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Validation of Screening Checklist for Learning Difficulties in Mathematics

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Abstract

This research aimed to validate the screening checklist for the students with learning difficulties in the subject of mathematics at primary level in the public schools. Students of the 5th class constituted the population for the study. Simple random sampling technique was used to select the sample from population. Cronbach's Aplha Reliability of the screening checklist was .87. Pearson correlation coefficient for the concurrent validity was .91. There was a significant difference among the low and high achievers.

Keywords: Learning difficulties, screening checklist, concurrent validity, content validity, reliability

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Introduction

According to National Health and Medical Research Council (NHMRC) Learning disabilities are lifelong and persistent, and do not respond eagerly to rigorous educational intervention; but learning difficulties are caused from specific reasons, such as emotional, educational, enviornmental, or physical factors. Learning difficulties are not an indication of intelligence level, but these show that student may face difficulty in the same way as others do (https://www.nhmrc.gov.au/).

Learning difficulties are responsive to rigorous educational interventions while the learning disabilities are lifetime conditions which are extremely sturdy to educational interventions (Westwood, 2014). Even with rigorous proven educational interventions, abilities do not progress rapidly or considerably. If a student has universal learning problems then s/he will find all features of understanding and learning difficult nevertheless of what kind of pedagogy and method of teaching is used (Patel, 2002). This kind of students may be named as slow learners. Such a student may get a low score on Intelligent Quotient tests or other kinds of assessments of learning (Dowker, 2005).

Some children have “specific learning difficulties” meaning that merely certain characteristics of psychological processes are challenging. These students are often reasonably bright, but from time to time misinterpreted and misguided for being lazy or careless, when in fact they are compensating for some type of sensory processing style (Atkins, 1999).

The objective of this research study was to develop and validate the screening checklist for the children with learning difficulties (LDs) in the subject of Mathematics at primary level in the province of Punjab in Pakistan.

In Pakistan there is a dire need to conduct such type of the studies because there is no such systematic and the in depth study to deal with the kind of the problems of learning difficulties.

Review of Related Literature

This section of the study contains the definition of learning difficulties, prevalence, validity and the reliability.

"Formal learning of mathematics is often far away from smooth process of learning and understanding" (Ginsberg, 2011, p.23). In the same way that human children appear to be biological preprogrammed to acquire language very rapidly and easily in the preschool years, so it too seems they are pre-programmed with the capacity to deal with quantitative features of their environment (Geary, 2000; Wynn, 1998).

A great deal of informal learning of number concepts and skills begins at a very early age, supported in a variety of natural ways by parents and others (Aubrey, 2001). Preschool students seem to have an implicit understanding of numeracy, simple arithmetic (adding, taking away, and sharing), ordinarily, and counting even without direct method of teaching (Ginsberg, 2011). This informal quantitative experience lays the firm foundation for future skills acquisition and conceptual development when the child begins school. When children enter school they encounter for the first time a much more formally structured kind of mathematics. Students cannot easily discover the characteristics of school mathematics in an absolutely informal way, and they need therefore to be taught in conventional way of teaching, instructional procedures, terminology, signs and symbols, as well as familiarized to new notions and problems in a chronological manner. They require to meet age-appropriate mathematical scenarios and they need to practise and apply new talents in order to uphold interest, build self-confidence, and develop automaticity (Booker, 2004).

From the day students begin school, their achievement in mathematics depends seriously on the quality of the instructions they receive. In broad-spectrum, research on teacher efficiency in mathematics has supported the usage of a structured method and prudently sequenced program, mainly for children with learning difficulties in mathematics (Heward, 2013a).

It is now generally recognized that the utmost real teaching approach combines important features of direct method of teaching together with the most significant and encouraging components of student-centered, learning. High quality teaching in the subject of mathematics requires a teacher with excellent subject knowledge who can stimulate students' interest and involvement. The teacher's part of play is to develop a learning atmosphere where there are abundant chances for active contribution by students, and also to communicate relevant material and teach particular skills (Abell, 2009).

It is one of the major complications of the exceptional students especially with learning disabilities in Pakistan that they are not appropriately identified. They are not even cured according to their particular learning problems in mathematics in specific areas. The students with specific learning difficulties cannot do well in oral tasks in accordance with their non-verbal ability tasks. They perform general ability tasks in a good manner. But their achievement in academic tasks is not excellent (Elkind, 2013).

The teacher perceives their learning problems, as they are creating troubles in doing academic tasks. Teachers are assessing their achievement without getting their real deficiencies in verbal and non-verbal areas of academic achievement. They treat and even punish them harshly. Finally, their real problems have been neglected. It is all due to the lack of attentiveness of the real difficulties of the children (Wearmouth, 2013).

