

Cognitive Meaning of Inclusive Education of Students with Disability in Regular Education Teachers

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Abstract: *Background:* Successful inclusive education strongly represents the development of society, promoting better living conditions for students with disabilities.

Objective: This study explored the mental representation of knowledge of inclusive education and disability held by regular education teachers with experience in this field.

Methods: First, participants performed a conceptual definition task through the Natural Semantic Networks technique. Teachers defined ten target concepts related to the cognitive schema of inclusive education. They had 60 seconds to define each target, using verbs, adjectives, nouns, and pronouns, after rating the definers' quality to conceptualize the target. Subsequently, the authors implemented a constraint satisfaction neural network to simulate the school inclusion schema's behavior and carried out a chronometric cognitive analysis using data from the first study.

Results: Participants organized the educative inclusion meaning on four dimensions (definition, actors' qualities, stakeholders, and inclusion program effects). However, some concepts about school integration and conventional education appeared in the educative inclusion schema. Further, computer simulations showed that participants seem to have an internal locus of control over inclusive actions. Generally, experience with students with disabilities promotes the formation of a favorable educational inclusion schema. However, even though participants in this study have experience in inclusion programs, they are still constructing the inclusive education schema.

Conclusion: The cognitive evaluation provides useful information to empower teachers to be aware of their knowledge and biases on inclusive education and the importance of their work in the success of school inclusion programs.

Keywords: Educative inclusion schema, disability, mental representation, teachers, regular education.

1. INTRODUCTION

Establishing conditions to guarantee the inclusion, well-being, and good living of all persons regardless of their physical or intellectual condition is an essential requirement for the human development of society. Unfortunately, human history has dire examples of marginalization and discrimination (e.g., genocides and social segregation). One group that has experienced the consequences of human discrimination is persons with disabilities.

The World Report on Disability 2011 [1] mentions that a high percentage of people with disabilities live in high poverty rates as they have fewer opportunities for economic participation. Consequently, these people have fewer opportunities to access high-quality health and education services. Factors contributing to maintaining and even causing these adverse conditions for the population with disabilities are negative

attitudes, biases, and stereotypes about disabilities held by other members of society [2,3].

The lack of knowledge on disabilities contributes to people presenting a negatively biased view of the population with disabilities [4, 5]. In particular, people with intellectual disabilities (ID) face negative attitudes more frequently, unlike other groups with disabilities [6, 7]. Because a considerable portion of this population is aware of the lack of acceptance and respect from other groups in the general population, they frequently experience feelings of frustration [8] and isolation that can contribute to their social exclusion [7, 9, 10].

Education is one of the most effective social strategies to eradicate segregation and promote attitudes and actions that facilitate the inclusion of all members of a population. It also provides tools that contribute to improving the quality of life of people with disabilities by reducing the probability that they will experience conditions of vulnerability (e.g., illiteracy). In this regard, Freeman and Alkin [11] pointed out that the school inclusion of people with disabilities in regular educational environments had a beneficial effect on the academic development of students from this

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population, in addition to promoting the social inclusion of students with disabilities and providing opportunities for interaction with other students with and without disabilities [12]. The quantity and quality of interactions between both groups of students can reduce negative attitudes since contact is one of the factors that contribute to the elimination of intergroup biases and prejudices [8, 13-15].

Generally, an inclusive education promotes the social, emotional, behavioral, and cognitive development of students with disabilities and also broadens the understanding and acceptance of diversity among students in general [16-18]. Therefore, education was declared as a cardinal means to help students with disabilities achieve successful integration in their community [19], and the inclusion of people with disabilities in regular schools is a fundamental task of society [20]. In addition, inclusive education embraces the adaptation and improvement of learning spaces and their processes to provide all students with the same opportunities to learn while respecting their race, economic circumstance, sexual orientation, or ability [21]. The fundamental principle of inclusive education is that education is a universal human right and is the foundation on which just societies are built [22, 23]. This idea has generated an international effort to promote the educational inclusion of students with disabilities in regular schools, but the response to this effort differs among stakeholders [24]. In this regard, teachers' reactions to school inclusion are fundamental; how they perceive this process significantly affects the success of efforts to achieve more inclusive education [25].

Considering the above, scientists increased their interest in understanding teachers' perceptions and attitudes toward school inclusion in recent years. In this regard, authors such as Alahbabi [26], Ross-Hill [27], and Kalyva *et al.* [28] used scales to explore the attitudes of regular and special education teachers from the United Arab Emirates (UAE), USA, and Serbia, respectively, toward the inclusion of students with special needs. Alahbabi [26] found that among regular education teachers, attitudes toward inclusion were less favorable than special education teachers and that regular elementary education teachers expressed more favorable attitudes than other school grades (preschool, middle and high school). On the other hand, Ross-Hill [27] found that regular education teachers' attitudes ranged from favorable to neutral toward inclusive practices. Kalyva *et al.* [28] observed that teachers in Serbia expressed a slightly negative

attitude toward school inclusion of children with Special Educational Needs (SEN).

