SPECIAL EDUCATION TEACHERS' PRACTICES AND PERCEPTIONS REGARDING THE CREATION OF A DEVELOPMENTAL ENVIRONMENT THAT SUPPORTS THE CORRECTION OF THE COGNITIVE ACTIVITY OF CHILDREN WITH INTELLECTUAL DISABILITY

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Abstract. Teaching children with intellectual disability is a particularly challenging task because of their limitations in intellectual functioning and adaptive behavior. Their learning characteristics demand specific curriculum content and instructional strategies. Furthermore, although a carefully designed and positive learning environment is beneficial for all students, it is more important for their education. Therefore, their teachers should create the appropriate physical, psychosocial and pedagogical environment which can promote their cognitive activity and the full development of their strengths. In order to investigate how everyday school life teachers, perceive and try to establish the optimal environment for their intellectually disabled students, a survey on special education teachers' perceptions and practices has been conducted. The results have shown that the participants are well aware of the importance of all aspects of the appropriate learning environment for their students with intellectual disability and that they try to establish this environment in their everyday school life in order to enhance their cognitive activity.

Keywords: students with intellectual disability; special education teachers; environment; cognitive activity

Introduction

As the morals of people differ in time and space, disabled people are addressed differently from era to era for various reasons (Winzer, 2007). Nowadays, special education of disabled people strongly concerns our society. Among the disabled children in inclusive or special classes there is a particularly challenging category of students, that of children or adolescents with intellectual disability. They are characterized by significant limitations both in intellectual functioning, such as reasoning, problem solving, planning, abstract thinking, judgment, academic

learning, and learning from experience, and in adaptive behavior in the conceptual, social, and practical domains of everyday life, with onset of these limitations during the developmental period, before the age of 18 (AAIDD, 2013; APA, 2013).

In schools, children with intellectual disability make a heterogeneous group of pupils with characteristics that may not apply to all of them (Utley and Obiakor, 2003). Their characteristics vary according to the degree of severity of their condition. This heterogeneity means that, for the purpose of education and treatment, persons who are profoundly intellectually disabled and multiply handicapped cannot be taught in the same way with those characterized by mild intellectual disability, sometimes barely distinguishable from the norm (Haywood, 2006, as cited in Kirk et al., 2009). Consequently, they need the appropriate learning environments and instructional strategies in order to be educated. Teachers' responsibility is to establish those environments which will promote their cognitive activity and facilitate their learning.

The first step is to understand their learning characteristics. The most obvious characteristic is their limited ability to process information which affects their academic work (Kirk et al., 2009). Generally, children with intellectual disability present difficulties in all the cognitive processes, such as sensory registration, perception, appraisal, decision making, memory, learning, concept formation, perceptual organizations, language, and many more (Corr, 2010). At first, they have difficulty in distinguishing colors, shapes, size of objects, or people's facial expressions and their perception is limited and inaccurate (Terziyska, 2014b). Moreover, deficits in cognitive functioning and learning characteristics of students with intellectual disability include poor memory, slow learning rates, attention problems, difficulty generalizing what they have learned, lack of motivation and sometimes receptive and expressive language impairments (Utley and Obiakor, 2003; Heward, 2013). Furthermore, reduced intellectual and adaptive abilities of persons with intellectual disability that affect problem-solving and flexibly thinking capacities are sometimes linked to vulnerability to risks. Thus, they are often characterized by a desire to please, gullibility, and naiveté, features that put them in risk of abuse by acquaintances or strangers (Snell et al. 2009).

