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Latent Learning Disabilities in the Classroom: Interpreting Children's Learning Styles Identified by Memory Recalls

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Abstract
If a learning disability is not defined, it can be said that primary school children show the features of adaptable students within the learning atmosphere of the classroom. Most of the time, teachers think that they teach and their students learn easily. However, studies on children's memory show that the learning process gets abstract when the number of stimulants in the learning environment increase. Children especially have difficulties when they use more than one sensory memory, like seeing, hearing and touching, at the same time and it gets harder to remember things they learned. In this study, it is aimed to investigate the learning profiles related to the visual, auditory, kinesthetic & tactile and combined (visual+auditory+kinesthetic) memories of primary school children and to define whether learning results related to the combined memory cause a learning disability in terms of remembering. According to the results of the study, it has come out that a considerable amount of children have difficulties while learning with the combined memory. However, their teachers and probably also their parents are not aware of this situation. This result makes teachers consider that they have to help their students out individually in the learning environment in order to make students' learning easier.

Keywords: Children's Learning Style, Memory Recall, Learning Disability

1. Introduction

If a learning disability is not defined, it can be said that primary school children generally display adaptive learner characteristics in the classroom. In the positive atmosphere of learning in the classroom, teachers often think that they teach and that students learn easily. However, studies on child memory have shown that when the stimuli in the learning environment increase, the learning process becomes abstract. Especially when children use more than one sensory memory such as visual, aural and kinesthetic together, it is difficult for them to remember what they have learned.

According to the Learning Disabilities Association of America (LDA) (2022), "Learning Disabilities is an umbrella term describing a number of other, more specific learning disabilities. A learning disability cannot be cured or fixed; it is a lifelong challenge. However, with appropriate support and intervention, people with learning disabilities can achieve success in school, at work, in relationships, and in the community". Learning disability is a term used to describe a range of learning and thinking differences that can affect the way the brain takes in, uses, stores, and sends out information. There are many reasons why a child may have difficulties

learning. The causes aren't always known, but in many cases children have a parent or relative with the same or similar learning and thinking differences and difficulties (Zubler (2021). A lack of consistency in definition constructs varied interpretations which impact on discussions about how schools identify and make provision for children with difficulties in learning (Rivalland, 2000, 12). Children's academic inadequacy despite their normal mental and emotional skills" is the most striking indicator of learning disability. Identifying learning disabilities is a very complex process, and in this process, many experts such as physiotherapist/occupational therapist, pediatrician, classroom teacher, speech and language therapist, physical education teacher, psychologist (Macintyre & Deponio, 2003, 5) need to work together.

Regardless of the reasons for the learning difficulties of the students, with the professional role of the teacher or expert, the learning in the classroom can evolve into a positive atmosphere for the child. Pieere (2021) thinks that social work done with an inclusive approach in the classroom plays an encouraging and facilitating role in the learning of students with learning disabilities, and the results of her research confirm this fact. But wherever you are in the world, it is impossible to come across a team of experts who can work specifically with students with learning disabilities in schools. In fact, from time to time, there may not even be a teacher specialized in special education. In the study, learning disability was defined as remembering disability. It was tried to analyze the relationships between the memory tests and the learning style scores obtained by giving the stimuli separately (visual x auditory x kinesthetic) and together (visual + auditory + kinesthetic = combined). The problem of the research can be explained as "describing the learning difficulties that children have learning styles in the context of learning products".

2.Method

The study is an experimental study with an empirical design. The problem of the study dates back to the period when the researcher was preparing his doctoral thesis (Erginer, 2002, Erginer, 2021). While trying to measure the learning styles of elementary school students, the researcher observed that they had some recall difficulties. He finalised his doctoral study and, he redesigned his study by focusing on the learning difficulties of students in a different sample group and focused only on children with recall difficulties. In the study, it was aimed to examine the learning profiles of elementary school children regarding their visual, auditory, tactile and combined (visual+auditory+kinesthetic) memory and to determine whether the learning results related to combined memory cause learning difficulties in terms of retention. The following image shows the steps of the study:

