Intention to Transfer and Transfer Following eLearning in Spain

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Abstract
Understanding vocational learning and transfer is vital to European citizens. We need to understand how transfer works, which factors influence it, and how these factors affect employee behaviour. Research in online training specific to Southern Europe is needed to move the field forward. The Unified Model of Motivation for Training Transfer (MTT) was proposed to understand behaviour change after training. It conceives three phases: (1) forming transfer intentions, (2) actualizing implementation intentions for transfer, and (3) strengthening transfer commitment. We analysed initial transfer intention and transfer following online training in three Spanish organisations. We used an ex post facto prospective design with one group (n = 204). We applied the online version of the Initial Transfer Intention questionnaire (ITI) three days before the training, and the Transfer Questionnaire (TrQ) three to four months after the training. Training consisted of 22 online courses offered by the three participating organisations. A cluster analysis and post hoc analysis were performed. We identified three groups (k = 3), indicating that there were significant differences in the means between employees with low and high intention to transfer. Results showed a greater difference in the factor profile between participants with LowPT and HighPT. We identified common characteristics among people with low levels of transfer; this information can help understand what type of employee will transfer less and provide cues on how to prevent this from happening in future training activities. Limitations and recommendations for research and practice are discussed.

Keywords Learning transfer · Training transfer · Intention to transfer · Motivation · Cluster analysis
The European Commission states that a focus on adult learning is vital for Europe to overcome economic challenges and respond to the demand for new skills and sustained productivity (European Commission, 2021). Working individuals must rely on continuous professional development to remain competitive on the labour market.

For training to be effective, it should be transferred to the job. Learning transfer or training transfer refers to the employee’s level of application of what they learnt in training into the workplace (Ford et al., 2018); it explores employees’ behavioural change due to learning acquired in training activities (Reinhold et al., 2018).

Although research in transfer started more than 30 years ago, we still need to understand how transfer works, which factors influence it, and how these factors affect employee’s behaviours (e.g., Blume et al., 2019; Huang et al., 2015; Mas senberg et al., 2017). The study of transfer and the factors that influence transfer requires the application of longitudinal designs; however, such research designs have proven to be scarce in the transfer field (Schoeb et al., 2020).

In the more than 30 years of transfer research, the online teaching modality has been progressively gaining strength. It grew 900% in the past 20 years (Global Industry Analysts, 2020), becoming more and more frequent in organisations. In addition, the COVID-19 pandemic cut for months face-to-face interactions and temporarily positioned online delivery as the only possibility to facilitate training (Soni, 2020).

Additionally, it has been estimated that online training can cut energy consumption by 90% (Global Industry Analysts, 2020), positioning this mode of instruction as the sustainable alternative. Knowing that organisations are aligning their strategies with the UN’s sustainable development goals (Rosati & Faria, 2019), aiming at reducing consumption and resources, online training seems to have a projected well-established position in the future of organisations. In this scenario, research in transfer and transfer factors in online environments is a key necessity that can contribute to move the field forward.

In the HRD field in general, and in the transfer field in particular, USA and Western European perspectives have dominated literature (Garavan et al., 2016). Carrying out research in Southern Europe could add evidence from different cultural backgrounds, which could help to build a more globalised perspective. Within Southern Europe, Spain is one of the main countries and a highly active member of the European project (European Union, 2022). Being Spanish the second language in the number of native speakers around the world, with the cultural connections that language implies, makes the study of transfer in Spain an interesting opportunity.

**eLearning**

Online learning, also named eLearning, digital learning and virtual learning is the learning that occurs through technology and the internet (Ozuorcun & Tabak, 2012). It is the most common instructional method in distance education (Traxler, 2018). During the past decade, eLearning has been developed in different formats, such as synchronous and asynchronous training, including simulations (Hallinger et al.,...
Learning Transfer

Learning transfer and training transfer have been studied for more than 30 years (e. g., Baldwin & Ford, 1988; Baldwin et al., 2017). At this point, researchers appear to have obtained some consensus via empirical research and meta-analysis, including the assumption that there are individual differences involved (Ford et al., 2018).

Based on the existence of individual differences, researchers have stressed the need for applying a trainee/centred focus when studying learning transfer (Massenberg et al., 2017; Poell, 2017). This trainee/centred focus might include the study of motivation (Gegenfurtner, 2011; Reinhold et al., 2018), initial intention to transfer, and subjective norms (Cheng et al., 2015; Testers et al., 2019).

It has been theorised that intention to transfer might influence the initial attempts to utilise transfer, that is, the first transfer experience (Blume et al., 2019). In addition, it appears to be a critical determinant of training effectiveness (Al-Swidi & Al Yahya, 2017), and it has been found mediating the relationship between the antecedents and transfer behaviour (Cheng et al., 2015).

Background, The Unified Model of Motivation for Training Transfer (MTT)

To better understand intention to transfer and transfer, the Unified Model of Motivation for Training Transfer (MTT) was proposed (Quesada-Pallarès & Gegenfurtner, 2015). The MTT is a model for understanding behaviour change after training. The model integrates elements from classic motivation theories and conceives three phases: (1) forming transfer intentions influenced by attitudes, norms, and perceived transfer control, (2) actualizing implementation intentions for transfer, and (3) strengthening transfer commitment. Figure 1 shows the MTT model.
Fig. 1 Unified Model of Motivation for Training Transfer (MTT) (Quesada-Pallarès & Gegenfurtner, 2015, p.115)
Forming Transfer Intentions

Transfer intentions are influenced by attitudes, norms, and perceived transfer control. Attitudes towards transfer are trainees’ attitudes to transfer, which are determined by cognitive, affective, and behavioural elements (Quesada-Pallarès & Gegenfurtner, 2015).

Subjective norms towards transfer refers to the social pressure felt by trainees when transferring (Wallace et al., 2005). It includes seven sources of normative influence: colleagues and peers, supervisors, subordinates, management, clients (customers or consumers), the trainer, and other relevant people for the employee (Quesada-Pallarès & Gegenfurtner, 2015).

Perceived behavioural control includes trainees’ perceived difficulty in transferring, in overcoming obstacles or barriers during transfer, and trainees’ control when steering transfer. Research has found robust results when using self-efficacy to predict transfer among different training contexts (Gegenfurtner et al., 2014).

Actualizing implementation intentions for transfer

Transfer commitment measures trainees’ commitment to transfer intentions, a necessary antecedent to achieve transfer (Gegenfurtner, 2013; Pineda-Herrero et al., 2014). It explores the importance given by the trainee to the transfer.

Strengthening Transfer Commitment

The model differentiated two types of behavioural intentions: intention to transfer in a pre-decisional or deliberative phase and implementation intention in a post-decisional or implemental phase. The second phase preceded the action and involved how trainees prepare and implement the action plans (Heckhausen & Gollwitzer, 1987). Here, the commitment to perform specific plans plays a key role by establishing a link between the trainee and the implementation of the necessary steps to ensure the action plans are executed (Rise et al., 2003).

This phase aims at achieving the intended results. It covers the actions carried out by trainees focused on transferring.

To measure intention to transfer in the MTT, the Initial Transfer Intention (ITI) questionnaire was developed in Spain (Quesada-Pallarès, 2014). Although different studies have analysed intention to transfer (e.g., Al-Swidi & Al Yahya, 2017; Testers et al., 2019), no identified study has examined the relation between intention to transfer and transfer following eLearning in a Spanish sample.