Then, teachers can try to meet their specific needs through the adequate curriculum content and instructional strategies which are described in their Individual Education Plans. Regarding the academic curriculum, they should acquire the basic skills of reading, writing, and mathematics. However, they also need to learn skills that will prepare them to participate as independently as possible in daily life. They are taught these skills through the functional, or ecological, or life-skills curriculum (Davis & Rehfeldt, 2007). Moreover, social skills, such as the ability to work cooperatively or communicate effectively with others, leisure-time skills and some work skills useful for self-supporting in adulthood are essential for independent living in community (Kirk et al., 2009). Another skill that must be taught to students with intellectual disability is self-determination, which encompasses, among others, choice making, problem solving, self-monitoring,

decision making, goal setting, and self-advocacy (Wehmeyer, 2005). In inclusive classrooms, differentiated instruction ensures their progress. Although the content of the lessons is the same, the teacher must modify the teaching strategies in order to meet the needs of students with intellectual disability. Kirk et al. (2009) propose that Positive Behavior Supports, Scaffolding and Reciprocal Teaching, Cooperative Learning, Motivation, alongside the use of Assistive and Instructional Technology are most beneficial for those students.

In general, quality instruction on academic subjects is not sufficient, if teachers do not shape the physical, emotional, and social aspects of the classroom environment that will support each learner's overall development and sense of well-being (Voltz et al., 2010). Classroom, as well as school, climates can enhance student outcomes and depend on physical environment, either in its actual aspects or in the way people are dealing with it, the social system, that is the relations between persons in the classroom, and the culture, that is the belief systems, the values, or in other words the expectations people may have about the educational outcomes (Creemers and Reezigt, 1999). As physical environments influence cognitive and affective performance, the physical characteristics of a classroom setting can influence the behavior of its users. Size of the classroom, building design, spatial organization, including seating and arranging furniture to create appropriate spaces for movement and learning activities, temperature, lighting, noise, wall decoration in a classroom are all factors that can affect behavior and learning (Marx et al, 2000; Horne Martin, 2004; Jensen, 2005). On the other hand, the psychosocial learning environment covers psychological and social factors, such as thoughts, emotions and behavior, or relationships, tradition and culture, that are related to learners' and teachers' satisfaction, health and ability to perform at learning places (UNESCO, 2016). These two aspects refer to the climate of the classroom which is an important factor affecting educational outcomes.

However, although a carefully designed and positive learning environment is beneficial for every child's education and growth, it is of greater importance for children with intellectual disability. That is why their teachers must create the appropriate environment which will focus on the correction of their cognitive activity and the full development of their strengths. According to research findings, adaptation of classroom environmental conditions for students with intellectual disability would enable them to better acquire information and demonstrate what they have learned (Wehmeyer et al., 2002). Specifically, the classroom physical environment should offer physical comfort to all children, ensuring adequate lighting, temperature, air quality, as well as reduced noise level, avoiding thus possible distractions. Color and decoration of walls can also give them a sense of comfort and security that promotes the sense of ownership. Decorative objects, pieces of art and craft, plants and so on make the classroom environment more attractive. A neat and organized classroom that ensures accessibility to all areas

is crucial for children with intellectual disability. Arranging furniture to create appropriate spaces for movement and learning activities can prevent behavior problems and make sure that materials and resources for students are readily available. Particularly, seating arrangement is very important because it can affect their concentration and their social integration (Horne Martin, 2004; Bucholz & Sheffler, 2009; Banks, 2014; P.Terziyska, 2014b; Barrett et al., 2015).

Furthermore, all children need an environment where they are safe and valued and they feel psychologically secure in order that they can develop and learn (Rushton and Larkin, 2001). Teachers' responsibility is to create the appropriate classroom climate to embrace children with disabilities, intellectually disabled included. They should teach about diversity incorporating disability awareness in the curriculum goals (Broderick et al. 2005); they should highlight everyone's value, equality of rights and opportunities, and try to build empathy with the other's needs (Terziyska, 2016); and even they can use literature, social studies, history, or art in order to promote social and emotional literacy (Cohen, 2006). They should also avoid resulting in inappropriately low expectations for their disabled students communicated through frequent negative criticism of work, or through oversimplified learning tasks and indiscriminate praise for inadequate work (Beveridge, 1999). Therefore, as every other peer, students with intellectual disability should be supported and encouraged to engage in critical thinking and problem solving (Wehmeyer et al., 2002; Broderick et al. 2005). The network of social relationships in the classroom is also of great importance for children with intellectual disability as for any other child. At first, the teacher child relationship is crucial, specifically in early education. Because of their cognitive, social, and behavioral risk factors, children with intellectual disability require greater teacher caring and support in mastering the basic behavioral, academic, and social skills necessary in their school life (Eisenhower et al., 2007). Moreover, equally important are peer relationships. Theoretically, in inclusive classrooms intellectually disabled students have more opportunities for social interactions with typical peers, but first they should be taught social skills. That is why teachers should help them develop social and emotional skills that will enable their students to establish caring relationships with others (Elias, 2004).

