Science, Education and Innovations in the Context of Modern Problems
Issue 2, Vol. 9, 2026

RESEARCH ARTICLE

Construction and Psychometric Validation of a Multidimensional Scale Measuring Teachers' Attitudes Toward Inclusive Education: An Exploratory Factor Analysis Across Educational Levels

Benhazil Abderrahmen
Dr.
Abdelhamid Ben Badis University–Mostaganem, Laboratory for the Analysis of Quantitative Data on Psychological and Social Behaviors, Algeria.
Algeria
Email: Abderrahmen.benhazil.etu@univ-mosta.dz

Guidoum Ahmed
Dr.
Abdelhamid Ben Badis University–Mostaganem, Laboratory for the Analysis of Quantitative Data on Psychological and Social Behaviors, Algeria.
Algeria
Email: ahmed.guidoum@univ-mosta.dz

Issue web link https://imcra-az.org/archive/392-science-education-and-innovations-in-the-context-of-modern-problems-issue-2-vol-9-2026.html

Keywords
Mots clés : Inclusive education; Teachers' attitudes; Psychometric validation; Exploratory factor analysis; Scale development; Reliability; Cognitive, affective, and behavioral dimensions; Special educational needs; Educational inclusion; Teacher readiness.

Abstract

Teachers' attitudes constitute a central determinant of the successful implementation of inclusive education policies and practices. Positive perceptions toward inclusion influence classroom adaptation, instructional flexibility, and the effective participation of students with diverse learning needs. Despite the growing international commitment to inclusive education, there remains a need for reliable and contextually appropriate measurement tools capable of assessing teachers' attitudes from a multidimensional perspective. The present study aimed to develop and examine the psychometric properties of a comprehensive instrument designed to measure teachers' attitudes toward inclusive education across primary, middle, and secondary educational levels. The initial version of the scale consisted of 49 items constructed based on theoretical foundations and previous empirical studies addressing cognitive, affective, and behavioral components of attitudes. The instrument was administered to a purposively selected sample of 146 teachers representing different educational stages and geographic regions. To assess the suitability of the data for factor analysis, the Kaiser–Meyer–Olkin (KMO) measure and the Measure of Sampling Adequacy (MSA) were calculated, both yielding acceptable values exceeding the minimum recommended threshold of 0.50. Exploratory Factor Analysis (EFA) using factor extraction and rotation procedures resulted in the elimination of 22 items that did not meet loading criteria. The final structure revealed a three-factor solution consistent with the theoretical model: the cognitive dimension (11 items), reflecting teachers' beliefs and knowledge about inclusion; the affective dimension (6 items), representing emotional responses and concerns; and the behavioral dimension (9 items), indicating readiness to implement inclusive practices. Reliability analysis demonstrated high internal consistency for the overall scale, with a Cronbach's alpha coefficient of 0.92, indicating excellent reliability and stability. The findings support the validity of the proposed instrument as a robust tool for assessing teachers' attitudes toward inclusive education. This scale can contribute to educational research, teacher training evaluation, and policy development aimed at strengthening inclusive educational environments and improving the quality of learning for students with special educational needs.

Citation

Benhazil Abderrahmen; Guidoum Ahmed. (2026). Construction and Psychometric Validation of a Multidimensional Scale Measuring Teachers' Attitudes Toward Inclusive Education: An Exploratory Factor Analysis Across Educational Levels. *Science, Education and Innovations in the Context of Modern Problems*, 9(2), 1-5. https://doi.org/10.56334/sei/9.2.79

Received: 26.07.2025	Accepted: 10.12.2025	Published: 10.01.2026 (available online)

1. Introduction:

Education is presumed as a process that leads to provide social right for all members of society without exception, regardless of any barriers that may impede learning whether physical, cognitive, or sensory (Al-Hazmi, 2014). This necessitates the pursuit of modern strategies aimed at transforming the universal right to quality and appropriate education for all into a tangible reality. Such strategies seek to empower communities, systems, and institutions across all cultures and contexts to combat discrimination, promote inclusion, and overcome obstacles to learning, a concept known as inclusive education (Stubbs, 2008, p. 09).

While the global community advocates for the inclusion of individuals with special educational needs, this does not imply the abolition of what is known as special education. Rather, it calls for dismantling the underlying beliefs and practices that led to isolating these individuals in segregated schools. The binary division between special education and regular education was necessary in the past and achieved certain objectives, but it is no longer acceptable today. Moreover, full inclusion is no longer an option but an ongoing and established reality (Al-Khatib, 2009, p. 15).