Purpose

This study focused on two research questions: (RQ1) what are the levels of transfer in Spanish employees following online training? It refers to the perceived transfer level that a participant achieved, such a low transfer level (e.g. they transferred not
much of the learning acquired in training), medium transfer level or high transfer level (e.g. they transferred a lot of the learning acquired in training). And (RQ2) what is the relationship between the initial transfer intention factors and the levels of transfer in Spain when using cluster analysis technique? It refers to the output of applying the cluster analysis technique to identify groups of people with low, medium or high predisposition to transfer based on their scores on the initial transfer intention factors. Because the relation between transfer intention factors and transfer might vary based on the transfer level, we aimed at (1) categorising employees according to their transfer level, and (2) analysing the relation between the initial transfer intention factors and the different transfer levels.

Methods

In this section, we describe the procedures used, the sample, the training, the instruments, and data analysis.

Procedure

We used an ex post facto prospective design with one group (Kumatongo & Muzata, 2021) with no manipulation from the researcher. The ITI was administered online three days before the training (t1), and the Transfer Questionnaire (TrQ from now on) three-to-four months after the training (t2).

The research complied with the Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons regarding the processing of personal data and on the free movement of such data and repealing Directive 95/46/EC (General Data Protection Regulation). Participants gave their informed consent before completing the instruments and were free to stop answering at any point without completing the surveys.

Sample

Because we aimed at assessing transfer in Spain, we purposely reached for three large Spanish organisations. Organisations were based in different points of the country: two public organisations based in Middle and Southern Spain, and a private enterprise based in multiple locations across the country. The research team sourced the organisations by establishing direct contact with their human resource development professionals. A non-probabilistic sampling approach (Castro-Martín et al., 2020) was used to maximise the number of participants.

Participants were employees of the mentioned organisations who had attended one of the training courses (n=943). T1 got 430 responses (response rate = 46%); t2 got 282 responses (response rate = 66%).

Because giving personal details was optional to the participants, 78 respondents did not provide information that allowed the longitudinal match between t1 and t2. Hence, the final sample comprised 204 trainees who answered both questionnaires.
(22% of the initial sample). Based on the estimation of the average response rate for surveys in organisational studies (response rate = 36%) (Baruch, & Holtom, 2008), based on the estimation of an 11% decrease of online surveys than other survey modes (Fan & Yan, 2010), and knowing that the longitudinal design applied tended to increase participant mortality (Gonzalez-Ortiz-de-Zarate & Quesada-Pallarès, 2021), we considered the response rate adequate. We analysed the profile of the participants who dropped-out in the data analysis section.

Respondent information is shown in Table 1.

Ages ranged from 32- to 59-year-old, with 61% ranging from 40- to 52-year-old. The average age was 46-year-old (SD = 6.60).

**Training**

Training consisted of 22 online courses offered by the three organisations. The organisations classified the courses into three main categories: hard skills (53%), technological skills (31%), and soft skills (16%). Examples of the courses were Implementing Quality Management Systems, Web 2.0, and Effective Thinking. There was an average of 43 students per program (SD = 18.09).

**Instruments**

Data was gathered through two online questionnaires using the MTT instruments applied as self-reports: the ITI and the TrQ.

| Table 1  Sample Information | % |
|-----------------------------|---|
| Public administration in Middle Spain | 60 |
| Public administration in Southern Spain | 18 |
| Private enterprise | 22 |
| Women | 67 |
| Men | 33 |
| Technicians | 41 |
| Qualified employees | 22 |
| Managers | 18 |
| Directors | 9 |
| Low-qualified employees | 4 |
| Postgraduate degrees | 8 |
| Bachelor’s degree | 78 |
| Lower merits | 14 |

\( n = 202, \text{ after screening} \)
Initial Transfer Intention questionnaire (ITI)

The ITI (Quesada-Pallarès, 2014) was developed based on the motivational variables of the MTT that could play an important role in trainees’ intention to transfer. It consists of 96 items and three subscales, containing a total of 14 factors. The three subscales are: (1) initial intention to transfer (12 items, one factor), (2) subjective norms (16 items, four factors), and (3) the rest of transfer intention factors (68 items, nine factors). Answers are given through a 5-point Likert-type scale (1: not agree or never, 5: completely agree or always).

The subscales were validated in a sample of 667 participants through EFA and CFA following standard procedures (Quesada-Pallarès, 2014). Table 2 shows ITI’s composition and definitions.

Transfer Questionnaire (TrQ)

The TrQ measures transfer from the participants’ perspective with the goal of identifying the degree to which a trainee applied knowledge, skills and attitudes learned in training to the workplace. It consists of six items and a single factor. Answers are given through a 5-point Likert-type scale (1: not agree; 5: completely agree). It was validated through EFA \( n = 282 \) and CFA \( n = 70 \), showing a high internal consistency (\( \alpha = 0.92 \)) and following standard procedures (Quesada-Pallarès, 2014). An example of an item is Due to the training, I have modified my job performance. An early version of the TrQ was developed by Quesada-Pallarès et al. (2015).

Data Analysis

SPSS was used for the analysis. Exploratory analyses were performed to ensure sample’s normality and detect outliers. Descriptive statistics and correlation matrix are shown in Table 3.

Because we wanted to categorise participants according to their transfer level, we applied a cluster analysis technique, which allowed us to group participants in clusters based on their level of transfer.

Given the goal of this study, we chose a non-hierarchical procedure, which partitions the data in non-overlapping sets without hierarchical relationships between them. The K-means approach was selected due to its application in cases where it can be suspected that different participants might perform the task differently, but where we have no external indicator of the subsets except for performance on the task (Farrell & Lewandowsky, 2018). Given a fixed number (k) of clusters, each observation was assigned to one of the clusters, so that the means across clusters (for all variables being considered), were as different from each other as possible. The difference between observations was measured in terms of one of several distance measures (Euclidean distances). To validate the number of clusters we used distance in cluster analysis. We carried out a cross-validation to a range of the numbers of clusters and observed the resulting average distance of the observations (in the cross-validation subsample) from the corresponding cluster centres. Because we
| Factor                              | Definition and item example                                                                                                                                                                                                 | Number of items | α  | VE  |
|------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|----|-----|
| 1. Intention to transfer (1)       | The degree to which trainees are willing to transfer learning, or how much effort they are willing to make to accomplish this transfer  
E.g., I want to apply in my work what I learned in training in the next months                                                                                       | 12              | .97| 76% |
| 2. Boss’s desire to transfer (2)   | Trainees’ perception about what their boss believes is in relation to the application of what they learned in training to their workplace  
E.g., My boss wants me to apply what I learned in training to the workplace                                                                                      | 3               | .97| 33% |
| 3. Clients’ desire to transfer (2) | Trainees’ perception about what their clients or customers believe is in relation to applying what they learned in training to their workplace  
E.g., My clients want me to apply what I learned in training to the workplace                                                                                   | 3               | .96| 9%  |
| 4. Subordinates’ desire to transfer (2) | Trainees’ perception about what their subordinates believe is in relation to applying what they learned in training to their workplace  
E.g., My subordinates want me to apply what I learned in training to the workplace                                                                               | 3               | .93| 10% |
| 5. Pressure to transfer (2)        | Trainees’ perception about what others believe is in relation to applying what they learned in training to their workplace  
E.g., I feel pressured by my work colleagues to apply what I learned in training to the workplace                                                                       | 7               | .85| 19% |
| 6. Overcoming indeterminant obstacles during transfer (3) | The confidence the trainees have when they apply the learnings to their workplace, despite any type of obstacles they may encounter in the process  
E.g., I believe that I will solve the problems that appear when I apply what I learned in training to the workplace                                                       | 4               | .93| 4%  |
| 7. Decision-making in the transfer process (3) | Trainees’ freedom in deciding whether to apply what they learned in training to their workplace  
E.g., It’s up to me to decide whether or not I apply what I learned in training to the workplace                                                                           | 3               | .95| 9%  |
| 8. Negative feelings towards transfer (3) | Negative feelings that trainees have when they apply the learnings to their workplace  
E.g., I feel insecure when I apply what I learned in training to the workplace                                                                                   | 11              | .93| 8%  |
| Factor | Definition and item example | Number of items | α<sup>a</sup> | VE |
|--------|-----------------------------|-----------------|-------------|---|
| 9. Overcoming work environment obstacles during transfer (3) | The confidence trainees have when they apply the learnings to their workplace, despite any work environment obstacles they may encounter in the process. E.g., I believe that I will be able to apply what I learned in training to the workplace, even if my work environment doesn’t help. | 5 | .91 | 5% |
| 10. Habits in the transfer process (3) | Trainees’ usual behaviours when they apply the learnings to their workplace. E.g., Before applying what I learned in training to the workplace, I think about how I’m going to do it. | 11 | .93 | 4% |
| 11. Positive feelings towards transfer (3) | Positive feelings that trainees have when they apply the learnings to their workplace. E.g., I feel satisfied when I apply what I learned in training to the workplace. | 8 | .92 | 4% |
| 12. Beliefs about transfer (3) | Opinions and convictions that trainees have when they apply the learnings to their workplace. E.g., I think that the training’s purpose is to apply what I learned during the training to the workplace. | 17 | .95 | 22% |
| 13. Ability to control transfer (3) | Trainees’ have freedom in deciding which way they apply the learnings to their workplace. E.g., I can’t decide when to apply what I learned in training to the workplace. | 5 | .92 | 3% |
| 14. Transfer commitment (3) | The extent to which trainees believe applying what they learned in training to their workplace is a priority. E.g., I’m willing to exert effort beyond the usual to apply what I learned in training to the workplace. | 4 | .87 | 2% |

