Article

Web-based Training Program for Writing Instruction: Preservice Teachers' Beliefs Profiles and Their Satisfaction

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Abstract

Background: Preservice teachers' satisfaction with online training should be considered to guarantee a successful e-learning experience. This study aims to determine whether preservice teachers' belief profiles influence their satisfaction with web-based training for teaching writing. **Method:** To achieve this purpose, two main analyses were conducted: (1) validation of a satisfaction's scale through Confirmatory Factor Analysis, and (2) MANOVA with independent inter-subject variables group belief profiles (i.e., Eclectic Profile, Socio-cultural Profile, and Person-environment Profile) and as dependent variables the five dimensions of the satisfaction scale. **Results:** Results showed high satisfaction ratings with the web-based training in all the groups. Nevertheless, significant differences in satisfaction ratings were found between belief profiles. **Conclusions:** Finally, educational implications for preservice teachers' development are highlighted in the discussion.

Keywords: Satisfaction; beliefs; web-based training; preservice teachers; writing.

Resumen

Programa Web Para la Enseñanza de la Escritura: Perfiles de Creencias y Satisfacción de Maestros en Formación. **Antecedentes:** para garantizar experiencias de formación en línea exitosas debe tenerse en consideración la satisfacción de los maestros/as en formación con la formación en línea. Este estudio tiene como objetivo determinar si los perfiles de creencias de los futuros maestros/as influyen en su satisfacción con una formación web para la enseñanza de la escritura. **Método:** para alcanzar este objetivo se llevaron a cabo dos análisis: (1) validación de una escala de satisfacción a través de un Análisis Factorial Confirmatorio, y (2) MANOVA con variables independientes inter-sujetos, perfiles de creencias grupales (i.e., Perfil Ecléctico, Perfil Sociocultural y Perfil Persona-Ambiente) y como variables dependientes las cinco dimensiones de la escala de satisfacción. **Resultados:** los resultados mostraron altos índices de satisfacción con la formación web en todos los grupos. Sin embargo, se encontraron diferencias significativas en las calificaciones de satisfacción entre los perfiles de creencias. **Conclusiones:** por último, en la discusión se destacan implicaciones educativas para el desarrollo profesional de los futuros maestros/as.

Palabras clave: satisfacción; creencias; formación web; maestros/as en formación; escritura.

Teacher education courses are specific educational programs designed to prepare students for entry into the teaching profession (Ferry & Kervin, 2011). Nowadays, an increasing number of teacher education courses are being delivered online (Dyment & Downing, 2020). Satisfaction is key to the continued effectiveness of e-learning courses (Al-Samarraie et al., 2017). Previous studies have focused on how satisfaction depends on the delivery method (Jiménez et al., 2021), the gender of the users, the period of internet use (Bağci, 2018), or the design of the course (Al-Samarraie et al., 2017). However, little is known about the relationship between satisfaction and users' prior beliefs. The present research proposes a new approach to the study of satisfaction in online environments. To our knowledge, there has been no research to date on how prior beliefs could mediate satisfaction with web-based training (WBT) for writing instruction. The present work will therefore focus on whether satisfaction with WBT for writing instruction could be related to preservice teachers' (PTs) prior belief profiles regarding writing instruction and learning.

Online education meets the learning needs of PTs by providing flexibility, pace, and lifetime access to online materials, in addition to relationships and community within the e-learning environment (Paechter & Maier, 2010; Shand & Farrelly, 2018). Web-based interventions have be come an especially popular delivery method due to their convenience (Alkhattabi, 2016). As a result, user satisfaction has been used as an outcome measure with which to ensure a high-quality e-learning experience (Dunst et al., 2019). *Satisfaction* may be defined as students' overall evaluation of service quality (Pham et al., 2019). Satisfaction has been proposed as crucial to the continued effectiveness of the e-learning experience (Al-Samarraie et al., 2017). However, to ensure user satisfaction, it is important to consider the design features of the online environment (Al-Samarraie et al., 2017). Various reviews have demonstrated the existence of core elements within the

design of WBT such as course organization and presentation, the setting of learning objectives and assessments, interpersonal interaction, information quality, and technology considerations such as task-technology fit and system quality (Jaggars & Xu, 2016; Al-Samarraie et al., 2017).

