



Review

Influencing variables and moderators of transfer of learning to the workplace within the area of staff development in higher education: Research review

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ABSTRACT

The goal of staff development in higher education is a change in teacher practices to positively influence student learning. In other words, the goal of staff development is the transfer of learning to the workplace. Research illuminates that this transfer of learning to the workplace is a complex issue. To make an accurate assessment of staff development initiatives one must consider what works for whom and under what conditions. We need to understand which influencing variables actually lead to which effects. Furthermore, we have to gain insight into moderators in the relationship between influencing variables and transfer of learning.

With this interdisciplinary review we combine the findings of management, Human Resource Development (HRD), and organisational psychological research with educational research. We attempt to generate guidelines for further research to improve staff development by revealing gaps in earlier research on impact of staff development.

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1. Introduction

The recognition of the importance of staff development has never been greater than it is today. Staff development can play a critical role in ensuring the quality of teaching and learning in universities (Devlin, 2006). Staff development is emphasised in proposals to reform, restructure or transform schools. Staff development is seen as the most important vehicle in efforts to bring about much-needed change (Guskey, 1996).

A wide range of other terms are used to describe the profession of staff development, being instructional development, instructional training, academic development, faculty development, faculty training, professional development, educational development, educational training, pedagogical training. In this study we opt for the term staff development. Staff development is a general term that can encompass a whole set of processes (Fraser, 2001). According to Stefani (2003) the term staff development would refer to working to improve the capabilities and practice of educators.

In this study, staff development is defined as the coherent sum of activities targeted to strengthen and extend the knowledge, skills and conceptions of the teachers in a way that will lead to changes in their way of thinking and their educational behaviour (Fenstermacher & Berliner, 1985) and to the maximisation of the learning process of students (Sparks & Loucks-Horsley, 1990). These changes take place continuously within the context of institutes of higher education as organisations, and are aimed at the school team as an organised group (Guskey, 1996). The focus is on the needs of the individual teacher and the school team. Staff development is the sum of formal (e.g., workshops) and informal (e.g., exchange of ideas among teachers) learning experiences of the teacher (Fullan, 1990).

The definition of staff development indicates that teachers have to translate their acquired knowledge, skills and conceptions into changes in their way of thinking and their educational behaviour. Based on Baldwin and Ford (1988) we define this transfer of learning to the workplace as a result of staff development as: 'the effective (generalisation) and continuing (maintenance) application in the job environment of the skills, knowledge and conceptions gained in a staff development context'. Transfer of learning to the workplace seems to be rather complex. In their regular work environment teachers have to overcome a lot of barriers before they can really use their newly acquired knowledge, skills and conceptions. Management studies mention that only 10% of learning actually transfers to job performance (Fitzpatrick, 2001; Holton & Baldwin, 2000; Kupritz, 2002). Transfer of learning to the workplace is not easy to achieve and is complex.

Earlier educational reviews have studied the impact of staff development on different levels (Levinson-Rose & Menges, 1981; McAlpine, 2003; Steinert et al., 2006; Stes, Min-Leliveld, Gijbels, & Van Petegem, 2010; Weimer & Lenze, 1998). Examples of these levels studied, are change within teacher, change within students, and so on.

The reviews reveal some interesting findings. The first one is that they prove the complexity of transfer to the workplace. The reviews accentuate the difficulty of measuring transfer of learning to the workplace (McAlpine, 2003). More attention should be given to research studying transfer of staff development learning, especially measuring actual changes in teacher performance (Stes et al., 2010).

In order to gain insight into this complex process, previous reviews also emphasise the importance of more qualitative or mixed method studies (Levinson-Rose & Menges, 1981; Steinert et al., 2006; Weimer & Lenze, 1998). The reviews reveal that well-designed studies are scarce and elucidate the importance of more and better-designed research on the impact of staff development (Levinson-Rose & Menges, 1981; Steinert et al., 2006; Stes et al., 2010; Weimer & Lenze, 1998). A satisfying conclusion of Stes et al. (2010) is that research on the impact of staff development is gaining importance.

Next to this the reviews make a call to researchers to take the individual differences of teachers participating in staff development initiatives into account (Levinson-Rose & Menges, 1981). Also, a framework is needed for studies to build upon each other and to enable comparability of study results (Steinert et al., 2006; Stes et al., 2010). Furthermore, the reviews illuminate the importance of taking related fields into account (Weimer & Lenze, 1998).

Taking these conclusions of educational staff development reviews into account, we will describe what is lacking in educational research in the following paragraphs. In the succeeding part the research questions of the current review are presented.

1.1. Critique on the studies measuring the impact of staff development on transfer of learning

Educational reviews by Levinson-Rose and Menges (1981), Steinert et al. (2006), Stes et al. (2010), and Weimer and Lenze (1998) on the impact of staff development cluster studies on the basis of level of outcome (Kirkpatrick, 1998) measured. The model of Kirkpatrick (1998) distinguishes four levels of outcome: reaction, learning, behaviour and results (effect on the environment such as student learning outcomes). This model has become an accepted cornerstone of the classification of outcomes of interventions of staff development. The description of impact on the level of behaviour, being level three of Kirkpatrick's model, is the transfer of learning to the workplace (Kirkpatrick, 1998; Steinert et al., 2006; Stes et al., 2010).

Although Kirkpatrick's four level model serves a useful purpose because of its ease in classifying outcomes, we can criticise the model for the same reason. The lack of detail could be problematic with regard to the many different staff development initiatives existing. They differ in goal, method, length and so on. To make an accurate assessment of these staff development initiatives one must consider the variety of variables that can influence the learning of teachers. As stated in the educational review of Lawless and Pellegrino (2007) we must consider what works for whom and under what conditions. Unless we understand which variables influence transfer of staff development learning it will be challenging to improve staff development. We need to understand which influencing variables actually lead to consequential effects. Furthermore, we have to gain insight into moderators in the relationship between influencing variables and transfer of learning. This means we have to broaden our view because major variables affecting transfer of learning are not specified in Kirkpatrick's four level evaluation model (Holton, 1996).

It would be interesting to study the results of transfer studies in areas other than the educational field. Furthermore, it would be useful to investigate whether the results of this study could be of importance within the context of staff development in higher education. Such an approach enriches staff development research with knowledge from an interdisciplinary scientific angle, which could possibly lead to new insights and relevant suggestions for further research. In this review we will take such an approach. We will study management, HRD and organisational psychological research as those fields of research are closely related to education, and staff development in particular. In management, HRD and organisational psychological reviews on transfer we find similar descriptions of transfer to those in the staff development area: transfer of learning is defined as the degree to which learners effectively apply the knowledge, skills and beliefs gained in a learning context to the job (Baldwin & Ford, 1988). With the insights of this study process we will review the educational research measuring the transfer of staff development learning. We will use the findings of management, HRD and organisational psychological research as an analysis tool when studying the reviewed educational studies. Furthermore, we will refine our analysis tool by suggesting influencing variables additional to those mentioned in management, HRD and organisational psychological research. Therefore this review will generate new knowledge to improve staff development by discovering new horizons in the research on the impact of staff development.

1.2. Research questions

The findings of reviews on the impact of staff development demand more than isolated descriptive studies and call for information to assist staff developers in understanding the extent to which staff development initiatives are effective. As previous research lacks a systematic and clear influencing variable-moderator-transfer relationship, this review attempts to provide useful insights into the constitution of effective transfer of learning for teachers in higher education.

If we want to improve staff development we need to understand which variables and moderators do have influence. Therefore, the overall attempt of this review is to generate guidelines for further research to improve staff development, by revealing gaps in earlier research on the impact of staff development on transfer of learning to educational practice.

For this purpose we formulated the following research questions:

1. Which influencing variables – revealed in management, HRD and organisational psychology research – have an impact on transfer of learning?
2. Which moderating variables – revealed in management, HRD and organisational psychology research – have an impact on the relationship between influencing variables and transfer of learning?
3. Which of these influencing variables can be of importance within the context of staff development in higher education?
4. Which of these moderating variables can be of importance within the context of staff development in higher education?
5. Which influencing variables, additional to those found in management, HRD and organisational psychology research, can be found by studying transfer of staff development learning to the workplace in higher education.

2. Method

The method section consists of two parts. First we will present the method used to answer research questions 1 and 2. In the second part we will explain the method used to answer research questions 3–5. We will present the criteria for inclusion in our analysis. Afterwards we will present the procedures of our literature search, followed by the results of this search. Subsequently we introduce coding study characteristics and our synthesising research method.

2.1. Method part 1: management, HRD and organisational psychology research

2.1.1. Inclusion criteria

In our search for relevant literature on transfer in an attempt to answer research questions 1 and 2, the following criteria for inclusion were selected.

1. Studies had to be reviews.
2. Studies had to be in the field of management, HRD or organisational psychology.
3. Studies had to involve transfer of learning to the workplace or transfer of training to the workplace.

2.1.2. Literature search procedures and search results

We used the following keywords: transfer, learning, training, review. We conducted a search in the electronic database PsycINFO, Econlit and ERIC in February 2011. With each search the keywords 'transfer' and 'review' had to be in the title, in combination with the keywords 'learning' or 'training'. We did not limit the search in time, nor did we limit it in publication source.

