

Article

# Mexican Teachers' Knowledge about Gifted Children: Relation to Teacher Teaching Experience and Training

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**Abstract:** Gifted students are important for the development of knowledgeable societies. The present study examined Mexican elementary-school teachers' knowledge about gifted students, specifically on screening criteria, educational strategies, and their social value. The relationships between teachers' knowledge, teaching experience, and training in gifted education was analysed. A total of 1002 teachers ( $M$  age = 37.5,  $SD$  = 9.6 years old) from the 33 states of Mexico, 365 men and 510 females with 13.5 years of teaching experience, of whom 32% were trained in gifted education, completed an anonymous questionnaire.  $K$ -means cluster analysis revealed two clusters. Cluster 1 comprised teachers (61.2%) with poor knowledge, while Cluster 2 included teachers (38.8%) with basic knowledge and more teaching experience and training. Overall, the findings had implications for teachers' training and educational policy.

**Keywords:** gifted education; primary-school teachers

## 1. Introduction

The socioeconomic development of a country relies on the potential of its talented people. Gifted students have outstanding intelligence that leads them to high performance in a scientific and technological setting [1,2]. As a result, they are more likely to gain doctoral degrees, and achieve scientific and technological innovation [3,4], among other key actions, to enhance domestic human capital. Therefore, in knowledge-based societies, the education of the gifted should be prominent in educational policy.

Teachers play an important role in improving inventive and creative outcomes in gifted students [5,6]. In fact, studies suggested that gifted students were positively influenced by their teachers when they were aware of their unique educational needs [7–9]. Recent research indicated that gifted students' success was related to both teacher support and specialized education [10,11]. In order to provide adequate educational context to gifted students, teachers have to identify gifted students using accurate educational strategies, and need knowledge about different aspects of educating the gifted, such as identification, educational strategies, and becoming aware of the social value of the education of gifted students [7–14].

As in many countries [15,16], research in Mexico disclosed that teachers have problems with identifying and educating gifted students [17,18]. Several studies associated these difficulties with the scarce literature on the effects of teaching training programs in Mexico [19,20]. Nonetheless, a few studies argued that, when teachers have limited scientific information about gifted students' characteristics, their attitudes and practices toward them may be biased [21,22].

Despite the need for evidence-based knowledge concerning gifted education, there are limited studies to measure teachers' knowledge about gifted students in undeveloped countries. Empirical information about gifted education is needed to set appropriate training activities for in-service teachers, and to promote changes and improvement across teaching educational programs. For this study, we analysed Mexican elementary-teacher knowledge about gifted students in three essential topics: identification, educational strategies, and the social value of gifted education.

### *1.1. Teacher Knowledge about Gifted Identification*

Teachers' knowledge influences their attitudes and behaviour towards gifted students [23,24]. Many teachers have limited information about gifted students' characteristics. One study showed that only 26.8% of teachers responded correctly to questions about giftedness [10]. Studies also revealed that many teachers believed, contrary to scientific research findings, that gifted students tended to show less social adjustment than that of average-ability students [25,26]. Furthermore, there were sex and academic achievement biases in the teachers' judgment in terms of gifted intelligence [27,28]. Matheis et al. [26] also found that male gifted students were perceived by teachers as less socially and emotionally competent, and less adjusted than female gifted students. Limited teachers' knowledge was associated with bias-identification strategies on the basis of traditional conceptions of giftedness that convey stereotypes regarding the cognitive, socioemotional, and behavioural characteristics of gifted students [24,25].

### *1.2. Teacher Knowledge about Gifted Educational Strategies*

Diverse studies showed that there is a gap between teachers' beliefs about what is effective in gifted education and information supported by empirical evidence [28–33]. In this regard, some studies showed that teachers are biased about educational strategies such as acceleration [34]. Acceleration, as a common and effective gifted educational strategy, was conceived as problematic by teachers because they believed students might have emotional issues when skipping grades or missing important academic content [35–38].

A study conducted by Troxclair [22] found that teachers believed it is better to teach gifted students in a special centre despite what scientific research suggested. However, the study warned that most teachers believed that special programs for gifted children had the hitch of creating elitism and selfishness. Lastly, scholars suggested that teachers often assumed that gifted students do not have to be concerned about their learning because they are motivated and perform well in class, having good grades, scoring high on standardized assessments, and performing well just because they are gifted [30].

### *1.3. Factors Affecting Teacher Knowledge*

A teacher developmental model [39] posited that positive change in teacher knowledge and practices was associated with teaching experience and training. Specifically, researchers argued that both variables influenced teacher knowledge about gifted students [40–43]. In this regard, researchers reported that younger teachers showed less understanding about gifted education. As a result, they were less likely to provide gifted education. On the other hand, older teachers warned that gifted students needed special educational support [44–46]. Regarding the training of teachers, several studies [47–53] reported that teachers with proper training about gifted education were more likely to identify and refer students to gifted services. As expected, teachers with appropriate training tended to focus on student characteristics, strengths, and interests rather than IQ data as a means of identification. Therefore, teacher training seems to be an effective way to meet gifted students' educational needs.