The philosophy of inclusive education, as articulated by the Wisconsin Education Association Council (WEAC), states that all students, regardless of the nature or severity of their disabilities, should be educated in general education classrooms, fully integrated into regular programs on a full-time basis (WEAC, 2018).

(Bradley, Sirois, & Sutlik) clarified that the philosophy of inclusive education is that every student receives their core education alongside their peers in the regular classroom, irrespective of their individual needs.

The successful integration of students with special needs alongside their typically developing peers in inclusive classrooms depends primarily on several key factors. These include a well-equipped classroom environment tailored for inclusive education, the curriculum delivered in these classrooms along with the teaching methods employed, and the understanding and support of parents. The attitudes of teachers constitute a fundamental element upon which the success of inclusive education largely relies.

There remains considerable variation in attitudes and opinions regarding inclusive education, spanning multiple levels and continuing to provoke widespread debate among educators and scholars, with both supporters and opponents (Kaulina, Voita, Trubina, & Voits, 2016). These attitudes are shaped by an interplay of numerous informational inputs, knowledge bases, and school environment variables, which collectively influence attitude formation. Positive attitudes held by teachers toward inclusive education are among the critical factors contributing to the successful implementation of such programs (Voas, 2014).

Several studies have reported predominantly positive teacher attitudes, highlighting benefits such as the promotion of equality and fairness, the development of communication and collaboration skills, and the enhancement of self-confidence among students with special needs. Moreover, inclusive education fosters an environment that allows all students, regardless of their abilities and skills, to actively participate. These findings are evident in the studies by (Carvalho, Simó-Pinatella, Azevedo, & Adam Alcocer, 2024), (Khanolainen, Nesterova, Semenova, Fatkhulova, & Trach, 2024), and (Mosia & Kotelo, 2024).

Conversely, other studies have revealed negative attitudes among teachers towards inclusive education. These negative perceptions have been linked to various factors including insufficient training, lack of experience and professional competence, the nature and intensity of teacher-student relationships, and inadequate material and human resources necessary for the effective integration of students with special needs within mainstream educational settings Such findings are supported by the research of Say (Keerthan K, Gunjawate, Ravi, & Kumar, 2025), (Saiz-González, Fuente-González, Sierra-Díaz, & Uría-Valle, 2024), and (Baek, Aguilar, & Warschauer, 2024).

Researchers have employed diverse methodologies in investigating teacher attitudes toward inclusive education, with variations in the dimensions and components used to construct measurement scales. For example, (Al-Jabri & Shaaban, 2023) examined the attitudes of general primary education teachers toward implementing inclusive education for students with intellectual disabilities. Their study sample consisted of 244 teachers, and the questionnaire included 24 items distributed across three dimensions representing the components of attitudes: cognitive, affective, and behavioral. The results demonstrated strong internal consistency of the scale's items and revealed overall positive attitudes among the participants.

A study by (Benoit & Valls, 2019) measured teachers' attitudes toward inclusive education: the psychometric properties of the French version of the Performance Scale related to the inclusion of students with special needs. The scale was administered to 306 teachers from mainstream schools. Confirmatory and exploratory factor analyses were conducted

based on teacher responses. The results revealed that the scale comprised three factors cognitive, affective, and behavioral and the study's reliability coefficients ranged from 0.60 to 0.91.

Given the critical role that teachers' attitudes play in the success of inclusive education philosophy, and considering that the data derived from teachers' attitude scales toward inclusive education enable the identification of the type of attitude as well as the factors influencing its formation, it becomes possible to work on modifying and adjusting these attitudes to enhance the effectiveness of inclusive education strategies.

Building on the above, the idea emerged to develop a scale tailored to the research sample and directed at teachers to measure their attitudes toward inclusive education within the local context.

Study Problem:

Consequently, the current research problem crystallized around the following question:

What are the psychometric properties of the Teachers' Attitudes toward Inclusive Education Scale?

Study Objectives:

- To verify the validity of the exploratory factor and the reliability of the Teachers' Attitudes toward Inclusive Education Scale using the study sample data.
- To provide a test with acceptable validity levels that can be used to measure teachers' attitudes toward inclusive education.

1. Operational Definitions:

1.1 Exploratory Factor Analysis (EFA):

A statistical method involving various analytical techniques to examine psychological and social phenomena in order to identify their core components and underlying factors. In the current study, this refers to determining the factors of the Teachers' Attitudes toward Inclusive Education Scale, including their number and the number of items per factor.

1.2 Attitudes:

An individual's evaluations, emotional responses, psychological tendencies, or cognitive beliefs, expressed as responses that manifest as actions or inclinations toward a subject. These responses may be negative, positive, or neutral. In this study, attitudes specifically relate to the inclusion of students with special needs alongside their typically developing peers within mainstream educational institutions.