Ellins and Porter [29] mention that teachers with unfavorable attitudes toward school inclusion promote less success in their students with SEN. Thus, fostering favorable attitudes toward educative inclusion among teachers can increase the likelihood that they will be willing to participate in successful inclusion programs. However, forming favorable attitudes toward school inclusion depends on a number of variables, such as the severity of the disability and the degree of teacher involvement [30]. Furthermore, the level at which teachers feel empowered modulates their willingness to participate in inclusion programs. Jobling and Moni [31] mention that teachers do not feel safe carrying out inclusion activities when they do not have experience working with students with SEN. Similarly, Gaad and Khan [32] observed that the degree to which teachers felt empowered to participate in inclusion tasks influences the teachers' willingness to contribute to the inclusion of students with disability at regular schools. Kalyva *et al.* [28] found that those teachers who had experience working with students with SEN showed a more positive attitude towards school inclusion than those who did not have this experience.

Research such as the previous ones allowed the identification of the psychological structure that underlies inclusive education attitudes and has provided information on the factors involved in forming such attitudes (e.g., training, experience, and teachers' beliefs about the school inclusion process). One way to give continuity to these advances is to deepen our understanding of the effect of these factors on the cognitive nature of attitudes toward school inclusion. For example, little is known about teachers' experiences with students with disabilities and how this can transform their biases towards disability and school inclusion. How teachers conceive of working with students with disabilities affects not only their attitudes but also the way they implement programs. This is relevant since they are key protagonists in the development of these programs. However, only a handful of studies explore the cognitive nature of attitudes toward inclusion and provide information on the underlying knowledge schemas. In this regard, Hodkinson [33] found that future teachers conceived school inclusion as a multi-faceted and complex process; however, their conception was superficial, similar to experienced teachers' vision, which seems to present a narrow conception of this process.

Gonzalez-Trujillo *et al.* [34] explored the meaning of educative inclusion in Mexican teachers with and without experience in inclusive education. They explored concepts related to school inclusion (respect, diversity, union, equality, empathy, solidarity, patience, tolerance, equity, and acceptance) by using the Chronometric Constructive Cognitive Learning Evaluation Model (C3-LEM) proposed by Lopez *et al.* [35]. This assessment involves the intertwined use of mental representation techniques and computer simulations to explore the cognitive schemas of knowledge's behavior. Typically, in C3-LEM, researchers use the Natural Semantic Networks technique (NSN) proposed by Figueroa *et al.* [36] to explore the properties of the organization of information (e.g., semantic richness, semantic density, distance semantics) of the cognitive schema of knowledge. Lopez [37] and Lopez and Theios [38] modified the NSN; they proposed to define each target concept within a time limit and to rate the semantic relevance of each definer (verbs, nouns, or adjectives) one by one. This NSN metric allows operations on the data, such as the application of computational simulations helpful in observing the behavior of cognitive schemas.

Gonzalez-Trujillo *et al.* [34] found that the knowledge schema between both groups was similar in content but not in its organization, which led to different meanings of inclusion. For example, the concept of acceptance had a 60% conceptual similarity between experienced and inexperienced teachers. Both groups agreed that acceptance from the perspective of inclusion is related to respect, tolerance, understanding, patience, love, and inclusion, concepts related to the internal experience of inclusion. However, experienced teachers also considered definers related to interaction with others, such as diversity, empathy, integration, and equity. In contrast, inexperienced teachers included concepts such as union, tolerance, will, and success, which are related more to the role of the teacher themselves. On the other hand, both groups organized the concept of inclusion within a conglomerate that included concepts reflecting human development in its highest expression (respect, listening, support, help, sharing, union, understanding, love, tolerance, charity, acceptance, patience, kindness, and gender).

Gonzalez-Trujillo *et al.*'s study [34] is one of a handful of studies that explore how teachers and stakeholders in inclusive education signify experiences in this field. To broaden the conceptual spectrum in the exploration of educative inclusion and the disability

schema, this research examined how regular teachers with experience in this field form a psychological meaning of inclusive education for students with disabilities.

2. MATERIALS AND METHODS

The present study measured the properties of content, organization, and structure of the information that underlies regular teachers' cognitive schema of knowledge surrounding inclusive education and disability.

2.1. Study Design and Variables

An exploratory study was carried out through the NSN technique to observe the properties of the knowledge schema on school inclusion and disability. NSN studies must consider the following concepts to implement the task:

- Target concept: refers to the concepts selected to define the schema. Namely, each target represents a central conceptual node in the formation of the assessed knowledge schema.
- Definer concepts: refers to concepts (adjectives, verbs, nouns, and pronouns) that the participants use to define each target concept.
- The conceptual quality scale: refers to the cognitive judgment that the participant assumes on the schematic or semantic relevance of each definer in terms of its quality to define the target concept.
- Definition task: an NSN study implies a definition activity that involves the participant showing their conceptualization of the evaluated schema, defining each target concept with definers, and judging the semantic relevance of the latter.