<sup>a</sup>Cronbach’s alpha based on standardised items; VE means Variance Explained; (1) this factor was analysed separately during the exploratory factor analysis because it can be considered a dependent or a mediating variable; (2) these factors were analysed separately during the exploratory factor analysis because of their composition, obtaining a total VE of 70%; (3) these remaining factors were analysed altogether in the exploratory factor analysis, obtaining a total VE of 61%.
|     | F1   | F2   | F3   | F4   | F5   | F6   | F7   | F8   | F9   | F10  | F11  | F12  | F13  | F14  | Transfer |
|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----------|
| F1  | 3.27 | 0.23 | -0.17| 0.40*| 0.35*| 0.47**| 0.57**| 0.23 | 0.42**| 0.04  | 0.11  | 0.12  |      |      |           |
|     | (0.66)| (1.03)| (0.51)| (0.71)| (0.62)| (0.69)| (0.61)| (0.81)| (0.76)| (1.00)| (0.95)|      |      |      |           |
| F2  | 0.23 | 3.12 | -0.19|      |      |      |      |      |      |      |      |      |      |      |           |
|     | (1.03)|       | (0.51)|       |       |       |       |       |       |       |       |       |       |       |           |
| F3  | -0.17| -0.19| 1.51 |      |      |      |      |      |      |      |      |      |      |      |           |
|     | (0.51)|       |       |       |       |       |       |       |       |       |       |       |       |       |           |
| F4  | 0.40**| 0.30*| 0.02 | 2.80 |      |      |      |      |      |      |      |      |      |      |           |
|     |       |       |      | (0.71)|       |       |       |       |       |       |       |       |       |       |           |
| F5  | 0.35*| 0.10 | 0.10 | 0.25 | 0.37**| 0.61**| 0.30*| 0.32*| 0.49**| 0.04  | 0.11  | 0.12  |      |      | 3.19 (0.76) |
|     |       |       |      |      | (0.62)| (0.61)| (0.81)| (0.32)| (0.49)| (1.00)| (0.95)|      |      |      |           |
| F6  | 0.47**| 0.03 | -0.15| 0.14 | 0.34*| 3.9  |      |      |      |      |      |      |      |      |           |
|     |       |       |      |      | (0.69)|       |       |       |       |       |       |       |       |       |           |
| F7  | 0.57**| 0.21 | -0.13| 0.25 | 0.37**| 0.61**| 0.30*| 0.32*| 0.49**| 0.04  | 0.11  | 0.12  |      |      | 3.19 (0.76) |
|     |       |       |      |      | (0.62)| (0.61)| (0.81)| (0.32)| (0.49)| (1.00)| (0.95)|      |      |      |           |
| F8  | 0.23 | 0.52**| -0.25| 0.30*| 0.32*| 0.23 | 0.35*| 3.87 |      |      |      |      |      |      |           |
|     |       |       |      |      |       |      |      | (0.81)|       |       |       |       |       |       |           |
| F9  | 0.42**| 0.19 | -0.16| 0.13 | 0.32*| 0.49**| 0.41**| 0.23 |      |      |      |      |      |      |           |
|     |       |       |      |      |       | (0.76)| (0.76)| (0.81)|       |       |       |       |       |       |           |
| F10 | 0.04 | 0.12 | -0.20| 0.06 | 0.18 | 0.04 | 0.34*| 0.19 | 0.05 |      |      |      |      |      | 3.17 (1.00) |
|     |       |       |      |      |      |      |      |      |      |       |       |       |       |       |           |
| F11 | 0.11 | 0.01 | 0.03 | 0.08 | 0.32*| 0.12 | 0.30*| 0.25 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 2.83 (0.95) |
|     |       |       |      |      |      |      |      |      |      |      |      |      |      |      |           |
| F12 | 0.12 | -0.11| -0.23| -0.15| -0.02| 0.18 | 0.24 | 0.01 | 0.01 | 0.34*| 0.49**| 3.13 |      |      | 3.13 (0.75) |
|     |       |       |      |      |      |      |      |      |      |      |      |      |      |      |           |
Table 3 (continued)

|       | F1    | F2    | F3    | F4    | F5    | F6    | F7    | F8    | F9    | F10   | F11   | F12   | F13   | F14   | Transfer |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|
| F13   | -0.15 | -0.33*| 0.49**| -0.05 | 0.09  | -0.26 | -0.04 | -0.23 | -0.22 | 0.23  | 0.18  | 0.12  | 1.58  |        | (0.52)   |
| F14   | 0.41**| 0.30* | -0.35*| 0.08  | 0.12  | 0.60**| 0.50**| 0.32* | 0.63**| 0.11  | 0.19  | 0.07  | -0.38**| 3.8    | (0.77)   |
| Transfer | 0.14  | -0.19 | -0.06 | -0.01 | 0.08  | 0.38**| 0.15  | -0.01 | 0.37**| -0.11 | 0.28* | 0.03  | -0.03 | 0.27  | 2.81     | (0.84)   |

n = 204, after screening. Values in the diagonal refer to the mean and standard deviation (in parenthesis) of each factor; **Correlation is significant at the .01 level (2-tailed); * Correlation is significant at the .05 level (2-tailed); F1: Overcoming indeterminate obstacles during transfer; F2: Decision-making in the transfer process; F3: Negative feelings towards transfer; F4: Overcoming work environment obstacles during transfer; F5: Habits in the transfer process; F6: Positive feelings towards transfer; F7: Beliefs about transfer; F8: Ability to control transfer; F9: Transfer commitment; F10: Boss’s desire to transfer; F11: Clients’ desire to transfer; F12: Subordinates’ desire to transfer; F13: Pressure to transfer; F14: Intention to transfer.
chose the cluster structure with the best fit to the data, as demonstrated by the smallest average distance from their centres, the solution of 3 clusters was adopted: 3 levels of transfer.

Following the identification of clusters and the employees who belonged to each of the clusters, we conducted post-hoc analysis, such as contingency tables and inferential analysis. For the contingency tables, we used the chi-square test to analyse the degree in which the three clusters (predisposition to transfer levels) were associated to the transfer levels. Regarding the inferential analysis, we used the One-way ANOVA test (with Bonferroni correction) to explore if the fourteen ITI factors were behaving significantly different among the three clusters.