This search resulted in 30 references. We read these articles and selected the manuscripts that reported a review study presenting a clear, extensive overview of influencing variables and moderators of transfer with support from extant evidence of previous research. As a result of this selection, three review studies (Baldwin & Ford, 1988; Blume, Ford, Baldwin, & Huang, 2010; Burke & Hutchins, 2007) were selected to build a framework upon. The study of Baldwin and Ford (1988) has become an accepted cornerstone in the field of management, HRD or organisational psychology. The study presents three groups of influencing variables. The review of Burke and Hutchins (2007) is a strong and recent study that builds upon the study of Baldwin and Ford (1988) and presents a clear overview of influencing variables. The review of Blume et al. (2010) is the most recent review on transfer of training showing the reader a clear overview of moderators in the influencing variable-transfer relationship. Those three studies give us a good and up to date overview of well founded research results in the field of management, HRD or organisational psychology. We elaborate on those selected studies in the result part of this study.

2.2. Method part 2: educational research

2.2.1. Inclusion criteria

In order to answer research questions 3–5 we searched for relevant educational studies. Before searching the literature for work pertaining to transfer of staff development learning we determined the criteria for inclusion of our analysis. The following criteria had to be met for a study to be included in this review.

- (1) Studies had to involve a staff development activity or initiative in higher education. We defined staff development as follows: 'Staff development is the coherent sum of activities targeted to strengthen and extend the knowledge, skills and conceptions of the teachers in a way that will lead to changes in their way of thinking and their educational behaviour (Fenstermacher & Berliner, 1985) and to the maximisation of the learning process of students (Sparks & Loucks-Horsley, 1990). These changes take place continuously within the context of institutes of higher education as organisations, and are aimed at the school team as an organised group (Guskey, 1996). The focus is on the needs of the individual teacher and the school team. Staff development is the sum of formal (e.g., workshops) and informal (e.g., exchange of ideas among teachers) learning experiences of the teacher (Fullan, 1990)'.
- (2) Studies had to involve a measure of transfer of learning to the workplace as a central object of the study. Based on Baldwin and Ford (1988) we defined transfer of learning to the workplace as a result of staff development as: 'the effective (generalisation) and continuing (maintenance) application in the job environment of the skills, knowledge and conceptions gained in a staff development context'.
- (3) Studies had to be empirical.

2.2.2. Literature search procedures and search results

Because of differences in terminology in previous research the literature search is based on a variety of terms that can refer to staff development. Based on Stes et al. (2010) and Taylor and Rege Colet (2009) we composed a list of keywords: staff development, instructional development, instructional training, academic development, faculty development, faculty

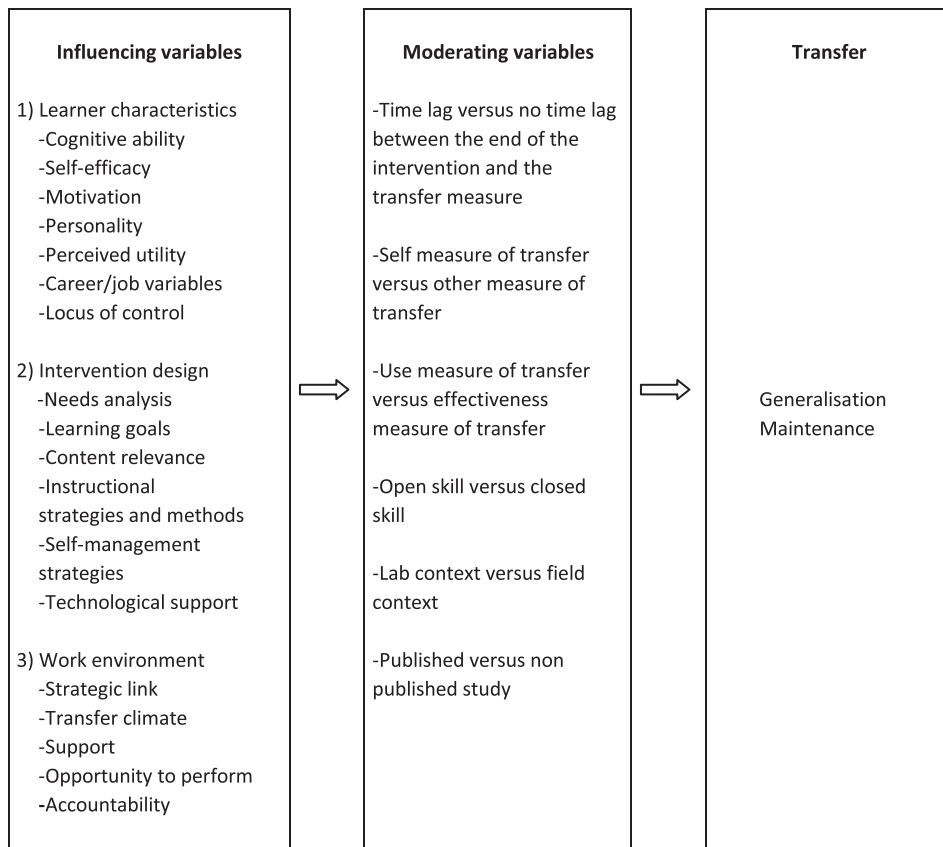


Fig. 1. Conceptual framework for potential variables involved in transfer of learning in staff development interventions (Based on Baldwin and Ford (1988), Blume et al. (2010) and Burke and Hutchins (2007)).

training, professional development, educational development, educational training, pedagogical training, and university teacher.

We conducted a search in the electronic database ERIC in February 2011. With each search one of the previously mentioned 11 keywords was indicated in the title in combination with the term 'teaching', which had to appear in the abstract. We did not limit the search in time, nor did we limit it in publication source.

This search resulted in 2211 references. We read the abstracts of these articles and selected the manuscripts that met the inclusion criteria. As a result of this selection, 134 studies were selected to be examined. One study was published in two different journals. We included this study only once. After careful reading of the full manuscripts of the 134 selected studies, 44 articles met our criteria for inclusion. Two of those selected articles report on two different interventions (Barlett & Rappaport, 2009; Sydow, 1998). Therefore, those studies are divided into two parts. The a part and the b part are seen as two different studies in order to gain more specified insights. Two studies by Postareff, Lindblom-Ylänne, and Nevgi (2007, 2008) investigate the same staff development interventions. Postareff et al., 2008 is a follow up study presenting the longitudinal effects. Both publications are coded. Both studies report on three staff development interventions varying in length. Because all three interventions are extended over time, we decided to categorise them in each of the two publications as one study. We coded the largest staff development intervention (30 ECTS-points or more). This brings us to a total of 46 studies included in our review.

2.2.3. Coding of the studies

The results of research questions 1 and 2 provided the conceptual framework we used for the coding of the educational studies measuring transfer of staff development learning. This conceptual framework is based on Baldwin and Ford (1988), Blume et al. (2010) and Burke and Hutchins (2007).

Each study was coded using the variables influencing transfer. We distinguished three groups of influencing variables, namely learner characteristics, intervention design, and work environment as presented in Fig. 1 and explained in Table 1. Furthermore, outcomes measured were coded using the moderators in the relationship between influencing variables and transfer as presented in Fig. 1 and explained in Table 2.

With the intention to refine Fig. 1 with specific findings from educational research, we studied the articles with an open view looking for more influencing variables, retrieved from earlier educational reviews. Therefore, we put down characteristics of the learners and the staff development design in addition to those mentioned in the framework.

Table 1
Variables influencing transfer (based on Burke & Hutchins, 2007).

Influencing variables	Description
<i>Learner characteristics</i>	
Cognitive ability (1. Cognitive ability)	General mental ability.
Self-efficacy (2. Self-efficacy)	Judgements individuals make about their competency to perform defined tasks.
Pre-intervention motivation (3. Motivation)	The intensity and persistence of efforts that learners apply in a learning-oriented improvement activity as measured before the intervention.
Motivation to learn (3. Motivation)	The intensity and persistence of efforts that learners apply in a learning-oriented improvement activity.
Motivation to transfer (3. Motivation)	The learner's intended efforts to utilise skills and knowledge learned in a staff development setting to a real world work situation.
Extrinsic versus intrinsic motivation (3. Motivation)	Extrinsic versus intrinsic reasons to attend a staff development intervention.
Anxiety/Negativity (4. Personality)	State of worry and nervousness.
Affectivity (4. Personality)	The dispositional tendency of individuals to feel negative emotions.
Conscientiousness (4. Personality)	The quality of being in accord with the motivation deriving logically from ethical or moral principles that govern a person's thoughts and actions.
Openness to experience (4. Personality)	Intellectual curiosity.
Extroversion (4. Personality)	Being highly sociable.
Perceived utility (5. Perceived utility)	Perceived value associated with staff development interventions.
Career planning (6. Career/job variables)	The extent to which employees create and update specific plans for achieving their goals.
Organisational commitment (6. Career/job variables)	The degree to which an employee identifies with the job and actively participates in the organisation.
External versus internal locus of control (7. LOC)	The extent to which individuals believe that they can control events that affect them.
<i>Intervention design</i>	
Needs analysis (1. Needs analysis)	Assess the cause of a performance situation to ensure an appropriate intervention is employed, prior to staff development interventions.
Learning goals (2. Learning goals)	Explicitly communicated objectives.
Content relevance (3. Content relevance)	The extent to which content, goals and materials are closely relevant to the transfer task.
Practice and feedback (4. Instructional strategies and methods)	The extent of rehearsal, practice and feedback that is given.
Over-learning (4. Instructional strategies and methods)	Repeated practice even after correct performance has been demonstrated.
Cognitive overload (4. Instructional strategies and methods)	Attempting to understand and interpret too much or irrelevant information at one time.
Active learning (4. Instructional strategies and methods)	The use of models of instruction that focus the responsibility of learning on learners.
Behavioural modelling (4. Instructional strategies and methods)	Learners are encouraged to mimic their specified role models in similar situations.
Error-based examples (4. Instructional strategies and methods)	Sharing with the learner what can go wrong if they do not use the trained skills back on the job.
Self-management strategies (5. Self-management strategies)	Equip learners with necessary skills to transfer what is learned to the workplace.
Technological support (6. Technological support)	Information Technology tools geared specifically toward transfer.
<i>Work environment</i>	
Strategic link (1. Strategic link)	The extent to which interventions support organisational goals and strategies.
Transfer climate (2. Transfer climate)	Situations and consequences in organisations that either inhibit or facilitate the use of what is learned, during a staff development intervention, back on the job.
Supervisory support (3. Support)	The support learners receive from their supervisor to use what is learned.
Peer support (3. Support)	The support learners receive from their peers and colleagues to use what is learned.
Opportunity to perform (4. Opportunity to perform)	Opportunities to use new learning in their work setting.
Accountability (5. Accountability)	The degree to which the organisation, culture, and/or management expects learners to use new learning on the job and holds them responsible for doing so.

