

## **Determining the Effectiveness of (Tpack) Method by Special Education Instructors on Children with Hearing Impairment**

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### **ABSTRACT**

*The terms "deaf" and "hard of hearing" are both included under the umbrella phrase "hearing impairment." Hearing problems that prevent a person from successfully processing linguistic information through audition are referred to as "deafness," and this can occur with or without the use of a hearing aid. Itinerant specialised instructors of deaf and hard of hearing pupils had their duties and obligations as educators of those students' scrutinised. It would indicate that determining the effectiveness of the programme through an analysis of the perspectives held by instructors in regard to inclusive education is a viable way. Despite the fact that this topic has been thoroughly investigated in a great number of nations, the evidence that is now available is inconsistent. guideline to help policy makers, programme designers, and school administrators better understand and accommodate the requirements of special education teachers (those with hearing impairments). It may be advantageous to rethink, revamp, and enhance the professional development in order to combine the knowledge bases of technology, pedagogy, and content together as one.*

**KEYWORDS:** *Hearing Impairment , technology, pedagogy, children*

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### **I. INTRODUCTION**

One day, everyone will have access to quality education. Each and every contemporary nation in the globe is working tirelessly toward the realisation of this ambition. In our nation, efforts are being made to integrate children who have special requirements into the educational system on a more equal footing with their typically developing peers. These youngsters with exceptional needs are now beginning to participate in normal school, which was previously unavailable to them. From the international level down to the national level, then down to the state level, and finally down to the school level, the transmission of fresh concepts, cutting-edge technologies, and expansive philosophies takes place. One of these highly helpful initiatives in our nation is the implementation of the Sarva Shiksha Abhiyan, which provides an inclusive education for children with special needs.

There has been a significant shift over the past two to three decades in the placement of students with special educational needs in mainstream schools rather than in separate special schools and special classes in the majority of developed nations. This shift has occurred in response to the recognition that students with special educational needs benefit from being educated alongside their peers. This action has been referred to in a number of different ways, including integration, mainstreaming, and most recently, inclusion. The term "inclusion" refers to the process through which children with disabilities are integrated into general education classrooms, where they are provided with a relevant curriculum, the appropriate assistance, and instruction that makes use of successful instructional practises (Smith 2014). Students who have disabilities and special needs should have the same access as all other students to a regular school environment as well as to a curriculum that is broad, balanced, and relevant, according to the fundamental premise of the integration and inclusion movement. This is based on the idea that it is imperative that students with disabilities and special needs should enjoy the same access as all other students to a regular school environment.

In the modern environment, inclusive education for hearing-impaired students is a concept that has gained acceptance and is utilised often all over the world. Furthermore, it has received legal support through a number of international treaties. As a consequence of this, several developed and developing nations all over the world supported the inclusive system of education for hearing impaired students in mainstream schools via the establishment of legal framework and regulations. "considered to be ethically acceptable, psycho-socially sound, pedagogically respectable, and cost effective as compared to segregated education" (UNESCO, 1994). This refers to the fact that inclusive education for hearing impaired students is more cost effective. Teachers are one of the most critical components that determine the effective implementation of any inclusive policy, and they play a significant role in this achievement.

Inclusion would imply that students who have hearing impairments, in particular, would get the same type of education as their hearing counterparts inside the same educational system. The principles of

normalisation provide the conceptual foundation for a significant portion of the reasoning for inclusion. Education for individuals with disabilities should strive to be as typical in both its methods and its outcomes as is humanly feasible, according to the principle of normalisation. Full inclusion refers to the process of simply integrating the child into the regular educational setting. This signifies that the kid will be a legitimate participant in the standard educational system and will complete all of his or her coursework inside a typical classroom setting (Moore, 2015).