2.2. Participants

The study involved 57 regular education teachers (10 men and 47 women) with a mean age of 44 (range= 24-64 SD=9). The participants were volunteers without financial remuneration and received the results of the study in talks requested by them.

2.3. Ethical Approval

This research project was reviewed and approved by the Institute of Research on the University and Education (IISUE), National Autonomous University of

Mexico (UNAM) (dated November 15, 2021). At the time of the study, verbal informed consent was obtained from all participants.

2.4. Material and Instruments

For the study, ten target concepts associated with inclusive education were used, suggested by teachers who have participated in inclusive education programs. The present authors organized the concepts in three axes of exploration: the definition of school inclusion (inclusion, school inclusion, benefits, challenges), the stakeholders (students with disabilities, regular teachers, regular education institutions), and the context of inclusive education (teaching practice, regular school, regular education, special education).

The stimuli presentation, data capture, and analysis were carried out through the EVCOG (Cognitive Evaluator). This software allows for the configuration, application, and analysis of mental representation studies with the NSN technique [39-42].

2.5. Procedure

The study had three phases: first, "The call" was an invitation extended to 100 teachers from the regular education system who may or may not have experience in inclusive education. In the second phase, "the preparation," the present authors obtained verbal consent from the teachers who agreed to participate. They were gathered as a group to provide specific instructions for the study and to carry out a practice phase on the study's task. In the last phase, "The study," the participants were required to carry out the definitional task on the ten target concepts. Teachers had 60 seconds to define each target concept with verbs, nouns, adjectives, and pronouns. After, the participants judged the quality of each of the definers using a 10-point scale. The higher the rating, the greater the quality of the schematic relationship between the definer and the defined target.

2.6. Data Analysis

The present authors analyzed the definers and scores obtained in the NSN from a cognitive perspective of the mental representation of knowledge. The analysis involved three inspections of the data: first, the present authors obtained the numerical indicators from the NSN, according to Lopez and Theios [38]. The properties conventionally explored in NSNs included the semantic richness or *J-value*, which refers to the number of different definers that constitute

the NSN of the target concept to be defined. The semantic weight or *M-value* implies the weight of semantic relevance that the participants give to each definer concept for each target concept. The group of concepts with the greatest semantic weight, or Semantic Analysis of M value's groups (*SAM Group*), represents the definers that mainly build the meaning of the target concept. The semantic density or *G-Value* accounts for the semantic closeness or distance among the NSN definers. Finally, the standardized distance or *FMG-value* is the standardized distance among the definer with the highest M-value and the other definers. This last value allows the determination of a distance/proximity index.

The second analysis covered the qualitative exploration of the NSN tables' content and the visual inspection of the NSNs' organization by obtaining connection graphs of the conceptual nodes with the GEPHI software [43]. First, the present authors obtained the Semantic Analyzer of Schema Organization matrix or SASO matrix [37, 38] to build the GEPHI graphs. The SASO matrix results from the calculation of the probability of co-occurrence between the NSNs' definers using the EVCOG software, which uses an algorithm based on the formula set out by Lopez and Theios [38]:

$$W_{ij} = -1n\{[p(X=0 \& Y = 1) p(X=1 \& Y = 0)]^* [p(X=1 \& Y = 1) p(X=0 \& Y = 0)]^{-1}\} \quad (1)$$

EVCOG computed the association weight (W_{ij}) between two concepts (X and Y) by obtaining the probability of co-occurrence between the pairs of concepts. It implied calculating the probability that X and Y do not appear together through the network $p(X = 0 \& Y = 1)$. After, the software similarly obtained other elements of the formula, except for the calculation of $p(X = 1 \& Y = 1)$, which involved the hierarchical modulation of the semantic weight in the SAM groups. The SASO matrix fed the GEPHI software [43], which has a visualization tool of the connections between the information nodes extracted from the NSN.

The third analysis involved the examination of the behavior of the inclusive education and disability schema. In this regard, the authors fed the EVCOG software with the SASO matrix to simulate the schematic behavior and observe the conceptual activation and coactivation patterns. In addition, the authors analyzed the time pattern of conceptual accessibility by visually representing the relationship between the M value and the Inter-Response Time or

IRT values. According to Morales-Martinez *et al.* [44], IRT values refer to the time to recover and write a definer in an NSN task.