The following information was recorded in tables: (a) first author or two authors and year of publication, (b) learner characteristics, (c) intervention design, (d) work environment, (e) moderating variables, (f) research design, and (g) results (transfer measured).

From the studies that met the criteria of inclusion we selected methods and results with regard to transfer measure. For example, an assessment which is part of a particular study but which measures the resulting increase in knowledge is not taken into account as this is no transfer measure.

Three coders with experience in educational research methodology and in the area of staff development were involved in the coding procedure. The coding procedure consisted of three stages. First, the three coders independently coded an initial set of seven studies. After doing so the three coders discussed problems encountered and lack of clarity, and as a result of this the guidelines for coding were revised. In the second phase one of the authors coded all the studies independently. In the

Table 2

Moderators in the relationship between Influencing variables and transfer (based on Blume et al., 2010).

Moderators	Description
Time lag versus no time lag between the end of the intervention and the transfer measure	Transfer measure can be taken immediately after the staff development intervention or after some time lag.
Self measure of transfer versus other measure of transfer	The source of transfer rating: self measure of transfer versus other measure of transfer.
Use measure of transfer versus effectiveness measure of transfer	Transfer can be measured as the use of what is learned or as the effectiveness of the learner in applying the knowledge and skills.
Open skill versus closed skill	Closed skills are skills that trainees have to adopt in essentially the same form as they are presented in training. The trainee has to imitate the trained behaviour. Open skills means that the trainee has to be creative with the new information, skills and beliefs in order to fit their personal needs.
Lab context versus field context	The study is using a lab context versus field context.
Publication source	The study is published or unpublished.

third phase aspects that the coder felt unsure about were discussed by the three coders together until a consensus among all coders was reached. With these phases we increased coder consistency.

2.2.4. Synthesising research

The studies that met our inclusion criteria were 10 quantitative studies (22%), 21 qualitative studies (46%) and 15 studies with a mixed design (32%). None of the quantitative studies mentioned effect sizes.

There are three methods of reviewing literature: meta-analyses, quantitative methods and qualitative reviews. Meta-analyses have one major advantage. Studies can vary substantially and still be integrated without being greatly influenced by the interpretation of the reviewer. Quantitative methods utilise simple mathematical procedures like vote counting. This means counting frequencies into box scores. Quantitative methods are more objective, however they give less in-depth information than a qualitative review. A qualitative, narrative review gives the author the opportunity to make sense of the literature in a creative way. By reading the studies carefully the author is interpreting the studies and is looking for patterns in the results.

For our review purposes and with the search results mentioned we opted for a quantitative vote counting method in combination with a narrative review method.

The vote counting method is used to search for influencing variables and moderators mostly mentioned in educational research (research questions 3–5). The narrative method is used to interpret the selected reviews on transfer with the goal of answering research questions 1 and 2. Furthermore, the narrative method is used to interpret the counting results and to decide on which variable further research is most needed (research questions 3–5). The narrative method is also used for proposing additional influencing variables (research question 5).

3. Results

Section 3.1 reports on conclusions from management, HRD and organisational psychology research to answer research questions 1 and 2. The findings are presented as new horizons in the research on the impact of staff development and are summarised in a conceptual framework.

Section 3.2 reports on conclusions from management, HRD and organisational psychology research mirrored in educational research. The conceptual framework is the guideline for those results. First we present an overview of our findings answering research questions 3 and 4. Next we elaborate on those findings in order to generate guidelines for further research to improve staff development. We take a closer look at the influencing variables of transfer that are most mentioned in educational research (research question 3). As those influencing variables are not measured in the educational studies, we look at the strength of the relationship of that specific influencing variable with transfer in management, HRD and organisational psychology research. The review of Burke and Hutchins (2007) is used for this exercise. If in the review of Burke and Hutchins (2007) no strong or moderate relationship with transfer is proven, we indicate that research on this topic in the educational field is needed. We present our interpretations for the three groups of influencing variables, namely learner characteristics, intervention design and work environment. Subsequently we take a closer look at the moderators with the intention of providing guidelines for further research (research question 4). To do so our findings are compared with conclusions from the three selected reviews from the field of management, HRD and organisational psychology (Baldwin & Ford, 1988; Blume et al., 2010; Burke & Hutchins, 2007).

Section 3.3 introduces new elements into the conceptual framework. We indicate variables, additional to those found in management, HRD and organisational psychology research, which can be of importance for the transfer of learning to the workplace within the field of staff development. These additional variables are retrieved from educational reviews of studies on the impact of staff development. In an attempt to guide staff developers and to generate guidelines for further research we refine the conceptual framework by including those new elements. Section 3.3 gives an answer to the fifth research question.

Table 3

Overview of the studies reporting on transfer of learning in staff development (Result: + = indication of transfer, – = no indication of transfer, +/- = partial indication of transfer).

Study	Variables influencing transfer: Learner characteristics	Variables influencing transfer: Intervention design	Variables influencing transfer: Work climate	Moderating variables	Research design	Result
Addy and Blanchard (2010)	Motivation to learn	Needs analysis Learning goals Content relevance Practice and feedback Active learning Behavioural modelling	Opportunity to perform	No time lag Other measure Use measure Open skill Field context Published	Qualitative with partly quantified results Video analysis (RTOP) Case study	–
Archambault, Wetzel, Foulger, and Williams (2010)	Motivation to learn	Learning goals Content relevance Practice and feedback Active learning Behavioural modelling Self-management strategies Technological support	Strategic link Transfer climate (negative) Opportunity to perform	No time lag Self measure Effectiveness measure Open skill Field context Published	Qualitative Survey	+
Ash, Brown, Kluger-Bell, and Hunter (2009)	Motivation to learn	Needs analysis Learning goals Content relevance Practice and feedback Active learning Self-management strategies	Opportunity to perform	Self measure Use measure Open skill Field context Published	Qualitative Interview +Ethnographic notes	+
Barlett and Rappaport (2009a) TELI Program		Learning goals Content relevance Practice and feedback Active learning Behavioural modelling Self-management strategies	Strategic link Opportunity to perform	Time lag Self measure Use measure Effectiveness measure Open skill Field context Published	Mixed Survey	+
Barlett and Rappaport (2009b) Piedmont program	Motivation to learn	Learning goals Content relevance Practice and feedback Active learning Self-management strategies	Strategic link Opportunity to perform	Time lag Self measure Use measure Effectiveness measure Open skill Field context Published	Mixed Survey	+
Braxton (1978)		Learning goals		Self measure Use measure Open skill Field context Published	Quantitative Survey	+
Chitpin (2011)	Self-efficacy Motivation to learn Motivation to transfer	Needs analysis Learning goals Content relevance	Strategic link Peer support Opportunity to perform Accountability	Time lag Self measure Other measure	Qualitative Case study	+

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Table 3 (continued)

Study	Variables influencing transfer: Learner characteristics	Variables influencing transfer: Intervention design	Variables influencing transfer: Work climate	Moderating variables	Research design	Result
	Extrinsic and intrinsic motivation Conscientiousness Openness to experience	Practice and feedback		Use measure		
Cilliers and Herman (2010)		Active learning Behavioural modelling Self-management strategies Technological support Learning goals Content relevance Practice and feedback Active learning Behavioural modelling	Opportunity to perform	Effectiveness measure Open skill Field context Published Time lag Self measure Use measure Effectiveness measure Open skill Field context Published	Mixed Survey + interview	+
Claus and Zullo (1987)	Motivation to learn	Needs analysis Learning goals	Strategic link Opportunity to perform	No time lag Other measure	Qualitative with quantified results Observation of videotaped lectures (pretest)	+
Dixon and Scott (2003)		Content relevance Practice and feedback Active learning Self-management strategies Content relevance Practice and feedback	Strategic link Supervisory support Opportunity to perform	Use measure Open skill Field context Published Self measure Use measure Effectiveness measure Open skill Field context Published	Quantitative Survey	+/0
Fedock, Zambo, and Cobern (1996)	Motivation to learn Motivation to transfer	Needs analysis Learning goals Content relevance Practice and feedback Active learning Behavioural modelling Self-management strategies Learning goals	Strategic link Transfer climate Peer support Opportunity to perform	Self measure Use measure Effectiveness measure Open skill Field context Published	Qualitative Interview	+
Fidler, Neururer-Rotholz, and Richardson (1999)			Strategic link Opportunity to perform	Self measure Use measure Effectiveness measure Open skill Field context Published	Mixed Survey + interview	+

Table 3 (continued)