1.3 Inclusive Education:

Inclusive education involves integrating students with special needs alongside their typically developing peers in mainstream schools. It encompasses their participation in diverse school activities, thereby providing them with opportunities to live and interact with others naturally. It also aims to facilitate their education according to their abilities within regular school settings.

2. Theoretical Background of the Study:

A review of prior research on measuring teachers' attitudes toward inclusive education was conducted, particularly drawing on studies by Valerie Benait (2016), Majorie Volls (2018), (Fakih, 2019), and (Al-Jabri & Shaaban, 2023), which informed the development of the scale's items. Additionally, the works of Gregory & Natto (2012) and (Kimble,w.j 2017) were utilized to define and classify the scale's dimensions. These studies consistently agree that attitudes comprise three components: the cognitive, affective, and behavioral components.

- Cognitive Component: This refers to the opinions, ideas, perceptions, and beliefs held by an individual regarding the attitude object (Rabee, 2022).
- Affective Component: This relates to the individual's feelings, emotions, and affective responses toward the attitude object. It reflects the degree to which a person accepts or rejects a subject. For instance, an individual may feel positively drawn to a topic and respond favorably, or conversely, may dislike a topic and react negatively (Jaber, 2011).
- Behavioral Component: This component is evident in how an individual responds behaviorally toward the attitude object. Attitudes serve as guides for human behavior, motivating negative actions when one holds negative attitudes toward the object, or positive actions when attitudes are positive (Al-Maaytah, 2000).

This paper seeks to verify the psychometric properties (exploratory factorial validity and reliability) of the attitude measurement tool toward inclusive education among teachers in the Algerian context.

Furthermore, the current study encompasses two main aspects. The first aspect focuses on developing a scale to measure attitudes toward inclusive education, drawing upon both Arab and international literature and studies. The second aspect involves verifying the psychometric properties of this scale within the Algerian context.

Additionally, the study emphasizes the preparation and training of teachers by equipping them with the necessary knowledge on how to effectively engage with both regular students and those with special needs. This includes understanding the required modifications in teaching methods to address the specific needs of children with disabilities within mainstream classrooms. Consequently, the aim is to transform and positively shift the attitudes of society at large,

and more specifically, those working in educational institutions such as administrators, teachers, and parents moving from a negative stance toward a positive orientation that supports the inclusion of this special group (Butrus, 2000).

3. Method:

3.1 Study Population and Sample:

The study population comprised all teachers across the primary, middle, and secondary education levels within the Wilaya of Tlemcen. The sample included 146 teachers who were selected through purposive sampling.

As illustrated in the table:

Table 01: Distribution of the Study Sample by Gender Variable

Gender	Frequency	Percentage (%)
Male	32	21.4
Female	114	78.6
Total	146	100

The table shows that the sample consists of 32 male teachers, representing 21.4% of the total sample, and 114 female teachers, accounting for 78.6% of the overall sample.

3.2 The Study tool:

To achieve the objectives of the study, we reviewed a range of scales and relevant studies previously used to measure teachers' attitudes toward inclusive education. Drawing from this review, we developed and constructed the current instrument. Initially, the scale consisted of 49 items. After conducting exploratory factor analysis, a refined version emerged comprising 27 items distributed across three dimensions. Responses were recorded using a five-point Likert scale (Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree). Following data collection, the responses were entered and processed using the Statistical Package for the Social Sciences (SPSS), version 26.

This process aimed to evaluate the psychometric properties of the scale, including exploratory factor validity and reliability. It involved determining the appropriate extraction and rotation methods for factors and identifying the specific items associated with each factor.

4. Steps for Conducting Exploratory Factor Analysis (EFA):

Conducting exploratory factor analysis requires certain assumptions and conditions related to the data. These are divided into two categories: prerequisites before the analysis and criteria assessed during the analysis. The study follows the procedural protocol outlined by (Williams, Onsman, & Brown, 2020).

4.1 Prerequisites before conducting Exploratory Factor Analysis:

Phase 1: Verifying the suitability of the correlation matrix for analysis

- Examination of the correlation matrix involves applying a threshold value of 0.30 to determine weak item correlations. Items with correlations below 0.30 are considered weak and candidates for removal. Conversely, items with correlations exceeding 0.90 are also removed due to potential overrepresentation in factor determination.

Upon reviewing the correlation matrix, some items demonstrated correlations exceeding the 0.30 cutoff, indicating strong alignment with the overall scale structure. Other items exhibited weak correlations with most items and were thus removed (Thompson, 2004, p. 61).