Beliefs have been defined as "psychologically held understandings, premises or prepositions about the world that are felt to be true" (Richardson, 2003, p. 178). Beliefs have profound implications for teacher education (Lunn et al., 2015) because they are linked to curricular and instructional decisions (Pajares, 1992). The identification of belief profiles has commonly been used to understand PT performance (Reichert & Torney-Purta, 2019). Following this line of thought, beliefs should be a prerequisite within the methodological design of WBT interventions (Thurm, 2018). *Theoretical orientations* (Graham et al., 2002) refer to teachers' assumptions or beliefs regarding writing instruction and learning. The Writing Orientation Scale (Graham et al., 2002) is based on the relationship between belief and practice and offers three assumptions relating to the learning and teaching of writing: (1) *corrective writing*, (2) *explicit instruction*, and (3) *natural learning*. The scale has been widely used (e.g., Rietdijk et al., 2018; Ritchey et al., 2015).

In Spain, Seoane et al. (2020) developed the Questionnaire of Pre-service Teachers' Beliefs on Learning to Write (QPTBLW), highlighting—in contrast to the above-mentioned research—that the instrument involves a philosophical distinction between belief and knowledge that underlies the implicit theoretical approach (Rodrigo et al., 1993). The QPTBLW measures how people derive beliefs about learning to write from different learning theories. It was developed using confirmatory factor analysis (CFA) to measure PTs' implicit beliefs associated with six learning theories applied to writing: (1) *behaviorist* (i.e., holds that the learning process is the result of changes in behavior through instruction or correction) (α = .88; ω = .89); (2) *constructivist* (i.e., emphasizes the active construction of knowledge through the integration of new knowledge based on children's own experiences) (α = .72; ω = .74); (3) *psycholinguistic* (i.e., presumes that written language builds on the foundation of oral language) (α = .63; ω = .71); (4) *maturation* (i.e., holds that learning requires cognitive development through maturation) (α = .74; ω = .74); (5) *socio-cultural* (i.e., advocates that interaction and social communication in the environment are a must for learning) (α = .86; ω = .86); and (6) *nativist theory* (holds that humans are born with the predisposition to learn) (α = .77; ω = .77) (total scale α = .84; ω = .89).

The present study is part of a larger project in which knowledge, beliefs, and satisfaction with a web-based training program for writing instruction are explored in a single sample. In one of the studies of this larger project, unique belief profiles were explored with the PTs who completed the QPTBLW prior to the WBT (*N* = 319; Seoane et al., 2021). A latent profile analysis (LPA) was conducted to explore these unique belief profiles, and a three-profile solution was found to be the best fit after comparing models with two to five latent profiles. The final model revealed satisfactory entropy (.777) and participants were classified into three profiles: *Eclectic Profile* (*n* = 129), *Socio-cultural Profile* (*n* = 85), and *Person-environment Profile* (*n* = 105). The present study focuses only on those PTs who completed the WBT (158 out of the 319), and uses the classification obtained in the LPA: *Eclectic Profile* (*n* = 70), *Socio-cultural Profile* (*n* = 47), and *Person-environment Profile* (*n* = 41).

Broadly speaking, participants classified within the *Eclectic Profile* represent a group of PTs who understand the teaching of writing from different disciplinary perspectives because they hold beliefs about most learning theories applied to the field of writing. *Socio-cultural Profile* participants tend to agree less with statements relating to the role of direct and immediate feedback in learning and hold the highest attribution levels of socio-cultural and constructivist theories derived from a socio-cultural theory of learning (Tracey & Mandel, 2012). In other words, when compared to the other profiles, this group agrees to a greater degree with statements about individuals' active construction of knowledge by respecting their natural process. Finally, participants in the *Person-environment Profile* showed higher scores on psycholinguistic and behaviorist theories compared to the other profiles. As such, PTs in this profile have the highest attribution levels in statements focused on the importance of oral language, syntax, and graphemic language aspects for writing acquisition. They also show a tendency toward statements about the role of direct and immediate feedback in learning. Building on the studies mentioned, in the present work, PTs' belief profiles regarding writing instruction and learning will be considered in the study of satisfaction with WBT.