Study	Variables influencing transfer: Learner characteristics	Variables influencing transfer: Intervention design	Variables influencing transfer: Work climate	Moderating variables	Research design	Result
Finkelstein (1995)	Motivation to learn	Needs analysis Learning goals Content relevance Practice and feedback Active learning Behavioural modelling Self-management strategies	Peer support Opportunity to perform	No time lag Self measure Other measure Use measure Effectiveness measure Open skill Field context Published	Mixed Survey	+
Gallos, van den Berg, and Treagust (2005)		Learning goals	Strategic link	Self measure	Mixed	+
		Content relevance Behavioural modelling	Transfer climate Supervisory support Peer support Opportunity to perform Accountability Transfer climate (negative)	Other measure Use measure Open skill Field context Published Self measure Other measure	Observations + video recording + interview + Survey (pre test)	+/-
Gibbs and Coffey (2004)				Use measure Open skill Field context Published Time lag	Quantitative Survey (SEEQ, MEQ, ATI) (pre & post)	+/-
Gibbs, Browne, and Keeley (1988)		Learning goals	Strategic link	Time lag	Qualitative	+
		Content relevance Practice and feedback Active learning Behavioural modelling Self-management strategies	Opportunity to perform	Self measure Use measure Effectiveness measure Open skill Field context Published	Document analysis (results of the discussion group)	
Harnish and Wild (1993)	Motivation to learn	Needs analysis Learning goals Content relevance Practice and feedback Active learning Behavioural modelling	Strategic link Peer support Opportunity to perform	Self measure Other measure Use measure Effectiveness measure Open skill Field context Published	Qualitative Survey (pre & post) + Interview	+
Harris, Froman, and Surles (2009)	Motivation to learn	Needs analysis	Strategic link	Time lag	Mixed	+
		Learning goals Content relevance Practice and feedback Active learning	Opportunity to perform	Self measure Other measure Use measure Open skill	Survey + interview	

(continued on next page)

Table 3 (continued)

Study	Variables influencing transfer: Learner characteristics	Variables influencing transfer: Intervention design	Variables influencing transfer: Work climate	Moderating variables	Research design	Result
Hewson, Copeland, and Fishleder (2001)		Behavioural modelling Self-management strategies Needs analysis	Strategic link	Field context Published Time lag	Quantitative	+
		Learning goals Content relevance Practice and feedback.	Opportunity to perform	Self measure Other measure Use measure Effectiveness measure Open skill Field context Published	Survey (pre and post)	
Howland and Wedman (2004)	Motivation to learn	Needs analysis	Strategic link	Time lag (other)	Mixed	+
		Learning goals	Transfer climate	No time lag (self)	Survey (pre and post) + interview	
		Content relevance Practice and feedback Active learning Behavioural modelling Self-management strategies Technological support	Opportunity to perform	Self measure Other measure Use measure Open skill Closed skill Field context Published		
Kahn and Pred (2002)		Needs analysis Learning goals Content relevance Active learning		Time lag Self measure Use measure Open skill Field context Published article	Qualitative Survey	+
Light, Calkins, Luna, and Drane (2009)	Motivation to learn	Needs analysis	Strategic link	Time lag (interview)	Mixed	+
		Learning goals	Opportunity to perform	No time lag (ATI and critical report)	Report of teaching (Critical reports) + post program interview + ATI	
		Content relevance Practice and feedback		Self measure Use measure Effectiveness measure Open skill versus Field context Published		
McClusky de Swart (2010)	Motivation to learn	Needs analysis Learning goals	Strategic link Opportunity to perform	Time lag No time lag	Qualitative Survey + interview (Instrumental case study approach)	+
		Content relevance Practice and feedback Active learning		Self measure Use measure Effectiveness measure		

Table 3 (continued)

Study	Variables influencing transfer: Learner characteristics	Variables influencing transfer: Intervention design	Variables influencing transfer: Work climate	Moderating variables	Research design	Result
McDonough (2006)	Motivation to learn	Needs analysis Learning goals	Peer support Opportunity to perform	Open skill Field context Published Time lag No time lag	Qualitative Professional journal + reflective essay + action research projects course feedback from focus group + written course evaluation form + field notes from the author	+
McShannon and Hynes (2005)	Motivation to learn Perceived utility (negative)	Content relevance Practice and feedback Active learning Behavioural modelling Self-management strategies Needs analysis	Strategic link Transfer climate Opportunity to perform	Self measure Other measure Use measure Effectiveness measure Open skill Field context Published Self measure	Quantitative Survey	+
Medsker (1992)	Motivation to learn Motivation to transfer	Needs analysis Learning goals Content relevance Practice and feedback Active learning Behavioural modelling Self-management strategies Learning goals	Strategic link Transfer climate Peer support Opportunity to perform Accountability	Time lag Self measure Use measure Effectiveness measure Open skill Field context Published	Qualitative Telephone-interview	+
Nasmith et al. (1995)		Content relevance Practice and feedback	Opportunity to perform	Time lag Self measure Other measure	Qualitative with quantified results Observation using a observation grid Interview (retrospective pre & post) Experimental & control group	0
Nursing faculty development (1980)	Motivation to learn	Needs analysis Learning goals	Strategic link Transfer climate	Use measure Effectiveness measure Open skill Field context Published Self measure Other measure	Mixed Survey + site visits (reports of assigned evaluators)	+

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Table 3 (continued)

Study	Variables influencing transfer: Learner characteristics	Variables influencing transfer: Intervention design	Variables influencing transfer: Work climate	Moderating variables	Research design	Result
		Content relevance Practice and feedback	Supervisory support Opportunity to perform	Use measure Effectiveness measure Open skill Field context Published		
O'Hara and Pritchard (2008)	Motivation to learn Motivation to transfer	Needs analysis Learning goals Content relevance Practice and feedback Active learning Self-management strategies	Strategic link Transfer climate Supervisory support Peer support Opportunity to perform Accountability Opportunity to perform	No time lag Self measure Use measure Open skill Field context Published	Quantitative Survey (pre & post)	+
Persellin and Goodrick (2010)		Learning goals	Opportunity to perform	Time lag	Quantitative	+
		Content relevance Practice and feedback Cognitive overload (avoid) Behavioural modelling		Self measure Use measure Effectiveness measure Open skill Field context Published	Survey	
Pinheiro, Rohrer, and Heimann (1998)		Content relevance Practice and feedback	Opportunity to perform	Self measure	Mixed	+
				Other measure	Survey (pre & post – PALS) + video	
				Use measure Open skill Field context Published		
Postareff, Lindblom-Ylänne, and Nevgi (2007)	Motivation to learn	Learning goals	Strategic link	Time lag	Mixed	+
		Content relevance Practice and feedback Active learning Self-management strategies	Opportunity to perform	No time lag Self measure Use measure Effectiveness measure Open skill Field context Published	Survey (ATI) + interview	
Postareff et al. (2008)	Motivation to learn	Learning goals Content relevance Practice and feedback Active learning Self-management strategies	Strategic link Opportunity to perform	Time lag Self measure Use measure Effectiveness measure Open skill Field context Published	Quantitative Survey (ATI & ITTF)	+
Quirk, DeWitt, Lasser, Huppert, and Hunniwell (1998)		Learning goals	Opportunity to perform	Time lag	Quantitative	+

Table 3 (continued)

Study	Variables influencing transfer: Learner characteristics	Variables influencing transfer: Intervention design	Variables influencing transfer: Work climate	Moderating variables	Research design	Result
		Practice and feedback Behavioural modelling		No time lag Self measure Use measure Open skill Field context Published	Survey (pre, post & delayed)	
Rothman and Robinson (1977)		Learning goals Practice and feedback	Opportunity to perform	Time lag Self measure Use measure Effectiveness measure Open skill Field context Published	Qualitative with quantified results	+/0
Sarikaya, Kalaca, Yeen, and Cali (2010)		Learning goals Content relevance Practice and feedback Behavioural modelling	Opportunity to perform	Time lag Self measure Use measure Open skill Field context Published	Quantitative Survey	+
Schratz (1993)	Motivation to learn	Needs analysis Learning goals Content relevance Practice and feedback Active learning Behavioural modelling Self-management strategies	Strategic link Transfer climate Peer support Opportunity to perform	No time lag Self measure Use measure Effectiveness measure Open skill Field context Published	Qualitative Comments from discussion in working group	+
Sheets and Henry (1984)			Supervisory support Opportunity to perform	Time lag Other measure Use measure Open skill Field context Published	Qualitative 2 video-taped teaching simulations	+/0
Shteiman, Gidron, Eilon, and Katz (2010)	Motivation to learn Intrinsic motivation Career planning	Content relevance Practice and feedback Active learning Self-management strategies	Strategic link Opportunity to perform	Self measure Use measure Open skill Field context Published	Qualitative Interview + focus group	+
Skeff, Stratos, Bergen, and Regula (1998)	Motivation to learn	Needs analysis	Strategic link	Time lag	Mixed	+

(continued on next page)

Table 3 (continued)

