



RESEARCH PAPER

Mediating Role of School, Classroom and Student Levels between System and Outcomes for Parents of Students with Hearing Impairment

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ABSTRACT

The purpose of this research was to investigate the relationship between parents' perception of effectiveness of educational services (system, school, classroom and student levels) and learning outcome (cognitive, affective, psycho motor, new learning) and to investigate the serial mediating role of school, classroom, and student levels between the relationship of system level and outcomes for the parents of the students with hearing impairment. Quantitative paradigm was used to conduct this research. Parents of hearing-impaired pupils participating in government special education institutions in Punjab Province were taken into account for this study's demographic. For this investigation, the sample was chosen using a random sampling procedure. The sample for this study consisted of 500 parents of hearing-impaired students. The researchers produced an indigenous scale. The five-point Likert scale was used to evaluate each statement. For the parents of the students who have hearing impairments, a Pearson product moment correlation analysis was done to look into the relationship between the system, school, classroom, student levels, and outcomes. Structural equation model (SEM) was employed to examine mediating role of educational effectiveness including, school level, classroom level and student level between system level and outcomes for parents of students with hearing impairment.

KEYWORDS Educational Effectiveness, Hearing Impairment, Scale for Educational Effectiveness, Structural Equation Model

Introduction

Medical Children with disabilities must have effective access to education and receive it in a way that fosters as much social integration as possible, according to the section on "The Right of Access to Education" in the UN Convention on the Rights of Persons with Disabilities. This is accomplished by offering supportive services and creating fair accommodations (EFA, 2000). Rehabilitation is medical assistance that can help you regain, maintain, or increase the abilities you need to function in daily life. These skills could be cognitive (thinking and learning), mental, or physical. You might have lost them as a result of an illness, an accident, or a side effect from medication. Your functioning and daily life can be improved through rehabilitation (MedlinePlus, 2020).

The predicament of those who have hearing loss is still seen from the perspective of the beneficiary rather than the beneficiary. Hearing people become their recognized leaders and champions since hearing impaired people are unable to express themselves regularly. Because of this, it is important to carefully address each of the demands of hearing impaired people when designing a rehabilitation program for them. For example, education and training are crucial components of socioeconomic rehabilitation. Both of these are insufficient for people who have hearing impairments (Chauhan, 1999).

Literature Review

To determine the areas of deaf education research that are now being prioritized and any conclusions that could significantly affect the development of educational practice. First, the analysis reveals that it is frequently difficult to directly apply findings to teaching and learning due to a number of methodological and contextual issues in deaf education research (Swanwick and Marschark, 2010). A desire for additional training in hearing technology and efficient teaching methods had been analyzed, citing the significant barriers to accessing hearing aids and hearing aid maintenance (Nelson, 2015).

Deaf children in Cyprus who attend regular schools are provided with a variety of support services, such as one-on-one and group sessions, in-service training for designated teachers, adjustments to the way lessons are taught in the classroom, the presence of co-coordinators (special teachers of the Deaf), psychological support and counselling, acoustical treatment of the classrooms, and the provision and administration of personal amplification. It was suggested that different teaching methods, curriculum modifications, and adaptations be used to meet the needs of deaf children in an integrated context. Many of the deaf children argued that in order to follow the curriculum, they require one-on-one or small group instruction (Hadjikakou, Petridou and Stylianou, 2005). The circumstances already in place at the institution and the nature of its problems have an impact on how school-related elements are seen. There are situational consequences of school-related factors. Particularly, it was shown that the effects of creating a school policy for teaching and assessing that policy at the school level were stronger at schools with poor classroom teacher quality. Additionally, it was shown that due of the stability in that status through time, changes in how schools operate did not have a substantial impact on changes in how effective they were (Creemers and Kyriakides, 2009). It's critical that educators and other professionals recognize that deaf children are not merely hearing youngsters who are hard of hearing. Then educational approaches and materials can fully reflect the interests and needs of the students (Marschark and Knoors, 2012). The Factors Affecting Deaf Education in South Africa were identified by Parkin, (2010). South African Sign Language, Lack of Deaf Role Models for Deaf Learners Deaf education in South Africa is hampered by the lack of recognition as a subject in schools and the limited number of teachers who are proficient in South African Sign Language.