3. RESULTS

3.1. First Analysis

Conventional indicators and content analysis of the Natural Semantic Networks on inclusive education and disability

The organizational property analysis of teachers' NSN with experience in school inclusion (Table 1) indicated that the targets with the greatest semantic richness (J value) were *special education* and *regular education*, and those with the lowest semantic wealth were *regular teacher* and *inclusion challenges*. The targets with the highest semantic density or smallest G value were: *regular education* and *inclusion challenges*. In comparison, those with the highest G value or lowest density were: *special education*, *inclusion*, and *teaching practice*. The definers with the highest semantic relevance (M value) were: *support*, *include*, *integrate*, and *inclusion challenges*. On the other hand, those with the lowest M were: *strategies*, *integrator*, and *orientation*. The most frequent definers through the network were: *support*, *integration*, *acceptance*, *commitment*, *students*, and *integration*. The least frequent were: *challenge*, *satisfaction*, and *teaching*. Table 1 displays M values, the appearance frequency of each definer, and the type of definers obtained for each target.

Regarding the content, teachers used three conceptual categories related to inclusive education (Figure 1). Interestingly, in the three identified categories (stakeholders, actions, result), most definer concepts refer to nouns and verbs, and only one adjective appears in the definition of the actors of school inclusion and disability (responsible).

3.2. Second Analysis

Visual inspection of the content and organization of the Natural Semantic Networks' definers.

The GEPHI software offered a visual representation of the SASO matrix (Figure 2), indicating that participants organized the definers into four groups (*inclusion definition*, *qualities necessary for inclusive education*, *effects of inclusion programs*, and *stakeholders in the inclusion process*). The first grouping (purple) comprised 34.88% of the network

concepts, mostly related to the inclusion definition (*help*, *include*, *participate*, *respect*, *responsibility*, *equality*, *integrate*, *students*, *patience*, *adaptation*, *help*, *teacher*, *adaptation*, *append*, *add*). The second conglomerate (green) included 30.23% of the concepts, mostly describing qualities necessary to carry out an inclusion program (*commitment*, *support*, *preparation*, *children*, *integrator*, *guide*, *disability*, *challenge*, *strategies*, *effort*, *learning*, *socialization*, *participation*). The third group (orange) brought together 20.93% of the network's definers, which are associated with the effects of inclusion programs (*satisfaction*, *acceptance*, *integration*, *opportunity*, *improvement*, *achievements*, *knowledge*, *acceptance*, *capacity*). The last group (light blue) gathers 13.95% of the total definers, mainly linked to stakeholders in the inclusion process (*work*, *knowledge*, *teachers*, *teaching*, *values*, and *school*).

The central conceptual nodes of the inclusion definition module are *students*, *integration*, and *equality*, while *commitment*, *preparation*, and *support* were the definers with the greatest centrality for the qualities necessary for the school inclusion cluster. Regarding the effects of the inclusion programs group, the concepts with greater connectivity were *acceptance* and *integration*. At the same time, the central definers for the last cluster (stakeholders in the inclusion process) were *work* and *school*.

Third Analysis

On temporality and activation patterns of the educative inclusion and disability schema.

The access time pattern (Figure 3) showed that the handiest definers without averaging IRT were *supported*, *included*, *integrated*, and *challenge*. When the authors averaged the IRT and M values of the definers repeated across different target concepts, the definers with more accessibility were: *challenge*, *include*, and *support*. This result indicates that the level of accessibility of the definers varied depending on the target concept evaluated.

On the other hand, the present authors conducted a computational simulation using a constraint satisfaction neural network to obtain the coactivation pattern on the definers with the highest M value without averaging them (*support*, *challenge*, *include*) (Figure 4). The results indicated that the coactivation pattern between the concepts of *support* and *challenge* was quite similar. For both definers, the coactivation pattern mainly included concepts related to the actors' qualities and *adequacy activity*, while for the definer *to include*,

Table 1: Semantic Analysis of M Value's Groups of Teachers with Experience in School Inclusion's Natural Semantic Networks