Study	Variables influencing transfer: Learner characteristics	Variables influencing transfer: Intervention design	Variables influencing transfer: Work climate	Moderating variables	Research design	Result
		Content relevance Practice and feedback	Opportunity to perform	No time lag Self measure Other measure Use measure Effectiveness measure Open skill Field context Published	Survey (pre, post & delayed) + video (pre & post)	
Slavit, Sawyer, and Curley (2003)	Motivation to learn Anxiety/negativity	Needs analysis Learning goals Content relevance Practice and feedback Active learning Self-management strategies Technological support	Opportunity to perform	No time lag Self measure Use measure Effectiveness measure Open skill Field context Published study	Qualitative Running summary	+
Stepp-Greany (2004)	Motivation to learn Motivation to transfer	Needs analysis Learning goals Content relevance Practice and feedback Active learning Behavioural modelling Self-management strategies	Transfer climate Supervisory support Peer support Opportunity to perform	Time lag No time lag Self measure Other measure Use measure Effectiveness measure Open skill Field context Published study	Qualitative Observation & professional interactions (pre) + document analysis (notes) + student survey (post)	+
Stes, Coertjens, and Van Petegem (2010)	Motivation to learn	Learning goals Learning goals Content relevance Practice and feedback Active learning	Strategic link Opportunity to perform	No time lag Self measure Use measure Open skill Field context Published	Mixed Survey (ATI) (pre & post) + interview (post) Experimental & control group	+/-
Sydow (1998a) (Peer conference)	Motivation to learn	Needs analysis Learning goals Content relevance Practice and feedback Active learning	Strategic link Transfer climate Supervisory support Peer support Opportunity to perform	Self measure Use measure Open skill Field context Published	Qualitative Document analysis (peer group conference programs and agendas) Focus group Survey (pre & post)	+

Table 3 (continued)

Study	Variables influencing transfer: Learner characteristics	Variables influencing transfer: Intervention design	Variables influencing transfer: Work climate	Moderating variables	Research design	Result
Sydow (1998b) (Research grant)	Motivation to learn Motivation to transfer	Self-management strategies Needs analysis Learning goals Content relevance Practice and feedback Active learning Behavioural modelling Self-management strategies	Strategic link Transfer climate Supervisory support Peer support Opportunity to perform	Self measure Use measure Effectiveness measure Open skill Field context Published	Mixed Document analysis (proposals and report) Survey (pre & post)	+
Weurlander and Stenfors- Hayes (2008)			Opportunity to perform	Time lag Self measure Use measure Open skill Field context Published	Qualitative interview	+

3.1. Part 1: new horizons in the research on transfer of staff development learning to the workplace

Blume et al. (2010) conducted a meta-analytic review and defined transfer as consisting of two dimensions (Fig. 1, right column). The first dimension is called generalisation. This is the extent to which the knowledge, skills and beliefs acquired in a learning setting are applied in different settings, or situations from those trained. The second dimension is maintenance. This is the extent to which changes that result from a learning experience persist over time. Also Baldwin and Ford (1988) stress that learned behaviour must be generalised to the job context and maintained over a period of time on the job in order to conclude that transfer has occurred.

Burke and Hutchins (2007) synthesise the knowledge of variables influencing transfer. An overview of these influencing variables is presented in Fig. 1 (left column) and reveals three groups of influencing variables, namely intervention design, learner characteristics and work environment. Those influencing variables are substantiated by findings from a meta-analysis or at least two empirical studies in peer-reviewed journals. The influencing variables may either imply a benefit or a barrier to transfer occurring. For a description of the different influencing variables we refer to Table 1.

The most recent review on transfer of training is a meta-analysis of 89 empirical studies (Blume et al., 2010). The study quantitatively examines how decisions on research design affect reported relationships between influencing variables and transfer of learning. These research design decisions are labelled as moderators in the influencing variable-transfer relationship. These moderating variables are portrayed in Fig. 1 (middle column). For a description of the different moderators we refer to Table 2.

We can conclude that the management, HRD and organisational psychology literature shows clear influencing variable-moderator-transfer relationships, which are interesting for research on impact of staff development.

The outcomes from this research on reviews within the field of management, HRD and organisational psychology may provide our conceptual framework (Fig. 1) for studying transfer within the area of staff development.

3.2. Part 2: conclusions from management, HRD and organisational psychological research mirrored in educational research

The results of our analysis of the research studying transfer of learning in the context of staff development are summarised in Table 3. From the three groups of influencing variables of transfer, the intervention design group received most attention in articles studying the impact of staff development. We will, however, discuss our results in the following paragraphs for the three influencing variable groups and for the moderator group chronologically.

3.2.1. Influencing variable: learner characteristics

On the basis of our review we can conclude that motivation may be an influencing variable on transfer of staff development learning. As illustrated in Table 4, motivation to learn and especially motivation to transfer seem to be possible influencing variables of transfer in staff development initiatives. However, these are not the strongest influencing variables in management, HRD and organisational psychology research. Therefore, further educational research on motivation to learn and motivation to transfer is much needed. Educational empirical findings of direct or indirect relationships between those influencing variables and transfer of staff development learning to teaching practices could establish our preliminary findings.

3.2.2. Influencing variable: intervention design

Management, HRD and organisational psychology research lacks empirical evidence for the relationship between needs analysis and transfer of learning. On the other hand, management, HRD and organisational psychology research shows that learning goals and content relevance are strong or moderate influencing variables of transfer.

As illustrated in Table 5, these three variables (needs analysis, learning goals and content relevance) seem to be possible influencing variables of transfer in staff development initiatives. We could hypothesise that needs analysis has an indirect relationship with transfer. The basic idea of this hypothesis is that appropriate learning goals, content, methods and environment can be assigned through needs analysis. Further educational research into this hypothesis must bring clarification.

Practice and feedback and behavioural modelling seem to have a positive impact on transfer of staff development learning. Empirical management, HRD and organisational psychology research have proven a strong relationship with transfer.

Most of the educational studies with an active learning intervention design show positive transfer results. However, no prior management, HRD or organisational psychological studies have reported on the relationship with transfer; active learning is not studied as an influencing variable of transfer of learning. This is a noteworthy gap in management, HRD and organisational psychological research. Also, none of the educational studies reviewed has measured the impact of active learning on transfer of learning within the area of staff development. We do not question that learners should be cognitively engaged during learning. However, this gap in the research on transfer of learning in the area of management, HRD and organisational psychological studies and in the area of transfer of learning from staff development initiatives needs to be resolved. Therefore, we indicate active learning as an important subject for further research.

All educational studies describing an intervention design with self management strategies only report positive outcomes on transfer. As minimal empirical management, HRD and organisational psychology research exists on this topic, further research is needed. Table 5 displays a summary of our findings on intervention design.

Table 4
Summary of learner characteristics.

Influencing variable: learner characteristics	Number of times a relationship with positive transfer measure is found	Number of times a relationship with mixed transfer measure is found	Number of times a relationship with negative transfer measure is found	Research within the field of staff development is needed to clarify or to build findings
Cognitive ability	0	0	0	
Self-efficacy	1	0	0	
Pretraining	0	0	0	
Motivation to learn	26	1	1	x
Motivation to transfer	6	0	0	x
Extrinsic versus intrinsic motivation	1 (Extrinsic) 2 (Intrinsic)	0	0	
Anxiety/Negativity	1	0	0	
Affectivity	0	0	0	
Conscientiousness	1	0	0	
Openness to experience	1	0	0	
Extroversion	0	0	0	
Perceived utility	1 (negative perceived utility)	0	0	
Career planning	1	0	0	
Organisational commitment	0	0	0	
External versus internal locus of control	0	0	0	

3.2.3. Influencing variable: work environment

In educational research the existence of a ‘strategic link’ and a positive ‘transfer climate’ are associated with positive transfer outcomes. In management, HRD and organisational psychology research these influencing variables are subjects for further research, although positive effects are registered. Therefore, further research within the complex and specific context of higher education is desirable.

In management, HRD and organisational psychology research just as in educational research, we find indications that peer support positively influences transfer of learning. Adversely, the influence of supervisory support needs further clarification in both research areas. Table 6 shows a summary of our findings on work environment.

3.2.4. Moderating variables

On the one hand one could predict that transfer measures without a time lag between the end of the staff development intervention and the transfer measure show more positive results because this situation refers to near transfer in a temporal context. However, as change is a complex process we could also assume that the learner needs time for the transfer process to take place. Furthermore, the learner could need that time lag to have the opportunity to transfer knowledge, skills and conceptions. Our review shows no clear trends on this moderator. With regard to time lag versus no time lag in educational staff development studies measuring transfer of learning, no conclusions can be drawn. Burke and Hutchins (2007) accentuate that the research design of studies into transfer of learning should change from a short term measure to a retention interval of 12 months. Nevertheless, because of the inconclusiveness in educational research we suggest further research with both time lag conditions (short and long term time lag).

Most of the educational studies rely on self reports. Blume et al. (2010) reveal that transfer measures based on self reports have consistently stronger relationships with influencing variables than transfer measures based on the reports of others. In educational research self reports as estimations of competencies systematically show that self reports are not valid (Eva & Regehr, 2005; Gordon, 1991). Therefore, educational research on transfer of learning needs to switch from a single source data to a multiple source design. A combination of self and multiple other measures, such as supervisor, colleague and student measures, is necessary to gain more insight into the process of transfer.

In our review we make a distinction between a use measure of transfer (the use of what is learned) and an effectiveness measure of transfer (the effectiveness of the learner in applying the knowledge and skills). The majority of the educational studies examined describe a use measure of transfer. In management, HRD and organisational psychology research, use measures yield a slightly stronger influencing variable-transfer relationship than effectiveness measures (Blume et al., 2010). However, because of the small amount of studies involved, no strong conclusions can be drawn in management, HRD and organisational psychology research. We consider both measures, use and effectiveness measures, to be important for further educational research on staff development.

Table 5
Summary of intervention design.