Supporting this, the determinant of the correlation matrix was calculated as 4.15. Although this value is above 0.00001, it suggests the presence of some weak inter-item correlations, which could undermine the factor structure by limiting shared variance in factor construction. Consequently, one item was removed, and the analysis was repeated. This resulted in improved inter-item correlations, with no high correlations exceeding 0.90, indicating the absence of linear dependence among items.

- Examination of the determinant of the correlation matrix showed a value of 1.50, exceeding the minimum threshold of 0.00001. This indicates that the matrix is not singular and that multicollinearity among items is not problematic (Field, 2009, p. 657).
- Sample adequacy was assessed using the Kaiser-Meyer-Olkin (KMO) measure:

Table 02: Results of the Kaiser-Meyer-Olkin (KMO) Measure and Bartlett's Test

KMO Index and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO)		0.852
Bartlett's Test of Sphericity	Chi-Square Value	1,799,016
	Degrees of Freedom	351
	Significance Level	0

Kaiser-Meyer-Olkin (KMO) measure was calculated at 0.850, which exceeds the recommended threshold of 0.5. This indicates that the sample size is adequate for conducting factor analysis (Tabachnick & Fidell, 2013, p. 616). Additionally,

the Bartlett's Test of Sphericity yielded a chi-square value of 1799.01 with 351 degrees of freedom at a significance level of 0.000, which is statistically significant (Beavers, Lounsbury, Richards, Huck, & Skolits, 2013, p. 04). This suggests that the correlation matrix meets the minimum required level of inter-correlations.

Furthermore, reviewing the Measure of Sampling Adequacy (MSA) which is derived from partial correlations within the correlation matrix indicates that each item's correlation coefficient exceeds the threshold of 0.5. The MSA values ranged from 0.60 to 0.927, which is considered very good(Rencher, 2002, p. 445) and confirms the presence of sufficient correlations among items, as detailed in the table 03:

Table 03: Sample from the Measure of Sampling Adequacy (MSA) scale

Anti-image Matrices											
		Item 1	Item 3	Item 4	Item 5	Item 6	Item 7	Item 9	Item 11	Item 12	Item 13
Anti – image covariance	Item 1	,589	,023	-,018	-,086	-,059	-,081	-,052	,012	-,120	,000
	Item 3	,023	,462	-,265	-,021	-,033	-,040	-,055	,070	-,021	,050
	Item 4	-,018	-,265	,454	-,035	,032	-,091	-,008	-,015	-,017	-,016
	Item 5	-,086	-,021	-,035	,489	-,042	-,011	-,104	-,038	-,093	-,025
	Item 6	-,059	-,033	,032	-,042	,475	-,056	-,025	-,139	-,013	-,105
	Item 7	-,081	-,040	-,091	-,011	-,056	,645	,053	-,099	,155	-,070
	Item 9	-,052	-,055	-,008	-,104	-,025	,053	,425	-,061	,046	-,072
	Item 11	,012	,070	-,015	-,038	-,139	-,099	-,061	,392	-,146	,002
	Item 12	-,120	-,021	-,017	-,093	-,013	,155	,046	-,146	,446	-,083
	Item 13	,000	,050	-,016	-,025	-,105	-,070	-,072	,002	-,083	,494
Anti – image covariance	Item 1	,861[a]	,044	-,035	-,161	-,111	-,132	-,104	,025	-,234	,000
	Item 3	,044	,731[a]	-,578	-,045	-,071	-,074	-,124	,165	-,046	,105
	Item 4	-,035	-,578	,762[a]	-,073	,068	-,169	-,017	-,035	-,037	-,034
	Item 5	-,161	-,045	-,073	,916[a]	-,086	-,019	-,229	-,086	-,199	-,050
	Item 6	-,111	-,071	,068	-,086	,855[a]	-,101	-,056	-,321	-,029	-,218
	Item 7	-,132	-,074	-,169	-,019	-,101	,781[a]	,102	-,196	,289	-,125
	Item 9	-,104	-,124	-,017	-,229	-,056	,102	,890[a]	-,149	,105	-,158
	Item 11	,025	,165	-,035	-,086	-,321	-,196	-,149	,816[a]	-,349	,005
	Item 12	-,234	-,046	-,037	-,199	-,029	,289	,105	-,349	,786[a]	-,177
	Item 13	,000	,105	-,034	-,050	-,218	-,125	-,158	,005	-,177	,901[a]

Stage 2: Factor Extraction and Rotation

Researchers adopted The Principal Component Analysis (PCA) method,which accounts for total variance by reducing the set of items into a smaller number of coherent factors. These factors reflect the shared variance between the factor and its items. Varimax orthogonal rotation technique was used to maximize the distinction between high and low loadings within each factor.