In such learning environments students with intellectual disability should be provided with opportunities to learn through quality instruction adapted to their needs, through the use of appropriate instruction materials and technology, and through participation to various types of activities, including play, visual art activities, music, dance and drama.

However, apart from what is described in literature, it is worth finding how teachers of everyday school life perceive and try to establish the optimal for their intellectually disabled students' environment. Such investigations have already been conducted concerning the physical, psychosocial or pedagogical environment

separately, that is why there is a need for a more comprehensive view of their perceptions and practices regarding the establishment of an appropriate environment which can enhance intellectually disabled students' cognitive activity.

Purpose

For this reason, a study on practices and perceptions of special education teachers working with intellectually disabled students in special schools or integration classes within mainstream schools of the regional unit Larissa, Greece, has been conducted. The purpose of this study is to gather information from the perspective of the participant teachers about how they perceive the overall learning environment as a means of stimulating their intellectually disabled students' cognitive activity and consequently about what they usually do to ensure their progress in this environment. Specifically, they were asked to identify their perceptions and practices about the importance of classroom physical environment and seating arrangement; about the use of instructional materials and educational technology; about what they see and do in the schoolyard during recess time; and about the impact of the classroom climate and culture on their students' with intellectual disability learning and socialization. In addition, they were asked to state their propositions about establishing a development stimulating environment to promote the cognitive activity of intellectually disabled children. These are also the main research questions.

Method

The used research method is the survey and the research instrument for data collection is a questionnaire developed by the researcher. The sample size was decided to be 105 special education teachers working in forty-one schools of primary education and eight schools of secondary education of the regional unit Larissa, Greece. After having been approved by the Greek Ministry of Education, the questionnaires were delivered to the school principals who presented them to the special education teachers of their school. Anonymity was ensured. The research process did not require any amount of instructional time and the participant teachers could complete the questionnaires in their free time. The questionnaire had been previously checked in a pilot research. The final questionnaire is structured by a cover letter and forty-one questions, closed and open-ended. The first ten questions are about background information and all the following questions are related to the main research questions.

Results and discussion

From the sample of 105 teachers 99 questionnaires were returned, a percentage of 94.29%. The responses were encoded and entered into an Excel spreadsheet. The themes that emerged after the qualitative analysis of the responses to open-ended questions were also encoded in order to be measured quantitatively as the other items of the questionnaire. The encoded in the Excel spreadsheet data were transferred to SPSS Version 22, which was used for the statistical analysis. Subsequently, the qualitative analysis of open-ended questions has followed.

The results of the quantitative analysis of the 41 questions of the questionnaire are presented in 41 frequency tables respectively. The few responses in questions 24 and 28 have not permitted the creation of the respective tables. The responses to the open-ended questions were coded and labeled by the use of key words or phrases. Subsequently, these codes were used for the creation of themes. Some codes which could not be contained in the main themes were included in the theme Other. An exception was made in the propositions of question 41 where all the themes were presented even if they represented only one answer. Only some critical examples of the relevant tables and figures are presented in this article.

Over half of the respondents have teaching experience from nine to twenty years and the three quarters of them are women. They gave a variety of responses in regard to school type, the subjects and the grade level they teach. The majority of them have students with intellectual disability in their classes. The classes including intellectually disabled students are mostly small. The quantitative and qualitative analysis of the responses gave a clear depiction of the respondents' perceptions and practices about the establishment of a development stimulating environment that fosters the cognitive activity of children with intellectual disability.