Finally, we explored how participants who did not respond to the TrQ (n=148) behave on the initial transfer intention factors (these participants were not included in the longitudinal study). We applied a t-test by comparing the fourteen ITI factors between the drop-out cohort and the completed cohort. Even though participants from the drop-out cohort tend to show lower scores than the completed cohort, only three factors showed significant differences. The drop-out cohort informed of a significantly lower intention to transfer (M=3.61, SD=0.76) than those from the completed cohort (M=3.78, SD=0.77), t(374)=-2.123, p=.034. Similarly, the drop-out cohort felt having significantly less habits in the habits process (M=3.61, SD=0.66) than those from the completed cohort (M=3.74, SD=0.62), t(404)=-1.982, p=.048. Nonetheless, it was the drop-out cohort participants who thought their boss had significantly higher desire to transfer (M=3.37, SD=0.88), compared to the those from the completed cohort (M=3.17, SD=1.00), t(373)=2.108, p=.036. Therefore, the drop-out cohort felt a higher pressure from their bosses to transfer and at the same time, felt less prepared to deal with transfer and showed less intention to transfer. We should remember that employees from the drop-put cohort might (or might not) have been part of the training.

**Results**

Results are provided in this section: categorization of trainees by their transfer level and clusters’ post-hoc analysis.

**Categorising the Trainees by Their Learning Transfer Level**

We sought the number of clusters that best described the common motivational characteristics of trainees on their transfer through the $K$-mean method. The 14 factors were introduced in the analysis, establishing the number of clusters at two ($k=2$), three ($k=3$) and four ($k=4$), in separate analyses. The solution with 3 clusters was chosen considering results related to number of iterations, centroids distances, factors involved in clusters’ establishment, and the $M^2$error of the ANOVA: the two
Table 4 ANOVA’s Values of Cluster Analysis

| Factor                                           | Cluster                        | Error                        | F     | Sig  |
|--------------------------------------------------|--------------------------------|------------------------------|-------|------|
|                                                  | Root mean                      | Degrees of freedom           | Root mean | Degrees of freedom |
| Overcoming indeterminate obstacles during transfer| 14.30                          | 2                             | 0.29  | 201  | 48.72 | .000 |
| Decision-making in the transfer process          | 48.91                          | 2                             | 0.59  | 201  | 82.833 | .000 |
| Negative feelings towards transfer               | 1.46                           | 2                             | 0.25  | 201  | 5.76  | .004 |
| Overcoming work environment obstacles during transfer | 7.48                           | 2                             | 0.43  | 201  | 17.41 | .000 |
| Habits in the transfer process                   | 2.86                           | 2                             | 0.36  | 201  | 7.88  | .001 |
| Positive feelings towards transfer               | 14.44                          | 2                             | 0.33  | 201  | 43.69 | .000 |
| Beliefs about transfer                           | 15.73                          | 2                             | 0.22  | 201  | 73.03 | .000 |
| Ability to control transfer                      | 7.34                           | 2                             | 0.59  | 201  | 12.41 | .000 |
| Transfer commitment                              | 22.54                          | 2                             | 0.36  | 201  | 62.08 | .000 |
| Boss’s desire to transfer                        | 27.67                          | 2                             | 0.73  | 198  | 37.69 | .000 |
| Clients’ desire to transfer                      | 22.31                          | 2                             | 0.60  | 140  | 37.47 | .000 |
| Subordinates’ desire to transfer                  | 4.40                           | 2                             | 0.44  | 61   | 9.99  | .000 |
| Pressure to transfer                             | 1.70                           | 2                             | 0.26  | 201  | 6.50  | .002 |
| Intention to transfer                            | 32.29                          | 2                             | 0.28  | 201  | 116.87 | .000 |

n=204, after screening
clusters solution had a larger error, whereas the error did not change between the three and four cluster solutions. Thus, we report the results of the $k=3$ analysis.

After eight iterations, the centroids of the three clusters did not vary substantially. Cluster 1 and 3 showed the greatest differences between the centroids of the final clusters (3.53), while cluster 2 had smaller distances to clusters 1 (2.09) and 3 (2.37). Boss’ desire to transfer (0.73) and clients’ desire to transfer (0.60) had less in common with the clusters established in the analysis, as shown in Table 4.

Table 5 provides common characteristics of these clusters. Although the factor’s values did not follow an increasing tendency in the clusters, each cluster had specific shared characteristics of the observed factors.

Cluster 1 included Low Predisposition to Transfer participants (LowPT) (27%); cluster 2 included Medium Predisposition to Transfer participants (MedPT) (46%), and cluster 3 included High Predisposition to Transfer participants (HighPT) (27%). We identified the cluster for each participant. Post-hoc analysis followed.

Clusters’ Post-hoc Analyses

Contingency tables and inferential tests are presented in this section. Transfer was divided into thirds: low ($\leq 2.33$), medium (2.34—3.00) and high ($> 3.00$).

| Factor                                             | Clusters                      |
|----------------------------------------------------|-------------------------------|
|                                                   | LowPT | MedPT | HighPT |
| Overcoming indeterminate obstacles during transfer | 2.90  | 3.40  | 3.81   |
| Decision-making in the transfer process            | 2.90  | 2.48  | 4.29   |
| Negative feelings towards transfer                  | 1.63  | 1.47  | 1.34   |
| Overcoming work environment obstacles during transfer| 2.66  | 2.63  | 3.28   |
| Habits in the transfer process                      | 3.56  | 3.87  | 3.92   |
| Positive feelings towards transfer                  | 3.53  | 4.14  | 4.41   |
| Beliefs about transfer                              | 3.37  | 4.09  | 4.23   |
| Ability to control transfer                         | 3.71  | 3.73  | 4.34   |
| Transfer commitment                                 | 2.72  | 3.36  | 3.86   |
| Boss’s desire to transfer                           | 2.67  | 3.32  | 3.96   |
| Clients’ desire to transfer                         | 2.30  | 3.10  | 3.69   |
| Subordinates’ desire to transfer                     | 2.69  | 3.46  | 3.42   |
| Pressure to transfer                                | 1.55  | 1.76  | 1.42   |
| Intention to transfer                               | 3.19  | 4.09  | 4.50   |
| Number of samples allocated to each cluster         | 25 (27%) | 94 (46%) | 55 (27%)|

$n = 204$, after screening

LowPT = Low Predisposition to Transfer, which represents Cluster 1; MedPT = Medium Predisposition to Transfer, which represents Cluster 2; and HighPT = High Predisposition to Transfer, which represents Cluster 3
After applying the chi-square test, we found a significant association between the type of cluster belonging to ITI factors \((k = 3)\) and the employees’ transfer level, being \(X^2 (4) = 22.27, p < .001\) (see Table 6 and Fig. 2).

Figure 2 shows the percentage of employees classified by transfer and predisposition to transfer, indicating that employees in cluster 1 were more related to low levels of transfer compared to the other two clusters in which employees expressed medium and high transfer levels. The motivational and emotional dynamics corresponding to low transfer were clearly defined by employees in cluster 1, with a LowPT. However, identifying a specific cluster showing common characteristics in their motivational and emotional dynamics associated with medium and/or high transfer was of increased difficulty.