Criteria used to determine the number of factors (before and after rotation):

Results showed the presence of five eigenvalues greater than one, they explain 58.804% of the total variance of the test. According to Kaiser's criterion, which is based on eigenvalues, this indicates that the number of extracted factors is five, as detailed in the following table:

Table 04: Factors Extracted Based on Eigenvalues and the Percentage of Variance Explained by Each Factor Before and After Rotation

Eigenvalue After Rotation			Eigenvalue Before Rotation			Factor
Cumulative %	Variance %	Eigenvalue	Cumulative %	Variance %	Eigenvalue	Factor
17.502	17.502	4.726	31.913	31.913	8.616	1
32.465	14.962	4.04	41.911	9.998	2.699	2
44.475	12.011	3.243	48.206	6.295	1.7	3
52.042	7.567	2.043	53.732	5.527	1.492	4
58.804	6.761	1.826	58.804	5.071	1.369	5

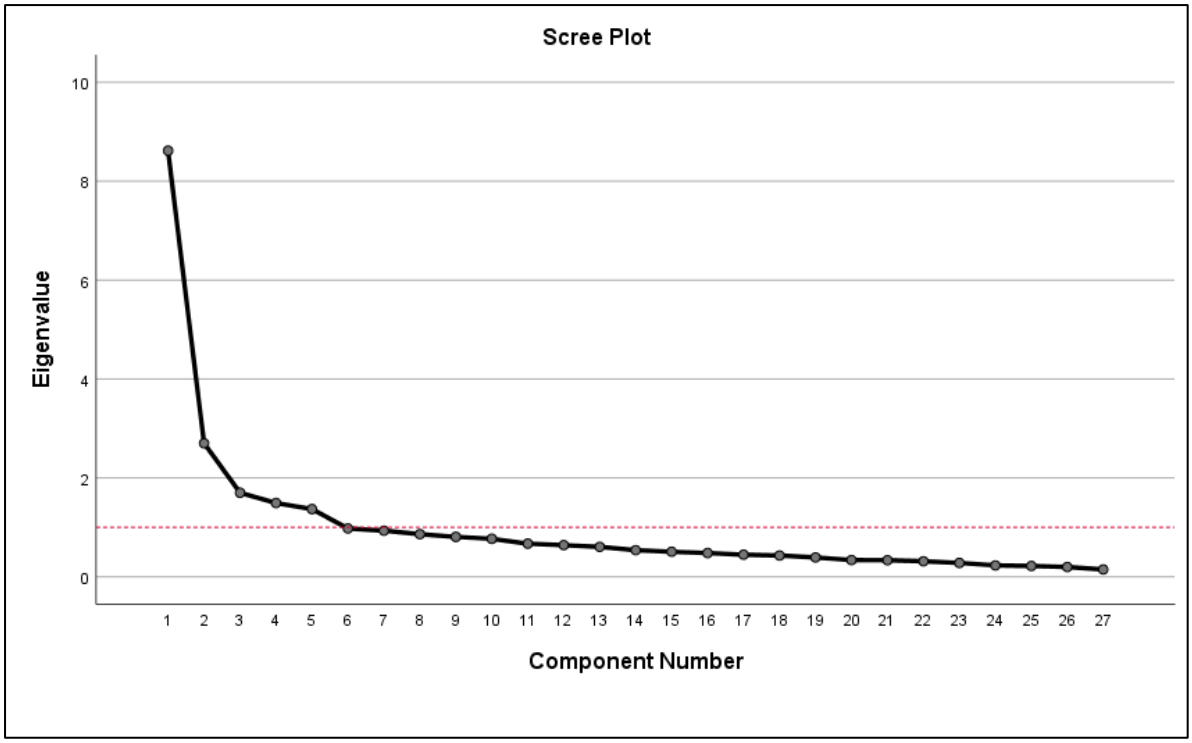
Table 04 shows that the eigenvalue for the first dimension reached 8.616, accounting for 31.913% of the total variance before rotation, which then decreased to 4.726, representing 17.502% of the total variance after rotation. For the other dimensions, we observe an increase in eigenvalues following the rotation process, with a similar rise in the percentage of explained variance.

