Computers in Human Behavior xxx (2013) xxx–xxx

Contents lists available at ScienceDirect

Computers in Human Behavior

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

Structural relationships among effective factors on e-learners' motivation for skill transfer

Young Ju Joo [a,1], Sunyoung Joung [b,*], Hyun Soo Son [a]

[a] Dept. of Edu. Technology, Ewha Womans University, 52, Ewhayeodae-gil, Seodaemum-gu, Seoul 120-750, Republic of Korea
[b] Dept. of Education, Kookmin University, 77 Jeongneung-ro Seongbuk-gu, Seoul 136-702, Republic of Korea

ARTICLE INFO

Article history:
Available online xxxx

Keywords:
Internal value
Learning usefulness
Motivation for skill transfer
e-Learner's achievement

ABSTRACT

This study investigates the structural relationships among the following factors: e-learners' internal value, learning usefulness, learning environment, satisfaction, learner achievement, and motivation for skill transfer. To answer the research questions, the researchers administered online surveys to 584 students enrolled in two courses, Conflict Management and Negotiation and Communication Skills, at S Cyber University. According to the results of structural equation modeling, the structural relationships among e-learners' internal value, learning usefulness, learning environment, learner satisfaction, learner achievement, and motivation for skill transfer were significant and showed positive influence. However, the relationships among learning usefulness, learning environment, learner satisfaction, and learner achievement and those of learning environment, learner satisfaction, and motivation for skill transfer were not significant. Overall, the findings suggest specific strategies to improve e-learners' learning outcomes.

1. Introduction

Although cyber universities are recognized as educational organizations of the future, their educational outcomes have not yet been fully studied. Particularly, despite various discussions on the design aspects of educational systems and programs for producing positive educational outcomes, research is scarce on the transfer of cyber university educational outcomes to career fields (Lim, 2009). Recently, transfer of training was used for educational evaluation in the enterprise educational environment. In cyber universities, however, it is difficult for most cyber learners to directly implement their knowledge and skills to their job situation. It is difficult to evaluate learning outcomes because the purpose of cyber universities is to provide higher education to adults who have not previously had the opportunity to attend tertiary institutions, due to either personal or economic reasons (Lim, 2009).

Motivation to transfer learned skills has proven to be an important factor predicting learners' actual behavioral change (transfer) in numerous research studies (e.g., Baldwin & Ford, 1988; Burke & Hutchins, 2007). It was confirmed that the motivation to transfer occurred prior to the transfer of training (Axtell, Maitlis, & Yearta, 1997; Chiaburu & Lindsay, 2008). Additionally, Gegenfurtner, Veermans, Festner, and Gruber (2009) emphasized the importance of research on the motivation of transfer by mentioning that major interests of human resource development (HRD) theory and practices include training failure, namely, low return on investment due to learners' low motivation to transfer. As it is confirmed that motivation to transfer is the main variable determining educational effects, in conjunction with learning motivation (Shin & Oh, 2004), measuring educational outcomes of cyber universities through motivation to transfer should provide meaningful insights.

The factors affecting transfer or motivation to learning transfer can be classified into three main types: learner characteristics, training design, and external environment. Baldwin and Ford (1988) proposed the transfer process model, in which they presumed that personal factors, training-related factors, and organizational factors affect transfer of learning both directly and indirectly. Noe (1986) argued that positive perception of the organizational environment affects transfer motivation by demonstrating the effects of learning motivation on educational training outcomes.

Additionally, Holton (1996) reported that learning, expected usefulness of the training, job attitude, learner satisfaction, and the transfer environment directly affect motivation to transfer by presenting the HRD evaluation research and measurement model. Moreover, Gegenfurtner et al. (2009) divided the factors affecting motivation to transfer as personal, training-related, or organizational. They also extended Baldwin and Ford's (1988) transfer process model by categorizing the factors as occurring before training, in the middle of training, or after training.

* Corresponding author. Tel.: +82 10 2667 7064.
E-mail addresses: youngju@ewha.ac.kr (Y.J. Joo), sjoung@kookmin.ac.kr (S. Joung).
[1] Tel.: +82 10 8975 3532.

0747-5632/$ - see front matter © 2013 Elsevier Ltd. All rights reserved.
http://dx.doi.org/10.1016/j.chb.2013.08.011

However, Noe (1986) pointed out most studies that analyzed learning outcomes according to the learner's personal characteristics were mainly focused on the learner's intellectual ability, and research on learner motivation and environment factors remains insufficient. Campbell (1988) and Tannenbaum and Yukl (1992) proposed that the concept of training effects should be extended to the personal variables of trainees and the research should include trainees' self-efficacy and motivation.

Meanwhile, Warr and Bunce (1995) mentioned that learners' responses to the usefulness of their learning can be effective on three learning design principles (i.e., same element, stimulus variation, general principles). They also pointed out that measuring only learner enjoyment is problematic; the instructor and job-related usefulness of training contents should also be studied as important response measurement estimates (Alliger & Janak, 1989; Warr & Bunce, 1995). Until now, learner satisfaction has been frequently used to evaluate training results due to measuring convenience.

Moreover, as the effects of external environment on motivation to transfer were studied with a focus on the workplace environment (e.g., seniors, colleague support, organizational environment) in previous works (Facteau, Dobbins, Russell, Ladd, & Kudisch, 1995; Huczynski & Lewis, 1980; Kirwan & Birchall, 2006; Seyler, Holton, Bates, Burnett, & Carvalho, 1998). It is thought that additional studies focused on the learning environment (e.g., instructor, colleague support, learning atmosphere) should be conducted to provide a more complete picture.

Therefore, the current study aims to investigate the effects of internal value as a personal characteristic of learners. It includes internal value as a motivational variable, learning usefulness as learning content variable, and learning environment as an external environmental variable possibly affecting learner achievement, learner satisfaction, and motivation to transfer. We adopt an integrative model and confirm the structural relationships among the variables. Moreover, we identify the effects employment status on learning by investigating the differences in structural relationships among the variables according to learners' employment status.