Trazo is a web-based program built on scientific evidence and designed to offer professional development to preservice and in-service teachers in the writing instruction field (Jiménez et al., 2020). The content knowledge of the program draws on classical writing models which postulate that mastering of transcription skills is necessary to achieving text generation (Berninger, 2000; Berninger & Graham, 1998; Berninger & Winn, 2006). Executive functions condition the success of this process (e.g., self-regulation, planning, review) and working memory supports information retrieval and review (McCutchen, 2000). The evidence provided informs about specific skills involved in the writing process and when to impart them. Furthermore, the program emphasizes the role of the different learning theories in understanding writing performance, asserting that to understand the teaching of writing requires the knowledge of different learning theories. For example, explicit and systematic instruction typical of a behaviorist approach might be beneficial for struggling students.

The present study aims to explore whether satisfaction with WBT for writing instruction could depend on PTs' prior belief profiles (i.e., *Eclectic Profile*, *Socio-cultural Profile*, and *Person-environment Profile*). A quasi-experimental design without a control group was employed. To our knowledge, there has been no research linking online training on writing education and prior writing beliefs to PT satisfaction. As such, we pose research questions rather than objectives.

RQ1: What is the satisfaction of the three belief profiles with the various dimensions of the web-based program?
RQ2: Are there differences between the three belief profiles in satisfaction with the web-based program?

Method

Participants

Participants were 158 PTs (age *M* = 22.59, *SD* = 5.19). One hundred eighteen self-identified as women (age *M* = 22.90, *SD* = 5.87) and 40 as men (age *M* = 21.67, *SD* = 1.99). Of those 158 participants, 70 were Early Childhood Education PTs from

Universidad de Las Palmas de Gran Canaria, and 88 were Primary School PTs from Universidad de La Laguna. Both universities are located in the Canary Islands (Spain). Participants were Spanish preservice teachers enrolled on a Spanish-language didactic course in the second year of the program. Recruitment efforts drew on talks aimed at PTs at both universities, provided by the course teachers. The inclusion criterion was enrollment on the official Spanish-language didactic course offered by the two universities.

We employed a previously existing classification of participants into three profiles: *Eclectic Profile* (*n* = 70), *Socio-cultural Profile* (*n* = 47), and *Person-environment Profile* (*n* = 41). A chi-square test of independence showed no significant association between gender and belief profile $\chi^2(2, N = 158) = 5.61, p = .06$.

Instruments

The Program Satisfaction Scale was created for this study and we used CFA to verify the factor structure. This scale was specifically designed for its use in this study using the Moodle e-learning platform (v.3.3.1), where the TRAZO program was hosted (http://trazo.iaas.ull.es). Full details of the procedure used to design and validate this predictive model of PT satisfaction can be found in the results section of this article (i.e., instrument validation). The questionnaire contained 20 items corresponding to five dimensions:

(1) *Content knowledge* (measures users' satisfaction with the understandability of the content presented).
(2) *Pedagogical knowledge for instruction* (measures users' satisfaction with the feasibility of the activities used).
(3) *Pedagogical knowledge for CBM assessment* (measures users' satisfaction with the proposed screening measure in terms of its usefulness and understandability).

(4) *Online resources* (measures users' satisfaction with the variety of extra online information provided).
(5) *Interactions* (measures users' satisfaction with the usefulness of the interaction channels).

The PTs were able to express their degree of agreement and disagreement on a Likert-type scale ranging from *strongly disagree* (score = 0) to *strongly agree* (score = 10) with the statement.

Procedure

Participants completed 18 weeks of WBT whose content was divided into five volumes. As shown in Table 1, in the first week the participants completed a belief questionnaire about writing instruction. Then, from weeks 2 to 14, content knowledge was provided through interactive videos. The following weeks were devoted to providing pedagogical knowledge for instruction, pedagogical knowledge for CBM assessment, resources on RtI teaching practices, and additional online resources. All participants completed the program according to the same schedule. After 17 weeks of training, users were required to complete an online scale of satisfaction with the content provided in the WBT. Participants were not given a time limit to complete the questionnaire, but had only one opportunity to fill it out. Only participants who finished all five volumes and completed the satisfaction questionnaire were included in the study (*N* = 158).