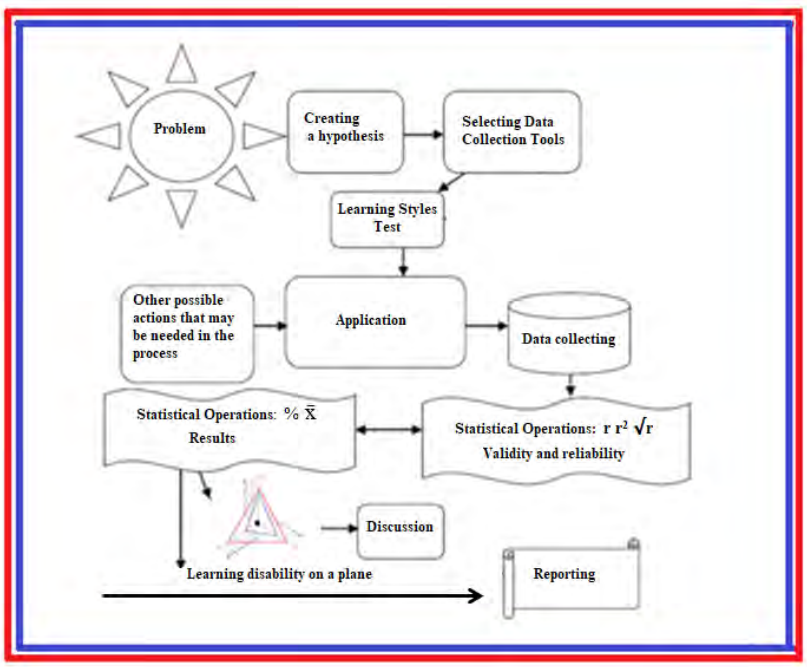

Figure 1: Research Process Steps

On the basis of the results of statistical operations after the application, students' learning disabilities were expressed by drawing on learning planes. The results were reported.

2.1. Participation

In the study in which convenience sampling and snowball approach were used to form the study group, the group consisted of first, second and third grade primary school students.

Table 1: Study Group

1st grade		2nd grade		3rd grade	
f	%	%	%	f	%
21	32.8	22	34.4	21	32,8
64 /100					

The study group consisted of 64 primary school first, second and third grade students. A group of 22 and two groups of 21 students were formed and the number of participants in three groups was tried to be equalized.

2.2. Measurement Tool and Reliability

The "Learning Styles Test (LST)" developed by Erginer (2002) was used in the study. The origin of this test is based on Vester (2004) and it is constructed with memory modeling.

2.2.1. LST (Learning Styles Test)

The Learning Styles Test consists of five common modules that examine visual, auditory, tactile, reading and combined learning characteristics and a mental operations box module (Erginer, 2002, 194-206). The reading module was not used in this study.

2.2.2. Visual Learning Style Module

In the module, to test the visual learning style, there are 10 pictures that have no semantic relationship with each other and do not evoke each other. After the student has looked at each of the 10 different objects for two seconds, the practitioner removes the pictures and asks the student to answer the questions in the mental processing box within 30 seconds. In the next 20 seconds, he asks the student which pictures he/she remembers. The number of pictures the student remembers constitutes the visual learning style score.

2.2.3. Auditory Learning Style Module

In the module, in order to test the auditory learning style, 10 words that have no semantic relationship with each other and do not evoke each other are placed on an A4 sheet of paper using 14-point size book letters. The practitioner reads the words aloud at two-second intervals. When the reading is over, he asks the student to answer the questions in the mental operations box within 30 seconds. In the next 20 seconds, he asks the student which of the words she/he remembers. The number of words the student remembers constitutes the auditory learning style score.

2.2.4. Kinesthetic Learning Style Module

In the module, there are 10 items that have no semantic relationship with each other and do not evoke each other in order to test the touch learning style. The practitioner gives the blindfolded student an item to touch every two seconds, then asks the student to answer the questions in the mental processing box within 30 seconds. In the next 20 seconds, he asks the student which items she/he remembers. The number of items the student remembers constitutes the tactile learning style score.

2.2.5. Combined Learning Style Module

The module set includes pictures of 10 concepts that have no semantic relationship with each other and do not evoke each other, driwing on A4 paper to be seen, written on A4 paper to be heard, and item forms to be touched in order to test visual, auditory, and tactile learning styles together. The practitioner gives the student 10 pictures at two-second intervals and allows the student to see them, reads the 10 words in the pictures at two-second intervals and allows the student to hear them, and allows the student to touch the item forms of the 10 words that the student sees the pictures of and hears at two-second intervals. When the practice is completed, the teacher asks the student to answer the questions in the mental processing box within 30 seconds. In the next 20 seconds, the instructor asks the student what he remembers. The number of pictures/words/items that the student remembers (visual, auditory, tactile) constitutes the combined learning style score.