Cyber universities typically have high proportions of learners who are employed than do traditional universities. Although many previous studies have investigated the effects of having a job on university students' academic achievement, the results are contradictory. That is to say, some researchers reported that simultaneously holding a job and studying at a university is potentially be harmful to one's learning (Astin, 1993; Lammers, Onwuegbizie, & Slate, 2001). Other researchers expressed positive opinions (Dallam & Hoyt, 1981; Lucas & Lammont, 1998). Furthermore, some proposed that it is not employment status but the difference in distribution of the learner's time (Dundes & Marx, 2006/2007; Gleason, 1993; Orszag, Orszag, & Whitemore, 2001).

The purpose of this study is to examine the effects of internal value, learning usefulness, and learning environment on learner satisfaction, learner achievement, and motivation to transfer of learning to their workplace. Additionally, we will investigate the structural relationships among e-learners' internal value, learning usefulness, learning environment, achievement and motivation for transfer depending on their employment status. The independent variables are internal value, learning usefulness, and learning environment. The dependent variable is the motivation to transfer of learning. The moderating variables are achievement and satisfaction. The specific research questions are as follows:

(1) Do e-learners' internal value, learning usefulness, and learning environment affect learner satisfaction?
(2) Do e-learners' internal value, learning usefulness, learning environment, and learner satisfaction affect learner achievement?
(3) Do e-learners' internal value, learning usefulness, learning environment, learner satisfaction, and learner achievement affect the motivation for skill transfer?

2. Theoretical background

Internal value is a concept related to learner motivation in Eccles's (1983) expectancy-value model. Numerous studies argue that learners with high internal value have the learning goal of mastery, are oriented toward learning and challenge, and think their project is interesting and important (Ames & Archer, 1988; Eccles, 1983; Meece, Blumenfeld, & Hoyle, 1988).*Learning usefulness* has been defined as encompassing three concepts: *interest in training*, *perceived usefulness*, and *perceived difficulties*, by Warr and Bunce (1995). In particular, usefulness reflects the potential for the application of training content to a job (Shin & Oh, 2004).

Learning environment, in this study, is considered to be made up of *instructors' support*, *colleagues' support*, and *learning atmosphere*. Instructors' support refers to information given to learners by their instructors about the curriculum and learning achievement (Butler & Winne, 1995). Colleagues' support refers to when colleagues help learners in their learning process and help them apply what they have learned (Holton, 1996).*Learning outcomes* in this study are *satisfaction*, *achievement*, and *transfer motivation*. Satisfaction refers to the emotional response toward educational training and the emotional attitude emerging from the perception of a particular educational program. It measures how satisfied learners are with the whole learning experience and includes assessment of areas such as how helpful the program was, whether they would recommend it to others, and how satisfied they were in general (Lim, 2009). Evaluation criteria for *achievement* in training criteria relate to traditional exam results (Kraiger, Ford, & Salas, 1993). Iverson, Colky, and Cyboran (2005) say that it is important to measure knowledge change after training by controlling prior knowledge. Exam problems extracted based on content analysis of curriculum resources confirm the importance of expert instructors to ensure content validity. Finally, transfer motivation, which is considered the most important variable in training program development, is defined as the trainee's desire to apply the knowledge and skills that they have learned from the training program. It is related to Kirkpatrick's third level of evaluation—"transfer measurement."

Studies regarding internal value and satisfaction report that the higher the internal value, the higher the satisfaction (Vansteenkiste et al., 2007). Vansteenkiste et al. (2007) confirmed that an internal as opposed to an external task value orientation shows fewer negative results (higher satisfaction, higher activities in task) and more positive results (low tiresomeness, long-term satisfaction after successful goal achievement, low intention to leave job), in research using self-determination theory.

Several studies have presented research regarding learning usefulness and satisfaction centered in a school environment. In research investigating the effects of learner- and instructor-related variables Hong (2002) reported that group discussion can make learner–instructor interaction more positive and that learners who perceive learning resources positively are satisfied with a web-based learning process.

Roszkowski and Soven (2010) performed research on the relationships among three types of responses, targeting university freshmen. Responses were divided into *amount learned*, *information usefulness*, and *satisfaction with training program*. Their results showed that amount learned and information usefulness appeared to predict training satisfaction higher.

The research on relationships between learning environment and satisfaction shows that learning environment can positively

Please cite this article in press as: Joo, Y. J., et al. Structural relationships among effective factors on e-learners' motivation for skill transfer. *Computers in Human Behavior* (2013), http://dx.doi.org/10.1016/j.chb.2013.08.011

affect satisfaction. Sahin (2007) showed that learner motivation and variables relating to online learning environment all relate to satisfaction. The research divided these variables into *teacher support*, *learner interaction and cooperation*, *individual relevance*, *practical learning*, *active learning*, and *learner volunteering*, and conducted correlation analysis on the basis of Distance Education Learning Environments Survey (DELES) results.

Kruger, Struzziero, Watts, and Vacca (1995) conducted a study predicting the effects of job environment on satisfaction. The measured *management support*, *perceived goal of teacher support team*, *team support*, and *teacher support team training* as components of the job environment. On the basis of measurement of 161 teacher support team training participants and 127 customers supporting teacher support teams from 27 schools, job environment appeared to predict the satisfaction of the teacher support team, while management support raised the satisfaction of customers supported by the teacher support team. Therefore, the following hypothesis was induced.

Hypothesis 1. E-learners' internal value, learning usefulness, and learning environment affect satisfaction.

Research on internal value and achievement has been conducted in relation to learning environment. For instance, Pintrich and DeGroot (1990) investigated relationships among *motivation orientation*, *self-regulated learning*, and *academic achievement* in the classroom using self-reporting methods targeting 173 seventh-graders participating in science and English classes. They confirmed positive relationships among these variables by collecting performance data based on performance results on class projects, finding that self-*efficacy* as a motivation factor and *internal value* have positive relationships with *cognitive flow* and *performance* (average of exam and quiz scores, essay marks, and report marks).