The Trazo web-based program also aims to between teacher training and their knowledge of writing instruction by providing an e-learning community. Throughout the implementation process, an online mentor accompanied users through the web-based training. The mentor was a graduate research assistant from an educational psychology program with experience in teaching literacy-related courses to undergraduate students. The mentor's main responsibilities were to prepare course materials, facilitate

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Table 1
Description of the implementation timeline, Trazo's web-based training content, and evaluation design

Implementation timeline	Web-based training content	Evaluation design		Description
Week	**Volumes**	**Variable**	**Instruments**	
1		Beliefs	QPTBLW	Questionnaire of Pre-service Teachers' Beliefs on Learning to Write (Seoane et al., 2020)
2-14	Content knowledge	–	–	Twelve interactive video tutorials covering seven themes: (1) *theories and beliefs on learning to write*, (2) *what is the writing activity*, (3) *handwriting*, (4) *spelling*, (5) *written expression*, (6) *writing with pen and keyboard*, and (7) *prevention and Response to Intervention (RtI) model*
15	Pedagogical knowledge for instruction	–	–	Structured materials for instruction when teaching a child how to write. The material includes four books, each with a version for teachers and a workbook for students that can be downloaded and printed for classroom use
16	Pedagogical knowledge for CBM assessment	–	–	Curriculum-based screening tool for 1st to 3rd graders (Jiménez & Gil, 2019). CBM has three versions with different forms (i.e., fall, winter, and spring) for detecting students at risk
17	RtI teaching practices	–	–	Video recordings on how to implement good teaching practices according to the RtI sequence of instruction (i.e., explicit, direct, scaffolded, and based on solid knowledge, practice and repetition, and a diversity of modalities and examples)
17	Extra online resources	–	–	References about writing instruction based on empirical evidence, focusing on predicting variables of writing success, references based on current Spanish educational legislation, and some related websites of interest
18		Satisfaction	Satisfaction scale	Web-based training satisfaction scale (scale validation was conducted in the present paper)

Note: CBM= Curriculum-based measurement; QPTBLW = Questionnaire of Pre-service Teachers' Beliefs on Learning to Write

online discussions, and provide written feedback. Thus, multiple forums and private chats were available throughout the volumes of the program through which to resolve doubts and share opinions between mentor and users.

Data analysis

Two main analyses were conducted to explore whether satisfaction with the WBT for writing instruction was related to the PTs' prior belief profiles.

First, it was necessary to develop a satisfaction scale adjusted to the designed WBT. A CFA was used to validate a predictive model of the satisfaction dimension. The detailed procedure is presented in the next section.

Second, to establish users' satisfaction with the program and whether satisfaction could depend on belief profiles, a MANOVA was conducted using a general linear model (GLM) that had group profiles as independent inter-subject variables and the five dimensions of the scale (i.e., content knowledge, pedagogical knowledge for instruction, pedagogical knowledge for CBM assessment, online resources, and interactions) as dependent variables. Wilks' lambda (Λ) was employed to test for differences between the means of identified groups over the dependent variables. The classification of participants prior the WBT into three profiles (i.e., *Eclectic Profile*, *Socio-cultural Profile*, and *Person-environment Profile*) was done in a previous study using latent profile analysis. The detailed statistical procedure can be seen in Seoane et al. (2021).

All analyses were carried out using RStudio (RStudio Team, 2020).

Results

Instrument validation

The objective of this part was to design and validate a model for measuring PTs' satisfaction with the WBT. The statistical procedure was conducted in five stages (Parahoo et al., 2016).

(1) Conceptual model development. Five dimensions emerged after reviewing scientific works on satisfaction in online learning: (1) *content knowledge*, (2) *pedagogical knowledge for instruction*, (3) *pedagogical knowledge for CBM assessment*, (4) *online resources*, and (5) *interactions* (Jiménez et al., 2014; Paechter & Maier, 2010).

(2) Item development. For each dimension identified, validated measures were obtained from the literature and fine-tuned to the context of the present study (Jiménez et al., 2014; Paechter & Maier, 2010). This process resulted in a pool of 50 statements deemed to influence PTs' satisfaction with the Trazo web-based program. These items were tested with a sample of 193 PTs.

(3) Item purification and final decision of measurement scales. A CFA was used to define how many factors are expected, which items belong to the factors, and which factors are related to each other. For the CFA, items with loadings of less than 0.5 on their respective factors were considered for the omission, thereby achieving purification of scales (Hair et al., 2010). Several model fit indices were used to examine the goodness-of-fit: root mean square error of

approximation (RMSEA) and its 90% confidence interval, the Tucker-Lewis index (TLI), and the comparative fit index (CFI). For the RMSEA, a value of .06 (90% CI upper limit close to ≤ .10, nonsignificant CFit) or less is considered a good fit. For the TLI and CFI, a cutoff value of .95 or greater and standardized root mean squared residual (SRMR) values close to .08 or below are considered an acceptable fit (Hu & Bentler, 1999). To examine the reliability of the scale, Cronbach's alpha and Composite Reliability (CR) values were assessed.