Inclusion				School Inclusion				Regular teacher			
F	Definer	M	IRT	F	Definer	M	IRT	F	Definer	M	IRT
2	To include	141	15	6	Students	63	15	2	Teacher	61	23
5	To integrate	118	20	5	To integrate	57	32	4	Work	60	20
6	Acceptance	64	24	6	Acceptance	55	20	3	Responsibility	57	26
4	Equality	60	21	4	Equality	50	34	1	Guide	56	21
1	Add	58	27	4	Work	45	30	6	Support for	49	30
2	To participate	49	21	3	School	40	24	5	To integrate	38	21
1	Adaptation	48	28	6	Integration	39	25	6	Commitment	37	27
2	Respect	36	32	2	To include	38	23	6	Students	35	21
6	Students	35	23	2	To participate	32	43	1	Integrator	28	39
1	Append	35	17	1	To help	29	23	4	Preparation	28	40
J-value: 235		G-value: 10.60		J-value: 234		G-value: 3.40		J-value: 230		G-value: 3.30	
Student with disability				Regular education institution				Inclusion benefits			
F	Definer	M	IRT	F	Definer	M	IRT	F	Definer	M	IRT
6	Support for	84	17	6	Commitment	77	36	1	Satisfaction	65	29
4	Adequacy	61	31	3	School	49	22	6	Acceptance	54	20
6	Students	52	19	6	Integration	49	22	1	To improve	52	17
6	Integration	45	30	6	Support for	48	28	2	Socialization	46	32
2	Aid	44	24	5	To integrate	44	23	4	Equality	45	28
2	Respect	36	20	4	Adequacy	41	32	6	Integration	39	20
3	Responsibility	36	24	2	Aid	40	18	1	Achievements	38	8
6	Acceptance	31	24	1	Knowledge	39	29	6	Support for	31	20
4	Equality	30	19	1	To accept	39	20	1	Opportunities	29	38
4	Patience	27	43	6	Acceptance	37	36	2	Learning	29	45
J-value: 239		G-value: 5.70		J-value: 232		G-value: 4.00		J-value: 239		G-value: 3.60	
Inclusion challenges				Teaching practice				Special education			
F	Definer	M	IRT	F	Definer	M	IRT	F	Definer	M	IRT
6	Acceptance	53	24	1	Challenge	105	18	6	Support for	148	19
4	Preparation	48	19	4	Adequacy	74	33	4	Adequacy	66	33
4	Patience	38	21	6	Support for	50	30	4	Patience	47	35
1	Capacity	37	23	4	Work	45	22	1	Disability	38	21
2	Learning	34	24	4	Patience	44	21	1	Kids	38	16
2	Participation	34	34	6	Commitment	39	26	6	Students	31	33
5	To integrate	29	32	4	Preparation	39	28	2	Teacher	30	39
6	Integration	28	31	6	Integration	37	36	4	Preparation	29	33
6	Commitment	28	19	1	Effort	30	33	6	Commitment	28	31
2	Socialization	27	20	1	Strategies	28	50	1	Orientation	28	32
J-value: 221		G-value: 2.60		J-value: 242		G-value: 7.70		J-value: 257		G-value: 12	

(Table 1). Continued.

Regular education			
F	Definer	M	IRT
1	Teaching	62	15
1	Teachers	57	24
6	Commitment	55	13
1	Values	47	23
4	Work	46	21
6	Students	44	32
1	Knowledge	39	27
2	Participation	38	24
3	Responsibility	35	38
3	School	34	19
J-value: 256		G-value: 2.30	

Note: J-value = semantic richness, G-value = semantic density, F = occurrence frequency, M = semantic weight, IRT = inter-response time.

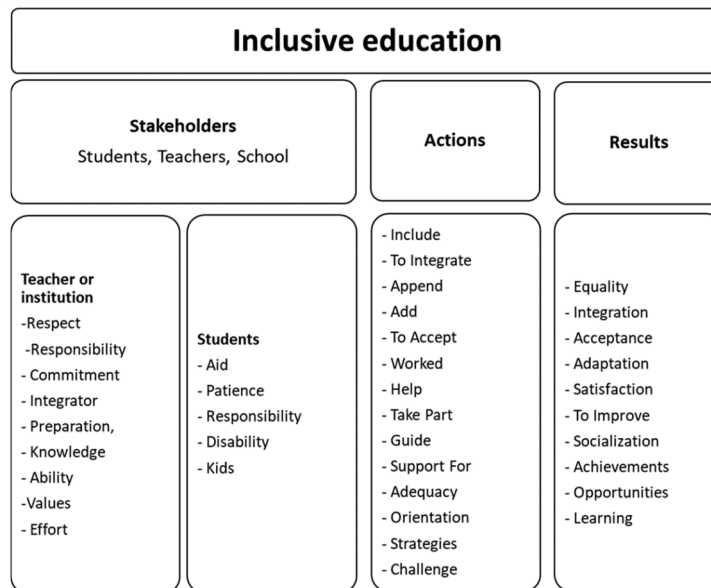


Figure 1: Inclusive education definers organized by conceptual categories.

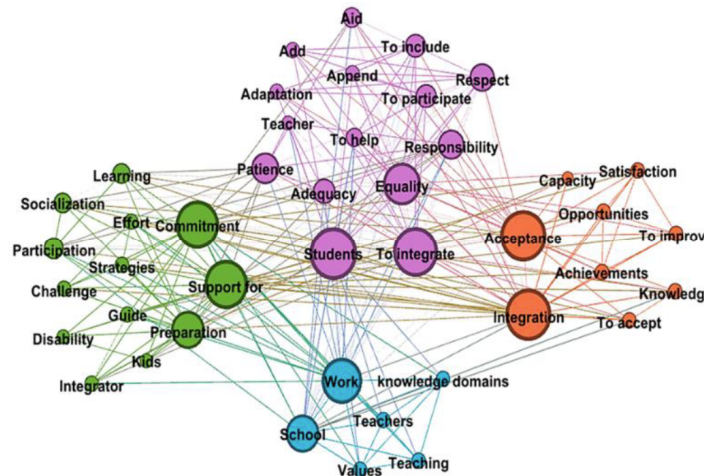


Figure 2: Conceptual modules on educational inclusion and disability.