Lan and Skoog (2003) investigated the relationships among twelveth-graders' *self-efficacy*, *internal value*, *motivation*, and some metacognitive variables including *cognitive belief toward learning*, *knowledge*, and *achievement*, using data from the TIMSS (Trends in International Math and Science Study). Research results confirmed that self-efficacy, internal value, and perceived belief all predicted achievement in both math and science.

Research on learning usefulness and achievement has been conducted in various ways in both school and corporate environments. Learning usefulness has been reported to affect achievement. Alliger, Tannenbaum, Bennett, Traver, and Shotland (1997) conducted a meta-analysis to find differences in perceived usefulness between learning undergone right after training and learning undergone after a certain period of time in terms of *persistence* and *behavior/skill execution* to confirm the fitness of the division of measurement of training response into emotion and usefulness. The division showed high confidence, and it was confirmed that usefulness has a stronger relationship with learning and transfer than does emotional response.

Research on the relationship between satisfaction and achievement has shown that satisfaction has positive effects on achievement. Picke (1991) found that the effects of satisfaction on achievement are stronger than those of achievement on satisfaction, unlike in other educational models. Eom and Wen (2006) conducted a study confirming the factors affecting learner satisfaction and learning results, targeting 397 learners who registered for more than one online course. They confirmed that *teacher feedback*, *learning style*, and satisfaction affect learning results. Accordingly, the following hypothesis was induced.

Hypothesis 2. E-learners' internal value, learning usefulness, learning environment, and satisfaction affect achievement.

The research on internal value and transfer motivation is currently very insufficient. Nevertheless, in this section, we try to infer the relationship between internal value and transfer motivation based on previous research results reporting that this relationship is strong and positive (Baldwin & Ford, 1988; Burke & Hutchins, 2007).

Osterloh and Frey (2000) conducted a study confirming that the effect of internal value on knowledge transfer is deterministic. Lin (2007) also confirmed the roles of external and internal value in *knowledge-sharing intention* among 172 laborers by integrating a motivational view with the theory of reasoned action, to investigate if internal and/or external motivation can be used to explain laborers' knowledge-sharing behavior.

Meanwhile, the previous literature on learning usefulness and transfer motivation reports consistent results. Liebermann and Hoffmann (2008) investigated the validity of the evaluation model developed by Baldwin and Ford (1998), targeting 213 bank employees participating in a training program for service quality improvement. Analysis results using a structural equation model confirmed that the relationship between training and practice positively affects participant's response, transfer motivation, and transfer to a significant degree.

Ruona, Leimbach, Holton, and Bates (2002) investigated the relationship between learners' usefulness response and variables predicting learning transfer, using LTSI (Learning Transfer System Inventory) and targeting 1616 laborers participating in various organizations and training program. They confirmed that perceived *usefulness* has relationships with *response transfer design*, *transfer efforts*, *perceived content validity*, and *performance self-efficacy* including transfer motivation, with particularly strong predictive effects for transfer motivation.

Huczynski and Lewis (1980) conducted a study confirming various factors affecting transfer motivation and transfer by measuring whether they apply training content to improve job performance. Learners transferring training content to practice were more likely to believe that the learning process would be useful for their job and to have more discussion with their seniors. Also, transfer motivation was more successful and useful when seniors provided new ideas. It was confirmed that *overload*, *job crisis*, and *insufficient faith in seniors* were inherent factors for transfer. Seniors' *management style* and seniors' *attitude* were also confirmed to be important.

Burke (1997) examined the effects of *recurrence-prevention training* on *sustaining learned knowledge and skills*. The results report that transferring ability, program response, satisfaction, achievement, and learning persistence have significant relationships with transferring motivation.

Research on achievement and transferring motivation reports positive relationship among the variables. Shin and Oh (2004) performed a study confirming relationships among prior training motivation, job-related usage, instructor quality, learning achievement, and transferring motivation. Specifically, it was confirmed that prior training motivation affects job-related usage, while instructor quality and prior training motivation affect learning achievement, and learning achievement affects transfer motivation. Thus, the following hypothesis was induced.

Hypothesis 3. E-learners' internal value, learning usefulness, learning environment, satisfaction, and achievement affect the motivation to skill transfer.

In the current study, internal value, learning usefulness, and learning environment are independent variables, satisfaction and achievement are moderate variable, and motivation to transfer of learning to their workplace is the dependent variable. Fig. 1 shows the hypothetical research model based on hypothesis as follows.

Please cite this article in press as: Joo, Y. J., et al. Structural relationships among effective factors on e-learners' motivation for skill transfer. *Computers in Human Behavior* (2013), http://dx.doi.org/10.1016/j.chb.2013.08.011

3. Methodology

3.1. Subject and procedure

Researchers administered online surveys over a two-week period to students enrolled in two courses, Conflict Management and Negotiation and Communication Skills, at S Cyber University. S Cyber University was selected because it was the first of its kind established in Korea and ranked number one in an evaluation conducted by the Education and Science Technology Department in 2007. It is also represents systematic education, with a re-registration rate of over 90% for three consecutive years. Finally, S Cyber University provides a venue for consistent research in that the participants use the same registration systems, learning management systems, learning service, grade evaluation methods, and grading systems.

Of the 599 survey responses received, 15 were excluded from analysis because they were incomplete. Therefore, data from 584 survey responses were considered in the final analysis. The survey participants were 60.1% (351) female and 39.9% (233) male. Among them, 48.5% (283) held a job and studied simultaneously. The participants ranged in age from 19 to 62. Their age distribution is as follows: Teens, 0.3% (2); twenties, 26.4% (154); thirties, 31.3% (183); forties, 32% (187); fifties, 9.6% (56); and sixties, 0.3% (2). Participants in their forties constituted the largest age group.

