Teaching Style: Is it Measurable and Changeable?

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Abstract

The purpose of the present study was two-fold: (a) to validate a teaching styles questionnaire, and, (b) to evaluate change in teaching styles as a function of different training programs. For (a) 849 teachers took part in the study and the factor structure of the scale was assessed using Latent Variable Modelling (LVM). For (b) 86 special educators were trained on written expression instructional approaches through different training media. Results regarding: (a) indicated that a 4-factor correlated simple structure best described the observed data, and, (b) the educators that participated in an interventional program altered significantly their teaching styles.

Keywords: Teaching styles questionnaire validation, Learning Disabilities, intervention, special education

1. Teaching and learning styles

Nowadays, the population of students is becoming increasingly diverse, since a lot of students with special educational needs are enrolled in the mainstream school. The number of children diagnosed with Learning Disabilities (LD) is steadily increasing today and consequently, so is the number of LD students enrolled in general and special education. This situation, combined with greater awareness of individual human rights, has led to an increased demand for effective teaching methods. According to Tomlinson (2005), in order to respond to all students’ learning needs within a classroom, teachers should differentiate their instruction in a way that it serves students’ cognitive abilities, interests and learning styles. Especially the latter has gained great interest in the general educational field for over forty years now (Dunn & Dunn, 1979).

Gardner (1983) was the first to mention the term multiple intelligences, by which he meant that individuals filter knowledge from diverse intellectual and learning domains. Cognitive (verbal/linguistic, logical/mathematical, spatial); psychomotor (bodily-kinesthetic, musical); and affective (interpersonal and intrapersonal) intelligences manifest themselves in different learning styles. Learning styles are “relatively stable indicators of how learners perceive, interact with, and respond to the learning environment” (Keefe, 1979, p. 4). According to Dunn (1983) learning styles correspond to the elements that influence a students’ learning, and they can be: a) environmental, b) emotional, c) sociological, d) psychological, and/or, e) physiological. However, the concept of learning styles not only seems to be controversial, as regards its dimensions (e.g., Kavale & Forness, 1990), but also seems to differentiate itself in the general compared to the special education field.

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Students with LD exhibit differences in the way they learn when compared to typical students, due to the fact that they comprehend differently the influential elements described above (Kyriacou & Dunn, 1994). In that line, Wild (1979) and Williams (1989) stressed that students with LD incline towards being less persistent, less motivated but more willing to learn by their teachers than their typical peers. Sideridis (2005) showed that specific attributes of the classroom climate (cooperation, interesting lesson, and mastery oriented climate) were linked to cognitive and emotional enhancement for LD students. Does this mean that when teachers’ style matches students’ cognitive needs and learning styles the teaching gains are significant? Research highlighted that an autonomy-supportive environment motivated and engaged typical students in the classroom (Hein et al., 2012; Trouilloud, Sarrazin, Bressoux, & Bois, 2006). On the special education field, Antoniou and Sideridis (2008) revealed the influence of educators’ structured teaching style when implementing a reading comprehension program in LD students. Positive teacher attitudes and highly structured lessons were positive predictors of reading comprehension gains. Furthermore, when the educators’ teaching style was more flexible, students’ reading comprehension gains were not significant, compared to a structured one.

The term “teaching style” refers to “a teacher’s personal behaviors and media used to transmit data or receive it from the learner” (Kaplan & Kies, 1995, p.29) and is based on teacher’s beliefs of best teaching (Conti, 2004). Teaching styles are based on the behaviors simulated by the teacher-student interaction and may differ among teaching situations, since teachers use several teaching styles in order to meet instructional and assessment objectives (Hein et al, 2012). Teaching styles are mostly “a continuum where the most student-centered (facilitative) style lies at one end and the most teacher-centered style (assertive) lies at the other end” (Bibace et al., 1981; as cited in Leung et al., 2003 p. 411). Nevertheless, the categorization that is most widely used was developed by Byrne and Long (1976). They categorized teachers’ behaviors as: 1. Assertive (e.g., teaches directly, informatively, guides students, and provides direct feedback), 2. Suggestive (e.g., provides opportunities and possible answers, summarizes, activates prior knowledge), 3. Collaborative (e.g., listens to students experiences, explores students’ understanding), and, 4. Facilitative (e.g., facilitates student’s expressiveness, autonomous learning and decision making).

Acknowledging the importance of adopting specific teaching styles in order to serve the learning of different school populations the present study aimed (a) to validate an adapted questionnaire of teaching styles in Greek; and (b) to examine whether the styles of teaching can be changed as a function of different special education training programs.