### **Concept of Hearing Impairment**

Hearing impairment is the educational term for individuals who are deaf or hard of hearing to the extent that they require social services to achieve optimally in the school environment. A disorder of hearing is defined as any significant deviation from the behaviour of the average normal ear. Brill, McNeil and Newman (2014) defined hearing impairment, deafness and hard of hearing. According to them, hearing impairment is a generic term indicating severity from mild to profound. The term "Hearing Impairment" includes the subsets of deaf and hard of hearing. The term "deafness" refers to hearing disabilities that preclude successful processing of linguistic information through audition, with or without a hearing aid. The term "hard of hearing" refers to impairment in hearing that does not entirely prevent practical communication by speech. Thus the person with hard of hearing, generally by use of hearing aid and by his residual hearing is enabled to process linguistic information successfully through audition.

### **Characteristics of Hearing Impairment**

McCall (1981) describes the characteristics of hearing impairment as follows:

1. Hearing loss provides diminished opportunities for conversation and the embarrassment of misunderstandings.
2. Hearing impaired child misses the tone of voice when conveyed so much.
3. Hearing impaired child suffers the humiliation of being thought stupid.
4. Participation in discussion, groups, meetings, conferences and lectures becomes impossible or difficult for hearing impaired child.
5. Hearing impaired child is not able to appreciate verbal art or repartee.
6. Fatigue is caused by constant alertness-concentration needed is very demanding for hearing impaired child to maintain communication.

### **Attitude of Teachers towards the Inclusion of Hearing Impairment Children**

The process of making it possible for all children to study and participate actively within standard educational settings is referred to as inclusive education. Children with varying aptitudes and requirements are not separated from one another in any way. To put it another way, it is to signal a change in mentality away from an artificially separated environment and toward the support of inclusive schools. The progress made toward inclusive education in Iran is predicated on the idea that educators are prepared to admit students with special needs into normal classrooms and accept responsibility for satisfying those students' individual requirements. On the other hand, the majority of the studies done on attitudes found that school instructors can have a range of attitudes, including positive, negative, neutral, or both positive and negative views.

According to findings of recent study, the attitudes of instructors working in mainstream schools regarding inclusion are complicated. The majority of the research that has been reviewed here and discussed has found that educators have favourable attitudes toward or perspectives on inclusive education. In order to determine the attitudes held by teachers in Malaysia, Ali, Mustapha, and Jelas administered a self-rated questionnaire to the teachers there. The researchers came to the conclusion that instructors, on the whole, had favourable opinions about inclusive education and were in agreement that inclusive education encourages more social contact while simultaneously reducing negative perceptions of students who have special educational needs. The authors suggested that in order to successfully implement inclusive education, instructors from both mainstream and special education settings need to work together.

## **II. OBJECTIVES OF THE STUDY**

1. To study on Characteristics of Hearing Impairment
2. To study on Concept of Hearing Impairment

## **III. RESEARCH METHODOLOGY**

In this study, a quantitative survey technique was taken to explore the TPACK of primary special education instructors who worked with students who had hearing impairments. Cronbach Alpha testing's reliability rating was used to demonstrate how well the things fit their intended purpose. Good internal reliability was achieved as a result of the administration of this survey on the participants in this study, as indicated by the

following high Cronbach alpha values: CK ( = 0.91), PK ( = 0.92), PCK ( = 0.95), TK ( = 0.93), TCK ( = 0.91), TPK ( = 0.93), and TPACK ( = 0.93). Overall, the Cronbach alpha comes in at 0.97. According to Pallant (2013), the figures presented above represent. 7 is deemed acceptable, however numbers higher than.8 are preferred.

#### IV. DATA ANALYSIS

The elementary special education teachers who work with students who have hearing impairments assessed themselves as being above average in all aspects of TPACK that do not include the use of technology. They had a high level of confidence in their CK (M = 5.84, SD =.93), PK (5.31, SD =.77), and PCK (M = 5.38, SD =.79), but they had a lower level of confidence in technology. The instructors ranked their technical knowledge (TK, TCK, TPK, and TPACK) as being lower than their content knowledge (CK), pedagogical content knowledge (PCK), and procedural content knowledge. Their scores for components TK (mean = 5.08, standard deviation = 0.9), on the other hand, were only very near to a rating of five on a scale of seven. In the meanwhile, the TCK score was 4.88 with a standard deviation of 0.82, the TPK score was 4.94 with a standard deviation of 0.83, and the TPACK score was 4.71 with a standard deviation of 0.83. The TPACK score was the lowest of the seven components. Table 1 provides some descriptive information regarding the TPACK perspectives of various teachers.