3.2. Measurement instrument

Researchers created a measurement instrument by adapting the previously existing ones for a cyber university environment. For each survey item, participants were asked to rate their level of agreement with a statement on a 5-point Likert scale from 5 "Strongly agree" to 1 "Strongly disagree." To measure the learner's internal value, we adapted the "internal value" part of Pintrich and DeGroot's (1990) measurement instrument. The measurement instrument for internal value consisted of 9 items (e.g., "I can learn new material because I like lectures that are challenging"). For the inter-item consistency of the measurement instrument, Cronbach's α was .88. The average extracted variance was .97. Therefore, we confirmed the instrument's convergent and discriminant validity.

We adapted the development instrument for enterprise in Warr and Bunce (1995) measurement instrument of learning usefulness. The development instrument consisted of 8 items (e.g., "The e-learning material can be usefully applied in other courses"). For the inter-item consistency of the measurement instrument, Cronbach's α was .93. The concept reliability of this study was .99, and the average extracted variance was .99. Therefore, we confirmed the instrument's convergent and discriminant validity.

We used Kim's (2009) instrument to measure learning environment after removing two items irrelevant to cyber universities (e.g., "My company allocates jobs for me to continue gaining new knowledge and skills"). The measurement instrument consisted of 6 items (e.g., "My colleagues fully support my learning"). The Cronbach's α of inter-item consistency was .92. The concept reliability of the study was .99, and the average extracted variance was .98. Therefore, we confirmed the instrument's convergent and discriminant validity.

We used Shin's (2003) instrument to measure satisfaction, which consisted of overall satisfaction, achievement, satisfaction with the lectures, and intention to recommend the cyber university to others (e.g., "My company allocate jobs for me to continually gain new knowledge and skills"). Measurement instrument consisted of 8 items (e.g., "My colleagues fully support my learning"). The Cronbach's α of inter-item consistency was .94. The concept reliability of current study was .99, and the average extracted variance was .99. Therefore, we confirmed the instrument's convergent and discriminant validity.

We used the participants' midterm and final examination scores to measure their achievement. Then, we employed Noe and Schmitt's (1986) instrument developed for the corporate environment to measure motivation to transfer learning, after adapting it to the cyber university environment. The measurement instrument consisted of 5 items (e.g., "The knowledge and experiences I have obtained from the training will help my career"). The Cronbach's α of inter-item consistency was .86. The concept reliability of current study was .99, and the average extracted variance was .98. Therefore, we confirmed the instrument's convergent and discriminant validity.

3.3. Data analysis

SPSS and AMOS were used for the data analysis. First, we examined average and standard deviation, skewness, and Kurtosis to confirm the normalization of multivariate distribution of the collected data. Second, we examined correlation to investigate the relevance among the main variables at each learner level. We also evaluated the validity of the measurement model through confirmatory factor analysis. Third, we examined the fitness of the measurement model and corrected model for explaining the structural relationships among e-learners' internal value, learning usefulness, learning environment, learner satisfaction, learner achievement, and motivation to skill transfer. Fourth, we conducted multi-level analysis to examine differences in the path coefficient for structural relationships among internal value, learning usefulness, learning environment, satisfaction, achievement, and motivation to transfer learning, according to the learner's employment status.

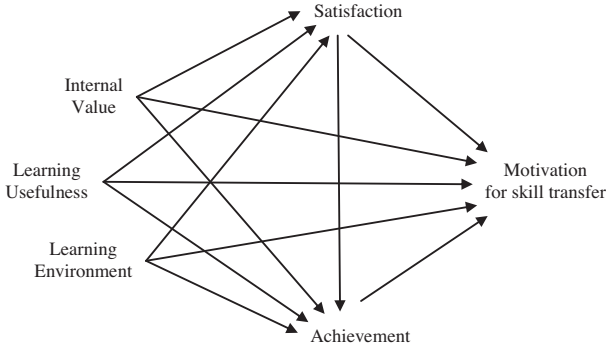

Fig. 1. Hypothetical research model.

4. Results

4.1. Descriptive statistics

To confirm the normalization of multivariate distribution of data, we analyzed average, standard deviation, skewness, and Kurtosis. The variables' means ranged from 3.67 to 53.43, standard deviation ranged from .64 to 3.97, skewness ranged from −.71 to .42, and Kurtosis ranged from −.73 to 6.24. This satisfied the basic assumptions of structural equation modeling examination, as the skewnesses of the measurement variables were less than 2 and their kurtoses were less than 7 (Curran, West, & Finch, 1996). We confirmed that all variables have a significant correlation at the $\alpha = .05$ level. Since the standard Kurtosis is smaller than 3, and Kurtosis is smaller than 10, all the normalization standards are satisfied (Kline, 2005). Thus, the current data satisfy the assumption of multivariate normal distribution. As seen in Table 1, the correlation analysis results among variables are as follows.

Please cite this article in press as: Joo, Y. J., et al. Structural relationships among effective factors on e-learners' motivation for skill transfer. *Computers in Human Behavior* (2013), http://dx.doi.org/10.1016/j.chb.2013.08.011

Table 1
Correlation analysis results among variables (n = 584).

Variables	1	2	3	4	5	6	7	8	9	10	11
1. Internal Value 1	1										
2. Internal Value 2	.78[a]	1									
3. Learning Usefulness 1	.39[a]	.44[a]	1								
4. Learning Usefulness2	.39[a]	.43[a]	.83[a]	1							
5. Learning Environment 1	.51[a]	.55[a]	.62[a]	.63[a]	1						
6. Learning Environment 2	.52[a]	.58[a]	.62[a]	.61[a]	.90[a]	1					
7. Satisfaction1	.50[a]	.56[a]	.52[a]	.53[a]	.63[a]	.67[a]	1				
8. Satisfaction2	.50[a]	.55[a]	.54[a]	.57[a]	.67[a]	.69[a]	.91[a]	1			
9. Achievement	.20[a]	.21[a]	.16[a]	.14[a]	.15[a]	.15[a]	.14[a]	.14[a]	1		
10. Transfer Motivation1	.51[a]	.57[a]	.50[a]	.53[a]	.67[a]	.71[a]	.77[a]	.78[a]	.12[a]	1	
11. Transfer Motivation 2	.50[a]	.55[a]	.48[a]	.48[a]	.63[a]	.68[a]	.71[a]	.71[a]	.15[a]	.84[a]	1
Mean	3.93	4.07	3.86	3.73	3.67	3.81	4.23	4.05	53.43	4.05	3.91
SD	.64	.64	.77	.72	.67	.66	.68	.72	3.97	.71	.67
Skewness	−.25	−.39	−.22	−.11	.12	.03	−.71	−.48	−1.48	−.46	−.24
Curtoses	−.43	−.39	−.73	−.42	−.49	−.54	.04	−.14	6.24	.02	−.31

[a] p<.05.