2. First Study

2.1. Participants of Study I

Participants were 849 general and special educators, 545 women with a mean age 38.15 (SD=7.43) and 218 men aged 41.70 (SD=6.87) years. Four hundred nine were general education teachers, 61 special, 41 preschool and the remaining 338 were employed in the secondary education in diverse specialties (mathematicians, physicians, foreign language tutors, educators of information technology, physical educators, etc.).

2.2. Teaching Styles Inventory

The Teaching Styles Inventory (TSI) is a self-rated questionnaire, which contains 24 items divided in three subsections. Each section reflects educators’ role when: (a) instructing, (b) providing tasks and assignments to the students, for practice within class and (c) assessing knowledge. The content of the eight items that compose each section (24 items in total) corresponds to the following teaching styles: assertive, suggestive, collaborative, and facilitative. Teachers mark a maximum of three items in each section that describes their teaching style. A sample item is, “When I teach a subject that reflects the current situation I (a) invite students to express themselves and the ideas they have; (b) provide every information I know on that matter; (c) try to understand my students’ feelings on that matter; or, (d) summarize the discussion for the students” (a = collaborative, b = assertive, c = facilitative, d = suggestive).
2.3. Data Analysis

Confirmatory factor analytic (CFA) models deal with the measurement of non-observable traits from the linear combination of observable behaviors. They evaluate whether the hypothesized item-construct relationships are supported from the data using a two-step approach. First a measurement model is fit to the data in order to establish that the theoretical simple structure holds. At a second step structural relations are imposed in the model (direct paths or correlations) and are evaluated using inferential means (Z-tests, at \( p < .05 \)). The overall model fit is evaluated by use of a Chi-square test, which is sensitive to excessive levels of power. To this end, several fit indices have been proposed as alternative evaluations of model fit (e.g., CFI, IFI, NFI, RMSEA, etc.) with values of .900 and above signalling adequate model fit (Bentler, 1995). In matrix language the model is expressed as following:

\[
\Sigma = \Lambda_X \Phi \Lambda_X' + \Theta_\delta
\]

Where,
- \( \Sigma \) = is the reproduced covariance matrix based on the sample estimates
- \( \Lambda_X \) = is the Matrix of factor loadings of the observed variables \( X_1, X_1, \ldots, X_\nu \), on their respective factor
- \( \Lambda_X' \) = is the transpose of \( \Lambda_X \)
- \( \phi \) = is the Matrix of correlations between latent variables, and,
- \( \theta_\delta \) = is the variance/covariance matrix of the errors (\( \delta \)) of the observed variables (\( X_\nu \))

2.4. Results of Study 1

The hypothetical model posited that the four subconstructs represent correlated structures that define the latent variable teaching style. The competing model involved a hierarchical structure in which all subconstructs loaded upon. In graphical form, the first and best model is shown below (Figure 1). Model fit was evaluated by means of three criteria: (a) adequacy of measurement model, (b) evaluation of residuals, and (c) correlation of subconstructs. For (a) it was important that all measured variables loaded significantly on their respective factors. For (b) the unstandardized index of the residuals (RMSEA) should be less than 10%. For (c) correlations between subconstructs should be significant using both inferential statistics and effect size estimates (\( r = .30 \) based on Cohen’s 1992 recommendations). Results indicated that (a) indeed all slopes linking each item to the latent construct were significant, (b) residuals were 9.6%, and, (c) structural correlations were significant at \( p < .001 \) and using effect size estimates (all were above .30). When comparing the two competing models results indicated a significant inferiority of the hierarchical model compared to the four-factor correlated model using a Chi-square difference test (at \( p < .001 \)).

3. Second Study

3.1. Participants of Study 2

Participants were 41 special educators, by which 13 were in an in-service training program on special education, 17 were post-students in special education and 11 special educators were taking part in an interventional program aiming to enhance LD students’ written expression. All of them participated in the different groups voluntarily, but they were not informed on the current study’s purpose. Table 1 provides information on the groups’ size, mean age, and years of experience in general and special education.