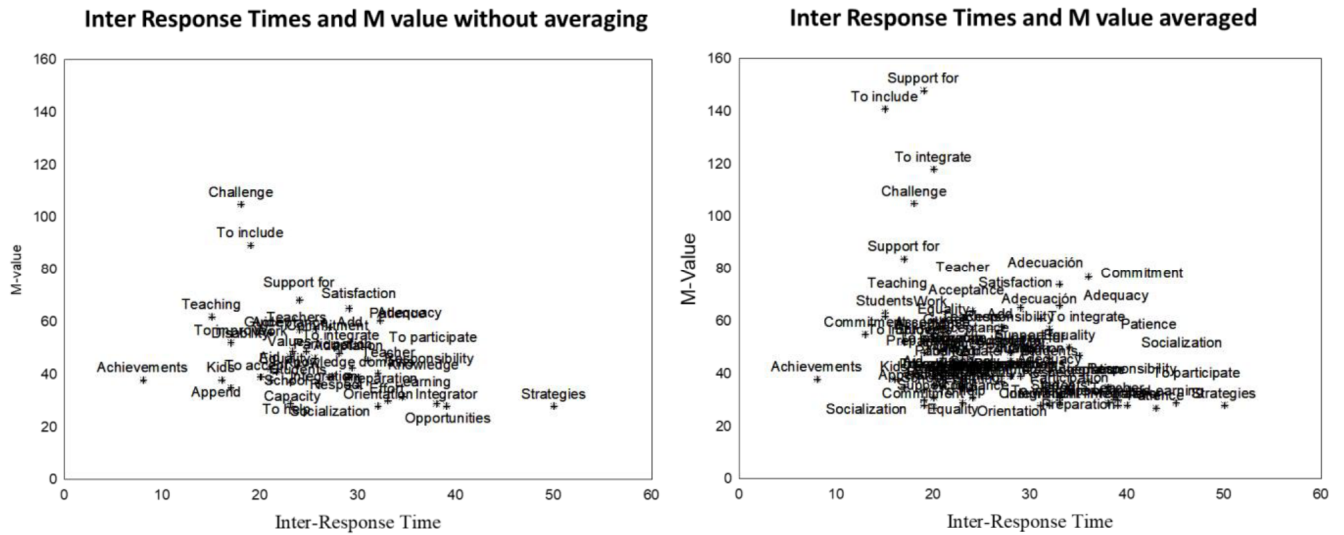


Figure 3: Trends of M values in relation to Inter Response Times.

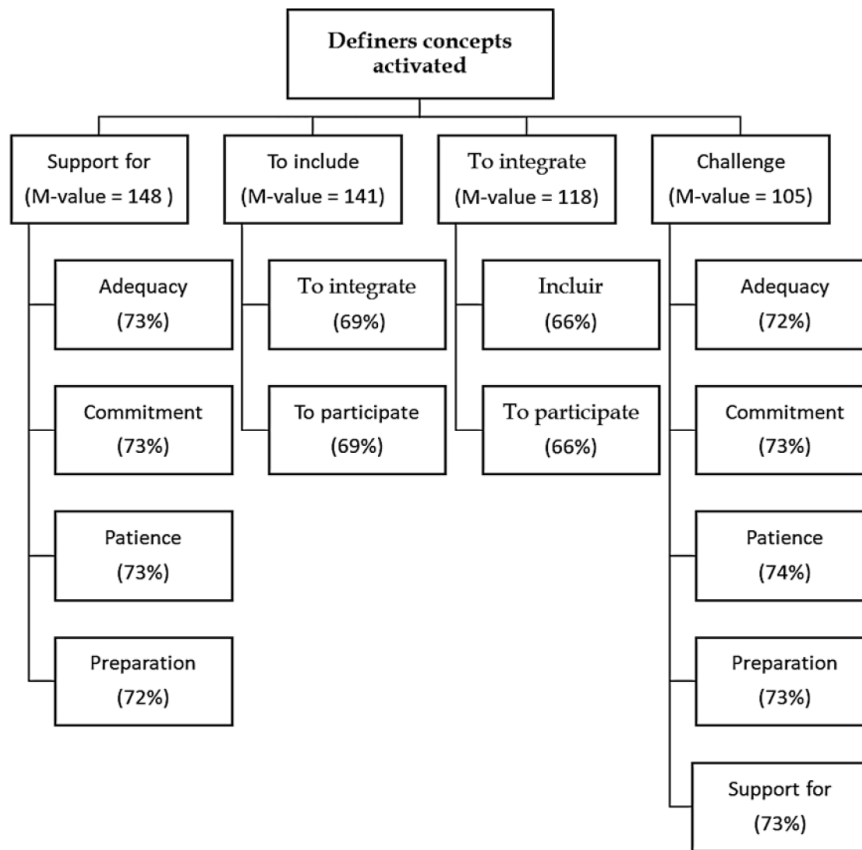


Figure 4: Coactivation patterns of the three concepts with greater semantic relevance through the Natural Semantic Networks on inclusive education.

the coactivation pattern involved concepts related to inclusive education actions.