### Table 6

| Transfer | Clusters | Count | LowPT | MedPT | HighPT | Total |
|----------|----------|-------|-------|-------|--------|-------|
| Low transfer | | | 39 | 10 | 6 | 55 |
| Expected count | | 25 | 16 | 14 | 55 |
| % within transfer levels | | 71 | 18 | 11 | 100 |
| % within clusters | | 42 | 17 | 12 | 27 |
| % of total | | 19 | 5 | 3 | 27 |
| Standardised residuals | | 2.7 | -1.5 | -2.0 | |
| Medium transfer | | | 40 | 29 | 25 | 94 |
| Expected count | | 43 | 28 | 23 | 94 |
| % within transfer levels | | 43 | 31 | 27 | 100 |
| % within clusters | | 43 | 48 | 50 | 46 |
| % of total | | 20 | 14 | 12 | 46 |
| Standardised residuals | | -0.5 | 0.3 | 0.4 | |
| High transfer | | | 15 | 21 | 19 | 55 |
| Expected count | | 25 | 16 | 14 | 55 |
| % within transfer levels | | 27 | 38 | 35 | 100 |
| % within clusters | | 16 | 35 | 38 | 27 |
| % of total | | 7 | 10 | 9 | 27 |
| Standardised residuals | | -2.1 | 1.2 | 1.5 | |
| Total | | | 94 | 60 | 50 | 204 |
| Expected count | | 94 | 60 | 50 | 204 |
| % within transfer levels | | 46 | 29 | 25 | 100 |
| % within clusters | | 100 | 100 | 100 | 100 |
| % of total | | 46 | 29 | 25 | 100 |
| Standardised residuals | | 15 | 21 | 19 | 55 |

\(n = 204,\) after screening

*LowPT* Low Predisposition to Transfer; *MedPT* Medium Predisposition to Transfer; and *HighPT* High Predisposition to Transfer
Inferential test with the 14 ITI factors as dependent variables and the three types of clusters as a between-subjects variable was performed. One-way ANOVA explored the differences between the 14 ITI factors among the three clusters.

Results in Table 7 show that participants with LowPT had different means in 11 of 14 factors, compared to employees with MedPT. In addition, it shows MedPT and HighPT factor means, indicating differences in 11 factors. Finally, factor means for participants with LowPT and HighPT showed that 13 factors had different means between clusters.

Tables showed a greater difference in the factor profile between participants with LowPT and HighPT. In addition, low transfer showed the greatest differences among the levels of participants’ predisposition to transfer. Figure 3 shows that participants with LowPT might transfer in a low (19%) or medium level (20%) and suggests that participants showing low transfer are mostly employees with LowPT (19%) compared to MedPT (5%) or HighPT (3%). Figure 3 provides the participants’ common motivational factors that showed low transfer, according to their cluster (predisposition) in their factor scores.

Employees in the LowPT and HighPT clusters showed fewer stable scores on their motivational factors, noting that not all employees with low transfer had the same predisposition to transfer or that their motivational state was diverse.

**Discussion**

We analysed the initial transfer intention factors and transfer following online training in participants from Spanish organisations by (1) categorising participants, through cluster analysis, according to their transfer level; and (2) by

![Fig. 2 Percentage of Employees Classified by Transfer and Predisposition to Transfer. Note. $n = 204$, after screening. LPT = Low Predisposition to Transfer; MPT = Medium Predisposition to Transfer; and HPT = High Predisposition to Transfer](image)
Table 7 | Differences Between the Factors of The Clusters

| Factor                                           | Mean of each Cluster (p value) | LowPT—MedPT                | MedPT—HighPT               | LowPT—HighPT               |
|--------------------------------------------------|------------------------------|-----------------------------|-----------------------------|-----------------------------|
| overcoming indeterminate obstacles during transfer |                              | 2.90—3.40 (.000*)          | 3.40—3.81 (.000*)          | 2.90—3.81 (.000*)          |
| decision-making in the transfer process           |                              | 2.90—2.48 (.004*)          | 2.48—4.29 (.000*)          | 2.90—4.29 (.000*)          |
| negative feelings towards transfer                |                              | 1.63—1.47 (.174)           | 1.47—1.34 (.505)           | 1.63—1.34 (.003*)          |
| overcoming work environment obstacles during transfer |                              | 2.66—2.63 (1.000)          | 2.63—3.28 (.000*)          | 2.66—3.28 (.000*)          |
| habits in the transfer process                    |                              | 3.56—3.87 (.006*)          | 3.87—3.92 (1.000)          | 3.56—3.92 (.002*)          |
| positive feelings towards transfer                |                              | 3.53—4.14 (.000*)          | 4.14—4.41 (.045*)          | 3.53—4.41 (.000*)          |
| beliefs about transfer                            |                              | 3.37—4.09 (.000*)          | 4.09—4.23 (.410)           | 3.37—4.23 (.000*)          |
| ability to control transfer                       |                              | 3.71—3.73 (1.000)          | 3.73—4.34 (.000*)          | 3.71—4.34 (.000*)          |
| transfer commitment                               |                              | 2.72—3.36 (.000*)          | 3.36—3.86 (.000*)          | 2.72—3.86 (.000*)          |
| boss’s desire to transfer                         |                              | 2.67—3.32 (.000*)          | 3.32—3.96 (.001*)          | 2.67—3.96 (.000*)          |
| clients’ desire to transfer                       |                              | 2.30—3.10 (.000*)          | 3.10—3.69 (.005*)          | 2.30—3.69 (.000*)          |
| subordinates’ desire to transfer                  |                              | 2.69—3.46 (.001*)          | 3.46—3.42 (.000*)          | 2.69—3.42 (.000*)          |
| pressure to transfer                              |                              | 1.55—1.76 (.034*)          | 1.76—1.42 (.002*)          | 1.55—1.42 (.465)           |
| intention to transfer                             |                              | 3.19—4.09 (.000*)          | 4.09—4.50 (.000*)          | 3.19—4.50 (.000*)          |

n = 204, after screening

*p = .05. LowPT Low Predisposition to Transfer; MedPT Medium Predisposition to Transfer; and HighPT High Predisposition to Transfer
analysing the relation between the initial transfer intention factors and the different transfer levels.

Through cluster analysis we identified three groups of participants based on their initial predisposition to transfer \((k=3)\). This allowed us to identify in each of the clusters: low (LowPT), medium (MedPT) and high (HighPT) predisposition to transfer. Post-hoc analyses showed that differences were greater between employees with LowPT and HighPT, showing differences in all factors except for pressure to transfer. Participants with low transfer differed more in their intention to transfer than those with medium–high transfer.

Comparisons between low transfer employees’ profile of factors according to their cluster could help identify generalised trends and discover which factors should be subject to interventions to increase the effectiveness of the training.

The boss’s desire to transfer was higher in the third cluster, however, that was not the case for perceived pressure to transfer. Some variables, such as job satisfaction, could be playing a role in these results, and therefore contribute to explain the different profiles in the clusters. Future research should explore the dynamics of these variables in their relation to the different transfer levels.

Results suggested motivational factors appear to influence transfer. In addition, the analysis identified key factors to enhance learning transfer in those employees who are expected to transfer less.

After comparing LowPT and HighPT, all factors except pressure to transfer helped to differentiate between clusters. Examining participants’ factor-profile before training can identify meaningful information for training managers. Based on
these results, a tree-map guide was developed (Fig. 4) to help practitioners diagnose potential low transfer before training, and to boost transfer.