Furthermore, in the adjustment of scales, there are different positions related to the number of items per factor and the size of the sample, and these are needed for the construction of the scale. If the sample is smaller than 200 cases, as in the present study ($N = 193$), three or four items per factor are needed (Ferrando & Anguiano-Carrasco, 2010). For this and other reasons (i.e., factor loadings and correlations), the initial pool of items was reduced to four per latent factor.
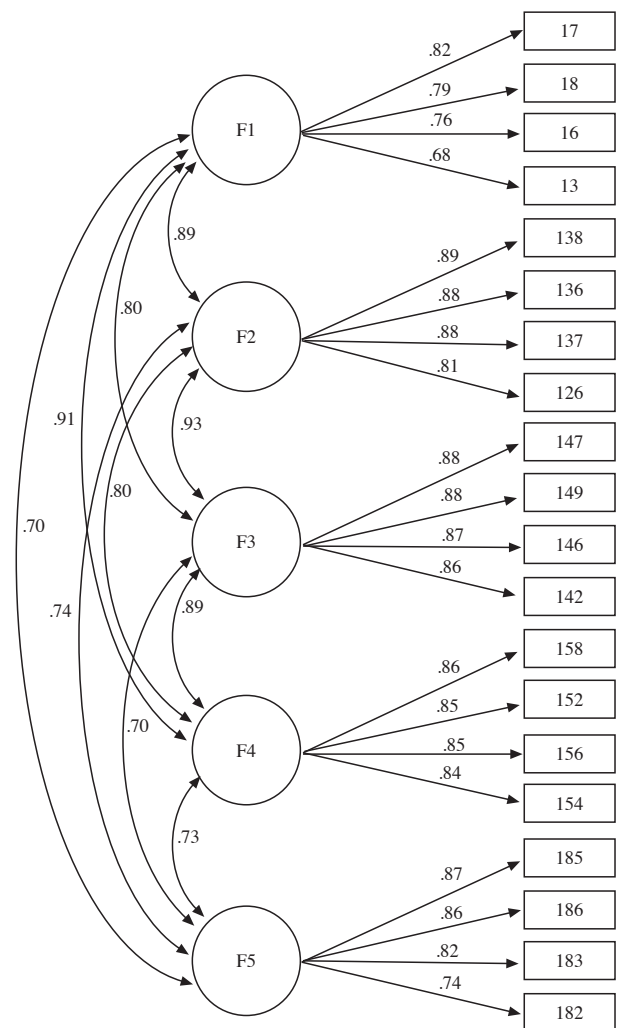

Figure 1 *Measurement model of the Program Satisfaction Scale*
Note. F1 = Content knowledge; F2 = Pedagogical knowledge for instruction; F3 = Pedagogical knowledge for CBM assessment; F4 = Online resources; F5 = Interactions item numbers are presented in rectangles

(4) Final measurement model. A final model with 20 items representing five latent factors (i.e., content knowledge, pedagogical knowledge for instruction, pedagogical knowledge for CBM assessment, online resources, and interactions) was tested for the unidimensionality of the scale using CFA. The maximum likelihood (ML) estimator was employed due to observed indicators following a continuous and normal distribution (Li, 2016). The model revealed an adequate fit to the data for the sample: X^2 (160, N = 193) = 299.64, p < .001; CFI = .96, RMSEA = .06, 90% CI [.05, .07], NFI = .91; TLI = .95. The final measurement model is presented in Figure 1. Results showed a normal distribution of the data (Kline, 2011). Descriptive statistics, standardized factor loadings above .74, and measurement errors for all items are presented in Table 2.

(5) Final model evaluation. The questionnaire showed reasonable reliability indices for the total scale (α = .96; ω = .97) and for each of the dimensions: *content knowledge* (α = .84; ω = .85), *pedagogical knowledge for instruction* (α = .92; ω = .92), *pedagogical knowledge for CBM*

assessment (α = .93; ω = .93), *online resources* (α = .91; ω = .91), and *interactions* (α = .89; ω = .90).

What is the satisfaction of the three belief profiles with the various dimensions of the web-based program?