Finally, the connectivity pattern between the network's definers seems moderate, as shown in the surface plot (Figure 5) obtained through the association weight (SASO matrix).

4. DISCUSSION

Participating in school inclusion programs is a highly complex task requiring the investment of time and effort from different educational actors (students, teachers, families, and institutions). In this regard, Scruggs and Mastropieri [30] reported that recognizing the

importance of educational inclusion does not necessarily imply that teachers wish to conduct inclusive tasks in the classroom.

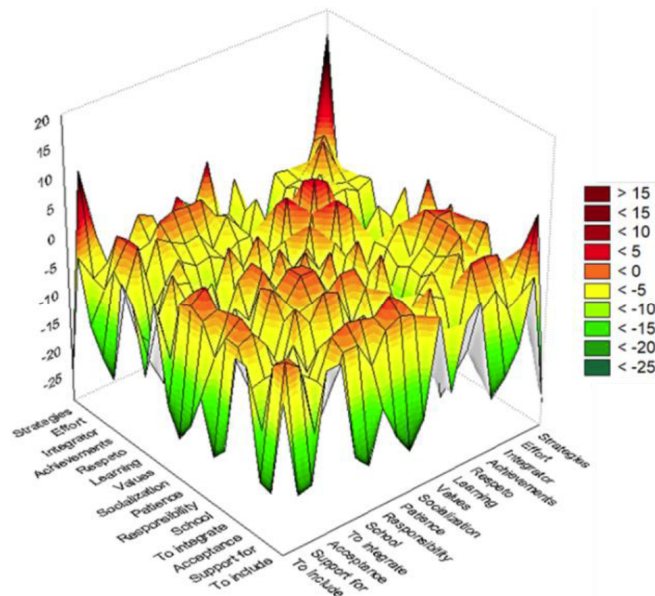


Figure 5: Surface plot of the connectivity pattern among definers on inclusive education.

They observed that a willingness to participate in inclusion programs depends on different factors, such as the beliefs on disability conditions and the obligations of each inclusive activity. However, the mental representation underlying behaviors and attitudes of teachers towards school inclusion and how these affect their perception of themselves within inclusion projects have little exploration. Teachers signify their own education experiences, influencing their approach to these. Following this, the primary purpose of this research was to explore how regular education teachers with experience in inclusive education represent the different dimensions of this process (actors, process, results), including themselves.

Discussion of the study's results embraces three axes: the content, the organization, and the dynamics of the knowledge schema on inclusive education and disability. Regarding the first axis, the results indicated that regular education teachers with experience in the process of school inclusion have in their knowledge schemas a greater conceptual breadth (larger J values) concerning the education systems compared to the other targets. These definers (special education, regular education) are related to the context in which teachers can develop their competencies and skills. However, the content of their NSN reflects a general schema of education rather than an inclusive vision of

education (see Table 1). The preceding suggests that the schema of knowledge surrounding educational systems is closer to conventional and segregated definitions of education rather than an inclusive educational vision.

The targets with less semantic richness were comprised of *regular teacher* and *inclusion challenges*; most of the definers in these two targets were related to the inclusive vision. In inclusion challenges, the participants referred to, to a greater extent, aspects linked more to their role as teachers (*preparation, patience, capacity*) rather than to external challenges in school inclusion (e.g., inequality, poverty, negative attitudes). Furthermore, in their NSN on regular teachers, the participants incorporated definers that described qualities necessary to be a "good teacher," such as responsible, preparation, commitment, and work. This result suggests that teachers have an internal locus of control, viewing themselves as directly involved in the inclusion process. In contrast, Hodkinson [33] observed that teacher trainees put the locus of control over the school in achieving effective inclusive education. This difference may be related to the factor of years of experience and the internalization of responsibility when one is a consolidated professional compared to the engagement feeling of a student. In this regard, Kalyva *et al.* [28] found that teachers' experience with students with disabilities can influence how they conceive inclusive education.

On the other hand, the NSN in the regular education system seems to be more cohesive (greater semantic density) than that of the special education system. This result aligns with the fact that the participants perform their job in the regular education system, which allows them to have a greater mastery of this field compared to special education. In this regard, Petra-Micu *et al.* [45] assume that a greater semantic density is associated with a greater consensus or cohesion among the definers to explain a target.