Table 2
Fitness examination results of the measurement model (n = 584).

	χ^2	df	TLI	CFI	RMSEA (90% Confidence Interval)
Measurement Model	46.174	25	.993	.996	.038 (.020–.055)

If RMSEA is less than .05, the model is close; if less than .08, it is reasonable; and if less than .10, it is poor (Browne & Cudeck, 1993).

Table 3
Examination results of fitness of structural model (n = 584).

	χ^2	df	TLI	CFI	RMSEA (90% Confidence Level)
Initial Research Model	49.615	30	.994	.996	.033 (.015–.050)

If RMSEA is less than .05, the model is close; lf less than .08, it is reasonable, less than .10, it is poor (Browne & Cudeck, 1993).

4.2. Measurement model

Before examining the structural model, we evaluated the fitness of the measurement model by Maximum Likelihood, according to the confirmation procedure of the second level model estimate (Kline, 2005). As seen in Table 2, all fitness indexes of the measurement model seemed desirable.

The standard factor loading index among the paths of measurement variables ranged from .838 to .965, and every path was statistically significant at the α = .05 level. Under the condition that the standard factor loading index should be greater than .30 (Hair, Anderson, Tatham, & Black, 1992), every measurement variable appeared to properly measure the corresponding latent variable.

4.3. Structural model

As the fitness index of the measurement model satisfied the fitness index criteria and the estimate possibility of the structural model was theoretically confirmed, we estimated the fitness of the initial research model. As a result of confirming the fitness index of the initial research model, we were able to confirm the generally good level seen in Table 3.

Given the hierarchical model relationship between the initial and revised models, we examined the difference in χ^2 to confirm the statistical difference. The χ^2 test showed the difference in χ^2 value between the two models was not statistically significant ($\Delta\chi^2$ (5, n = 584) = 1.155, p = .949), as shown in Table 4. Accordingly, since the revised model is more succinct and generally better fit than the initial model, we selected the revised model as the final research model and re-estimated the fitness and path coefficient of model.

We were able to confirm that the fitness index of the revised model is generally good, as shown in Table 5. The results of examining the statistical significance of path coefficient are as shown in Table 4. The relationships among variables according to the structural estimate of the revised model are as follows.

First, internal value (t = 5.453, p < .05), learning usefulness (t = 8.152, p < .05), and learning environment (t = 4.219, p < .05) had significant positive effects on learner satisfaction in the following order: learning usefulness (β = .439), internal value (β = .229), and learning environment (β = .206).

Second, internal value (t = 3.217, p < .05), learning usefulness (t = 6.686, p < .05), and learner satisfaction (t = 14.213, p < .05) had significant positive effects on motivation to transfer in the following order: satisfaction (β = .576), learning usefulness (β = .275), and internal value (β = .115).

Fig. 2 shows the path coefficient estimate of revised model as follows.

5. Discussion

The current study investigated the structural relationships among e-learners' internal value, learning usefulness, learning environment, satisfaction, achievement, and motivation for skill transfer. It also investigated the differences in structural relationships among variables.

First, the structural relationships among e-learners' internal value and learning usefulness, learning environment, satisfaction,

Please cite this article in press as: Joo, Y. J., et al. Structural relationships among effective factors on e-learners' motivation for skill transfer. *Computers in Human Behavior* (2013), http://dx.doi.org/10.1016/j.chb.2013.08.011

Table 4
Fitness examination results of the initial and revised models ($n = 584$).

	χ^2	*df*	TLI	CFI	RMSEA (90% Confidence Level)
Revised Model	50.770	35	.996	.997	.028 (.006–.044)
Initial Research Model	49.615	30	.994	.996	.033 (.015–.050)

If RMSEA is less than .05, the model is close; if less than .08, it is reasonable; if less than .10, it is poor (Browne & Cudeck, 1993).

Table 5
Structural coefficient estimate of the revised model ($n = 584$).

Paths between variables			Un-standardized estimate	Standardized estimate	Standard deviation	*t*	*p*
Satisfaction	←	Internal Value	.276	.229	.051	5.453*	.000
	←	Learning Usefulness	.452	.439	.055	8.152*	.000
	←	Learning Environment	.208	.206	.049	4.219*	.000
Achievement	←	Internal Value	1.715	.230	.320	5.365*	.000
Motivation to Skill transfer	←	Internal Value	.146	.115	.045	3.217*	.001
	←	Learning Usefulness	.297	.275	.044	6.686*	.000
	←	Satisfaction	.605	.576	.043	14.213*	.000

* $p<.05$.