2.2.6. Mind Operations Box Module

In this module, at the end of each learning style practice, there are questions that are asked to the student within 30 seconds. These questions are questions such as the student's name, favorite foods, hobbies, simple mental calculations. When the student answers the questions in the mental operations box, the next learning style module is administered. The reliability calculations of the test are shown in Table 2:

Table 2: Learning Style Test Reliability (n=64)

Learning Styles	r	√r	r^2	p
Visual	.89*	.95	.81	.00
Auditory	.85*	.92	.77	.00
Kinesthetic	.84*	.92	.71	.00
Combined	.90*	.95	.81	.00

*p<.01

According to Table 2, the reliability coefficient of each module varies between .77-.81. This indicates that the measurement tool modules are usable for research.

2.3. Some Limitations

The study was conducted over a period of three years due to data collection difficulties. The difficulty stems from the fact that a minimum of 30 minutes is needed to measure a student's learning profile. This includes the time spent convincing the child to take the test and the time spent playing games with the student. When the child is distracted, it can take up to an hour, and sometimes the process cannot be continued and the measurement is continued with another student. Especially as the age group gets younger, the work becomes more difficult. Appointment difficulties were also experienced in reaching the students. The possibility of students remembering the tests and telling each other during the implementation led to the necessity of not communicating with each other and resulted in working with fewer students. At times, it was also difficult to find distraction-free environments in schools. In addition, since the study required special parental permission, it was difficult to reach a sufficient number of students.

2.4. Operational Definitions

2.4.1. Learning Condition without Learning Disability

The study first defined a learning profile in which memory coordination and coherence were observed during the learning process, i.e. a learning profile without learning disabilities.

2.4.2. Mastery Learning

It is the learning situation with the highest scores for all learning style scores.

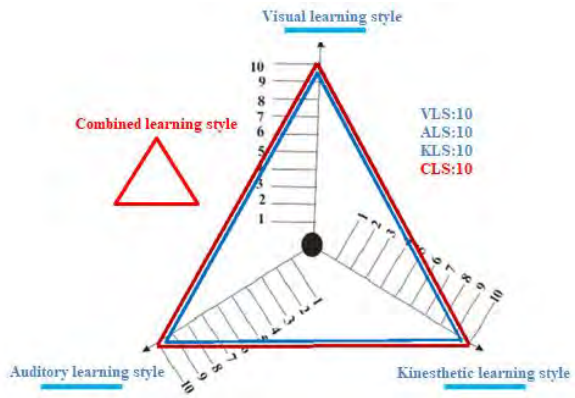

Figure 2: Mastery Learning

2.4.3. Ordinary Learning

In the learning plane, the combined learning style is defined with the highest score compared to other learning style scores and encompasses other memories.

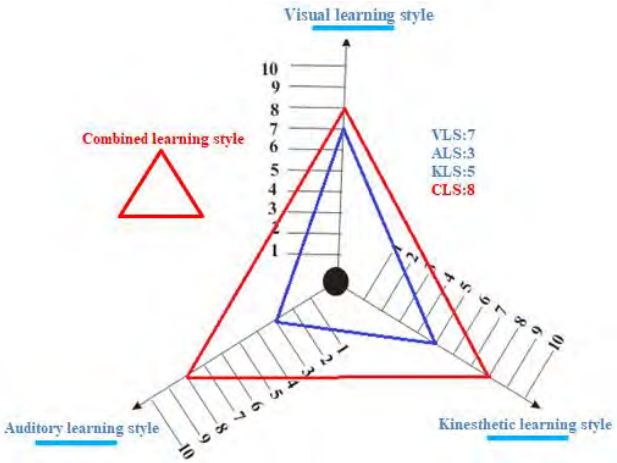

Figure 3: Ordinary Learning

2.4.4. Complete learning disability

This is when any learning style score is higher than the combined learning style score.