In Mexico, there are limited studies about teacher knowledge concerning gifted education [53–55]. These studies can be grouped into two main areas: gifted characteristics and educational strategies. Overall, Mexican studies showed that teachers often confuse high-achieving students with the gifted.

Moreover, Mexican elementary teachers believed that gifted education was not an important matter. Furthermore, it was shown that teachers were aware of their lack of training and scarce knowledge regarding the identification of gifted students [52,54].

On the other hand, some studies that examined Mexican teacher knowledge of gifted education reported that elementary-school teachers have limited knowledge. Specifically, scholars argued there is a lack of supportive attitudes toward acceleration among Mexican teachers [52]. In a similar vein, Palacios-Gonzalez [53] found negative attitudes from teachers toward acceleration, and the belief that acceleration might be “an elitist practice”. Palacios-Gonzalez explained that the general lack of knowledge about the acceleration strategy might be the reason for their negative attitudes. According to the author, teachers’ stances rely on stereotypical beliefs.

#### 1.4. Present Study

The study of teacher knowledge about gifted students is essential for enhancing teacher-training programs concerning gifted education. In this context, our study proposed: (1) identifying clusters in Mexican elementary teachers on the basis of their knowledge about the identification of gifted students, educational strategies, and social value; and (2) examining the association between teaching experience and training on gifted education, and teachers’ knowledge about gifted students.

To accomplish these proposals, the following hypotheses were tested:

**H1.** *Different clusters exist in Mexican elementary teachers on the basis of their knowledge about gifted students.*

**H2.** *Teacher experience and training are positively associated with teacher knowledge about gifted students.*

## 2. Materials and Methods

### 2.1. Participants

The sample included 1002 elementary teachers from 32 states of Mexico. Participants were selected by non-probabilistic sampling. The sample comprised 365 (36%) males ( $M$  age = 38.08,  $SD$  = 9.78 years), and 518 (64%) females ( $M$  age = 37.13,  $SD$  = 9.66 years). Research participants had between 1 and 56 years of teaching experience ( $M$  = 13.55,  $SD$  = 9.81 years). In total, 78% worked in public, whereas 22% taught in private schools. Nationwide, 89% of Mexican schools are public and 11% are private (Secretary of Public Education SEP by its Spanish acronym, 2013). Only 320 (31.9%) teachers had received training in gifted education.

### 2.2. Measures

#### Teacher Knowledge about Gifted Students

A scale was developed for the study. First, content-related validity was explored through experts (two gifted education teachers and four researchers in the field). The proposed scale comprised 16 items grouped in three dimensions: identification (6 items, Kuder–Richardson coefficient  $KR-20$  = 0.71), information about gifted traits and identification (e.g., “gifted students may be in areas of poverty and marginalisation”); educational strategies (6 items,  $KR-20$  = 0.73), comprising knowledge about strategies and the social value of gifted education (e.g., “gifted students can skip grades”); and social values (4 items,  $KR-20$  = 0.70), the importance of gifted education in policy and socioeconomic development (e.g., countries with specific policies for gifted students have higher levels of socioeconomic development).

### 2.3. Procedure

The study was approved by the Ethics Committee of the Technological Institute of Sonora. This committee is aligned with the principles of the Declaration of Helsinki and the American Educational Research (AERA) code of ethics. Potential research participants were reached to gather

volunteer participants. Later, a consent letter for participation in the study was signed by volunteers. Lastly, we ensured confidentiality by making the questionnaires anonymous. Research participants responded either by paper and pencil (484 teachers) or by completing an online form (518 teachers). The questionnaire was answered, on average, in 12 min.

#### 2.4. Data Analysis

The percentage of the missing data was 2% in the sample. In all cases, data were treated using the multiple-imputation method available in SPSS. Means, standard deviations, skewness, and kurtosis were calculated. *K*-means cluster analysis was used to group teachers in clusters on the basis of their knowledge of gifted students. In this procedure, scores in the teachers' knowledge concerning gifted-student identification, educational strategies, and social value were converted to *z*-scores. An independent-sample Student's *t* (homogeneity of variance was tested with Levine's statistic) and chi-squared test were calculated to examine how teaching experience and training were associated with teacher knowledge about gifted students. Differences in effect size were analysed using Cohen's *d* test and the phi coefficient.

### 3. Results

#### 3.1. Descriptive Analysis

Table 1 shows that teachers had limited knowledge concerning identification, educational strategies, and the social value of gifted students. Skewness and kurtosis values suggested univariate normality in data distribution.