3.2 Procedures and Materials in Study 2

All participants filled the TSI prior to and following training. During training, they were all instructed on what constitutes effective practices towards enhancing LD students’ written expression with an emphasis on evidence-based successful instructional approaches (e.g., direct and explicit instruction, self-regulated strategy development,
The difference between groups lied on the researcher’s instructional approach and on the training time. The instructor was the same for the three groups. The In-Service Training Group (ISTG) attended a 30-hour lecture that was delivered in two weekends. ISTG teachers were thoroughly informed on the best practices and instructional approaches that ameliorate LD students’ written expression. The Post Graduate Program Group (PGPG) participated in a workshop that lasted for 20 hours. The PGPG teachers worked on real written products of LD students and they were instructed how to build interventional programs according to those students’ needs. Their emphasis was on the instructional approach chosen. None of the two groups received further instructions. The Intervention Group (IG) attended an informative 3 hours meeting on the way they should use teachers’ handbook. This handbook guided the written expression program’s instructional procedure. It was developed to help special educators implement the writing strategies in their classrooms and to understand the theoretical background behind writing acquisition. It also included modeling of the instructional procedure to help teachers adopt specific instructional approaches in order to enhance LD students’ writing competence. There were also elaborate examples on the lesson’s sequence; guidance was provided on the implementation, use, and function of every strategy. The interventional program lasted for 20 hours and was delivered by special educators in the resource room. Although the lesson was observed during the intervention’s implementation, the researcher did not provide additional information than that offered at the informative meeting.

### Table 1. Means and standard deviations of the participants’ demographics

<table>
<thead>
<tr>
<th>Groups</th>
<th>N</th>
<th>Mean Age (SD)</th>
<th>Years in Education (SD)</th>
<th>Years in Special Education (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>In-service training (ISTG)</td>
<td>13</td>
<td>43 (1.00)</td>
<td>14.38 (9.14)</td>
<td>2.77 (3.68)</td>
</tr>
<tr>
<td>Post-graduate program (PGPG)</td>
<td>17</td>
<td>39.57 (3.16)</td>
<td>13.65 (3.77)</td>
<td>0.49 (0.12)</td>
</tr>
<tr>
<td>Intervention (IG)</td>
<td>11</td>
<td>45 (1.73)</td>
<td>14.75 (5.95)</td>
<td>2.83 (1.84)</td>
</tr>
</tbody>
</table>

### 3.3 Results of Study 2

Means (M) and standard deviations (SD) of all teaching styles across time points and condition (experimental versus control) are shown in Table 2. The point estimates suggest that distributions were approximately normal (as means were close to 2.5, out of a range between 1 and 5). Correlated Student’s T-tests comparing means between the two testing times were computed in order to assess educators’ teaching style change after the implementation of the different instructional approaches (see Table 3).

### Table 2. Means and Standard Deviations of the participants’ answers to the TSI prior to and following training

<table>
<thead>
<tr>
<th>Groups</th>
<th>Assertive</th>
<th>Suggestive</th>
<th>Collaborative</th>
<th>Facilitative</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre/SD</td>
<td>Post/SD</td>
<td>Pre/SD</td>
<td>Post/SD</td>
</tr>
<tr>
<td>In-service training (ISTG)</td>
<td>M: 2.18/0.56</td>
<td>2.00/0.71</td>
<td>2.47/0.47</td>
<td>2.33/0.71</td>
</tr>
<tr>
<td></td>
<td>1.62/0.28</td>
<td>1.58/0.46</td>
<td>1.99/0.65</td>
<td>1.66/0.50</td>
</tr>
<tr>
<td>Post-graduate program (PGPG)</td>
<td>M: 2.46/0.41</td>
<td>1.99/0.72</td>
<td>2.32/0.77</td>
<td>2.21/0.39</td>
</tr>
<tr>
<td></td>
<td>1.91/0.52</td>
<td>1.67/0.39</td>
<td>1.96/0.66</td>
<td>2.12/0.64</td>
</tr>
<tr>
<td>Intervention (IG)</td>
<td>M: 1.63/0.65</td>
<td>2.25/0.36</td>
<td>2.43/1.02</td>
<td>2.10/0.12</td>
</tr>
<tr>
<td></td>
<td>1.49/0.38</td>
<td>1.76/0.20</td>
<td>2.02/0.61</td>
<td>2.06/0.59</td>
</tr>
<tr>
<td>Total</td>
<td>M: 2.14/0.62</td>
<td>2.06/0.63</td>
<td>2.40/0.73</td>
<td>2.24/0.68</td>
</tr>
<tr>
<td></td>
<td>1.70/0.45</td>
<td>1.67/0.37</td>
<td>1.98/0.63</td>
<td>1.95/0.60</td>
</tr>
</tbody>
</table>

As shown in Table 3, there were no significant changes in teaching style prior to and after training for all groups. The only significant difference between means was with regard to assertiveness. The group of teachers that implemented the intervention was significantly more assertive at posttest compared to prior to its implementation.
Table 3. Differences between teaching style answers prior and after training for each group