Regarding the importance of classroom physical environment and seating arrangement (questions 11 – 20), they seemed to consider them very important for the correction of their students' cognitive activity. They explained the importance of the classroom physical environment, they ranked its characteristics, they stated a child's with intellectual disability usual seating placement and the reasons of their choice, and evaluated other aspects of the physical environment of the classroom including color and decoration of the walls, bulletin boards with various pieces of information, displays of students' work, use of visual aids as displays, and of hand-on materials to provide the intellectually disabled students with the relevant experiences.
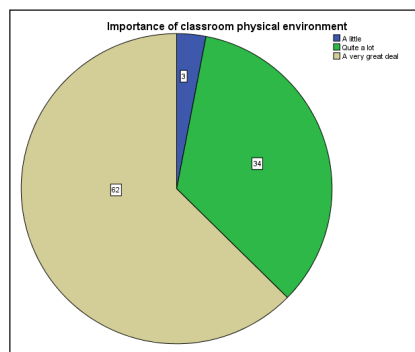

Figure 1. How important the participant teachers consider the classroom physical environment to be for children with intellectual disability

Table 1

Explanation of opinion about the classroom physical environment		
Themes	N	Percent (%)
Students' mood	11	11.1
Interest	3	3.0
Attention	7	7.1
Academic performance	12	12.1
Teaching	12	12.1
Calmness	6	6.1
Socialization	5	5.1
Stimuli	18	18.2
Other	5	5.1

Note: N shows the number of respondents (frequency) and Percent (%) shows the valid percent.

Table 2

Seating placement of children with intellectual disability in the classroom		
	N	Percent (%)
In the front rows	45	47.4
In the middle rows	2	2.1
In the back rows		
Near the teacher	75	78.9
Near the door	4	4.2

Note: N shows the number of respondents (frequency) and Percent (%) shows the valid percent.

Table 3

Explanation of the location of seating placement		
Themes	N	Percent (%)
Control	18	18.2
Attention	16	16.2
Safety	9	9.1
Communication	20	20.2
Individualized program	3	3.0
Understanding	5	5.1
Guidance	26	26.3
Easy exit	3	3.0
Other	8	8.1

Note: N shows the number of respondents (frequency) and Percent (%) shows the valid percent.

Teachers' perceptions and practices about the use of instructional materials and educational technology (questions 21-28) showed that almost all of them used various types of instructional materials very frequently and that the majority of them often used a computer in various ways while teaching children with intellectual disability.

Table 4

Examples of used instructional materials		
Themes	N	Percent (%)
Technology	37	37.4
Manipulative items	23	23.2
Pictorial materials	58	58.6
Diagrams	6	6.1
Books/Notebooks	11	11.1
Educational games/puzzles	34	34.3
Realia	16	16.2
Display media	7	7.1
Other	10	10.1

Note: N shows the number of respondents (frequency) and Percent (%) shows the valid percent.

Table 5

How a computer is used in a classroom with children with intellectual disability		
Themes	N	Percent (%)
Educational software	25	25.5
Text editing / printing	6	6.1
Educational games	13	13.3
Listening to music/ sounds/fairy tales	9	9.2
Painting	4	4.1
Multimedia	8	8.2
Viewing images, videos and showing presentations	17	17.3
Information search	7	7.2
It supports teaching	19	19.4

Note: N shows the number of respondents (frequency) and Percent (%) shows the valid percent.

Describing what they see and do in the schoolyard at recess time (questions 29 – 35), they seemed to be aware of the benefits of a well designed schoolyard where children with intellectual disability can continue to learn and develop their cognitive skills through physical exercise and play. Because many of those

children usually are not actively engaged in recess activities, they believe that they can intervene through giving them opportunities to participate in various types of games, teaching rules and modeling themselves, enhancing their behavior and promoting cooperation.

Table 6

What children with intellectual disability usually do in the schoolyard at recess time		
	N	Percent (%)
They simply stand around and talk	38	38.4
They stand or walk alone	68	68.7
They play with other children with disabilities	48	48.5
They play team games	28	28.3
They play pretend games	9	9.1
Other	14	14.1

Note: N shows the number of respondents (frequency) and Percent (%) shows the valid percent.