**Table 1.** Means, Standard deviation, skewness and kurtosis for variables in the study.

Variables	Minimum	Maximum	<i>M</i>	<i>SD</i>	<i>Skew</i>	<i>Kurt</i>
Gifted identification	0	6	2.86	1.26	−0.05	−0.16
Gifted educational strategies	0	8	2.95	1.34	−0.16	−0.45
Social value	0	4	2.04	1.03	0.07	−0.68
Teacher teaching experience	1	56	13.55	9.81	0.94	0.36

#### 3.2. K-Means Clustering

Convergence was reached in four iterations. Univariate ANOVA indicated that the clustered groups significantly differed on all variables. The final cluster centres and the numbers of cases in each cluster are shown in Table 2. Results showed that most of the teachers included in the cluster had poor knowledge about gifted students.

**Table 2.** Final cluster *z* score means on knowledge about gifted children.

Variables	Cluster 1 (Poor Knowledge)	Cluster 2 (Basic Knowledge)	<i>F</i> (1)
	<i>n</i> = 613 (61.2%)	<i>n</i> = 389 (38.8%)	
Identification	−0.67	0.47	372.70 *
Educational strategies	−0.76	0.53	494.62 *
Social value	−0.58	0.41	317.81 *

\*  $p \leq 0.001$ .

#### 3.3. Teacher Teaching Experience, Training, and Knowledge about Gifted Students

Levine's test showed that the assumption of homogeneity of variance was not violated in the teaching-experience variable ( $F = 1.60, p = 0.203$ ). Table 3 shows that teachers included in Cluster 2 (basic knowledge about gifted students) had more teaching experience than that of teachers included in Cluster 1 (poor knowledge). In addition, the chi-squared test showed that a higher proportion of

teachers had received training in gifted education in Cluster 2 (basic knowledge). In both variables, differences between clusters had a practical value.

**Table 3.** Mean values of frequencies for predictor variables as functions of cluster pertinence.

Variable	Cluster 1 (Poor Knowledge)	Cluster 2 (Basic Knowledge)	$\chi^2$ (1) <i>t</i> (1000)	<i>p</i>	Cohen's Phi Coefficient
Teaching experience	12.51	15.19	4.60	<0.001	0.29
Teacher training	613	389	19.28	<0.001	0.23

Note: *t* test used for teaching experience; chi-squared test was used for teacher training.

#### 4. Discussion

The intent of this study was to add information on Mexican elementary-teacher knowledge about gifted students. For this propose, the study examined teacher knowledge about gifted children's characteristics and education, and their relationship to teachers' experience and training in gifted education. Overall, our findings validated the proposed hypotheses about the existence of different groups in Mexican elementary teachers based on their knowledge about gifted students. In addition, our study confirmed the expected positive association between teachers' experience and training, and teachers' knowledge about gifted students.

##### 4.1. Teacher Knowledge about Gifted Students

The study showed that Mexican elementary teachers have limited knowledge about gifted students' characteristics and education. In particular, cluster analyses revealed that almost 70% of Mexican teachers do not have the necessary knowledge to effectively teach gifted students. These results are consistent with other reports in diverse studies [16–19] that suggested teachers do not have the necessary knowledge to effectively manage gifted students. This situation is worrying because teachers have an important influence on the intellectual and socioemotional development of gifted students [7–9]. Although further studies are necessary to explain these findings, these results may be associated with the little support that Mexican education policy gives to the development of talent in gifted students [55].

##### 4.2. Teacher Teaching Experience and Training Effects on Teacher Knowledge

Our results were expected because they reaffirm that teacher experience had a positive relationship with their knowledge about gifted students. These findings were similar to others reported in the literature [45–47] that suggested that experienced teachers recognise higher self-efficacy for inquiry in gifted students and employ diverse instructional practices with students with special learning needs [48–54]. Lastly, studies suggested that an important predictor of teachers' knowledge about gifted students is based on contact with gifted students, since they help teachers recognize their characteristics and educational needs [41,51].

Consistent with the literature, we found that teaching training is positively associated with teachers' knowledge about gifted students [49–51]. This finding showed the importance of teacher training for improving teachers' information about gifted students, which is important because knowledge about gifted students improves the teachers' identification and instructional strategy.

The study provided important empirical data about Mexican elementary teachers' knowledge about gifted students. However, the findings had some limitations. First, we only reported reliability of a scale developed for the present study. More studies are necessary for examining psychometric properties of the scale (e.g., construct and concurrent validity). Second, a transversal design did not allow the establishment of causal relationships between variables. Longitudinal and experiment designs that allow investigating the causal relationships between these variables are recommended. Finally,

although the sample came from teachers from different Mexican states, it might not be representative of the diversity of teachers in the entirety of Mexico (e.g., teachers that teach in indigenous and rural schools).

## 5. Conclusions

From a theoretical perspective, the study confirmed the value of a teacher developmental model [39] to study teacher variables associated with their knowledge of gifted students. It showed that teachers' teaching experience and training were both critical variables to explain teachers' knowledge about gifted students. From a practical viewpoint, the results suggested that teaching experience and training were both critical in improving teachers' knowledge about gifted students. Lastly, the findings suggested that it is necessary in future studies to explore other teacher variables with respect to their knowledge in this topic, such as intelligence, mindset, and attitudes to gifted education.

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