Influencing variable: intervention design	Number of times a relationship with positive transfer measure is found	Number of times a relationship with mixed transfer measure is found	Number of times a relationship with negative transfer measure is found	Research within the field of staff development is needed to clarify or to build findings
Needs analysis	23	0	1	x
Learning goals	34	2	2	
Content relevance	35	2	2	
Practice and feedback	34	3	2	
Over-learning	0	0	0	
Cognitive overload	1 (avoid overload)	0	0	
Active learning	26	1	1	x
Behavioural modelling	19	0	1	
Error-based examples	0	0	0	
Self-management strategies	22	0	0	x
Technological support	4	0	0	

All of the studies mention open skills. One study mentions both open and closed skills. Teaching aims to diagnose and make use of variability, rather than implement uniform techniques or routines (Darling-Hammond & Snyder, 2000). It seems logical that studies on transfer of staff development learning measure open skills.

All of the educational studies report a field context. However, it would be interesting to create a lab context for studies measuring transfer of learning in the context of staff development.

All of the educational studies are published. The meta-analytic review of Blume et al. (2010) resulted in limited evidence that published studies demonstrate higher correlations than unpublished studies.

Table 7 shows a summary of our findings on moderating variables.

3.3. Part 3: refining the conceptual framework – additional influencing variables

In the previous section we clarified whether influencing variables and moderators revealed by management, HRD and organisational psychology research are likewise of importance within the context of staff development in higher education. We pointed out the variables that need further research the most.

In the following part we rely on earlier educational reviews on transfer of staff development learning to suggest some more possible influencing variables which are not mentioned in management, HRD and organisational psychology research. We describe the additional influencing variables and review the studies that met our inclusion criteria regarding these additional influencing variables of transfer of learning. For each additional influencing variable a preliminary conclusion is presented. With these new elements we refine the conceptual framework.

In the following section we present four additional influencing variables of transfer of learning, namely amount of experience, nature of the intervention, amount of time spent and learning climate.

3.3.1. Amount of experience

Many staff development activities target new faculty members (Weimer & Lenze, 1998). Weimer and Lenze (1998) make a call for studies looking at the impact of staff development (including transfer of staff development learning) on specific

Table 6
Summary of work environment.

Influencing variable: work environment	Number of times a relationship with positive transfer measure is found	Number of times a relationship with mixed transfer measure is found	Number of times a relationship with negative transfer measure is found	Research within the field of staff development is needed to clarify or to build findings
Strategic link	26	2	0	x
Transfer climate	12	1 (negative)	0	x
Supervisory support	6	2	0	x
Peer support	12	0	0	
Opportunity to perform	37	4	2	
Accountability	4	0	0	

Table 7
Summary of moderating variables.

Moderators in the relationship between predictors and transfer	Number of times a relationship with positive transfer measure is found	Number of times a relationship with mixed transfer measure is found	Number of times a relationship with negative transfer measure is found	Research within the field of staff development is needed to clarify or to build findings
Time lag between the end of the intervention and the transfer measure	21	2	1	x
No time lag between the end of the intervention and the transfer measure	14	1	1	x
Self measure of transfer	38	4	0	x
Other measure of transfer	13	2	2	x
Use measure of transfer	38	5	2	x
Effectiveness measure of transfer	25	2	0	x
Open skill	39	5	2	x
Closed skill	1	0	0	
Lab context	0	0	0	
Field context	39	5	2	
Published	39	5	2	
Non-published	0	0	0	

faculty groups. The review of Stes et al. (2010) searched for evidence that staff development initiatives targeting teaching assistants or new faculty members had more positive outcomes than other or non specific target groups. The results of the review showed a lack of evidence. No conclusions could be formulated. In reaction to these previous reviews we label the amount of experience (novices versus experienced teachers) as an additional influencing variable of transfer of learning in staff development.

In our review teachers with less than five years of experience are defined as novices. Teachers with more than five years of experience are defined as experts. We classified our studies into three classes depending on the amount of experience of the target group: novice teachers, experienced teachers or both novice and experienced teachers.

Table 8 shows the results of our findings on amount of experience. Six studies examine the transfer of learning of novice teachers. Three of those six studies report positive transfer results. Two studies show partial impact and one study finds no impact on transfer of learning. All of the studies (6) with experienced teachers report positive results. Most of the studies (20) report on staff development interventions for both novice and experienced teachers. One of those 20 studies shows negative results and two studies report partial impact. A preliminary conclusion is that experienced teachers show more transfer of learning to the workplace than their novice colleagues. Another preliminary finding is that those novice teachers show more transfer of learning after collaboration with more experienced colleagues. Novice teachers will gain from methods where novices can learn through collaboration with others and by working alongside more experienced colleagues. Communities of practice are an example of such a method (Barab, MaKinster, & Scheckler, 2003). As these conclusions are preliminary and further research into the hypothesis is needed.

3.3.2. Nature of the intervention

The review of Stes et al. (2010) gives some evidence that the nature of the staff development intervention influences transfer of learning. The review concludes with a call for further research into transfer of learning as a result of interventions with varying formats. Therefore the current review searches for the effect of the nature of the intervention on transfer to the workplace. Earlier reviews all used different categorisation to cluster studies based on the nature of the staff development intervention presented (Levinson-Rose & Menges, 1981; Steinert et al., 2006; Stes et al., 2010; Weimer & Lenze, 1998). In reaction to these previous reviews we label the nature of the intervention (learning on the job versus learning off the job) as an additional influencing variable of transfer of learning in staff development. This dichotomy, being on the job/off the job, has never been used before in a review investigating the impact of staff development.

In our review, learning on the job means that the learning of teachers occurs as they engage in their teaching practices. The learning is situated in educational contexts with actual students, an actual curriculum, or actual problems of practice. On the job learning can be both formal and informal. Learning on the job means workplace learning. Forms of on the job learning include study groups, reflective logs (portfolio, case study), action research, community of practice, experiential learning, self directed professional development, (peer) coaching and mentoring. Off the job learning is when the staff development intervention takes place away from the normal work situation or away from teachers' practices. Off the job learning can make use of authentic materials and real life problems encountered by the teachers. Examples of off the job learning are workshops, training sessions or seminars.

Table 8 shows the results of our findings on the nature of the intervention.

Table 8

An overview of the coding of the additional influencing variables.

Additional influencing variables	Number of times a relationship with positive transfer measure is found	Number of times a relationship with mixed transfer measure is found	Number of times a relationship with negative transfer measure is found	Research within the field of staff development is needed to clarify or to build findings
<i>Learner characteristics</i>				
Novice teacher	3 (Harris et al., 2009; Light et al., 2009; Stepp-Greany, 2004)	2 (Dixon & Scott, 2003; Gibbs & Coffey, 2004 (remark: "mostly inexperienced"))	1 (Addy & Blanchard, 2010)	X
Experienced teacher	6 (Archambault et al., 2010; Chitpin, 2011; Fedock et al., 1996; Finkelstein, 1995; Howland & Wedman, 2004; Shteiman et al., 2010)	0	0	X
Novice and experienced teacher	17 (Ash et al., 2009; Barlett & Rappaport, 2009a,2009b; Braxton, 1978; Cilliers & Herman, 2010; Gallos et al., 2005; Hewson et al., 2001; McClusky de Swart, 2010; McDonough, 2006; Nursing faculty development, 1980; Persellin & Goodrick, 2010; Postareff et al., 2007, 2008; Skeff et al., 1998; Sydow, 1998a, 1998b; Weurlander & Stenfors-Hayes, 2008)	2 (Rothman & Robinson, 1977; Stes, Coertjens, and Van Petegem (2010))	1 (Nasmith et al., 1995)	X
<i>Intervention design</i>				
Learning on the job	12 (Chitpin, 2011; Fedock et al., 1996; Finkelstein, 1995; Harnish & Wild, 1993; Howland & Wedman, 2004; McDonough, 2006; McShannon & Hynes, 2005; O'Hara and Pritchard, 2008; Schratz, 1993; Shteiman et al., 2010; Stepp-Greany, 2004; Sydow, 1998b)	0	0	X
Learning off the job	11 (Braxton, 1978; Cilliers & Herman, 2010; Claus & Zullo, 1987; Fidler et al., 1999; Gibbs et al., 1988; Harris et al., 2009; Kahn & Pred, 2002; McClusky de Swart, 2010; Quirk et al., 1998; Sarikaya et al., 2010; Sydow, 1998a)	4 (Dixon & Scott, 2003; Rothman & Robinson, 1977; Sheets & Henry, 1984; Stes, Coertjens, & Van Petegem, 2010)	1 (Nasmith et al., 1995)	X
Combination of learning on the job and learning off the job	15 (Archambault et al., 2010; Ash et al., 2009a, 2009b; Barlett & Rappaport, 2009a,2009b; Gallos et al., 2005; Hewson et al., 2001; Light et al., 2009; Medsker, 1992; Nursing faculty development, 1980; Persellin & Goodrick, 2010; Pinheiro et al., 1998; Postareff et al., 2007, 2008; Skeff et al., 1998; Slavik et al., 2003)	0	1 (Addy & Blanchard, 2010)	X
Amount of training time spent: one time event	3 (Kahn & Pred, 2002; Quirk et al., 1998; Sydow, 1998a)	1 (Dixon & Scott, i)	1 (Nasmith et al., 1995)	X
Amount of training time spent: extended over time	35 (Archambault et al., 2010; Ash et al., 2009; Barlett & Rappaport, 2009a, 2009b; Chitpin, 2011; Cilliers & Herman, 2010; Claus & Zullo, 1987; Fedock et al., 1996; Fidler et al., 1999; Finkelstein, 1995; Gallos et al., 2005; Gibbs et al., 1988; Harnish & Wild, 1993; Harris et al., 2009; Hewson et al., 2001; Howland & Wedman, 2004; Light et al., 2009; McClusky de Swart, 2010; McDonough, 2006; McShannon & Hynes, 2005; Medsker, 1992; Nursing faculty development, 1980; O'Hara and Pritchard, 2008; Persellin & Goodrick, 2010; Pinheiro et al., 1998; Postareff et al., 2007, 2008; Sarikaya et al., 2010; Schratz, 1993; Shteiman et al., 2010; Skeff et al., 1998; Slavik et al., 2003; Stepp-Greany, 2004; Sydow, 1998b; Weurlander & Stenfors-Hayes, 2008)	4 (Gibbs & Coffey, 2004; Rothman & Robinson, 1977; Sheets & Henry, 1984; Stes, Coertjens, & Van Petegem, 2010)	1 (Addy & Blanchard, 2010)	X
Learning climate: appreciative approach	30 (Archambault et al., 2010; Ash et al., 2009; Barlett & Rappaport, 2009a, 2009b; Chitpin, 2011; Claus & Zullo, 1987; Fedock et al., 1996; Fidler et al., 1999; Finkelstein, 1995; Gibbs et al., 1988; Harnish & Wild, 1993; Harris et al., 2009; Howland & Wedman, 2004; Kahn & Pred, 2002; McClusky de Swart, 2010; McDonough, 2006; McShannon & Hynes, 2005; Medsker,	0	1 (Addy & Blanchard, 2010)	X

