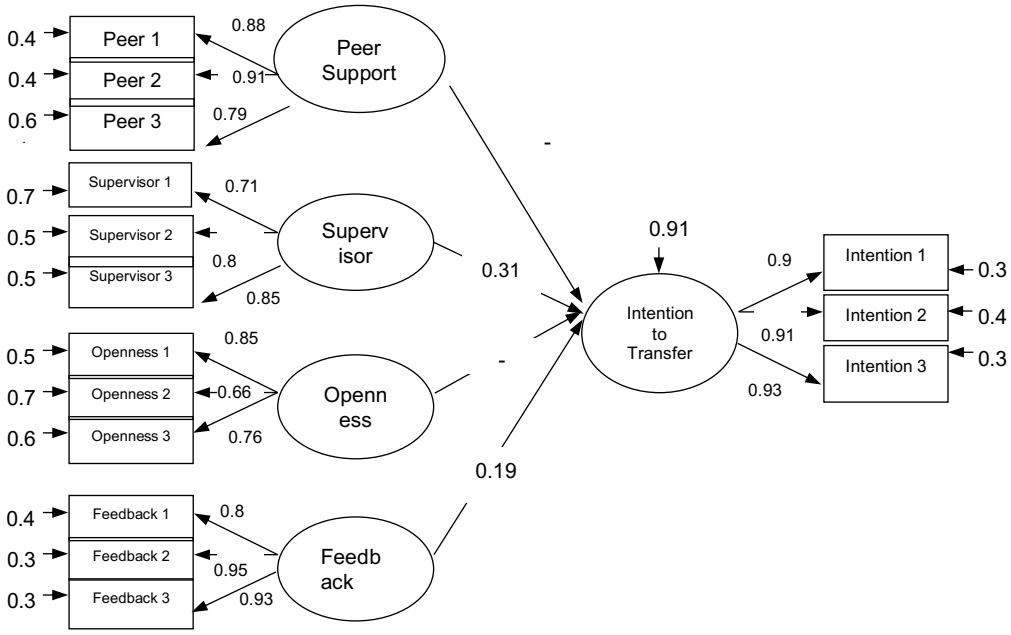

Figure 3. Measurement and structural model parameter estimates of transfer context: Work

A comparison between the two transfer contexts Study and Work indicates that the model parameter estimates between the independent and dependent variables were higher in the Study context. Table 7 presents the differences between beta coefficients for all variables. The highest difference emerged for Feedback (Study context: $\beta = 0.37$, Work context: $\beta = 0.19$, $\Delta = 0.18$) followed by Openness to Change (Study context: $\beta = 0.10$, Work context: $\beta = -0.04$, $\Delta = 0.14$). These analyses tend to indicate the benefits of examining multiple transfer contexts when estimating organizational predictors of intention to transfer.

Table 7
Comparison of Beta Coefficients Between the Two Transfer Contexts *Study and Work*

	Transfer Context		
Influence on Intention to Transfer	*Study*	*Work*	Δ
Peer Support	0.04	-0.05	0.09
Supervisor Support	0.31	0.31	0.00
Openness to Change	0.10	-0.04	0.14
Feedback	0.37	0.19	0.18

4. Discussion

The goal of this study was to complement previous research on the intention to transfer new learning by investigating the students' pre-course perception of the influence of five support-related variables on their intention to transfer learning to both their study and their work context.

In educational settings transfer of learning is typically measured during a test after the training. The first finding of our study is that already before the actual training, in this case a course in generic information literacy competences, five of the eight variables used for both the study and work context were considered significant for the students' intention to transfer competences they were about to learn during the course. From the literature we learn that transfer is a dynamic process with a temporal dimension, influenced by a multitude of variables, not only during and after, but also already before an intervention (Baldwin & Ford, 1988; Broad, 2005, Burke & Hutchins, 2008; Gegenfurtner, Veermans, Festner, & Gruber, 2009; Grossman & Salas, 2011; Holton & Baldwin, 2003). This study confirms this influence in the first pre-training stage of the transfer process. Instructional designers might take this into account when framing and presenting a training. (Baldwin & Magjuka, 1991). Preceding a training, for example when designing the course programme but also later on during the course, they might communicate to the students the importance of the variables that appear to be significant predictors of intention to transfer in the students' study and work context and how they are integrated into the course. Follow-up studies will investigate the other temporal dimensions.

A second finding from the model parameter estimates shows that there is a difference between the beta coefficients for the two transfer contexts study and work. This is especially relevant in situations where it involves education in so-called generic competences like information literacy that can be, or are meant to be applied in various contexts, be it study, work or private life. This finding tends to indicate that, for educational designers, it is beneficial to gain insight into the conditions of, and main actors within the intended transfer contexts. One option would be to involve the input of former students when designing and framing a specific course, for example by using course evaluation reports.