The value of implementing progress monitoring with deaf or hard-of-hearing pupils was seen very favorably by the teachers. They stated that frequent and consistent use of simple to administer and grade tests produced data that was utilized to assess the efficacy of education. They stated that the information was also utilized to inform classroom improvements and discussions about student performance with parents, colleagues, and the pupils themselves (Luckner and Bowen, 2010).

Framework of this study was based and designed through The Dynamic Model of Educational Effectiveness by Bert P. M. Creemers and Leonidas Kyriakides.

Research Hypotheses

- 1: There will be a positive relationship between *parents'* perception of effectiveness of educational services (system, school, classroom and student levels) and learning outcome (cognitive, affective, psycho motor, new learning).
2. School level, classroom level and student level will mediate the relationship between system level and learning outcome of the perceptions for the parents of the students with hearing impairment.
3. School level, classroom level and student level will serially mediate the relationship between system level and learning outcome of the perceptions for the parents of the students with hearing impairment.

Material and Methods

Quantitative research method was used to conduct this study along with descriptive research design.

Population and Sampling Strategy

Parents of hearing-impaired students studying in government special education institutes in Punjab Province made up the study's population. The method of random sampling was utilized to carry out this investigation. 500 parents of students with hearing impairment were chosen as the study's sample.

Development of scale for Parents of the Students with Hearing Impairment

Demographic data was included in the first section of the survey given to the parents of hearing-impaired pupils participating in government special education programs in Punjab province. There were two sections to this demographic data. The parents' demographic data, including their age, gender, marital status, education, income, city, district, and language, is provided in the first section. In the second section, demographic data on the students with hearing impairments was gathered, including information on their age, gender, school, class, language, and degree of disability. The definition of the sample's demographics and characteristics was aided by all of the demographic information. There were 40 statements total on the scale. The five-point Likert scale was used to build each statement on the scale. This scale evaluated the accomplishments of hearing-impaired children enrolled in government-run special education institutions in Punjab province. Researchers noted how hearing-impaired children's parents responded to the five factors listed below.

Agree, Neutral, Disagree, Strongly Disagree, and Agree.

Data Collection from Parents

500 number of parents of hearing-impaired children who were enrolled in government special education institutions in Punjab Province provided information for this study. The Punjab Province's eight divisions were represented in the data collection. These divisions included Bahawalpur, D.G. Khan, Faisalabad, Gujranwala, Lahore, Multan, Rawalpindi, and Sargodha. Fourteen districts, including Bahawalpur, D. G. Khan, Rajan Pur, Faisalabad, T. T. Singh, Gujrat, Hafizabaad, Sialkot, Kasur, Lahore, Khanewal, Multan, Rawalpindi, and Mian Wali, participated in the data collection process from these eight divisions. The information was acquired from colleges, schools, and special education institutions run by the Punjab government. The information was submitted by parents whose hearing-impaired children were enrolled in age from 5 to 25.

Results and Discussion

Table 1

Mean and Standard Deviation of Parental Responses Against all Statements of Scale			
Sr#	Statements	Mean	St.D
System Level			
1.	There are enough institutes for pupils with hearing impairments.	3.37	1.25
2.	National disability policy satisfies the educational requirements of pupils with hearing impairment.	3.60	1.10
3.	The school's structure has been created to meet the needs of kids who have hearing loss.	3.91	.96
4.	You are pleased with how well hearing-impaired pupils are being educated.	3.92	.93