Referring to the table of communalities after extraction, five values range between 0.70 and 0.81, while the remaining values fall between 0.29 and 0.66. These values aid in determining the extracted factors, as illustrated in the table and figure below:

Table 05: Communalities and Extraction Values for the Scale Items

Initial	Extraction	Items
1,000	,499	1
1,000	,773	3
1,000	,788	4
1,000	,589	5
1,000	,530	6
1,000	,292	7
1,000	,577	9
1,000	,606	11
1,000	,545	12
1,000	,548	13
1,000	,819	16
1,000	,774	17
1,000	,507	20
1,000	,562	21
1,000	,638	22
1,000	,517	23
1,000	,503	26
1,000	,612	27
1,000	,644	28
1,000	,547	29
1,000	,511	30
1,000	,455	42
1,000	,431	44
1,000	,603	45
1,000	,638	46

Figure 01: Scree Plot Test for Extracted Factors of the Attitudes Scale



The scree plot illustrates a clear inflection point observed at the cutoff or first elbow indicated by the dashed line. This suggests the extraction of five latent factors, consistent with the number of factors identified by the Kaiser criterion based on eigenvalues.

5. Determination of the Component Matrix or Loadings Before and After Rotation:

To identify factors and the items loading on them, a cutoff value of 0.4 was adopted, representing the minimum threshold for loadings used to establish an item's association with a specific factor, as detailed in the following table:

Table 6: Component Matrix (Loadings) Before Rotation

Factors					Item Number
5	4	3	2	1	
				,698	27
				,694	28
				,676	22
				,656	26
				,652	9
				,647	21
				,623	30
				,623	13
				,621	48
				,616	23
				,610	44
				,610	29
				,597	42
			-,469	,574	11
				,572	45
				,563	6
				,560	46
			-,520	,549	5
				,524	12
		,479		,514	49
			,451	,467	20
				,444	7
			-,467	,417	1
	,704				16

	,646				17
-,533				,423	4
-,510				,412	3

Through the table above, most items in the pre-rotation matrix are centered on the first factor, with 23 out of 27 items showing strong loadings, alongside cross-loadings on other factors. The second factor had loadings from four items, also with shared cross-loadings; the third factor had only one item, while the fourth and fifth factors had two items each. This distribution indicates an imbalance in the factor loadings across the extracted factors, which complicates interpretation.

Factor Naming:

Table 7: Component Matrix (Loadings) After Rotation

Factors					Item Number
5	4	3	2	1	
				,758	22
				,745	28
				,708	29
				,704	27
				,666	21
				,659	20
				,625	23
				,588	30
				,564	26
			,729		11
			,715		12
			,703		1
			,689		5
			,675		6
			,635		13
			,584		9
			,436		44
		,789			49
		,763			48
		,724			45
		,716			46
		,535			42
	,854				4
	,852				3
					7
,884					16
,849					17

From the table above, we notice that the loadings were redistributed after rotation, highlighting strong and weak loadings on each factor. This resulted in a more balanced pattern of loadings, where:

Factor One:

Nine items loaded significantly on this factor, specifically items numbered 17, 20, 21, 22, 23, 26, 27, 28, 29, and 30. The listed items relate to responses reflecting a certain attitude toward the process, thus this factor was designated as the behavioral factor. The loadings for these items ranged from 0.56 to 0.849, as detailed in the following table:

Table 8: Component Matrix (Extracted Items) After Rotation for the Behavioral Factor

Factor	Items	Factor Loading
Behavioral Factor	- I exert effort when teaching both regular and special needs students in the same classroom.	0.849
	- I provide more time and opportunities for students with special needs to complete their tasks.	0.758

	- I offer sufficient support to teach students with special needs alongside their regular peers.	0.745
	- I communicate with the parents of students with special needs to discuss assessment results.	0.708
	- I repeat instructions to students with special needs so they can learn social skills designed for regular education students.	0.704
	- I ensure repetition of information during explanations to help students with special needs understand.	0.666
	- I provide appropriate reinforcement to students with special needs.	0.659
	- I use feedback to clarify mistakes made by students with special needs.	0.625
	- I collaborate with the multidisciplinary team (psychologist, speech therapist, guidance counselor, etc.) in making educational decisions related to students with special needs.	0.588
	- I participate in training courses to learn teaching strategies for students with special needs.	0.564

Second Factor:

The second factor comprised eight items: 1, 5, 6, 9, 11, 12, 13, and 44. They tend to measure ideas, and perceptions, and therefore this factor was named the Cognitive Factor. The factor loadings for these items ranged from 0.43 to 0.88, as detailed in the following table:

Table 9: Component Matrix (Items) Extracted After Rotation for the Cognitive Factor