A third finding refers to the variable 'Opportunity to use' that was dropped from this study. In previous reviews and studies opportunity appeared to be one of the strongest predictors of transfer. In our exploratory factor analysis it loaded onto one factor together with intention to transfer. Correlation analysis also showed a relatively strong positive relationship. This might be difficult to explain when looking at the items that were used for both constructs. The ones used for intention referred to the respondents' plans or efforts to apply new learning, while items for opportunity to use specifically referred to workload and the availability of sufficient facilities and opportunities to apply new learning. Follow-up interviews with respondents might have shed more light on why they have interpreted both variables in the same manner.

Looking at the differences between the two transfer contexts in more detail we notice that in the study context feedback (0.37, Hypothesis 5), supervisor support (0.31, Hypothesis 2), and openness to change (0.10, Hypothesis 4) appear to be significant moderate predictors of the students' intention to transfer learning. This is not surprising as especially in an educational context, where students are gaining new competencies, feedback and the support by supervisors, in this case lecturers, is considered essential to, and even a precondition for the proper application of new learning. Communicating, for example in the course guide, that both are important aspects of the course might boost the students' pre-course self-confidence and subsequently their intention to apply their newly acquired competences. Another aspect within the study context that is significant for the students' intention to transfer, although with a significantly lower beta coefficient, is

openness to change. This might be understandable as behavioural change is part and parcel of educational settings and openness to these changes might therefore be taken for granted by the students. The specific educational setting in this research, distance education at the open university with little or no direct contact between students, might explain why peer support isn't seen as significant for the intention to transfer setting.

In the students' work context supervisor support (0.31, Hypothesis 2) and feedback (0.19, Hypothesis 5) appear to be significant for the students' intention to apply new learning. One explanation might be that doing a Master programme beside work is a challenging, time and energy consuming activity that will not only improve the learners' individual competences but will also be beneficial for the quality of the organization at large. Students therefore might expect that when applying these new competences this will be acknowledged and facilitated by the organization in the person of the supervisors. When it involves an in-company training instructional designers might pay special attention to the organizational support that is available or might have to be organized in order to enhance transfer of learning. As educational designers generally don't have any influence on the supportive conditions within the students' work context they might integrate discussions about these aspects in the course, asking students how relevant feedback and supervisor support are for them, if and how both are available in their organization and in case it is lacking, what steps might be taken to organize it. These discussions might also give an indication of what kind of support is expected. Extending the current research by interviewing respondents might also give an explanation of why support of colleagues and an open, innovative team or organizational climate are not relevant for their application of new learning.

4.1. Theoretical implications

The theoretical relevance of this study is that it adds a novel dimension to the conceptual development of transfer studies. A multicontextual perspective on transfer is currently absent from the training literature, as are studies that systematically compare transfer to more than one context within one sample. We expect that studies addressing this multicontextuality of transfer will continue to confirm or challenge previous monocontextual research on the importance of environmental predictors in specific settings.

4.2 Practical implications

The practical value of this study lies in the field of educational design. The results confirm that transfer of learning isn't only happening after an intervention. It is a longitudinal process in which various aspects may influence the learners' intention to transfer new learning not only after but already before the actual intervention. Furthermore, from a lifelong learning perspective and especially when generic competences are involved, it is important for educational designers not only to focus on the educational setting of an intervention but also to pay attention to aspects of current or prospective transfer contexts, be it study, work or private life, that might be relevant for the transfer process. In order to enhance multicontextual transfer, learners could be involved in the design process for their knowledge of the transfer context.

4.3 Limitations and directions for future research

One limitation of this study is the use of self-report surveys. Although there are valid arguments against using self-report like social desirability or common method bias, some specific situations might prevent additional external measurements. This can be the case when it involves a construct like intention that is difficult to estimate with behavioural measures, or when it involves more autonomously working respondents. Previous studies on the other hand indicate that respondents are very well capable of reporting on their own transfer process (Chiaburu & Tekleab, 2005; Devos, Dumay, Bonami, Bates, & Holton, 2007; Facteau et al., 1995; Velada et al., 2007) and that they themselves know best which variables they consider relevant for their intention to transfer. We have attempted to limit undesirable bias by communicating that data was collected anonymously and by offering the opportunity to answer the surveys electronically and therefore in private. For future research however data triangulation using additional measurement instruments would be advisable.

Another limitation is the setting in which this study has taken place namely adult learners in a distance education context. Distance learning creates specific conditions that may have implications for some transfer related variables like peer support. Furthermore, according to Heery (1996, p. 5) non-traditional students like distance learners "often show an unusual degree of motivation and commitment". We therefore recommend

future studies to be carried out in other learning contexts, for example at regular universities of applied sciences where learning is also directed towards transfer of new learning to study and work contexts. Finally, the course and also the integrated survey were mandatory. Various studies recommend voluntary enrolment in order to enhance motivation and transfer (Gegenfurtner, Könings, Kosmajac, & Gebhardt, 2016) while others argue that mandatory participation enhances transfer as it expresses the importance of the course to the organization (Baldwin & Magjuka, 1991). Future research might investigate the implications of these differences in more detail.