5.	The current educational setting is ideal for the individualized instruction of hearing-impaired children.	3.78	.96
School Level			
6.	There are enough teachers in the school to adequately instruct the deaf children.	3.70	1.09
7.	Your hearing-impaired children are doing well in school.	4.05	.82
8.	Your hearing-impaired children can participate in extracurricular activities.	3.84	.96
9.	Students with hearing loss receive instruction in all subjects at school.	3.96	.90
10.	You are pleased with the standard of instruction at your school.	3.95	.85
11.	You are aware of the objectives of the institution.	3.92	.89
12.	You are routinely updated on the performance of your students.	3.91	.97
13.	For your children who have hearing loss, the environment of educational institutions is accessible.	3.93	.84
14.	The choice-making process involves you.	3.50	1.19
Classroom Level			
15.	Students are assigned homework every day.	4.14	.81
16.	It is beneficial to teach your children who have hearing impairments at school.	4.04	.81
17.	Your kids with hearing loss can participate in extracurricular activities.	3.95	.85
18.	You are pleased with how well the teachers at your hearing-impaired child's school are doing their jobs.	4.10	.76
19.	For your children who have hearing loss, a customized educational plan has been created.	3.74	1.00
20.	You are given education and training to help you be able to offer your children who are deaf-blind meaningful learning opportunities.	3.70	1.04
Student Level			
21.	Your hearing-impaired children joyfully attend school.	4.21	.76
22.	Your youngster with hearing loss has become a diligent worker as a result of these educational programs.	4.03	.89
23.	Your child with hearing loss has a greater sense of discipline as a result of this schooling.	4.06	.84
24.	Your hearing-impaired children receive the greatest amount of educational chances.	3.96	.84
25.	Social economic status is not a factor in any discrimination.	4.01	.84
26.	The gender gap is reduced by this educational system.	3.97	.84
27.	The justification for discrimination based on ethnicity is absent.	4.08	.85
28.	Your hearing impaired youngster can converse effectively while receiving educational assistance.	3.99	.95
29.	Your youngster with hearing loss is now able to live a happy life as a result of this educational method.	3.95	.92
30.	Because of the availability of these educational resources, your child's critical thinking abilities have improved.	3.88	.88
31.	Your child's skills are further improved through schooling.	4.08	.78
Outcome			
32.	Your hearing-impaired child's capacity for problem-solving has improved thanks to educational services.	4.02	.78
33.	Your child's hearing disability has improved with the aid of schooling in terms of social interaction.	4.03	.77
34.	While receiving educational resources, your hearing-impaired youngster has developed into a contributing member of society.	3.97	.85
35.	Students with hearing impairments grow in their ability to learn new things.	4.02	.76

36.	Students with hearing impairments feel proud of themselves thanks to this educational system.	4	.83
37.	Your child with hearing loss can find a fulfilling profession in society thanks to the educational programs offered to pupils with hearing loss.	3.75	1.01
38.	Students with hearing impairments can live happy lives with the aid of this educational method.	4.01	.81
39.	The ability of the pupils with hearing impairment to make decisions has improved because to these educational offerings.	3.96	.85
40.	The moral principles of your hearing-impaired youngster have improved as a result of these educational activities.	4.02	.89

Pearson Product Moment Correlation Analysis

It was hypothesized there will be a positive relationship between the determinants of educational effectiveness including (system, school, classroom, student levels and outcomes) for the parents of the students with hearing impairment. Pearson product moment correlation analysis was carried out to investigate the relationship between system, school, classroom, student levels and outcomes for the parents of the students with hearing impairment.

Table 2
Intercorrelation between System, School, Classroom, Student Levels and Outcomes for the Parents of the Students with Hearing Impairment (N = 500)

Variables	1	2	3	4	5
1. System	-	.74***	.67***	.59***	.57***
2. School		-	.77***	.71***	.63***
3. Classroom			-	.69***	.64***
4. Students				-	.77***
5. Outcome					-

*p<.05. **p<.01, ***p<.001.

The results of correlation analysis shows that system level is found to be significantly positively correlated with school, classroom, student levels and outcome. Whereas school level is also found to be significantly positively associated with classroom level, student level and outcome. However, classroom level is significantly positively correlated with student level and outcome, while student level is significantly positively correlated with outcome for the parents of the students with hearing impairment.