Prevalence of Students with learning difficulties

Prevalence evaluations designate that children with learning difficulties form of enormous ratio of children in the mainstream schools. This kind of approximations in Australia are conventional as particular children continue kept undisclosed as a formal assessment process is not mandatory. An OECD (1999) report projected prevalence of children with learning difficulties between 12% and 16%. Whereas, an Australian national survey of special education (Andrews, Elkins, Berry, & Burge, 2014), proposed levels of prevalence of children 11% with numbers as maximum as 30% in selected grades. Confirmation of this last statistics was conveyed by the recent Australian national survey of children with learning difficulties (Brady, Milton & Rohl, 2000) and supplementary provision for greater numbers arises from a numeral separate Australian and international research studies which also recognized these children as the greatest group with special educational needs (Westwood & Graham, Bartholomay, Gordon, & Pruny, 2000; Anderson, Wallace, & McKinnon, 2013).

However, there is agreement about the features and learning developments distinctive of children with learning difficulties in different areas of knowledge. In general, they are observed as lethargic and incompetent learners, are often off-task, and are easily distracted. These learners often are not able to assimilate past information and their personal experiences into whatever they learn from those experiences. These influences shared with learned powerlessness and convoying social and emotional problems often outcomes in the development of poor self-esteem and expectation of lower achievement in academic areas (Ashman & Elkins, 2002; Treuen, van Kraayenood, & Gallaher, 2000; van Kraayenoord & Farrell, 1998; Westwood, 2004).

In the absence suitable pedagogical techniques and proper accommodations, this kind of students constantly underachievement or fail at the secondary school level. This kind of personal, educational and social disadvantage resulting from school failure may include joblessness, poverty, uprightness, and poor physical, emotional and mental health (Weare, 2006).

Research Methodology

In this descriptive research, students of the 5th grade of public schools constituted the population of study. A sample of 912 students were randomly selected from the public schools studying in 5^{th} grade for the purpose of this research. The type of the research was used is the descriptive type of research.

Data Collection

It is due to the non availability of the screening checklist which can meet the local norms to find out the learning difficulties in the subject of mathematics at primary level in Punjab. The researcher himself established a screening checklist was used to collect the data from the students with learning difficulties in mathematics. Screening checklist was consisting on the 30items related to the learning difficulties in the subject of Mathematics. Researcher himself administered the screening checklist to the teachers teaching mathematics to the 5^{th} grade in the mainstream public schools of the province of Punjab in Pakistan. Enough amount of time of 1 week was given to the respondents to fill this screening checklist for the students with learning difficulties in Mathematics. Guidelines were formally conveyed to the respondents concerning the responses of the screening checklist.

Data Analysis

The collected data was scored and entered into the computer in the SPSS. Descriptive and inferential statistics was used to analyze the data. Cronbach's Alpha was used to check the reliability of the screening checklist and the Pearson correlation coefficient was used to find out the concurrent validity of the screening checklist. Independent sample t-test was used to compare the achievement between the low and high scorers. The analyzed data was presented in the following tables given below:

Table 1
Cronbach's Alpha reliability of the screening checklist

Scale Factor	No of Items	Cronbach's Alpha Coefficients
Screening Checklist	30	.87

Table 1 shows that the reliability coefficient for the Screening checklist for the students is .87 which is considered as a good reliability.

Table 2
Pearson Correlation Coefficient for the concurrent validity of the screening checklist

Scale Factor	No of Items	Correlation Coefficients
Pearson correlation coefficient	30	.91

Table 3
Comparison of the low and high achiever students

Achievement	*N*	*M*	*Df*	*T*	*Sig*
Low achievers	408	33.36	406	-1.12	.001
High Achievers	504	43.06	502		

*P < .05 Level of Significance

Table 3 shows that there is a significant difference among the low and high achievers in the scoring of screening checklist for students with learning difficulties in the subject of mathematics at primary level.

Findings

To ensure the content validity of the screening checklist of students with learning difficulties in mathematics opinion of panel of experts of the relevant field were framed. For the purpose of data analysis Cronbach's alpha was used to find out the reliability of the screening checklist for students with learning difficulties in mathematics. To guarantee the concurrent validity of the screening checklist for students with learning difficulties in mathematics Pearson correlation coefficient was used.

Coefficient of Cronbach's alpha for the screening checklist was .87 and the coefficient of Pearson correlation for the screening checklist was .91. There was a significant difference among the students with low and high achievers upon the scoring of screening checklist.

Conclusion and discussion

This study was conducted to develop and validate the screening checklist of learning difficulties for the students with learning difficulties in mathematics at primary level in Punjab. Experts of the field were confirmed the face and content validity of the screening checklist. Reliability for the screening checklist was ensured by the Cronbach's alpha. Moreover, the screening checklist has the good strength to differentiate the students with the low and high achievers.

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