All belief profile groups evaluated the WBT positively, showing above 84% satisfaction in all dimensions. The content knowledge dimension was evaluated best by the whole sample, while interactions were evaluated the least well. The highest rating was attributed by the *Socio-cultural Profile* to the pedagogical knowledge for instruction dimension. The lowest rating was given by the *Eclectic Profile* to the online resources dimension (see Table 3).

Are there differences between the three belief profiles in satisfaction with the web-based program?

The results showed a significant effect [F (2, 302) = 2.95, p < .001] of group (i.e., the three belief profiles) on the dependent variables (i.e., the five dimensions of the satisfaction questionnaire). This means that there was a statistically significant difference in general WBT satisfaction according to belief profiles. The main effects demonstrated that mean scores for satisfaction were statistically

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Table 2
Standardized factor loadings and standard errors per item of the satisfaction survey

Items	M	SD	A	K	Factor Loading	Error
Factor 1: Content knowledge						
The content knowledge offered is well-sequenced and supported with specific examples	9.02	1.41	-1.79	3.06	.82	.02
The theoretical concepts, such as 'fluency,' are sufficiently explained	9.06	1.34	-1.74	3.35	.79	.03
The content knowledge of the program is essential to teaching practice	8.95	1.50	-2.05	5.84	.76	.03
The content knowledge contains didactic guidelines	8.81	1.54	-1.66	2.96	.68	.04
Factor 2: Pedagogical knowledge for instruction						
The activities offered for writing sentences and texts allow for work on written composition from different levels	8.79	1.51	-1.59	3.17	.89	.01
The number of activities proposed allows for work on the different levels of writing development (handwriting, spelling, sentences, and written composition)	8.82	1.48	-1.59	3.10	.88	.01
The sequence of activities proposed for each lesson allows the incorporation of other similar activities	8.81	1.46	-1.46	2.46	.88	.01
The proposed activities are compatible with other teaching strategies for writing instruction	8.78	1.56	-1.67	3.59	.81	.02
Factor 3: Pedagogical knowledge for CBM assessment						
The evaluation tool, based on curriculum IPAE, is useful for identifying students at risk of presenting learning difficulties in writing	8.81	1.43	-1.44	2.46	.88	.01
The student assessment instruments include all the components that are worked on in the intervention program	8.77	1.46	-1.36	1.81	.88	.01
The instruments used to assess student progress are easy to apply	8.76	1.49	-1.53	2.89	.87	.01
The explanations given about the application and correction of the assessment instruments are clear and necessary to be able to conduct student evaluation	8.76	1.52	-1.55	2.59	.86	.02
Factor 4: Online resources						
The web addresses provided help to reinforce content knowledge	8.76	1.55	-1.48	2.26	.86	.02
The Trazo web-based program offers a wide variety of information and support resources	8.92	1.44	-1.41	1.49	.85	.02
The references allow users to reinforce content knowledge	8.70	1.63	-1.51	0.09	.85	.02
The videos that show how to plot handwriting serve as a model for implementation	8.81	1.60	-1.67	2.81	.84	.02
Factor 5: Interactions						
Mentors who oversee the learning process help to solve queries and/or incidents during the training	8.38	2.05	-1.76	0.09	.87	.02
The Trazo web-based program facilitates the generalization of the knowledge acquired with users of other educational centers through different spaces available on the platform (i.e., private messages, interactive forums)	8.50	1.90	-1.54	2.64	.86	.02
The Trazo web-based program enables interaction with mentors who enhance the use of the online training received	8.37	2.08	-1.70	3.14	.82	.02
The Trazo web-based program offers interactive forums that are always available for discussion and exchange of ideas among users	8.86	1.69	-2.00	4.79	.74	.03

Note: *M* = mean*; SD* = standard deviation*; A* = asymmetry*; K* = kurtosis; IPAE= Indicadores de Progreso de Aprendizaje en Escritura [Indicators of basic early writing skills] [Suplemental material]; CBM= Curriculum-based measurement