Table 7

How teachers intervene in intellectually disabled children's behavior at recess time		
Themes	N	Percent (%)
Opportunities for socialization	17	17.5
Encouraging participation	17	17.5
Teaching participation rules	5	5.2
Enhancing student's behavior	13	13.4
Creating group activities	10	10.3
Various types of games	18	18.6
Creating a cooperative class	3	3.1
Active participation of teacher	15	15.5
Other	13	13.4

Note: N shows the number of respondents (frequency) and Percent (%) shows the valid percent.

They also showed their awareness of the impact of the classroom climate and culture on their students' with intellectual disability learning and socialization (questions 36 – 40). The majority of them consider the classroom climate to be important for their intellectually disabled students' learning along with reduction of unwanted behavior, encouragement and cooperative relationships. They also ranked the importance of practices that foster their students' social integration such as modeling acceptance, promoting cooperation with typical peers, teaching them

behavior management and how to recognize emotions, and promoting social skills through games.

Table 8

Classroom climate can affect the ability of a student with intellectual disability to learn				
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	68	68.7	68.7	68.7
	Agree	24	24.2	24.2	92.9
	Neutral	1	1.0	1.0	93.9
	Disagree	3	3.0	3.0	97.0
	Strongly disagree	3	3.0	3.0	100.0
	Total	99	100.0	100.0	

Table 9

Emphasizing cooperative relationships that promote the inclusion of all children in a classroom enhances children's with intellectual disability learning				
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	56	56.6	57.1	57.1
	Agree	26	26.3	26.5	83.7
	Neutral	7	7.1	7.1	90.8
	Disagree	6	6.1	6.1	96.9
	Strongly disagree	3	3.0	3.1	100.0
	Total	98	99.0	100.0	
Missing	System	1	1.0		
Total		99	100,0		

Table 10

Importance of practices which promote children's with intellectual disability social integration						
	N (%)					N
	1 The most important	2 (Quite important)	3 (Important)	4 (Less important)	5 The least important	Missing
Acceptance [a]	53 (57.0)	15 (16.1)	11 (11.8)	8 (8.6)	6 (6.5)	6
Cooperation [b]	42 (44.7)	23 (24.5)	19 (20.2)	6 (6.4)	4 (4.3)	5
Behavior [c]	37 (39.8)	23 (24.7)	10 (10.8)	12 (12.9)	11 (11.8)	6
Emotions [d]	29 (30.9)	22 (23.4)	9 (9.6)	17 (18.1)	17 (18.1)	5
Games [e]	24 (25.5)	14 (14.9)	19 (20.2)	14 (14.9)	23 (24.5)	5

Note: N (%) shows the number of the respondents, i.e. the frequency, and the valid percent in brackets. N shows the number of missing responses.

[a] The teacher should model *acceptance* of children with intellectual disability in order that their nondisabled peers are also accepting and supportive.

[b] The teacher should provide frequent opportunities for children with intellectual disability to *cooperate* with typically developing peers, e.g. involving them in group activities, or carefully considering seating arrangements in the classroom.

[c] Children with intellectual disability should be taught how to manage their own *behavior*, because good social skills also require behavioral management skills.

[d] Children with intellectual disability should be taught the ability to understand *emotions*.

[e] *Games* that make children exhibit certain social behaviors can support the teaching of social skills.

In the final main question(question 41) about their propositions they pinpointed various aspects of the physical, psychosocial and pedagogical learning environment indicating that they know how to take advantage of the appropriate environment for their intellectually disabled students' progress.

Table 11

Propositions about establishing a development stimulating environment to promote the cognitive activity of children with intellectual disability		
Themes	N	Percent (%)
Organized environment	18	18.4
New school buildings and equipment	3	3.1
Small classes	3	3.1
Sufficient staff	1	1.0
Staff collaboration	3	3.1
Parents' briefing	1	1.0
Qualified teachers	6	6.1
Quality of physical environment	11	11.2
Educational materials and computers	22	22.4
Teaching methods and content	21	21.4
Creating a positive climate	27	27.6
Socialization	9	9.2
Classroom behavior management	5	5.1

Note: N shows the number of respondents (frequency) and Percent (%) shows the valid percent.