Future steps in this research will investigate the influence of learner characteristics and intervention variables on the intention to transfer learning to multiple contexts, as well as their longitudinal development over time, measured directly after and three months after the course. Despite the extensive body of knowledge on transfer of learning, including on the intention to transfer, studies typically have focussed on transfer within one specific context. A multicontextual focus however is in place when it concerns transfer of generic competences that can be, or are intended to be applied in more than one context. This has been confirmed by the results of the present study. Furthermore, in contexts where it's difficult to measure actual transfer, intention can function as a valuable precursor to and predictor of transfer. The present study indicates that variables and items used in the study offer a valuable contribution to the design of a practical instrument to measure the influence of a selection of key factors on the transfer process. This instrument in turn will help instructional designers to create educational interventions that enhance the transfer of learning.

Keypoints

- The present study extends previous research on transfer of learning by introducing a multicontextual perspective when designing training of generic competences that are meant to be applied in more than one context, for example study, work or daily life.
- We hypothesised positive relationships of five organizational variables on students' pre-training intention to transfer generic competences from the prospective training to both their study and work context.
- Participants were 303 students at an open university starting a course in information literacy. Data was collected by means of pre-course self-reports and analysed using structural equation modelling.
- Before starting the course supervisor support and feedback were the strongest predictors of intention to transfer new learning in both the study and the work context.
- Our study confirmed the presumption that transfer of learning is a process that already starts before an actual training.

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Appendix 1

The six scales and thirty-six items used in the present study.

Intention Direction, intensity, and persistence of effort toward utilizing skills and knowledge learned Study • I intend to apply the newly gained competences in my study • I plan to use this course to improve my performance in my study • I will try to use the newly gained competences in my study Work • I intend to apply the newly gained competences in my work • I plan to use this course to improve my performance in my work • I will try to use the newly gained competences in my work
Peer Support Extent to which peers reinforce and support the use of new learning Study • I expect to be encouraged to use the newly gained competences by my fellow students • I expect that applying the newly gained competences will be supported by my fellow students • I expect that applying the newly gained competence will be appreciated by my fellow students Work • I expect to be encouraged to use the newly gained competences by my colleagues • I expect that applying the newly gained competences will be supported by my colleagues • Application of the newly gained competences will be easier if I am supported by my colleagues
Supervisor Support Extent to which supervisors/principals reinforce and support the use of new learning Study • Application of the newly gained competences will be easier if I am supported by my lecturers • I expect that applying the newly gained competence will be appreciated by my lecturers • I find it important that applying the newly gained competences is appreciated by my lecturers Work • Application of the newly gained competences will be easier if I am supported by my supervisor(s)/principal(s)

- I expect to be encouraged to use the newly gained competences by my supervisor(s)/principal(s)
- I expect that applying the newly gained competences will be supported by my supervisor(s)/principal(s)

Opportunity to Use
Extent to which trainees are provided with or obtain resources and tasks on the job enabling them to use training on the job

Study
- I expect to get sufficient opportunities to practice the newly gained competences in my study
- After this course I expect to have the facilities (ICT, access to information resources etc.) at my disposal in order to apply the newly gained competences in my study
- I expect that my workload will not allow me time to try the newly gained competences in my study

Work
- I expect to get sufficient opportunities to practice the newly gained competences in my work
- After this course I expect to have the facilities (ICT, access to information resources etc.) at my disposal in order to apply the newly gained competences at my work
- I expect that my workload will not allow me time to try the newly gained competences in my work

Openness to Change
Extent to which prevailing group norms are perceived by individuals to resist or discourage the use of skills and knowledge acquired in training

Study
- There is an open atmosphere that enables changes in the way things are normally done at the OU
- I will be encouraged to use the newly gained competences to improve my performance at the OU
- There is an open attitude towards change when it will improve performance of my group/team at the OU

Work
- There is an open atmosphere that enables changes in the way things are normally done in my work environment
- I will be encouraged to use the newly gained competences to improve my performance in my work environment
- There is an open attitude towards change when it will improve performance of my group/team in my work environment

Feedback
Formal and informal indicators from an organization about an individual's job performance

Study
- I expect to receive advice on how to use the newly gained competences from my lecturer(s)
- After the course, I expect to receive feedback on how well I am applying my newly gained competences from my lecturer(s)
- When I use the newly gained competences, I expect to receive help from my lecturer(s)

Work
- I expect to receive advice on how to use the newly gained competences from my supervisor(s)/ principal(s)
- After the course, I expect to receive feedback on how well I am applying my newly gained competences from my supervisor(s)/principal(s)
- When I use the newly gained competences, I expect to receive help from my supervisor(s)/ principal(s)