If the training is not aligned with organisational strategies, practitioners also use training as a reward or to promote employees’ fulfilment. For instance, employees may participate in the activity due to their personal goals (Bosset & Bourgeois, 2015) and then training design may not need to change. However, when the training activity is aligned with organisational strategies, HRD agents can intervene through four strategies. First, they can develop external and internal communication plans about what employees have innovated in their workplace; the idea is to enhance the organisation’s transparency (Rawlins, 2008) and to acknowledge employees’ innovations, which can be useful as organisations’ public relations (Baker, 2008) and accountability (Gilpin et al., 2010). Second, they can design training content using examples that can be easily related to employees’ own workplace situation (Yamnill & McLean, 2001); design the training to ensure that it responds to employees’ professional needs (Brown, 2002); and use meaningful learning and instruction mechanisms such as experiential learning (Valkanos & Fragouli, 2007), practice variability (Holladay & Quiñones, 2003)
or error-encouragement framing (Bell & Kozlowski, 2008). Third, they can promote a culture change towards appreciating the value of innovation. The last strategy suggests adding action plans as part of the training design, supervised by trainers and trainees’ supervisors; these action plans are transfer implementation intentions (Friedman & Ronen, 2015). Furthermore, action plans must be accompanied by follow-up sessions (Richman–Hirsch, 2001) to ensure its correct implementation. Through the implementation of the tree-map model, organisations can intervene before and during the training and transfer processes, increasing the chances of positive transfer of learning.

Advancing to solve the transfer problem (Saks & Burke, 2012) will decrease organisations’ concerns regarding their return on investment (Williams & Nafukho, 2015). Indeed, organisations cannot lose their money (Curry & Caplan, 1996) nor their resources in training activities that will not benefit them. Therefore “drawing attention to the importance of incorporating training initiatives at the highest level of strategic decision-making” is the first phase of our tree-map process model (Hurt, 2016, p.56). Findings from this study should help HRD units to make specific recommendations to their employees or division. One way to increase an organisation’s potential to achieve a better position in the labour market is to improve transfer of learning through well-planned and managed training (Kim & Ployhart, 2014).

This study answers the call for research in transfer evaluation through a trainee/centred focus (Massenberg et al., 2017; Poell, 2017), and it includes the study of the initial intention to transfer, which had also been claimed (Cheng et al., 2015; Testers et al., 2019). In addition, it takes two measures on each participant, answering the claim for longitudinal designs (Schoeb et al., 2020).

Specifically, this study carries out research in transfer in Southern Europe (Spain), making data from other regions than the USA and Western Europe public (Garavan et al., 2016). The study of transfer in Spain offers empirical data using participants whose first language is Spanish, complementing the pool of transfer evaluation data. These results are valid to the specific context of eLearning in Spain. Further research should investigate whether comparable results are obtained in different countries and cultures. Being Spain linked to most of Central and South America through the language, these results might also apply in those countries. Further research should explore whether these results could be generalised to the Spanish-speaking community, or are contingent to the context of Spain.

The study also contributes to the understanding of training transfer following eLearning interventions. Results can be used to better understand the eLearning modality and the controversy on training effectiveness based on the training modality (DeRouin et al., 2005; Lahti et al., 2014; Lee & Lin, 2013; Sitzmann et al., 2006). Further research should explore whether these results apply to face-to-face interventions.

We identified some limitations. First, using self-reports as the only technique to measure transfer. This is a common practice when objective measures involve high costs for (Chiaburu et al., 2010). To overcome possible bias, self-reports could be administered together with other techniques, such as peer evaluations, performance evaluation, or indicators of economic performance at an organisational level (De Grip & Sauermann, 2013; Segers et al., 2003). Second, it seemed easier to detect participants who will show low transfer levels than those who show medium or
high transfer. This situation has also been found when other methodologies were applied, such as behaviour pattern analysis (e.g., Musso et al., 2013); indeed, predictive systems obtained clearer results when identifying lower performance because only more complex solutions were able to do so with equal precision for higher performance. Thus, this study showed that knowing which transfer predisposition profile a trainee will show at the beginning of a training activity can help practitioners to easily identify those that will have low transfer. In this manner, minimum conditions to transfer can be established. Third, the MTT (Quesada-Pallarès & Gegenfurtner, 2015) was not fully applied. We did not use the post-decisional stage, therefore, future research applying the entire model through a broader longitudinal design is needed. Fourth, while the sample was adequate, participants belonged to three organisations only, therefore, results do not represent all Spanish employees. More research in this topic is needed, including a larger number of organisations from different sectors to generalise the results to the Spanish context. Last, although performing a multilevel analysis could have been an interesting alternative due to the nature of data (22 online courses offered by three organisations and classified in three categories), the sample size did not allow us to perform these kinds of analyses (Maas and Hox, 2005). In addition, the proportion of the courses was disproportionate (hard skills: 53%; technological skills: 31%; soft skills: 16%). Future research could include a larger sample that allows multilevel analyses on a sufficient sample.

To conclude, there are two options to design further steps for this research. First, additional post-hoc analyses could be applied to this data, such as discriminant analysis or regression models among employees with low transfer level and the three profiles detected. Secondly, more advanced techniques could be used, like predictive systems using neural networks. This latter technique would allow us to obtain a mathematical model with predictive value, which could handle the vast array of potential predictors and their complex interactions. Second, we could perform further studies to confirm these behaviour trends and to explore the typological groups of each cluster (personality traits, job motivations, educational profile, etc.) and to add other relevant aspects, such as the learning path, that may help us understand trainees’ learning-path strategy (Poell, 2017) using a within-person centred approach (Huang et al., 2017). Also, we could conduct a study using only the significant factors from the MTT (Quesada-Pallarès & Gegenfurtner, 2015) that help us differentiate among clusters, so data is simpler. To do so though, a new validation of the reduced model should be conducted first. Furthermore, cross-cultural, and representative studies that would allow us to generalise these results or to explore other profiles are needed.

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Declarations

Conflict of interest  The authors have no competing interests to declare that are relevant to the content of this article.
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References

Al-Swidi, A., & Al Yahya, M. (2017). Training transfer intention and training effectiveness: Assessing the gender differences using multi-group structural equation modelling approach. International Journal of Organizational Analysis, 25(5), 839–860. https://doi.org/10.1108/IJOA-07-2016-1043

Aparicio, M., Bacao, F., & Oliveira, T. (2014). Trends in the e-learning ecosystem: A bibliometric study. En Case, T., Mclean, E. y Watson, R. (Eds.). 2014 Americas Conference on Information Systems: Smart Sustainability: The Information Systems Opportunity, Savannah, Georgia, EE.UU.

Baker, S. (2008). The model of the principled advocate and the pathological partisan: A virtue ethics construct of opposing archetypes of public relations and advertising practitioners. Journal of Mass Media Ethics, 23(3), 235–253. https://doi.org/10.1080/08900520802222050

Baldwin, T. T. & Ford, J. K. (1988). Transfer of training: a review and directions for future research. Personnel Psychology, 41(1), 63–105. https://doi.org/10.1111/j.1744-6570.1988.tb00632.x

Baldwin, T. T., Kevin Ford, J., & Blume, B. D. (2017). The state of transfer of training research: Moving toward more consumer-centric inquiry. Human Resource Development Quarterly, 28(1), 17–28. https://doi.org/10.1002/hrdq.21278

Baruch, Y., & Holtom, B. C. (2008). Survey response rate levels and trends in organizational research. Human Relations, 61(8), 1139–1160. https://doi.org/10.1177/0018726708094863

Bell, B. S., & Kozlowski, S. W. (2008). Active learning: Effects of core training design elements on self-regulatory processes, learning, and adaptability. Journal of Applied Psychology, 93(2), 296–316. https://doi.org/10.1037/0021-9010.93.2.296

Blume, B. D., Ford, J. K., Surface, E. A., & Olenick, J. (2019). A dynamic model of training transfer. Human Resource Management Review, 29(2), 270–283. https://doi.org/10.1016/j.hrmr.2017.11.004

Bennett, E. E., & McWhorter, R. R. (2021). Virtual HRD’s role in crisis and the post Covid-19 professional lifeworld: Accelerating skills for digital transformation. Advances in Developing Human Resources, 23(1), 5–25. https://doi.org/10.1177/1523422320973288