Table 3
Means and standard deviations of satisfaction dimensions by participants who completed the web-based training and by belief profiles

| | Participants who complete WBT N = 158 | | Belief profiles | | | | | | |
| | | | Eclectic n = 70 | | Socio-cultural n = 47 | | Person-environment n = 41 | | |
Dimension	M	SD	M	SD	M	SD	M	SD	Effect
Factor 1: Content knowledge	33.65	5.30	31.72	5.85	35.00	4.16	35.41	4.46	$F(2, 472) = 9.24, p < .00$
Factor 2: Pedagogical knowledge for instruction	33.24	5.56	30.98	5.63	35.44	4.51	34.56	5.21	$F(2, 652) = 12.06, p < .00$
Factor 3: Pedagogical knowledge for CBM assessment	33.02	5.59	30.98	5.78	34.93	4.49	34.31	5.35	$F(2, 656) = 12.06, p < .00$
Factor 4: Online resources	33.27	5.83	31.25	5.99	34.97	5.32	34.78	5.08	$F(2, 514) = 8.26, p < .00$
Factor 5: Interactions	32.87	6.36	31.52	6.10	33.63	7.02	34.31	5.65	$F(2, 240) = 3.03, p < .05$

Note: WBT = web-based training; CBM = curriculum-based measurement; *M* = mean; *SD* = standard deviation
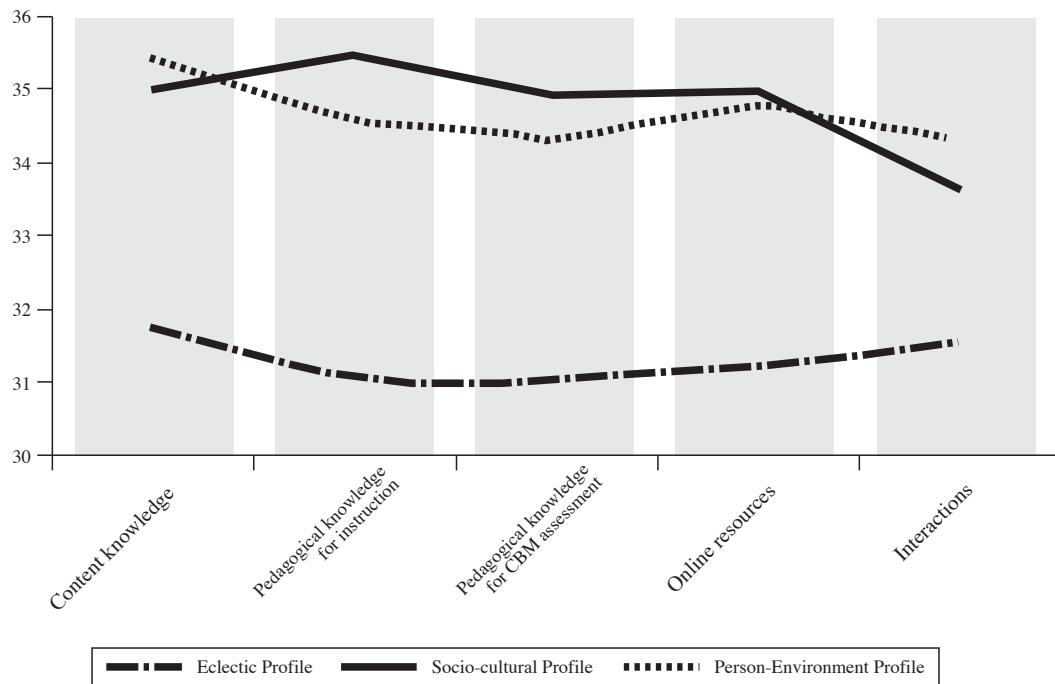

Figure 2. *Satisfaction scores by belief profiles and dimensions of the Program Satisfaction Scale*

significantly different between the *Eclectic Profile* and the *Socio-cultural Profile* (*p* < .001) and between the *Eclectic Profile* and the *Person-Environment Profile* (*p* < .001), but not between the *Socio-cultural Profile* and the *Person-Environment Profile* (*p* = .90). These differences are visualized in Figure 2, which illustrates that satisfaction was significantly lower within the *Eclectic Profile*. Significant effects were also found across all dimensions of the satisfaction scale (see Table 3).

Discussion

In higher education, the study of satisfaction with the e-learning experience is essential to the continued effectiveness of online training processes (Al-Samarraie et al., 2017). To our knowledge, there has been no research to date focused on how prior beliefs could mediate satisfaction with WBT in the field of writing. This

study presents a new approach to the study of satisfaction by focusing on whether satisfaction with WBT for writing instruction could be dependent on PTs' prior belief profiles regarding writing instruction and learning.