Structural Equation Modeling: Mediation for Parents

Structural equation model (SEM) was employed to examine mediating role of educational effectiveness including, school level, classroom level and student level between system level and outcomes for *parents* of students with hearing impairment. At the same time, the serial indirect effect of school level, classroom level and student level between system level and outcomes for *parents* of students with hearing impairment was also investigated. Model fit is presented in table 3

Table 3
Model fit Indices of Serial Indirect Effect of School Level, Classroom Level and Student Level between System Level and Outcomes for Parents of Students With Hearing Impairment (N = 500).

Model	χ^2	df	χ^2/df	GFI	CFI	NFI	RMSEA	SRMR
Initial Model	342.40	31	11.05	.89	.85	.84	.14	.12
Model Fit	83.23	28	2.97	.96	.96	.95	.07	.06
$\Delta \chi^2$	259.17*							

Note. GFI= Goodness of fit index, CFI=comparative fit index, NNFI = non-normed fit index; RMSEA=root mean square error of approximation, SRMR=Standardized root means square, $\Delta\chi^2$ = chi-square change.

Table 3 displays the fit indices of the Serial indirect effect of school level, classroom level and student level between system level and Outcomes for both absolute and relative model fit. The first model's absolute fit index revealed that the estimations of the fit were subpar, reading as $\chi^2 (28) = 83.23 p < .05$. In a typical model, the sample size and the number of estimated parameters are thought to have a significant impact on the chi-square statistic, which is used to measure the absolute model fit (Hair et al. 2010). Therefore, in this perspective, researchers advised taking into account various relative fit indices, such as the Goodness of Fit Index (GFI), Cumulative Fit Index (CFI), Normative Fit Index (NFI), Root Mean Square Approximation Error (RMSEA), and Standardized Root Mean Square (SRMR). Some guidelines were suggested to be followed in order to assess the model's fit; for instance, the χ^2/df should range between 0 and 3. To be excellent estimates for the model, the RMSEA and SRMR estimates must be .08 or less, while the CFI, NNFI, and GFI estimates must be .90 or higher (Hu & Bentler, 1999).

The fit indices of the initial model were observed and found that the χ^2/df was 11.04. Whereas the estimates of the RMSEA and SRMR were .14 and .12 while the CFI, NNFI, and GFI were .89, .84, .85 respectively. As a result, the specified criteria for model fit were not met by the present estimations of the relative fit. See figure 1.

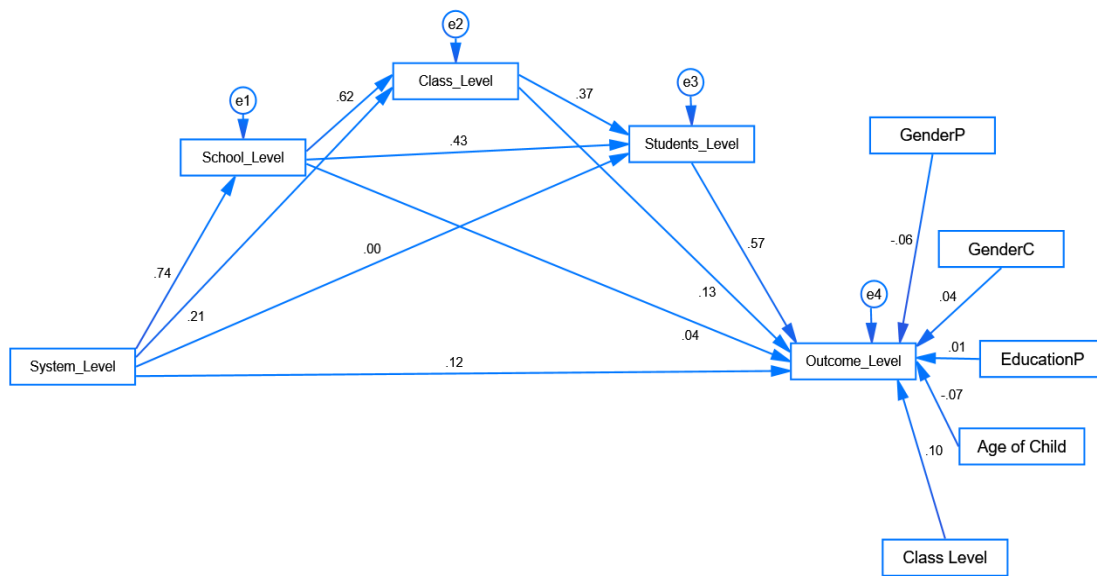


Figure 1

Initial Model of Serial Indirect Effect of School Level, Classroom Level and Student Level between System Level and Outcomes for Parents of Students with Hearing Impairment.