Through their propositions the respondent teachers clearly show their perceptions and experiences about the optimal environment that can promote the correction of their intellectually disabled students' cognitive activity. They believe that the physical classroom environment should be well designed and organized with the appropriate classroom layout and seating arrangement. The instructional materials should be tidy and, in general,

the classroom should be comfortable, safe and pleasant to the students. New school buildings and equipment make the physical environment more functional and attractive. On the other hand, they pinpoint the importance of the psychosocial aspect of the learning environment for their intellectually disabled students' progress and development. They think that they should ensure a positive climate in the classroom where teachers love and respect them, and peers accept diversity, where they are encouraged and supported, and, the most important, where there are good relationships between teacher and students and among students themselves. In this environment their socialization should be enhanced through encouragement of their social integration and thorough instruction of social skills. Classroom behavior management helps maintain the positive climate. They also describe the optimal pedagogical environment for their intellectually disabled students' learning. Using the appropriate for them teaching methods they try to instruct them what is useful for their everyday life. Furthermore, they believe that good use of instructional materials and ICT contribute to their progress. They also mention the necessity of small classes and of teachers' adequate training which would enable them to better understand their students' peculiarities and make good use of the environment. Moreover, apart from special education teachers for the integration classes, schools need staff such as a charwoman, a music teacher, a gymnastics teacher, and waiters for full-day schools. Teachers and the other members of the school staff should cooperate with each other and also with parents who should be informed about their children's educational needs and progress.

Concluding, it is worth noting that the respondent teachers' perceptions and practices about the creation of a development stimulating environment that nurtures the cognitive activity of children with intellectual disability seem to be consistent with what literature suggests. Regardless of numbers, in all, the respondents showed that they consider both the physical and the psychosocial learning environment along with the appropriate pedagogical factors to be important for their students' with intellectual disability development and academic achievement. They seem that they care about both the physical and the psychosocial classroom environment in which they will use every pedagogical means in order to enhance their students' learning. In other words, they care about creating the appropriate learning environment for their students' with or without intellectual disability.

Limitations – Implications for practice

This study is limited in only one regional unit and, although it is not completed with interviews, the participants were free to express their own opinions about the research topic in the open questions. Another limitation is that a number of participants chose not to answer the open-ended questions, as the whole process was voluntary. Despite these limitations, the survey has shown that special education teachers are well aware of the importance of all aspects of the appropriate learning environment for all their students and especially for those with intellectual disability, and consequently, they can use this environment as a means of stimulating their interest and enhancing their cognitive activity.

Therefore, not only special education teachers but also regular education ones, especially those of inclusive classrooms, should be trained to create and take advantage of a development stimulating environment in order to promote the correction of the cognitive activity of mentally handicapped children. In this way, all teachers would be able to create an appropriate learning environment for their intellectually disabled students. Thus, it is recommended that, in given buildings, all teachers should try to adapt the design and the arrangement of space and furniture in the classroom to suit their educational goals and their students' needs (Weinstein, 1992; Horne Martin, 2004). They can even suggest solutions to various problems regarding temperature, lighting and noise in the classroom (Jensen, 2005). Moreover, they should try to create a calm, safe and caring classroom environment where all students and especially the vulnerable intellectually disables ones can be accepted by everyone and be expected to succeed according to their strengths.

The school principals, on the other hand, should facilitate teachers' interventions in the classroom and school environments, and foster a positive school climate in which students, teachers, parents and other staff members are able to cooperate in order to ensure the optimal conditions for learning.

Last but not least, the government should fund the construction of new school buildings or the renovation of older ones along with the provision of the adequate technology and instructional materials, and ensure that there is sufficiently trained staff in every school.

All the above practices are beneficial for all students and specifically for those with intellectual disability who will not stop being intellectually disabled, but they can reach the maximum of their potential and live a better life.

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