Special education, inclusion, and teaching practice met little conceptual consensus. This result suggests that despite the experience in school inclusion, regular teachers do not have a clearly defined inclusive vision within each of these areas. Although teachers mentioned a high percentage of concepts related to the vision of educational inclusion (e.g., acceptance, adequacy, participation) throughout the whole NSN, some concepts still appear to be more related to the vision of school integration (e.g., append, add, disability). This finding suggests that, to some extent,

there is still a conceptual mix between both concepts (integration and inclusion). Hodkinson [33] observed a similar conceptual confusion among teacher trainees. However, although there are still remnants of the integration model in teachers' memories, it is clear that a new culture of inclusion is beginning to emerge. Increasing opportunities to have direct contact with students with disabilities will permeate the cognitive schema of knowledge about the school inclusion of teachers and will favor the formation of more positive attitudes towards this group [8, 13-15]. For example, in the present study, the cognitive schemas of the participants included concepts with a positive bias towards the treatment of students with disabilities (e.g., commitment, patience, values).

On the other hand, teachers know that the school inclusion process requires participation at different levels of educational work (e.g., institutions, teachers, students), besides performing multiple tasks to achieve effective school inclusion (e.g., adapt, adapt, socialize) (Figure 1). In other words, they are aware of the two qualities that inclusive education has: it is multi-faceted and complex. However, similar to Hodkinson's study [33], participants in this study used more integration definers to define regular teachers than school inclusion concepts. Participants, therefore, need to broaden their conception of the school inclusion process.

Participants showed a four-dimensional model regarding the organization of knowledge on inclusive education and disability (Figure 2). Dimensions were conceptually coherent, which suggests that the participants have an organized schema for school inclusion of persons with disabilities, even when they express mixed opinions towards inclusive education, educational integration, and a conventional vision of education. Furthermore, as in the study by Gonzalez-Trujillo *et al.* [34], the participants mentioned some human qualities or values as relevant to define school inclusion (e.g., equality, respect, responsibility, patience, commitment, guidance, support, effort) in different dimensions of their schema. In addition, they recognized the importance of considering the institutional dimension and its relationship with other actors, such as students and teachers. They showed a projection of expected results in school inclusion programs, with a marked positive attitude toward the effects of this type of educative intervention.

Finally, the chronometric analysis (Figure 3) pointed out that the participants represent inclusive education

of students with disability in terms of teaching actions (support, including integrating students with disabilities). Furthermore, interestingly, they signify inclusion as a challenge, which suggests that teachers can implicitly discern that their inclusive actions are complex and require multiple factors for effectiveness. These findings are consistent with results in the computational simulations (Figure 4), which revealed that the activation of the quickest access definers also coactivated concepts related to the teaching task. This observation is consistent with the idea that participants have an internal locus of control in applying and achieving effective educational inclusion. Despite this attribution, the analysis of the semantic organization showed that the participants also recognized the relevance of institutional participation and its relationship with the teaching function (Figure 2). However, the participants seem to assume a more significant commitment to inclusion programs, although they are aware that the context has a relevant influence on achieving effectiveness in inclusion programs.

In short, the participants showed a cognitive schema of knowledge about school inclusion with concepts closely related to inclusion. However, they still reveal an intermediate level of training in this field. Also, the content analysis showed that the educative inclusion and disability schema focuses on verbs that denote actions and nouns that refer to elements, qualities, or actors necessary to carry out an effective inclusive education. However, some relevant concepts to the schema of school inclusion are absent, such as diversity; other concepts related to specific strategies of educational inclusion did not appear.

The study's results cannot be generalized since it is necessary to expand the sample and consider factors such as the type of educational service (public or private), the experience years, and the type of disability a teacher experienced, among other factors. However, this study's findings suggest a need for continual enrichment of the educative inclusion vision of our academic community.

5. CONCLUSION

In this study, teachers with experience in educational inclusion showed a favorable view of this enterprise. Also, participants exhibited an internal locus of control over the effectiveness of the inclusion process. However, they also recognized the importance of the context and other actors' participation in achieving inclusive education. In

general, the use of cognitive evaluation techniques, such as the one used in this study, can account for specific aspects of mental representation and the meaning that underlies the cognitive approach of teachers toward the processes of school inclusion.

Obtaining information on the attitudes and perceptions of the stakeholders who participate directly in school and social inclusion programs in order to benefit students with disabilities helps influence the training of personnel who care for this population. Knowing the psychological reality of educative professionals participating in school inclusion is essential to develop more effective training programs. Promoting behaviors, attitudes, and actions that facilitate educative inclusion will improve the quality of life of students with disabilities. Better educational conditions reduce the probability that persons with disabilities will experience conditions of vulnerability, illiteracy, or a lack of basic knowledge that hinder their development into an autonomous and independent life.

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