



ELSEVIER

Contents lists available at SciVerse ScienceDirect

Educational Research Review

journal homepage: www.elsevier.com/locate/EDUREV

Review

Effects of computer support, collaboration, and time lag on performance self-efficacy and transfer of training: A longitudinal meta-analysis

Andreas Gegenfurtner^{a,*}, Koen Veermans^b, Marja Vauras^b^aTUM School of Education, Technical University of Munich, Schellingstr. 33, D-80799 Munich, Germany^bCentre for Learning Research, University of Turku, Assistentinkatu 5, FI-20014 Turku, Finland

ARTICLE INFO

Article history:

Available online 13 April 2012

Keywords:

Self-efficacy

Transfer of training

Computer-supported collaborative learning

(CSCL)

Time lag

Longitudinal meta-analysis

ABSTRACT

This meta-analysis (29 studies, $k = 33$, $N = 4158$) examined the longitudinal development of the relationship between performance self-efficacy and transfer before and after training. A specific focus was on training programs that afforded varying degrees of computer-supported collaborative learning (CSCL). Consistent with social cognitive theory, results suggested positive population correlation estimates between self-efficacy and transfer before ($\rho = 0.31$) and after ($\rho = 0.39$) training, and thus a small but positive increase. Three boundary conditions were estimated. First, effect sizes were higher in trainings with rather than without computer support. Second, effect sizes were higher in trainings without rather than with collaboration. Third, time lag had marginal effects. These findings are discussed in terms of their implications for theories of complex social and computer-mediated learning environments and their practical significance for scaffolding technology-enhanced learning and interaction.

© 2012 Elsevier Ltd. All rights reserved.

Contents

1. Introduction	76
1.1. Self-efficacy and transfer of training	76
1.2. Time lag	76
1.3. Computer-supported collaborative learning	77
1.4. The present study—hypotheses	77
2. Method	78
2.1. Literature searches and criteria for inclusion	78
2.2. Recorded variables	78
2.3. Meta-analytic methods used	78
2.3.1. Primary meta-analysis	78
2.3.2. Meta-analytic moderator estimation	79
3. Results	79
3.1. Description of the included studies	79
3.2. Primary meta-analyses	79
3.3. Meta-analytic moderator estimation	79
3.3.1. Time lag	79
3.3.2. Computer support	80
3.3.3. Collaboration	82

* Corresponding author. Tel.: +49 89 289 25101; fax: +49 89 289 25172.

E-mail address: andreas.gegenfurtner@tum.de (A. Gegenfurtner).

3.3.4. Computer support and collaboration.	82
3.4. Longitudinal development of effect sizes.	82
4. Discussion.	83
4.1. Discussion of primary meta-analysis.	83
4.2. Discussion of meta-analytic moderator estimation.	83
4.3. Implications for educational practice.	84
4.4. Study limitations and directions for future research.	84
4.5. Conclusion.	85
Appendix A.	85
References.	87

1. Introduction

Training research has shown that self-efficacy is positively related with transfer of training (Gegenfurtner, 2011; Stevens, Bavetta, & Gist, 1993). However, systematic estimation of the longitudinal development of the relationship between self-efficacy (Bandura, 1997) and transfer of training (Gegenfurtner, 2011) is in its infancy, particularly with regard to the boundary conditions under which efficacy beliefs affect transfer at work (Kanfer, 2005). The present study investigates how the self-efficacy–transfer relationship develops and whether computer support, collaboration, and time lag function as moderators of this development.

1.1. Self-efficacy and transfer of training

Self-efficacy refers to “beliefs in one’s capabilities to organize and execute the courses of action required to produce given attainments” (Bandura, 1997, p. 3). Efficacy beliefs are among the most widely documented predictors of achievement, which has been documented in domains including industry (Granados Cannawurf, 2005), military (Tannenbaum, Mathieu, Salas, & Cannon-Bowers, 1991), and education (Baeten, Kyndt, Struyven, & Dochy, 2010; Van Dinther, Dochy, & Segers, 2011).

Transfer of training can be defined as the productive use of newly acquired knowledge and skills in application contexts on the job (De Grip & Sauermann, 2012; Festner & Gruber, 2008; Gegenfurtner, Festner, Gallenberger, Lehtinen, & Gruber, 2009; Kauffeld, 2010), and as such can be seen as one form of achievement. Therefore, if efficacy beliefs predict achievement, it would be expected that efficacy beliefs also predict successful transfer of training. However, the literature shows mixed evidence. For example, some investigations showed high correlation estimates between self-efficacy and training transfer (Cole, 2008; Gist, Stevens, & Bavetta, 1991), while other investigations suggested that the magnitude of this relationship is negligible (Brown & Warren, 2009; Marett, Biros, & Knode, 2004).

When the literature shows mixed evidence, meta-analysis can provide a framework for interpreting these mixed results. For instance, one possible explanation for mixed evidence is the influence of sampling error and error of measurement (Hunter & Schmidt, 2004), which may have induced biases on the true score population correlation estimate.

Another important aspect of meta-analysis is that it looks at a variety of studies in the same domain or on a similar topic. So, apart from being able to estimate biases related to sampling error and error of measurement, it might also be used to study the effects of some of the variables, settings, and factors that vary over the different studies.

Studies might vary in how the concepts that were used have been measured and operationalized, but also with regard to how interventions have been implemented. As Kanfer (2005) argued, identifying differential effects of implementation or boundary conditions has important implications for testing the predictive validity of social cognitive theory in a training context.

Because self-efficacy and transfer are influenced by training implementation as well as by organizational and workplace factors after training, it seems significant to examine the self-efficacy–training transfer relationship under different boundary conditions over time. Inquiring into these characteristics as boundary conditions is significant, because they may explain some of the disagreement in the existing literature.

Therefore, one aim of the present study was to use meta-analytic methods to inquire whether performance self-efficacy, after controlling for sampling error and error of measurement and averaging over conceptual and measurement differences, exhibits a stable influence on transfer and whether this relationship would be higher after training than before training. The present study analyzed two boundary conditions that emerged from preliminary analyses of publications in the field: time lag and computer-supported collaborative learning.

1.2. Time lag

Time lag refers to the time interval between the last day of the training program and the measure for assessing transfer. Previous reviews indicated that time lag can significantly moderate the size of the relationship between self-efficacy and transfer (Blume, Ford, Baldwin, & Huang, 2010; De Rijdt, Stes, Van der Vleuten, & Dochy, 2012). For example, Blume and colleagues (2010) documented a higher population correlation estimate between transfer and pre-training self-efficacy in stud-

Download English Version:

<https://daneshyari.com/en/article/355123>

Download Persian Version:

<https://daneshyari.com/article/355123>

[Daneshyari.com](https://daneshyari.com)