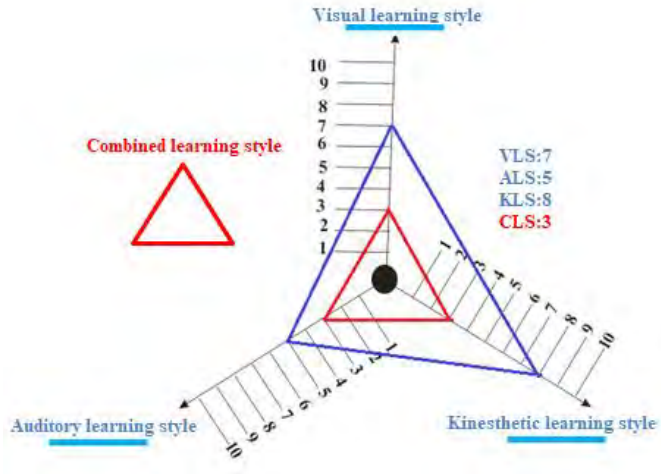

Figure 4: Complete Learning Disability

2.4.5. Ordinary Learning Disability

When any learning style scores are higher than the combined learning style score.

Figure 5: Visual-based Learning Disability

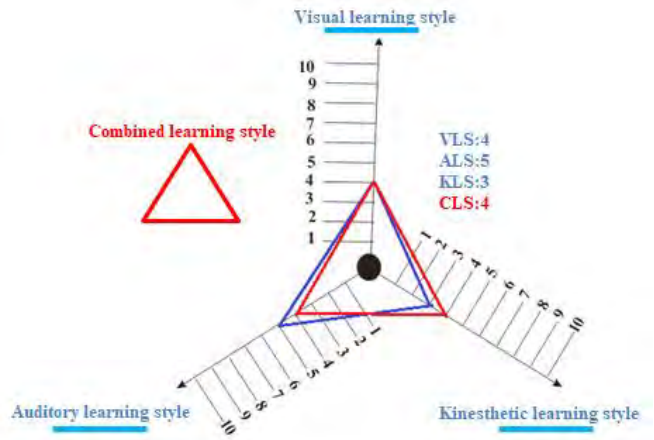

Figure 6: Auditory-based Learning Disability

Figure 7: Kinesthetic-based Learning Disability

In the context of the above definitions, it is possible to analyse learning disability according to the type of memory deficit.

3.Results

Below are the findings for learning disabilities, which exclude students who do not have learning disabilities.

Table 3: Learning Disability by Grade (n=64)

Grade	Visual $\bar{x}$	Auditory $\bar{x}$	Kinesthetic $\bar{x}$	Combined $\bar{x}$	Learning Disability f	Learning Disability %
1st grade	5.30	3.00	5.70	5.95	8	12.50
2nd grade	6.05	2,95	6.35	6.90	7*	10.94
3rd grade	6.40	2,85	6.50	6.70	9	14.06
Toplam					24	37.50

*Auditory memory score of 2 students was 0. It is known that the problem is not complete hearing loss. There does not seem to be a problem in children's use of combined memory.

When the results are analyzed, it is understood that 37.5% of the children have a learning disability. The results of the research show that a considerable number of children have difficulties in learning with combined memory. However, their teachers and possibly their parents are not aware of this. This result suggests that teachers should provide individual support to their students in the learning environment in order to facilitate their learning. When the situation is evaluated in terms of inclusive classrooms, it can be said that the disadvantaged position of special children (such as having a visual, hearing or orthopedic disability) requires the teacher to make an extra effort for such children.

The researcher is currently conducting two similar studies with different age groups (4th and 5th graders). It is thought that it will be healthier to make generalizations on the results when the sample groups are larger. The results of the study revealed that a considerable number of children had difficulties in learning with combined memory. However, their teachers and possibly their parents are not aware of this. This result suggests that teachers should provide individual support to their students in the learning environment in order to facilitate their learning.

4. Discussion

Children's learning difficulties have attracted the attention of childhood researchers for many years. However, it can also be said that research on children's learning difficulties is very diverse and complicated. This is a challenge for researchers. Although the definition of learning disability is sometimes described in relation to intellectual disability (Mayes & Calhoun, 2005), this perspective is often misleading. Rhodes-Sanders (2020) concluded that it is important to enrich educators' knowledge and understanding of children's working memory and executive function weaknesses. The results of this study, which provides teachers with data on latent learning disabilities in the classroom, can therefore be considered to support this view.

Specific learning disorder is one of the most common neurodevelopmental disorders affecting 3% - 10% of children (Shah, Sagar, Somaiya, & Nagpal,2019). In the light of the fact that the results of this study provide data about specific learning difficulties, it will be served that children, the most valuable creatures of the world, who can be diagnosed with learning difficulties, can breathe more easily in learning environments. It is the researcher's wish that all children can be happy together in learning environments.

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