What is the satisfaction of the three belief profiles with the various dimensions of the web-based program?

Regarding degree of satisfaction, the three belief profiles examined in the present study reported a high degree of satisfaction. Satisfaction ratings were above 84% in all of the evaluated dimensions (i.e., content knowledge, pedagogical knowledge for instruction, pedagogical knowledge for CBM assessment, and online resources). These results support previous research that establishes the importance of paying attention to the design and organization of the different elements of the e-learning environment. Course

design in terms of clarity and coherent structure of the different learning materials, the establishment of clear learning objectives (Jaggars & Xu, 2016), and opportunities to access online resources are important dimensions for online student satisfaction (Paechter & Maier, 2010). The presence of these elements directly affects user satisfaction with the online training received (Al-Samarraie et al., 2017). More specifically, the results indicate that the *content knowledge* dimension was the best-rated dimension by PTs. In this regard, it should be noted that special attention was paid to the course content during the design of Trazo and, in particular, in the first module (i.e., content knowledge). Attention to content knowledge involved extensive work to present the information accurately, comprehensively, and consistently in the form of video tutorials. This was done with sensitivity to the fact that, in the online environment, there is only one way to access information—the e-learning environment itself—and that this makes it even more important to provide quality and well-organized information. The results of this study support previous findings on the importance of providing quality information in order to increase satisfaction with the virtual environment (Delone & McLean, 2003).

Are there differences between the three belief profiles in satisfaction with the web-based program?

Although it was found that PTs reported high levels of satisfaction with all of dimensions of the scale, the *Eclectic Profile* satisfaction score was significantly lower than those of the *Socio-cultural Profile* and *Person-Environment Profile*.

The lowest satisfaction scores were found to correspond with the lowest self-attributed belief profile (i.e., *Eclectic Profile*). PTs belonging to the *Eclectic Profile* represent a more homogeneous group, showing moderate and similar levels of self-attribution in all learning theories (i.e., behaviorist, constructivist, psycholinguistic, maturation, socio-cultural, and nativist). Despite being the least satisfied belief profile, the *Eclectic Profile* represents a group of PTs who might understand the teaching of writing from different disciplinary perspectives, as they hold beliefs about all learning theories that apply to the field of writing. Understanding writing development implies awareness of multiple related elements (e.g., cognitive capacities and processes, language abilities, motor systems, motivational aspects, and social practices) (Bazerman et al., 2017). The course content drew on a broad range of writing research gathered from the various learning theories applied to the curricular area of writing. As the *Eclectic Profile* group is closer to this broad-based view of writing, WBT content might be less novel for someone with this profile. As such, they might be less satisfied at the end of the WBT than the other profiles.

Future studies could further assess this relationship in order to shed light on how different belief attributions affect WBT satisfaction. For example, incorporation of interviews and open questionnaires could provide a deeper understanding of PT belief profiles and how they relate to satisfaction.

Finally, this study presents certain limitations that should be mentioned. On one hand, the sample size does not allow generalization of the results, so it would be beneficial to readdress the research questions using larger populations. On the other, the self-reported nature of the data compromises the reliability of the results. Given the results obtained, and as noted above, future research should consider the advantages of interviews in terms of providing complementary information that could shed light on the differences between belief profiles found in the various dimensions of the satisfaction questionnaire. Notwithstanding these limitations, we hope that this paper will spark a broader conversation about how users' beliefs can mediate satisfaction with online training.

Concluding Remarks

There is a growing need to analyze and understand the impact of WBT on PTs' professional development. Addressing this issue through analysis of student satisfaction is essential to ensuring the continued effectiveness of e-learning. This is especially relevant in the case of writing instruction given constant demand for teacher training courses to enhance professional development in the field (Brenner & McQuirk, 2019; Oliveira et al., 2019; Troia, 2019).

The modest results derived from this research support the need for close attention to the design and organization of the different elements within the virtual learning space given its impact on PT satisfaction. This finding highlights educational implications for the design of WBT aimed at teachers in training, such as the need to offer different communication channels in the webspace or to present information on the content in compliance with quality standards. Finally, the results suggest that an eclectic belief profile regarding the subject matter may be less satisfied following WBT than polarized profiles. Future research into how satisfaction could rely on prior belief profiles regarding the subject matter should consider mixed research methods in order to obtain more comprehensive information on belief profiles and how they relate to satisfaction.

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