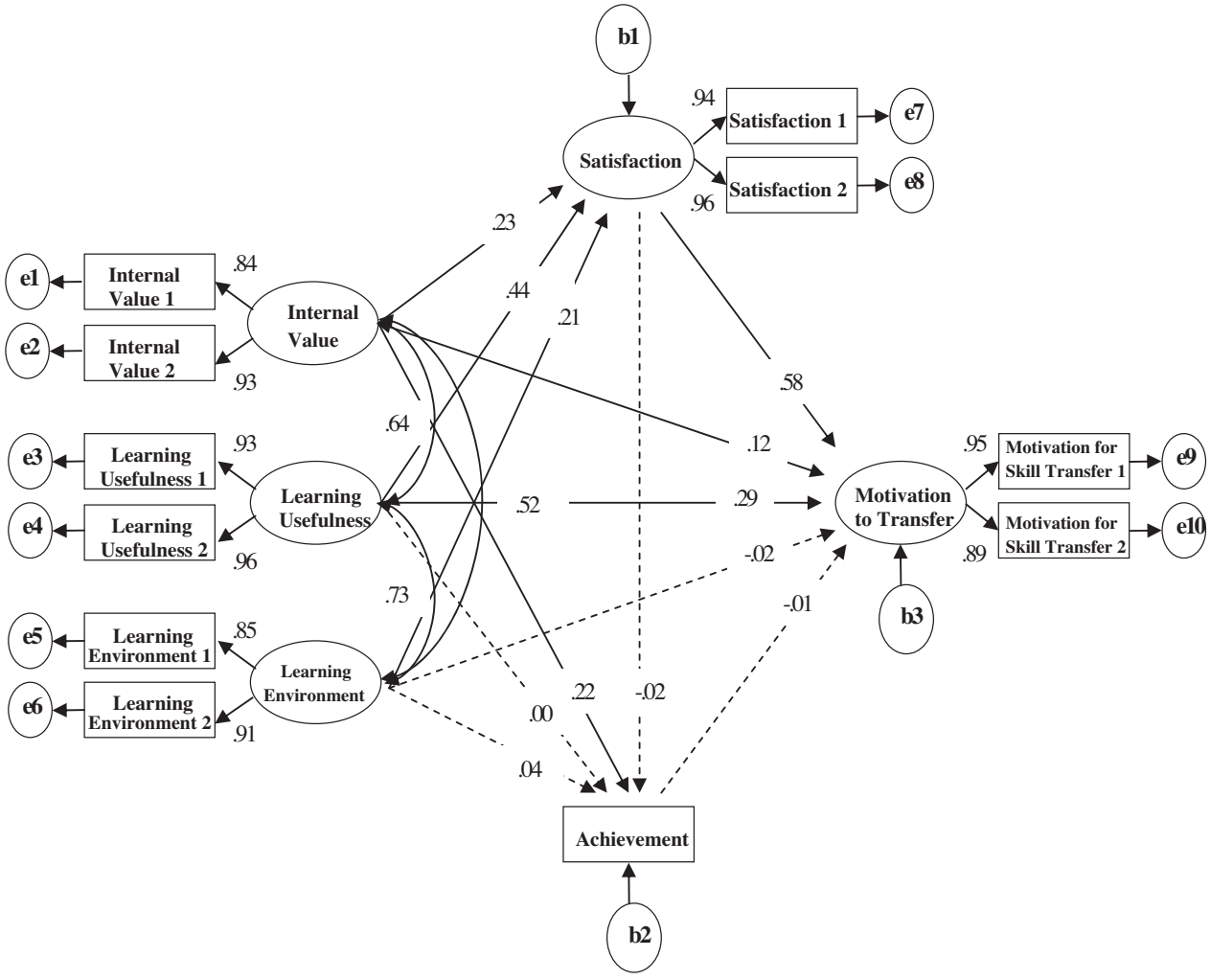

Fig. 2. Path coefficient estimate of revised model.

achievement, and transfer motivation were statistically significant except for the effects of learning usefulness, learning environment, and satisfaction on achievement and those of learning environment and achievement on transfer motivation.

Second, the results of the examination of the difference in path coefficients among internal value, learning environment, satisfaction, achievement, and transfer motivation depending on employment status were not statistically significant.

Please cite this article in press as: Joo, Y. J., et al. Structural relationships among effective factors on e-learners' motivation for skill transfer. *Computers in Human Behavior* (2013), http://dx.doi.org/10.1016/j.chb.2013.08.011

The results of the investigation of the structural relationships among variables were as follows:

First, the effects of e-learners' internal value, learning usefulness, and learning environment on satisfaction were statistically significant for all three variables. These results are consistent with the previous research (Hong, 2002; Kruger et al., 1995; Roszkowski & Soven, 2010; Sahin, 2007; Vansteenkiste et al., 2007).

Second, the results confirming the effect of internal value on achievement was statistically significant. This is consistent with previous studies (Lan & Skoog, 2003; Pintrich & DeGroot, 1990). However, the effects of learning usefulness, learning environment, and satisfaction on achievement were not statistically significant, a finding which is not consistent with previous studies (Alliger et al., 1997; Eom & Wen, 2006; Iverson et al., 2005; Johnson, Aragon, Shaik, & Palma-Rivas, 2000; Marchant, Paulson, & Rothlisberg, 2001; Picke, 1991). This may be because our subjects were students taking two different courses that might have had different achievement expectations, since each course measures ability and attitude for particular job environments. The reasons why there was no effect of learning environment on achievement may be that the subjects' learning styles had already formed or they had already developed problem-solving strategies.

Third, the effects of e-learners internal value, learning usefulness, satisfaction with learning environment, achievement, internal value, learning usefulness, and satisfaction on transfer motivation were significant, which is consistent with previous studies (Burke, 1997; Kuchinke, 2000; Liebermann & Hoffmann, 2008; Ruona et al., 2002). However, the effects of learning environment and achievement on transfer motivation were not significant, which is inconsistent with previous studies (Facteau et al., 1995; Huczynski & Lewis, 1980). First of all, disregarding for a moment the previous research, the significant relationships between internal value and transfer motivation confirmed in the current study are meaningful. They suggest that some subjects in this study, who wanted to complete the study for self-participation and pleasure, had high intentionality toward practical application of learned knowledge and skills to a job. No effect of learning environment on transfer motivation has been reported in previous studies, which have agreed that job environment as opposed to learning environment predicts motivation and affects transfer motivation. In contrast, we find motivation stemming from different learning environment in this study. Also, the subjects of this study had various majors.

6. Conclusion

We make several suggestions for e-learning practice based on the current research results as follows: First, we suggest that instructors need to consider learners' focus (job, task, or goal) in planning classes. We can predict that learners were unable to support learning and learning atmosphere. In addition, achievement did not significantly affect transfer motivation. The reason may be that learners think that their completing a course rather than applying for or securing a job is what completes their learning process. In this way, the learners seem to separate learning and securing a job. Particularly for learners without a job, achievement does not affect transfer motivation, since they do not know how to apply content learned to the job search, which is a priority.