Bosset, I., & Bourgeois, E. (2015). Motivation to transfer: Linking perceived organizational support to training to personal goals. Zeitschrift Für Erziehungswissenschaft, 18(1), 169–199. https://doi.org/10.1007/s11618-014-0594-2

Brown, J. (2002). Training needs assessment: A must for developing an effective training program. Public Personnel Management, 31(4), 569–578. https://doi.org/10.1177/009106260203100012

Castro-Martín, L., del M Rueda, M., & Ferri-García, R. (2020). Estimating general parameters from non-probability surveys using propensity score adjustment. Mathematics, 8(11), 2096–2110. https://doi.org/10.3390/math8112096

Cheng, B., Liu, M., Suk, H. I., Shen, D., Zhang, D., & Alzheimer’s Disease Neuroimaging Initiative. (2015). Multimodal manifold-regularized transfer learning for MCI conversion prediction. Brain Imaging and Behavior, 9, 913–926. https://doi.org/10.1007/s11682-015-9356-x

Chiaburu, D. S., Sawyer, K. B., & Thoroughgood, C. N. (2010). Transferring more than learned in training: Employees’ and managers’ (over) generalization of skills. International Journal of Selection and Assessment, 18(4), 380–393. https://doi.org/10.1111/j.1468-2389.2010.00520.x

Curry, D., & Caplan, P. (1996). The transfer field: A training exercise. The Child and Youth Care Leader, 7, 28–30.
De Grip, A., & Sauermann, J. (2013). The effect of training on productivity: The transfer of on-the-job training from the perspective of economics. Educational Research Review, 8, 28–36. https://doi.org/10.1016/j.edurev.2012.05.005

Derouin, R. E., Fritzschke, B. A., & Salas, E. (2005). E-learning in organizations. Journal of Management, 31(6), 920–940. https://doi.org/10.1177/0149206305279815

European Commission (2021). EU policy in the field of adult learning. European Commission. https://ec.europa.eu/education/policies/eu-policy-in-the-field-of-adult-learning_en

European Union (2022). Spain. European Union. https://europe-union.europa.eu/principles-countries-history/country-profiles/spain_es

Fan, W., & Yan, Z. (2010). Factors affecting response rates of the web survey: A systematic review. Computers in Human Behavior, 26(2), 132–139. https://doi.org/10.1016/j.chb.2009.10.015

Farrell, S., & Lewandowsky, S. (2018). Computational modeling in cognition and behavior. Cambridge University Press. https://doi.org/10.1016/j.chb.2009.10.015

Ford, J. K., Baldwin, T. T., & Prasad, J. (2018). Transfer of training: The known and the unknown. Annual Review of Organizational Psychology and Organizational Behavior, 5, 201–225. https://doi.org/10.1146/annurev-orgpsych-032117-104443

Friedman, S., & Ronen, S. (2015). The effect of implementation intentions on transfer of training. European Journal of Social Psychology, 45(4), 409–416. https://doi.org/10.1002/ejsp.2114

Garavan, T. N., McCarthy, A. M., & Morley, M. J. (2016). Global human resource development. Routledge. https://doi.org/10.4324/9781315818177

Gegenfurtner, A. (2011). Motivation and transfer in professional training: A meta-analysis of moderating effects of knowledge type, instruction, and assessment conditions. Educational Research Review, 6(3), 153–168. https://doi.org/10.1016/j.edurev.2011.04.001

Gegenfurtner, A. (2013). Dimensions of motivation to transfer: A longitudinal analysis of their influence on retention, transfer, and attitude change. Vocations and Learning, 6, 187–205. https://doi.org/10.1007/s12186-012-9084-y

Gegenfurtner, A., Quesada-Pallarès, C., & Knogler, M. (2014). Digital simulation-based training: A meta-analysis. British Journal of Educational Technology, 45(6), 1097–1114. https://doi.org/10.1111/bjed.12188

Gilpin, D. R., Palazzolo, E. T., & Brody, N. (2010). Socially mediated authenticity. Journal of Communication Management, 14(3), 258–278. https://doi.org/10.1108/13632541011064526

Global Industry Analystsists (2020). eLearning, Market Analysis, Trends and Forecasts. Industry Analysts, Inc. USA. https://www.strategyr.com/market-report-e-learning-forecasts-global-industry-analysts-inc.asp

Gollwitzer, P. M. (1987). The implementation of identity intentions: A motivational-volitional perspective on symbolic self-completion. In Motivation, intention, and volition (pp. 349–369). Springer. https://doi.org/10.1007/978-3-642-70967-8_24

González-Ortiz-de-Zarate, A. & Quesada-Pallarès, C. (2021, August). Transfer around participant mortality [Invited symposium]. Education and Citizenship: Learning and Instruction and the Shaping of Futures, online. https://www.earl.org/EARLI2021

Hallinger, P., Wang, R., Chatpinjakooop, C., Nguyen, V. T., & Nguyen, U. P. (2020). A bibliometric review of research on simulations and serious games used in educating for sustainability, 1997–2019. Journal of Cleaner Production, 256, 120358. https://doi.org/10.1016/j.jclepro.2020.120358

Holladay, C. L., & Quiñones, M. A. (2003). Practice variability and transfer of training: The role of self-efficacy generality. Journal of Applied Psychology, 88(6), 1094–1103. https://doi.org/10.1037/0021-9010.88.6.1094

Huang, J. L., Blume, B. D., Ford, J. K., & Baldwin, T. T. (2015). A tale of two transfers: Disentangling maximum and typical transfer and their respective predictors. Journal of Business and Psychology, 30(4), 709–732. https://doi.org/10.1007/s10869-014-9394-1

Huang, J. L., Ford, J. K., & Ryan, A. M. (2017). Ignored no more: Within-person variability enables better understanding of training transfer. Personnel Psychology, 70(3), 557–596. https://doi.org/10.1111/peps.12155
Huang, W. H. D., Han, S. H., Park, U. Y., & Seo, J. J. (2010). Managing employees’ motivation, cognition, and performance in virtual workplaces: The blueprint of a game-based adaptive performance platform (GAPP). *Advances in Developing Human Resources, 12*(6), 700–714. https://doi.org/10.1177/1523422310394794

Hurt, K. J. (2016). A theoretical model of training and its transference: The pivotal role of top management team composition and characteristics. *Human Resource Development International, 19*(1), 44–66. https://doi.org/10.1080/13678868.2015.1102007

Kim, Y., & Ployhart, R. E. (2014). The effects of staffing and training on firm productivity and profit growth before, during, and after the Great Recession. *Journal of Applied Psychology, 99*(3), 361–389. https://doi.org/10.1037/a0035408

Klaudia, B., & Bastiaens, T. J. (2020). Towards a motivational design? Connecting gamification user types and online learning activities. *Research and Practice in Technology Enhanced Learning, 15*(1), 1–18. https://doi.org/10.1186/s41039-019-0121-4

Kumatongo, B., & Muzata, K. K. (2021). Research Paradigms and Designs with their Application in Education. *Journal of Lexicography and Terminology*, 5(1), 16–32. https://medicine.unza.zm/index.php/jlt/article/view/551/482

Maas, C. J., & Hox, J. J. (2005). Sufficient sample sizes for multilevel modeling. *Methodology, 1*(3), 86–92. https://doi.org/10.1027/1614-2241.1.3.86

Massenberg, A. C., Schulte, E. M., & Kauffeld, S. (2017). Never too early: Learning transfer system factors affecting motivation to transfer before and after training programs. *Human Resource Development Quarterly, 28*(1), 55–85. https://doi.org/10.1002/hrdq.21256