<table>
<thead>
<tr>
<th>Groups</th>
<th>Teaching Style</th>
<th>df</th>
<th>T-Value</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>In-service training</td>
<td>facilitative</td>
<td>10</td>
<td>1.44</td>
<td>&gt;.10</td>
</tr>
<tr>
<td></td>
<td>collaborative</td>
<td>12</td>
<td>0.38</td>
<td>&gt;.10</td>
</tr>
<tr>
<td></td>
<td>suggestive</td>
<td>6</td>
<td>0.77</td>
<td>&gt;.10</td>
</tr>
<tr>
<td></td>
<td>assertive</td>
<td>12</td>
<td>1.02</td>
<td>&gt;.10</td>
</tr>
<tr>
<td>Post-graduate</td>
<td>facilitative</td>
<td>12</td>
<td>0.43</td>
<td>&gt;.10</td>
</tr>
<tr>
<td>program</td>
<td>collaborative</td>
<td>12</td>
<td>1.09</td>
<td>&gt;.10</td>
</tr>
<tr>
<td></td>
<td>suggestive</td>
<td>4</td>
<td>0</td>
<td>&gt;.10</td>
</tr>
<tr>
<td></td>
<td>assertive</td>
<td>10</td>
<td>2.2</td>
<td>&gt;.10</td>
</tr>
<tr>
<td>Intervention (IG)</td>
<td>facilitative</td>
<td>10</td>
<td>0.17</td>
<td>&gt;.10</td>
</tr>
<tr>
<td></td>
<td>collaborative</td>
<td>10</td>
<td>1.97</td>
<td>&gt;.10</td>
</tr>
<tr>
<td></td>
<td>suggestive</td>
<td>3</td>
<td>1.32</td>
<td>&gt;.10</td>
</tr>
<tr>
<td></td>
<td>assertive</td>
<td>9</td>
<td>2.21</td>
<td>&lt;.05</td>
</tr>
</tbody>
</table>

4. Discussion

The purpose of the present study was twofold. The first aim was to provide the validation characteristics of a newly adapted inventory in teaching styles in Greece. The second aim was to find out if a training approach can change special educators’ teaching styles in a direction that will be helpful towards students’ participation and understanding of written expression strategies.

With regard to the findings of Study 1, a four-factor correlated model provided the best fit to the data. Thus, teaching styles is defined by four correlated constructs, namely facilitative, collaborative, suggesting, and assertive. Using both inferential statistical estimates (e.g., significance of factor loadings) and effect size indicators (i.e., magnitude of correlations using Cohen’s (1992) recommendations, results suggested that the four-factor model provided the best fit to the data. Thus, the first study provided the means (valid instrumentation) to conduct the experimental study (Study 2).

The second study provided evidence that when special educators implement an instructional program, they become familiarized with the theoretical background of the best instructional practises through written chunks of modelled instruction and do not just attend lectures or workshops on the same subject, their teaching style can be changed in a good direction. Thus, teachers became significantly more assertive than prior to the informative meeting and program’s implementation. According to the literature, when teachers provide guided instruction to students with LD in less autonomous environments, students feel more secure and that security may be associated with positive achievement outcomes (Antoniou & Sideridis, 2008). Furthermore, Turner et al., (2002) demonstrated that highly structured lessons are supportive for students’ learning. However, the previous finding has also shown that too much guidance may contribute to students’ feeling less competent and efficacious. Only when a classroom environment is characterized by autonomous support, but also autonomy, students’ competence levels are high (Trouilloud, Sarrazin, Bressoux, & Bois, 2006).

It seems that effective teachers need to be informed of and become aware of different teaching styles so that they can successfully fulfil the increasing diversity of their students’ learning needs (Kulinna & Cothran, 2003). Despite the instructional difficulties that are associated with the education of students with LD, when teachers adopt approaches and resources that match their students’ learning styles and needs, they significantly contribute to their students’ success (Andrews, 1990; Bauer, 1987; Brunner & Majewski, 1990; Quinn, 1994). Tomlinson (2005) suggested that by matching teaching strategies with learning styles students’ achievement gains can be greatly enhanced. Unfortunately, however, the empirical base on teaching styles is scarce in comparison to the number of studies conducted on learning styles (Leung, Lue & Lee, 2002). Future research could give emphasis on the matching hypothesis put forth by Tomlinson (2005). How we teach, rather than how much we teach, should receive primary attention, and should be related to both what we teach and to whom we teach.
References