Second, to increase the effect of learning usefulness on satisfaction for the employed group, instructors should come to better comprehend these learners' future career needs and connect learning usefulness to the satisfaction by including practical material such as case studies. Accordingly, to increase the learner's satisfaction, it would be helpful to suggest efficient learning strategies that reduce time and physical constraints.

Third, it is better to support unemployed learners to develop a specific career goal by systematically providing specific information about the various jobs that learners may want, to help them connect their sense of the usefulness of the learning content to transfer motivation. To increase the effect of learner satisfaction on transfer motivation, practical experience such as internships should be made available.

We wish to note some tasks for further study to address the limitations of the current research, which include the following: First, we sampled students from two courses, and there may be some differences between these courses in terms of learning usefulness, learning environment, satisfaction, achievement, and transfer motivation. The current data are also a little out of date since they were collected almost five years ago. We, therefore, need to recollect data from the students taking the same course for the further study to increase the credibility. Second, perceived usefulness and transfer motivation will differ according to the subjects' various jobs and work cultures. We suggest controlling difference in positions and job environments in further study. Third, to investigate the effects of employment status on learning, various learning achievement variables need to be considered. It is necessary to examine the relationships among not only learning achievement variables but also variables affecting them, such as sense of social belonging and sense of psychological happiness.

This study considers the structural relationships among e-learners' internal value, learning usefulness, learning environment, satisfaction, achievement and transfer motivation. We have empirically reconfirmed the effect of employment status on learning, and expect that the results will help in the development of new strategies to improve e-learners' learning outcomes.

Acknowledgements

This work was supported by National Research Foundation of Korea Grant funded by the Korean Government (2012-045331).

This research article was invited to the special issue of CHB.

References

Alliger, G. M., & Janak, E. A. (1989). Kirkpatrick's level of training criteria: Thirty years laters. *Personnel Psychology, 42*, 331–342.

Alliger, G. M., Tannenbaum, S. 1., Bennett, W., Traver, H., & Shotland, A. (1997). A mcta-analysis of the relations among training criteria. *Personnel Psychology, 50*, 341–358.

Ames, C., & Archer, J. (1988). Achievement goals in the classroom: Student learning strategies and motivation processes. *Journal of Educational Psychology, 80*, 260–267.

Astin, A. W. (1993). *Preventing students from dropping out*. San Francisco: Jossey-Bass.

Axtell, C. M., Maitlis, S., & Yearta, S. (1997). Predicting immediate and longer-term transfer of training. *Personnel Review, 26*, 201–213.

Baldwin, T. T., & Ford, J. K. (1988). Transfer of training: A review and directions for future research. *Personnel Psychology, 41*, 63–105.

Browne, M. W., & Cudeck, R. (1993). Alternative ways of assessing model fit. In K. A. Bollen & J. S. Long (Eds.), *Testing structural equation models* (pp. 136–162). Newbury Park, CA: Sage.

Burke, L. A. (1997). Improving positive transfer: A test of relapse prevention training on transfer outcomes. *Human Resource Development Quarterly, 8*(2), 115–128.

Burke, L. A., & Hutchins, H. M. (2007). Training transfer: An integrative literature review. *Human Resource Development Review, 6*, 263–296.

Butler, D. L., & Winne, P. H. (1995). Feedback and self-regulated learning: A theoretical synthesis. *Review of Educational Research, 65*(3), 245–281.

Campbell, J. P. (1988). Training design for performance improvement. In J. P. Campbell, R. J. Campbell, & Associate (Eds.), Productivity in Organization (pp. 177–215). San Francisco: Jossey-Bass.

Chiaburu, D. S., & Lindsay, D. R. (2008). Can do or will do? The importance of self-efficacy and instrumentality for training transfer. *Human Resource Development International, 11*, 199–206.

Dallam, J. W., & Hoyt, D. P. (1981). Do college students have enough time to study? *College and University, 57*(1), 84–91.

Dundes, L., & Marx, J. (2006/2007). Balancing work and academics in college: Why do students working 10 to 19 hours per week excel? Journal of College Student Retention: Research, Theory & Practice, 8, 107–120.