Monteiro, S. B. S., Lima, A. C. F., Mariano, A. M. & Júnior, E. S. (2020). Plataforma unificada de metodologia Ativa (PUMA): um projeto multidisciplinar. *RISTI - Revista Iberica de Sistemas e Tecnologias de Informacao, 28*(4), 766–778. https://bit.ly/3wO8xwB

Musso, M. F., Kyndt, E., Cascallar, E., & Dochy, F. (2013). Predicting general academic performance and identifying the differential contribution of participating variables using artificial neural networks. *Frontline Learning Research, 1*(1), 42–71. https://doi.org/10.14786/fllr.v1i1.13

Naciri, A., Baba, M. A., Achbani, A., & Kharbach, A. (2020). Mobile learning in higher education: Unavoidable Alternative during COVID-19. *Aquademia, 4*(1), ep20016. https://doi.org/10.29333/aquademia/8227

Lahti, M., Hätönen, H., & Välimäki, M. (2014). Impact of e-learning on nurses’ and student nurses’ knowledge, skills, and satisfaction: A systematic review and meta-analysis. *International Journal of Nursing Studies, 51*(1), 136–149. https://doi.org/10.1016/j.ijnurstu.2012.12.017

Lan, M., & Hew, K. F. (2020). Examining learning engagement in MOOCs: A self-determination theoretical perspective using mixed method. *International Journal of Educational Technology in Higher Education, 17*(7), 1–24. https://doi.org/10.1186/s41239-020-0179-5

Lee, T.-Y., & Lin, F.-Y. (2013). The effectiveness of an e-learning program on pediatric medication safety for undergraduate students: A pretest–post-test intervention study. *Nurse Education Today, 33*(4), 378–383. https://doi.org/10.1016/j.nedt.2013.01.023

Ozuorcun, N. C., & Tabak, F. (2012). Is m-learning versus e-learning or are they supporting each other? *Procedia: Social and Behavioral Sciences, 46*, 299–305. https://doi.org/10.1016/j.sbspro.2012.05.110

Pineda-Herrero, P., Quesada-Pallarès, C., & Ciraso-Calí, A. (2014). Evaluation of training transfer factors: The FET model. In K. Schneider (ed.), *Transfer of learning in organizations* (pp.121–144). Springer International Publishing. https://doi.org/10.1007/978-3-319-02093-8_8

Poell, R. F. (2017). Time to ‘flip’ the training transfer tradition: Employees create learning paths strategically. *Human Resource Development Quarterly, 28*(1), 9–15. https://doi.org/10.1002/hrdq.21279

Quesada-Pallarès, C. (2014). ¿Se puede predecir la transferencia de los aprendizajes al puesto de trabajo?: Validación del Modelo de Predicción de la Transferencia. PhD diss., Universitat Autònoma de Barcelona. http://bit.ly/2e8DUvT

Quesada-Pallarès, C., Ciraso-Calí, A., Pineda-Herrero, P., & Janer-Hidalgo, À. (2015). Training for Innovation in Spain. In *Working and Learning in Times of Uncertainty* (pp. 183–195). SensePublishers.
Quesada-Pallarès, C., & Gegenfurtner, A. (2015). Toward a unified model of motivation for training transfer: A phase perspective. Zeitschrift Für Erziehungswissenschaft, 18(1), 107–121. https://doi.org/10.1007/s11618-014-0604-4

Rawlins, B. (2008). Give the emperor a mirror: Toward developing a stakeholder measurement of organizational transparency. Journal of Public Relations Research, 21(1), 71–99. https://doi.org/10.1080/10627260802153421

Reinhold, S., Gegenfurtner, A., & Lewalter, D. (2018). Social support and motivation to transfer as predictors of training transfer: Testing full and partial mediation using meta-analytic structural equation modelling. International Journal of Training and Development, 22(1), 1–14. https://doi.org/10.1111/iijt.12115

Richman-Hirsch, W. L. (2001). Posttraining interventions to enhance transfer: The moderating effects of work environments. Human Resource Development Quarterly, 12(2), 105–120. https://doi.org/10.1002/hrdq.2

Rise, J., Thompson, M., & Verplanken, B. (2003). Measuring implementation intentions in the context of the theory of planned behavior. Scandinavian Journal of Psychology, 44, 87–95. https://doi.org/10.1111/1467-9450.00325

Rosati, F., & Faria, L. G. D. (2019). Business contribution to the Sustainable Development Agenda: Organizational factors related to early adoption of SDG reporting. Corporate Social Responsibility and Environmental Management, 26(3), 588–597. https://doi.org/10.1002/csr.1705

Saks, A. M., & Burke, L. A. (2012). An investigation into the relationship between training evaluation and the transfer of training. International Journal of Training and Development, 16(2), 118–127. https://doi.org/10.1111/j.1468-2419.2011.00397.x

Salter, S. M., Karia, A., Sanfilippo, F. M., & y Clifford, R. M. (2014). Effectiveness of e-learning in pharmacy education. American Journal of Pharmaceutical Education, 78(4), 1–12. https://doi.org/10.5688/ajpe78483

Schoe, G., Lafrenière-Carrier, B., Lauzier, M., & Courcy, F. (2020). Measuring transfer of training: Review and implications for future research. Canadian Journal of Administrative Sciences/revue Canadienne Des Sciences De L'administration, 38, 17–28. https://doi.org/10.1002/cjas.1577

Segers, M., Dochy, F., & Cascallar, E. (2003). The era of assessment engineering: Changing perspectives on teaching and learning and the role of new modes of assessment. In M. Segers, F. Dochy, & E. Cascallar (Eds.), Optimising new modes of assessment: In search of qualities and standards (pp. 1–12). Kluwer.

Sinclair, P. M., Kable, A., Levett-Jones, T., & Booth, D. (2016). The effectiveness of Internet-based e-learning on clinician behaviour and patient outcomes: A systematic review. International Journal of Nursing Studies, 57, 70–81. https://doi.org/10.1016/j.ijnurstu.2016.01.011

Sitzmann, T., Kraiger, K., Stewart, D., & Wisher, R. (2006). The comparative effectiveness of web-based and classroom instruction: A meta-analysis. Personnel Psychology, 59(3), 623–664. https://doi.org/10.1111/j.1744-6570.2006.00049.x

Soni, V. D. (2020). Global impact of E-learning during COVID 19. SSRN Electronic Journal, 2-12. https://doi.org/10.2139/ssrn.3630073

Testers, L. B. J. C. T., Gegenfurtner, A., van Geel, R., & Brand-Gruwel, S. (2019). From monocontextual to multicontextual transfer: Organizational determinants of the intention to transfer generic information literacy competences to multiple contexts. Frontline Learning Research, 7(1), 23–42. https://doi.org/10.14786/flr.v7i1.359

Traxler, J. (2018). Distance learning—Predictions and possibilities. Education Sciences, 8(1), 35–48. https://doi.org/10.3390/educsci8010035

Valkanos, E., & Fragonis, I. (2007). Experiential learning–its place in in-house education and training. Development and Learning in Organizations: An International Journal, 21(5), 21–23. https://doi.org/10.1108/14777280710779454

Wallace, J.C., Chen, G., & Kanfer, R. (2005). Development and validation of a work-specific measure of regulatory focus. Paper presented at the 20th Annual Conference of the Society for Industrial and Organizational Psychology (Los Angeles, CA, April 15–17, 2005).

Williams, R. C., & Nafukho, F. M. (2015). Technical Training Evaluation Revisited: An Exploratory, Mixed-Methods Study. Performance Improvement Quarterly, 28(1), 69–93. https://doi.org/10.1002/piq

Yanim, S., & McLean, G. N. (2001). Theories supporting transfer of training. Human Resource Development Quarterly, 12(2), 195–208. https://doi.org/10.1002/hrdq.7
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