(continued on next page)

Table 8 (continued)

Additional influencing variables	Number of times a relationship with positive transfer measure is found	Number of times a relationship with mixed transfer measure is found	Number of times a relationship with negative transfer measure is found	Research within the field of staff development is needed to clarify or to build findings
Learning climate: gap approach	1992; Nursing faculty development, 1980; O'Hara and Pritchard, 2008; Persellin & Goodrick, 2010; Postareff et al., 2007, 2008; Quirk et al., 1998; Schratz, 1993; Shteiman et al., 2010; Slavik et al., 2003; Stepp-Greany, 2004; Sydow, 1998a, 1998b) 0	0	0	X

Twelve of the studies that met our criteria for inclusion used an on the job approach. All of them present positive transfer results. Four of the 16 studies with an off the job approach show partly positive results, and one study shows a negative result. Sixteen studies report on a combination of learning on the job and learning off the job. One of those 16 studies shows negative transfer results. Fifteen of those 16 studies present positive transfer results. A preliminary conclusion is that on the job learning has a positive impact on transfer of learning but further research is needed.

3.3.3. Amount of time spent

McAlpine (2003), Steinert et al. (2006) and Stes et al. (2010) conclude that staff development interventions extended over time could be associated with more positive outcomes than one time events. Further research on this assumption is suggested by the authors. In reaction to these previous reviews we present the amount of time spent on staff development interventions as a possible influencing variable of transfer.

In our review we code our studies as one-time interventions if the amount of time spent on the staff development intervention varies from one hour/one day to two consecutive days. If the amount of time spent on the staff development intervention is more than one day with a time lag between the sessions, or more than two consecutive days, the study is coded as an extended over time intervention.

Only five studies report on one time events. Three of them report positive results, one study reports partial impact and one study shows negative results. Up to 40 studies report on an intervention extended over time. Most of the time (35) a positive impact is found. One of the 40 studies reports a negative impact and four of them show partial impact. The results of the coding are presented in Table 8. A preliminary conclusion is that staff development interventions extended over time show more positive results of transfer of learning than one-time interventions. Staff development must be an ongoing activity. Further research is needed.

3.3.4. Learning climate

The review of Weimer and Lenze (1998) stresses the importance of incorporating the results of studies on adult learning into further research on the impact of staff development. An important finding of research on adult learning is that the learning climate influences retention of employees (Kyndt, Dochy, Michielsen, & Moeyaert, 2009). Thus, since continuous learning and development is prerequisite of retention (Govaerts, Kyndt, Dochy, & Baert, 2011; Kyndt et al., 2009) we present the learning climate as a possible additional influencing variable transfer. In our review we categorise two different approaches to the learning climate, these being the 'appreciative approach' and 'gap approach' (Baert, De Rick, & Van Valckenborgh, 2006; Govaerts et al., 2011; Kyndt et al., 2009). The emphasis of the 'gap approach' is on what is lacking or what is going wrong in an organisation. The focus of this approach is on diagnosing the problem and subsequently implementing an action plan. The focus of the 'appreciative approach' is to find and ameliorate solutions that already exist. In this approach staff development interventions are used to further develop the strengths and talents of the teacher. The basic idea of this approach is that knowing your strengths and the further development of these talents offers the most room for teacher growth. We coded the studies following this dichotomy.

Deducing this information from the articles studied led to 31 studies offering information on an appreciative approach. Only one of those 31 studies showed a negative result on transfer of learning. Table 8 shows the result of our coding. It is conspicuous that no studies with a gap approach were found. As a consequence we suggest that further research on the effects of learning climate as an influencing variable on transfer to the workplace is needed. No preliminary conclusions can be formulated.

3.3.5. An adapted conceptual framework

We refined the conceptual framework by including the additional influencing variables of transfer as mentioned above. With this adapted version of the conceptual framework, presented in Fig. 2, we intend to provide guidelines for researchers and practitioners concerning staff development in higher education.

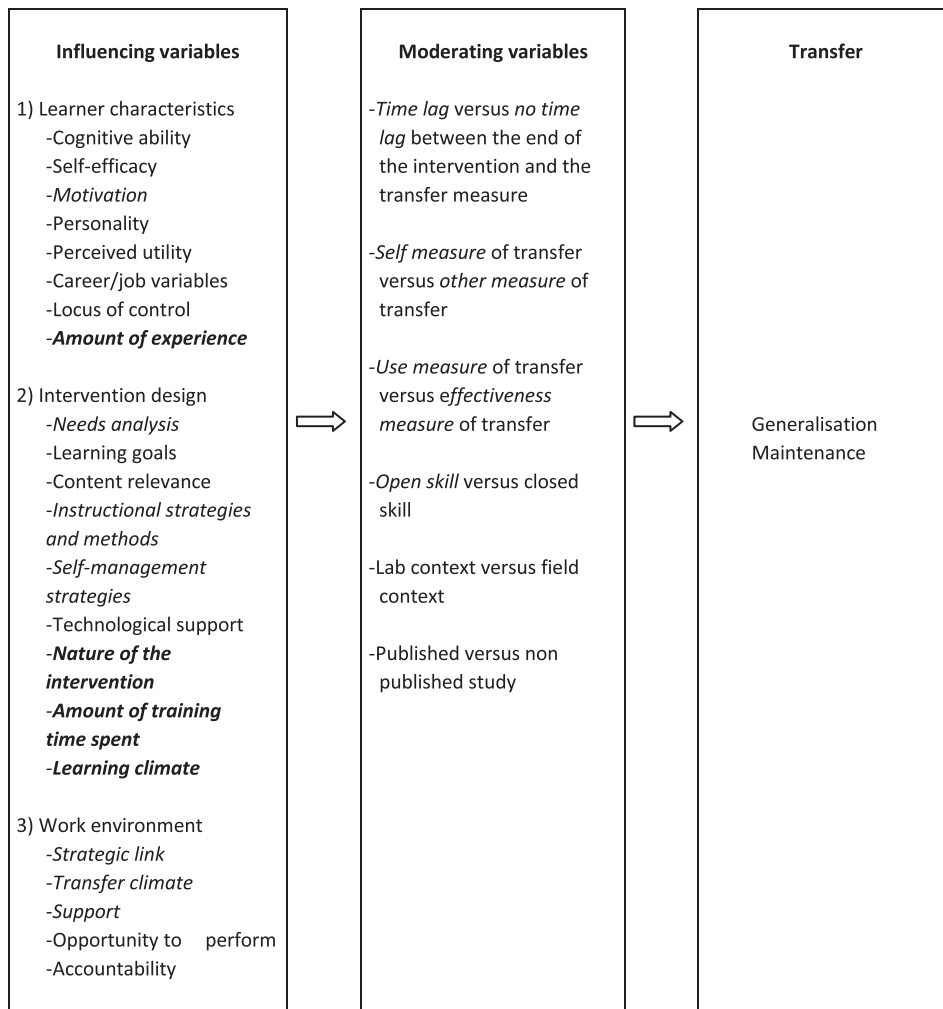


Fig. 2. Transformed conceptual framework for variables potentially influencing transfer of learning in staff development interventions. *Note:* Italics = Further research is needed. Bold = Additional influencing variables.

4. Conclusion and discussion

If we wish to improve staff development we need to know which variables really make a difference in the complex process of achieving transfer of learning. To gain new insights into this process, evidence from solid research is required.

Management, HRD and organisational psychological reviews are interesting sources to build a conceptual framework that could be used as an analysis tool for educational research (Research questions 1 and 2). This framework consists of three groups of influencing variables, being learner characteristics, intervention design and work environment. Learner characteristics are: cognitive ability, self-efficacy, motivation, personality, perceived utility, career/job variables, locus of control. Influencing variables of the intervention design cluster are: needs analysis, learning goals, content relevance, instructional strategies and methods, self-management strategies and technological support. The following influencing variables are part of the work environment cluster: strategic link, transfer climate, support, opportunity to perform, accountability (Research question 1).

Studying management, HRD and organisational psychological reviews we specified six moderating variables in our conceptual framework: time lag versus no time lag, self measure versus other measure of transfer, use measure versus effectiveness measure of transfer, open skill versus closed skill, lab context versus field context, and published versus non published study (Research question 2).