Eccles, J. (1983). Expectancies, values and academic behaviors. In J. T. Spence (Ed.), *Achievement and achievement motives* (pp. 75–146). San Francisco: Freeman.
Eom, S. B., & Wen, H. J. (2006). The determinants of students' perceived learning outcomes and satisfaction in university online education: An empirical investigation. *Decision Science Journal of Innovative Education, 4*(2), 215–235.
Facteau, J. D., Dobbins, G. H., Russell, J. E. A., Ladd, R. T., & Kudisch, J. D. (1995). The influence of general perceptions of the training environment on pretraining motivation and perceived training transfer. *Journal of Management, 21*, 1–15.
Gegenfurtner, A., Veermans, K., Festner, D., & Gruber, H. (2009). Motivation to transfer training: An integrative literature review. *Human Resource Development Review, 8*(3), 403–423.
Gleason, P. M. (1993). College student employment, academic progress, and post-college labor market success. *Journal of Student Financial Aid, 23*(2), 5–14.
Hair, J. T., Anderson, R. E., Tatham, R. L., & Black, W. C. (1992). *Multivariate data analysis with readings* (3rd ed.). New York: Macmillan.
Holton, E. F. (1996). The flawed four-level evaluation model. *Human Resource Development Quarterly, 7*(1), 5–21.
Hong, K. S. (2002). Relationships between students' and instructional variables with satisfaction and learning from a web-based course. *Internet and Higher Education, 5*, 267–281.
Huczynski, A. A., & Lewis, J. W. (1980). An empirical study into the learning transfer process in management training. *The Journal of Management Studies, 17*, 227–240.
Iverson, K. M., Colky, D. L., & Cyboran, V. (2005). E-learning takes the lead: an empirical investigation of learner differences in online and classroom delivery. *Performance Improvement Quarterly, 18*(4), 5–18.
Johnson, S. D., Aragon, S. R., Shaik, N, & Palma-Rivas, N. (2000). Comparative analysis of learner satisfaction and learning outcomes in online and face-to-face learning environment. *JI. Interactive Learning Research, 11*(1), 29–49.
Kim, N. Y. (2009). The structural relationship among academic motivation, program, organizational support, interaction, flow and learning outcome in cyber education. Unpublished doctoral dissertation. Ewha Womans University, Seoul, Korea.
Kirwan, C., & Birchall, D. (2006). Transfer of learning from management developmnent programmes: testing the Holton model. *International Journal of Training and Development, 10*(4), 252–268.
Kline, R. B. (2005). *Principles and practice of structural equation modeling* (2nd ed.). New York: The Guilford Press.
Kraiger, K., Ford, K. J., & Salas, E. (1993). Application of cognitive, skill-based, and affective theories of learning outcomes to new methods of training evaluation. *Journal of Applied Psychology, 78*, 311–328.
Kruger, L. J., Struzziero, J., Watts, R., & Vacca, D. (1995). The relationship between organizational support and satisfaction with teacher assistance teams. *Remedial and Special Education, 16*(4), 203–211.
Kuchinke, K. P. (2000). The role of feedback in management training settings. *Human Resource Development Quarterly, 11*(4), 381–401.
Lammers, W. J., Onwuegbizie, A. J., & Slate, J. R. (2001). Academic success as a function of the gender, class, age, study habits, and employment of college students. *Research in the Schools, 8*(2), 71–81.
Lan, W., & Skoog, G. (2003). *The relationship between high school students' motivational and metacognitive factors in science learning and their science achievement*. Texas Tech University: Unpublished manuscript.
Liebermann, S., & Hoffmann, S. (2008). The impact of practical relevance on training transfer: evidence from a service quality training program for german bank clerks. *International Journal of Training and Development, 12*(2), 74–86.
Lim, H. C. (2009). The effects of emotional response and learning outcomes of E-learning on transfer: centered in control effects of job flow and achievement motivation. *Korean Management Research, 22*(3), 1469–1487.
Lin, H. F. (2007). Effects of extrinsic and intrinsic motivation on employee knowledge sharing intentions. *Journal of Information Science, 33*(2), 135–149.
Lucas, R., & Lammont, N. (1998). Combing Work and Study: an empirical study of full-time students in school, college and university. *Journal of Education and Work, 11*(1), 41–56.
Marchant, G. J., Paulson, S. E., & Rothlisberg, B. A. (2001). Relations of middle school students' perceptions of family and school contexts with academic achievement. *Psychology in the Schools, 38*(6), 505–519.
Meece, J., Blumenfeld, P., & Hoyle, R. (1988). Students' goal orientations and cognitive engagement in classroom activities. *Journal of Educational Psychology, 80*, 514–523.
Noe, R. A. (1986). Trainees' attributes and attitudes: Neglected influences on training effectiveness. *Academy of Management Review, 11*(4), 736–749.
Noe, R. A., & Schmitt, N. (1986). The influence of trainee attitudes on training effectiveness: Test of a model. *Personnel Psychology, 39*, 497–523.
Orszag, J. M., Orszag, P. R., & Whitemore, D. M. (2001). Learning and earning: Working in college. Upromise, Inc.
Osterloh, M., & Frey, B. S. (2000). Motivation, knowledge, transfer, and organizational forms. *Organizaion Science, 11*(5), 538–550.
Picke, G. R. (1991). The effects of background, coursework, and involvement on students' grades and satisfaction. *Research in Higher Education, 32*, 15–30.
Pintrich, R. R., & DeGroot, E. V. (1990). Motivational and self-regulated learning components of classroom academic performance. *Journal of Educational Psychology, 82*, 33–40.
Roszkowski, M. J., & Soven, M. (2010). Did you learn something useful today? an analysis of how perceived utility relates to perceived learning and their predictiveness of satisfaction with training. *Performance Improvement Quarterly, 23*(2), 71–91.
Ruona, E. A., Leimbach, M., Holton, E. F., III, & Bates, R. A. (2002). The relationship between learner utility reactions and predicted learning transfer among trainees. *International Journal of Training and Development, 6*(4), 218–228.
Sahin, I. (2007). Predicting student satisfaction in distance education and learning environment. *Turkish Online Journal of Distance-TOJDE, 8*(2), 113–119.
Seyler, D. L., Holton, E. F., III, Bates, R. A., Burnett, M. F., & Carvalho, M. A. (1998). Factors affecting motivation to transfer training. *International Journal of Training and Development, 2*(1), 2–16.
Shin, N. (2003). Transactional Presence as a Critical Predictor of Success in Distance Learning. *Distance Education, 24*(1), 69–86.
Shin, K. H., & Oh, I. S. (2004). The role of pre- and post- training on learning and transfer motivation: Focusing on pre-training motivation, instructor qualification, and job related usage. *Korean Journal of Industrial and Organizational Psychology, 17*(2), 223–242 (In Korean).
Tannenbaum, S. I., & Yukl, G. (1992). Training and development in work organizations. *Annual Review of Psychology, 43*, 399–441.
Vansteenkiste, M., Neyrinck, B., Niemiec, C. P., Soenens, B., Witte, H. D., & Broeck, A. V. (2007). On the relations among work value orientations, psychological need satisfaction and job outcomes: A self-determination theory approach. *Journal of Occupational and Organizational psychology, 80*, 251–277.
Warr, P., & Bunce, D. (1995). Trainee characteristics and the outcomes of open learning. *Personnel Psychology, 48*, 347–376.

Please cite this article in press as: Joo, Y. J., et al. Structural relationships among effective factors on e-learners' motivation for skill transfer. *Computers in Human Behavior* (2013), http://dx.doi.org/10.1016/j.chb.2013.08.011