So, the model modification procedure was started in order to achieve the model fit. Therefore, only those covariances between the error terms that had contextual meaning were extracted from the constructs of educational effectiveness (Parents Version) (Kenny, 2011). Following the drawing of the covariances between the error terms, the absolute and relative fit indices were once again compared. The GFI, CFI, and NNFI values were .96, .96, and .95, respectively, while the RMSEA and SRMR were .07 and .06, respectively. As a result, the model fit indices and criteria fell into the category of excellent model fit. See figure 2.

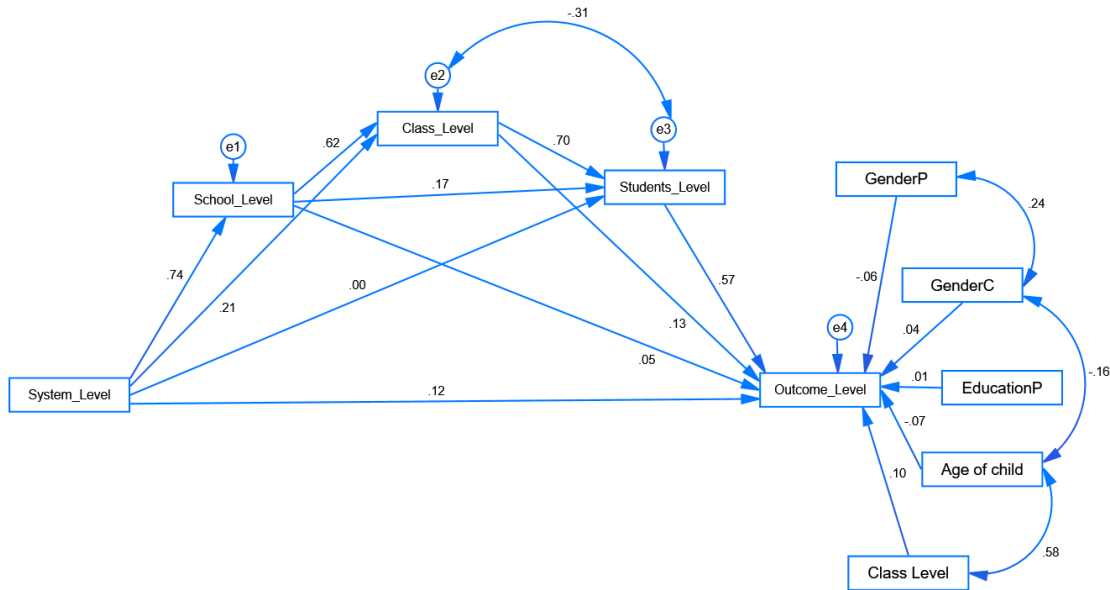


Figure 2 Model Fit of Serial Indirect Effect of School Level, Classroom Level and Student Level between System Level and Outcomes for Parents of Students with Hearing Impairment.

After than with the model fit, the estimates of direct, indirect and serial indirect effects were analyzed. A sample of 5000 bootstrapped sample was generated in order to validate the indirect and serial indirect effects.

Direct Effects

Direct effects of system, school, classroom, student levels on outcomes for parents of students with hearing impairment were presented in table 4.

Table 4
Standardized Estimates of Direct Effects of the Paths for System, School, Classroom, Students and Outcomes for Parents of Students with Hearing Impairment (N = 500).