Factor	Items	Factor Loading
Cognitive Factor	- The presence of students with special needs in regular classrooms hinders academic progress.	0.884
	- I have received training on inclusive education strategies.	0.852
	- Inclusive education contributes to achieving quality and equitable education for all students regardless of their abilities.	0.729
	- Inclusive education represents a positive change in the general education system.	0.715
	- I believe that the inclusive education program is successful.	0.703
	- I prefer the implementation of the inclusive education program in all regular schools.	0.689
	- I believe that all children can learn in all educational environments despite the differences among students (cognitively, psychologically, and physically).	0.675
	- Inclusive education increases opportunities for social interaction between students with special needs and their regular peers.	0.635
	- I believe that inclusive education develops and enhances my professional skills.	0.584
	- I welcome all students with special needs in regular education classes and enjoy working with them.	0.436

Third Factor:

The third factor included six items: 42, 44, 45, 46, 48, and 49. They are about, emotions, and affections, this factor was named the Affective Factor. The loadings for these items ranged between 0.53 and 0.85, as shown in the following table:

Table 10: Component Matrix (Items) Extracted After Rotation for the Affective Factor

Factor	Items	Factor Loading
Affective Factor	- I possess sufficient knowledge about the characteristics of students with special needs.	0.854
	- I strive to strengthen the personality of students with special needs so they do not feel embarrassed in front of their peers.	0.789
	- I develop the ability of students to express their feelings and understand their inclinations and thoughts.	0.763

	- I use appropriate language techniques to interact with students with special needs.	0.724
	- I work on improving personal and social adjustment among students with special needs.	0.716
	- I give attention to all students, whether with special needs or regular, when implementing inclusive education.	0.535

Regarding the factor analysis, it was determined that the test includes five factors. However, the fourth and fifth factors each consisted of only two items, which showed overlap with items from the first, second, and third factors.We,then, decided to merge these factors to simplify the model, and enhance the efficiency of the exploratory factor analysis.

Reliability: The consistency of the scale was verified using Cronbach's alpha coefficient for both the individual dimensions and the overall scale.

Dimension	Cronbach's Alpha Coefficient
Cognitive Dimension	0.73
Behavioral Dimension	0.79
Affective Dimension	0.76
Overall Scale	0.92

The results indicate that Cronbach's alpha values for the test's dimensions were 0.73 for the first factor, 0.79 for the second, and 0.76 for the third, all of which are acceptable and reflect satisfactory internal consistency for the dimensions. Cronbach's alpha for the entire test was estimated at 0.92, a strong value indicating that the scale measuring attitudes toward inclusive education demonstrates excellent reliability (Cronbach, 1951).

Conclusion:

Our research's findings suggest that the Teachers' Attitudes toward Inclusive Education test shows satisfactory validity and reliability indicators. Exploratory factor analysis identified three distinct factors comprising the test: cognitive, behavioral, and affective. However, it can be deduced that the test developed in this study is suitable for measuring teachers' attitudes toward inclusive education within the local educational context. Additionally, it may be utilized for research purposes, including correlation with other variables.

Ethical Considerations

This study was conducted in accordance with internationally accepted ethical standards for research involving human participants. Participation was voluntary, and all teachers were informed about the purpose and procedures of the study prior to data collection. Informed consent was obtained from all participants. Confidentiality and anonymity were strictly maintained, and no personal identifying information was collected or reported. Participants were assured of their right to withdraw from the study at any stage without any negative consequences. The research procedures complied with the ethical guidelines of the affiliated university and respected principles of privacy, data protection, and responsible scientific conduct.

Acknowledgements

The authors would like to express their sincere gratitude to the teachers who generously participated in this study and contributed their time and effort to the data collection process. The authors also acknowledge the support provided by the Laboratory for the Analysis of Quantitative Data on Psychological and Social Behaviors, Abdelhamid Ben Badis University–Mostaganem, for its academic and methodological guidance.

Funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Conflict of Interest

The authors declare that there are no conflicts of interest regarding the publication of this paper. The research was conducted independently, and the authors have no financial or personal relationships that could have influenced the work reported in this study.

References

1. Al-Hazmi, A. N. (2014). *Teaching students with intellectual disabilities* (2nd ed.). Dar Al-Maseera.
2. Al-Jabri, R. H., & Shaaban, M. M. (2023). Attitudes of general education teachers in the primary stage towards the implementation of inclusive education for students with intellectual disabilities. *Journal of Special Education and Rehabilitation, 16*(56), 311–357.
3. Al-Khatib, J. (2009). Challenges facing the integration of students with special needs in Arab countries. http://www.almareph.org