Those conclusions of management, HRD and organisational psychology research are used to review educational research on transfer of learning within the context of staff development in higher education. We conclude that motivation, needs analysis, learning goals, content relevance, practice and feedback, behavioural modelling, active learning, self management

strategies, strategic link, positive transfer climate, peer support and opportunity to perform may be influencing variables of transfer of staff development learning (Research question 3).

Comparing our findings with the conclusions of the selected reviews from the field of management, HRD and organisational psychology (Baldwin & Ford, 1988; Blume et al., 2010; Burke & Hutchins, 2007) we suggest that educational research on the following influencing variables is most needed: motivation to learn, motivation to transfer, needs analysis, active learning, self-management strategies, strategic link, transfer climate, supervisory support.

Moderating variables that could be of importance within the context of staff development in higher education and that need further research are time lag versus no time lag, self measure versus other measure of transfer, use measure versus effectiveness measure of transfer, and open skill (Research question 4).

Furthermore we present four additional influencing variables of transfer of learning: amount of experience, nature of the intervention, amount of time spent and learning climate (Research question 5). Further research on those four additional variables is necessary.

With our conceptual framework (Fig. 2) we intend to present some guidance for staff developers and educational researchers. As for effective learning and effective teaching, there is no single recipe for successful transfer of learning. This means that the task of the staff developer is a challenging one. With our framework we intend to give some guidance in this complex task. The framework is also an answer to our critique on previous research. It is highly curious that such limited documentation about variables influencing transfer is presented in studies measuring transfer of staff development learning. The framework gives an overview of variables which are relevant in our search for comprehension of transfer processes. Further research on transfer of staff development learning should carefully describe trainee characteristics, intervention characteristics and context characteristics such as work environment.

A conclusion of our review is that further research on transfer of staff development learning should focus on motivation to learn and motivation to transfer. Previous research on the process of transfer presents theoretical models addressing the central role of motivation in the transfer process (Beier & Kanfer, 2010; Gegenfurtner, Veermans, Festner, & Gruber, 2009; Kontoghiorghes, 2004). Further research within the field of staff development should build upon those theoretical models and conclusions of recent reviews on motivation and transfer (Gegenfurtner, 2011; Gegenfurtner, Veermans, & Vauras, 2013). The meta-review of Gegenfurtner (2011) studies whether motivation exhibits a stable influence on transfer. Furthermore this study estimates the extent to which moderator variables influence the motivation-transfer relationship. Gegenfurtner (2011) conceptualises motivation in nine dimensions and concludes that motivation is relevant for transfer. The author stresses that motivation is too complex a phenomenon to be downsized to a single factor. Theoretical models of training effectiveness need to reflect motivation in one or more of its multiple dimensions (p. 163). The moderator analysis shows that environmental factors explain important percentages of variance and therefore influence transfer. Findings of those interesting studies could be used to extend our framework for staff development research and practices.

With our findings we draw attention to a possible positive outcome bias in the research on transfer of staff development learning. Already in 1979 Rosenthal had introduced the term “file-drawer problem” reporting on this effect (Rosenthal, 1979). Of the 46 educational studies that met our inclusion criteria, 39 report positive transfer results. In other words, 80% of the studies show that learning actually transfers to job performance. This is in sharp contrast with management, HRD and organisational psychology studies showing that only 10% of learning actually transfers to job performance. So, it is possible that the studies published are not representative for the field. If the positive publication bias is a fact, it may distort our review results. With this remark we appeal to authors and editors. If we want to fully understand the complex process of transfer of learning, studies with negative results do matter.

On the other hand a recent meta-analysis study of Dalton, Aguinis, Dalton, Bosco, and Pierce (2012) shows that, contradictory to the previous remark, the file drawer problem does not pose a serious threat to validity of meta-analytically derived conclusions.

With the idea that negative result studies do matter if we want to understand the process of transfer of learning, we will take a closer look at the studies in our review, reporting negative transfer results. Two studies that met our inclusion criteria reported negative transfer results (Addy & Blanchard, 2010; Nasmith, Saroyan, Steinert, Lawn, & Franco, 1995). We will search for influencing variables and moderators that probably inhibit transfer of learning. Doing so, we apply our transformed conceptual framework (Fig. 2) to those two specific cases.

Applying our transformed conceptual framework (Fig. 2) we must conclude that unfortunately the study of Nasmith et al. (1995) includes minimal information on learner characteristics, intervention design and work environment. The study reports on a one-time event (two days) and off the job learning. The subjects of the study are experienced teachers. Transfer is measured by observation by a trained observer (other measure) and by a retrospective intervention and post intervention interview (self measure). The time lag between the end of the intervention and the transfer measure is six months to five years.

Interpreting those influencing variables and moderators mentioned, we conclude that maybe the effects of staff development learning decayed over time. The large time lag between the end of the intervention and the transfer measure could have a negative influence on the results. In addition, a remark must be made on the design of the study. We question the value of the control group in the study. The study mentions a developmental growth (from attended workshops, fellowship years and personal interest in techniques and methods related to small scale teaching) of the control group during the time lag between intervention and measure. This development of the control group could have influenced the results.

Despite the attention on a lot of influencing variables (motivation to learn, needs analysis, content relevance, practice and feedback, active learning, behavioural modelling and opportunity to perform) a negative result is found in the study of Addy

and Blanchard (2010). The message of this study is that bottom up reform is problematic if curriculum redesign is not taken into account. The authors believe that, although teaching assistants had the chance to teach and to use their gained knowledge, skills and conceptions, this was not sufficient. Teaching assistants were limited by the structure of the course they were teaching. The structure of the course did not allow the teaching assistants flexibility in terms of reform-minded choices. The authors conclude that teacher perceptions of environmental constraints can weaken the alignment of practices and beliefs (Addy & Blanchard, 2010, p. 1068). Furthermore, the authors question whether the RTOP was a good instrument regarding the context of their study.

These two studies are good examples of negative outcome studies giving an added value to our understanding of transfer of staff development learning.

The research design of the studies measuring transfer of staff development learning can also have an impact on the outcome reported. Further research on this assumption is needed. Gegenfurtner (2011) also emphasises the importance of different assessment sources if we want to measure transfer of learning. Studies with a pretest design or control group design are scarce. Previous educational reviews studying the impact of staff development stressed the importance of more qualitative or mixed method studies (Levinson-Rose and Menges, 1981; Weimer & Lenze, 1998). From our review we can conclude that the research field has taken this recommendation into account. Most of the studies that reached our criteria of inclusion were characterised by a qualitative or mixed method approach. On the other hand, despite the call of Levinson-Rose and Menges (1981) to take the individual differences of teachers participating in staff development initiatives into account, our review concludes that taking learner characteristics into consideration is still not common in studies looking into transfer of staff development learning. This review shows that, in relation to the review of Stes et al. (2010), during the last three years there has been a considerable growth in the amount of empirical research studying transfer of staff development learning. However, this growing body of evidence only brings limited clarity in the process of transfer. We hope this review illuminates some guidelines for further research. With this study we went one step further than the previous reviews and looked at what could work for whom under what conditions. A lot of influencing variables seem to matter.

A next step, especially towards the practical implications of staff development studies, is searching for ways to successfully modify those influencing variables of transfer of learning. What specific changes in, for example, intervention design are needed? Such an evolution would be interesting for educational practice and policy makers but also for educational research.

Future research could compare our adapted conceptual framework (Fig. 2) again with findings of management, HRD and organisational psychological studies. A combination of keywords different than those used in our review, could provide us with other interesting findings of management, HRD and organisational psychological research.

From management, HRD and organisational psychology (Burke & Hutchins, 2007) we learn that the research design of studies into transfer of learning should change from a short term measure to a retention interval of 12 months. As the duration of the retention interval might play an important role in transfer of learning, it would be an interesting topic for future review studies. With this suggestion for further research we appeal to all authors to mention the exact duration of the retention interval.

A limitation of the current review is that we define the results of our study as preliminary. We have two reasons to do so. The first reason is the possible positive outcome bias in the research on transfer of staff development learning. Therefore, our suggestion for further research is to publish more negative outcome studies. The second reason is that most of the studies that met the inclusion criteria do not include a measure of the influencing variables of transfer. Future research could focus on some important influencing variables of transfer and incorporate a real measure of these influencing variables into the study design.

As development will come about only by addressing teachers' underlying conceptions of teaching and learning (Norton, Richardson, Hartley, Newstead, & Mayes, 2005), a final suggestion for further research is incorporating the conceptions of teachers as an influencing variable on transfer of learning. The study of the conceptions of learners and teachers is a hot issue in educational research (Lotter, Harwood, & Bonner, 2007). Maybe the field of management, HRD and organisational psychology research can adopt this interesting topic for further research on transfer of learning.

With this review we focused on changes in behaviour. Further research could study change in conceptions or identity as a result of staff development. It would also be interesting to study whether changes in conceptions or identity occur after changes in behaviour knowledge and skills or vice versa. Hereabout the literature reveals the following two perspectives. Fitch and Kopp (1990) see improved instruction as the primary purpose of staff development. Effective staff development should therefore constantly focus on this goal. Therefore, it should build up common knowledge and concepts and contain clear objectives which are linked to what should be learned in classroom practice. Furthermore, the desired changes must be turned into beliefs and, in turn, these must be translated into specific behaviours. This can be seen in contrast to the work of Guskey (1986) and Eley (2006), who found changes in teachers' beliefs only after the implementation of new methods, new skills and new knowledge.

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*References marked with an asterisk indicate studies included in the present review.

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