Variables	School		Classroom		Students		Outcomes	
	β	SE	β	SE	β	SE	β	SE
Predictors	-	-	-	-	-	-	-	-
System	.74***	0.02	.21***	0.04	.06	0.07	.12	0.04
School			.62***	0.04	.39***	0.06	.05	0.06
Classroom					.70***	0.26	.12*	0.06
Students							.57***	0.05
Covariates							-	-
Gender of Child							.04	0.03
Age of Child							-.07*	0.03
Class Level							.11***	0.03
Gender of Parents							-.06	0.03
Parent Education							.01	0.02
<i>Total R²</i>	.557***		.632***		.583***		.637***	

The results of the perceptions of the *Parents* of students with hearing impairment about the education effectiveness shows that system level is found to be significant positive predictor of school level and classroom levels. Whereas system level is found to be non-significant predictor of student level and outcome. Meanwhile school level is also found to

be significant positive predictor of classroom level and student level, while school level is found to be non-significant predictor of outcome. Classroom level is found to be significant positive predictor of student level and outcome. Furthermore, student level is found to be significant positive predictor of outcome of the students.

Specific Indirect Effects

The specific indirect effect of school level, classroom level and student level between system level and outcomes for parents of students with hearing impairment were presented in table 5.

Table 5
Standardized Estimates of Specific Indirect Effects through School, Classroom, and Student between System and Outcome (N = 500).

Mediators	Outcome	
	β	SE
School	.03	.04
Classroom	.03*	.01
Student	.04	.03

* $p < .05$. ** $p < .01$. *** $p < .001$

The results of indirect effect shows that the classroom level is significantly mediated between system level and outcome for students with hearing impairment. Which shows that parents of students with hearing impairment have a positive perception at the system level, while positive perception of system tends to forms positive perception at classroom level. While positive perception of classroom level tends to increase the outcome in terms of performance. Results indicates no significant mediation of school and student levels between system level and outcomes.

Serial Indirect Effects

The serial indirect effect of school level, classroom level and student level between system level and outcomes for parents of students with hearing impairment were presented in table 6 and table 7.

Table 6
Standardized Estimates of Serial Indirect Effects through School, Classroom, and Student between System and Outcome (N = 500).

Mediators	Outcome	
	β	SE
School → Classroom	.06*	0.03
School → Student	.16**	0.04
Classroom → Student	.04*	0.01

* $p < .05$. ** $p < .01$. *** $p < .001$

The results of serial indirect effect shows that the school and classroom levels are significantly serially mediated between system level and outcome for students with hearing impairment. Which shows that parents of students with hearing impairment have a positive perception at the system level, while positive perception of system tends to form positive perception at school level. Whereas positive perception at school level in turns develop positive perception at classroom level, which tends to increase the outcome.

Meanwhile, school and students levels significantly serially mediated between system level and outcome for students with hearing impairment. Which shows that parents

of students with hearing impairment have a positive perception at the system level, while positive perception of system develops positive perception at school level. Whereas positive perception at school level in turns develop positive perception at student level, which tends to increase the outcome.

However, classroom and student levels significantly serially mediated between system level and outcome for students with hearing impairment. Which shows that parents of students with hearing impairment have a positive perception at the system level, while positive perception of system develops positive perception at classroom level. Whereas positive perception at classroom level develops positive perception at student level, which tends to increase the outcome.

Table 7
Standardized Estimates of Higher order Serial Indirect Effects through School, Classroom, and Student between System and Outcome (N = 500).

Mediators	Outcome	
	β	SE
School → Classroom → Student	.08*	0.02

* $p < .05$. ** $p < .01$. *** $p < .001$

The results of serial indirect effect shows that the school, classroom and student levels significantly serially mediated between system level and outcome for students with hearing impairment. Which depicts that parents of students with hearing impairment have a positive perception at the system level, while positive perception at system level tends to form positive perception at school level. Whereas positive perception at school level in turns develop positive perception at classroom level. However positive perception at classroom level also develops positive perception at student level, which tends to increase the outcome.

Conclusions

There was a positive relationship between the determinants of educational effectiveness including (system, school, classroom, student levels and outcomes) for the parents of the students with hearing impairment. School level, classroom level and student level was serially mediate the relationship between system level and learning outcome of the perceptions for the parents of the students with hearing impairment. It has the potential to reuse in the similar kind of field for knowing the mediating role of school, classroom and students levels between system and outcomes for parents of students with hearing impairment.

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