4. Al-Maaytah, K. A. (2000). *Social psychology* (1st ed.). Dar Al-Fikr.
5. Baek, C., Aguilar, S. J., & Warschauer, M. (2024). Exploring teachers' self-efficacy and willingness to provide accommodations in teaching students with autism: An intervention study. *Teaching and Teacher Education, 140*, 104488. https://doi.org/10.1016/j.tate.2023.104488
6. Beavers, A. S., Lounsbury, J. W., Richards, J. K., Huck, S. W., & Skolits, G. J. (2013). Practical considerations for using exploratory factor analysis in educational research. *Practical Assessment, Research, and Evaluation, 18*, 1–13.
7. Benoit, V. (2016). Measuring teachers' attitudes towards school inclusion: Psychometric qualities of the French version of the Opinions Relative to Integration of Students with Disabilities (ORI-F).
8. Benoit, V., & Valls, M. (2018). Mesurer les attitudes des enseignants vis-à-vis de l'intégration scolaire: Qualités psychométriques de la version française de l'échelle Opinions Relative to Integration of Students with Disabilities (ORI-f). *Mesure et évaluation en éducation, 41*(3), 1–29. https://doi.org/10.7202/1065163ar
9. Butrus, B. H. (2000). *Psychology of inclusion in early childhood*. Dar Al-Maseera.
10. Carvalho, M., Simó-Pinatella, D., Azevedo, H., & Adam Alcocer, A. L. (2024). Inclusive education in Portugal: Exploring sentiments, concerns and attitudes of teachers. *Journal of Research in Special Educational Needs, 24*(3), 729–741. https://doi.org/10.1111/1471-3802.12663
11. Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika, 16*(3), 297–334. https://doi.org/10.1007/BF02310555
12. Fakih, M. K. (2019). Teachers' attitudes towards inclusion of learners with disabilities at American private early childhood education in Dubai: An investigative study.
13. Field, A. (2009). *Discovering statistics using SPSS* (3rd ed.). SAGE.
14. Gregory, J. L., & Noto, L. A. (2012). *Technical manual for attitudes towards teaching all students (ATTAS-mm) instrument*. ERIC.
15. Jaber, J. B. (2011). *Social psychology* (2nd ed.). Dar Al-Thaqafa.
16. Kauliņa, A., Voita, D., Trubina, I., & Voits, T. (2016). Children with special educational needs and their inclusion in the educational system: Pedagogical and psychological aspects. *Signum Temporis, 8*(1).
17. Keerthan K., S., Gunjawate, D. R., Ravi, R., & Kumar, K. (2025). Exploring teacher knowledge and attitudes towards the inclusion of children with hearing impairment in mainstream education: A systematic review. *International Journal of Pediatric Otorhinolaryngology, 190*, 112255. https://doi.org/10.1016/j.ijporl.2025.112255
18. Khanolainen, D., Nesterova, Y., Semenova, E., Fatkhulova, E., & Trach, J. (2024). Teachers' beliefs and characteristics predictive of their willingness to cultivate a safe, ethnically inclusive school environment. *International Journal of Educational Research, 127*, 102420. https://doi.org/10.1016/j.ijer.2024.102420
19. Kimble, W. J. (2017). Middle school administrator and teacher attitudes towards students with mild to moderate disabilities in the inclusive classroom.
20. Mosia, P. A., & Kotelo, T. T. (2024). Teacher training for inclusive education in Lesotho: Assessing factors that influence teacher attitudes towards supporting LSEN in mainstream schools. *Cogent Education, 11*(1). https://doi.org/10.1080/2331186X.2024.2380167
21. Rabee, M. S. (2022). *Social psychology* (2nd ed.). Dar Al-Maseera.
22. Saiz-González, P., Fuente-González, S. D., Sierra-Díaz, J., & Uría-Valle, P. (2024). Inclusive education and physical education in Spain: A qualitative analysis of teachers' perspectives. *Education Sciences*.
23. Southern, J. L. (2012). *Technical manual for attitudes towards teaching all students (ATTAS-mm) instrument*. ERIC.
24. Stubbs, S. (2008). *Inclusive education: Where there are resources*. The Atlas Alliance.
25. Tabachnick, B. G., & Fidell, L. S. (2013). *Using multivariate statistics* (6th ed.). Pearson.
26. Teghza, B. (2012). *Exploratory and confirmatory factor analysis: Concepts and methodology using SPSS*.
27. Thompson, B. (2004). *Exploratory and confirmatory factor analysis: Understanding concepts and applications*. American Psychological Association.
28. Voas, D. (2014). Towards a sociology of attitudes. *Sociological Research Online, 19*(1). https://doi.org/10.5153/sro.3289
29. WEAC. (2018). Wisconsin Education Association Council. https://www.weac.org
30. Williams, B., Onsman, A., & Brown, T. (2020). Exploratory factor analysis: A five-step guide for novices. *Journal of Emergency Primary Health Care, 8*(3), 1–13.