**Table 1 - Perspectives of TPACK among elementary special education instructors for students with hearing impairments**

Component	Numbers of item	Mean	SD
CK	6	5.36	.81
PK	8	5.31	.77
PCK	8	5.38	.79
TK	8	5.08	.90
TCK	6	4.88	.82
TPK	7	4.94	.83
TPACK	7	4.71	.83

Independent samples Following that, t-tests were carried out in order to compare the mean scores of male and female educators with respect to the TPACK constructs (see Table 2). Only the constructs TCK (M = 5.15, SD =.70) and TPK (M =5.18, SD =.74) showed evidence of gender differences that were statistically significant in the study's findings. When it came to these constructs with intermediate effect sizes, male instructors had a higher opinion of themselves than female teachers did.

**Table 2 - The t-test examination of the TPACK of special education instructors who work with students who have hearing impairments by gender**

Component	Male		Female		t	p (2-tailed)	Cohen's d
	M	SD	M	SD			
<b>CK</b>	5.45	.76	5.30	.84	.849	.398	.18
<b>PK</b>	5.33	.75	5.30	.78	.198	.844	.04
<b>PCK</b>	5.35	.68	5.40	.85	-.286	.776	-.06
<b>TK</b>	5.29	.78	4.95	.94	1.730	.087	.37
<b>TCK</b>	5.15	.70	4.73	.85	2.337	<b>.022*</b>	<b>.50</b>
<b>TPK</b>	5.18	.74	4.80	.86	2.110	<b>.038*</b>	<b>.46</b>
<b>TPACK</b>	4.93	.80	4.58	.84	1.884	.063	.41

Note. \*p < .05

An analysis of variance (ANOVA) was carried out to investigate the major variations in TPACK exhibited by educators on the basis of their years in the classroom (see Table 3). Analyses showed that the levels of content knowledge (CK), pedagogical content knowledge (PK), professional content knowledge (PCK), technological content knowledge (TK), and pedagogical content knowledge (TPACK) that elementary school teachers with varying amounts of teaching experience possessed were significantly different from one another. Further investigation using a battery of Scheffé tests (post hoc tests) led the researchers to the conclusion that teachers with more years of teaching experience had significantly higher CK, PK, and PCK than teachers with fewer years of teaching experience. This was determined by comparing the results of the two groups.

**Table 3 - Means, standard deviations, and analyses of variance on TPACK based on years of teaching experience**

Component	≤ 3 (n = 15)		4 – 8 (n = 41)		9 – 16 (n = 16)		≥ 17 (n = 16)		F
	M	SD	M	SD	M	SD	M	SD	
<b>CK</b>	4.58	1.02	5.39	0.58	5.60	0.86	5.76	0.58	8.045***
<b>PK</b>	4.71	0.90	5.24	0.62	5.65	0.82	5.72	0.52	6.919***
<b>PCK</b>	4.57	0.90	5.38	0.63	5.77	0.73	5.77	0.55	10.518***
<b>TK</b>	5.25	0.85	5.31	0.81	4.84	0.83	4.55	1.00	3.709*
<b>TCK</b>	4.53	0.81	5.03	0.81	4.99	0.86	4.72	0.74	1.713
<b>TPK</b>	4.47	0.85	5.15	0.79	4.98	0.86	4.79	0.76	2.804*
<b>TPACK</b>	4.10	0.91	4.85	0.85	4.97	0.71	4.66	0.61	3.874*

Note. \*p < .05

An analysis of variance (ANOVA) was carried out to investigate the major variations in TPACK exhibited by educators on the basis of their years in the classroom.

## V. DISCUSSION

According to the descriptive data, elementary special education instructors who worked with students who had hearing impairments reported feeling a high level of confidence in terms of content, pedagogy, and pedagogical subject understanding (CK, PK, and PCK). On the other hand, the teachers lacked self-assurance when it comes to using technology. When content or pedagogy was integrated with technology, students' mean scores plummeted to a level lower than 5.00. Their special problems to be in the field of technology-driven education were shown by the lower mean scores of technology-related TPACK components (TPK, TCK, and TPACK). There is a possibility that the majority of special education instructors (81.8%), namely those working with students who have hearing impairments, did not integrate ICT into their lessons very frequently (less than three times per week).

According to a previous study (Ucar et al., 2014), TPACK abilities would also rise with increased usage of information and communication technologies (ICT). Therefore, it would appear that the instructors in classrooms with hearing challenged students require support that might aid them in effectively integrating technology with the material and pedagogical skills that they already possess. These findings were comparable to those found by Koh et al. (2014) for in-service teachers in Singapore, by Jang and Tsai (2014) for in-service secondary school science teachers, and by Archambault and Crippen (2018) for K-12 online instructors. However, these findings are in contrast to those of Jordan (2015) and Koseoglu (2015), who came to the conclusion that instructors exhibited the highest degree of trust in every aspect of the TPACK framework. It's possible that the differing findings are the result of differences in the unique circumstances of the scenario, such as the setting of the schools, the attitudes of the instructors about ICT, or the policies of the government regarding ICT. Doering et al. (2017) state that the knowledge that instructors have is greatly influenced by the setting in which it was acquired. It is contingent on a wide range of circumstances, such as the policies of the school and district, the particular culture of the classroom, the characteristics of the students, as well as a number of other aspects that cannot be foreseen nor accounted for in advance. The culture of the school, such as the school's willingness to change and the presence of an ICT school policy plan, are also positively associated to the usage and acceptance of ICT in view of fundamental ICT skills.

This is the case even when basic ICT skills are already present (Tondeur et al., 2016). In terms of teaching experience, primary special education (hearing impairment) teachers who had more years of teaching experience evaluated their students' CK, PK, and PCK much higher than those teachers who had fewer years of teaching experience. Jang and Chai (2013) revealed outcomes that were comparable in investigations that they conducted with samples of science instructors in Taiwan. In terms of correlation, a positively significant association had been observed between the CK, PK, and PCK of special education instructors who worked with students who had hearing impairments and the teachers' ages as well as the amount of teaching experience they had. On the other hand, there was a strong and inverse correlation between instructors' age and the number of years they had been teaching and their level of technological knowledge (TK). It was discovered that instructors with more years of experience and who were older had greater levels in their CK, PK, and PCK but had lower levels in their TK.

## VI. CONCLUSION

In general, men instructors had a higher opinion of themselves than female teachers did for technology-related constructs. There was a substantial and inverse correlation found between the instructors' age and the number of years they had been teaching and their levels of subject knowledge (TK). The findings may give a very important guideline to policy makers, programme designers, and school administrators, assisting them in

better understanding and meeting the requirements of special education teachers (those who have hearing impairments). It may be advantageous to rethink, revamp, and enhance the professional development in order to combine the knowledge bases of technology, pedagogy, and content together as one. In addition to these findings, we suggest that future teacher professional development programmes aim to: (1) understand that integrating ICT is not simply a matter of acquiring ICT skills, but rather in terms of specific pedagogical and instructional dimensions; (2) pay attention in their instructional design about that technologies, content, and pedagogy are not in isolation, but rather in the complex relationships system as they define; and (3) foster experienced teachers' integrated knowledge and skills with ICT. Due to the fact that this research was only conducted with 40 elementary special education teachers (those who work with students who have hearing impairments) in three different states in India, the findings cannot be generalised to the similar characteristics of instructors in other states. Therefore, the researchers suggest that future research could be replicated and expanded to cover the entirety of India, in addition to incorporating additional methods such as in-depth interviews and observations, in order to provide a picture that is both comprehensive and complementary of the findings through data triangulation.

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