DEVELOPMENT OF "INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) KNOWLEDGE SCALE "OF CORPORATION HIGHER SECONDARY SCHOOL TEACHERS

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Abstract

ICT means Information and Communication Technologies are fast and support communication easily with many people worldwide. ICT provides many platforms for teaching and learning in the modern education system. ICT helps teachers to teach effectively and students to learn interestingly. The major types of ICT are Computing and Information Technology, Broadcasting, Telecommunication, and the Internet. The Information and Communication Technology (ICT) Knowledge Scale has been constructed and standardized in the present study for Corporation Higher Secondary School Teachers. This scale consists of 50 statements. The simple random technique was used for the current investigation. The sample consists of 100 Corporation Higher Secondary School Teachers randomly selected from Chennai District. The Cronbach's Alpha technique was used to regulate the tool and finally, out of 50 statements, 42 statements were retained in the final study.

Keywords: ICT Knowledge, Higher secondary school teachers, Statements, Teaching and Learning Process, Corporation.

1. Introduction:

Teaching is a systematic process, which includes planning, implementing, and evaluation. Teaching and learning are continuous processes in the education system. Teacher plays a crucial role in the teaching and learning process. In this modern world, technology and teachers are mutually important in the teaching and learning process. Education plays a significant role in human life. Some of them are Self-dependent life, balanced life, Economic growth, Willpower, Skills, Techniques, etc.

Some of the basic resources needed for using ICT in Educational Institutions are:

- ➢ Computer and Internet
- ➢ Technology devices like Smartboard, Projector, etc.
- ➢ Digitalized resources
- ➢ Technological Classroom
- ➢ Technical Skilled Person

Some of the basic skills have to know for using ICT in the teaching and learning process are:

1. Technological Knowledge
2. Online Research
3. Social Media Management
4. Netiquette
5. Data Management
6. Word Processing
7. Organization

2. Need of the study:

There is a technological gap between modern society and the teaching methodology in school education. In our society, technology gives enormous changes in all fields and so the adoption of technological teaching methods is mandatory in this modern world. In the ancient period, knowledge was imparted by the teacher in the classroom, a teacher acted as a centric model of the classroom and it created boredom and no interest to the learners. Every day teachers receive new ideas and information in their day-to-day life in the modern world. Teachers face a number of challenges in their daily classroom teaching and so teachers enhance the quality of teaching through technology. Thus the investigator felt that there is a need to study some aspects of ICT knowledge towards teaching among Corporation Higher Secondary School Teachers in the Corporation Schools situated in the Chennai district.

3. Operational definitions:

The Operational Definitions of the variables are as follows:

3.1. ICT Knowledge

ICT is a communication device that includes audio, video, audio with video hardware and software systems, and so on. It also provides the various services and applications associated with them, such as audio and video meetings, video conferencing, and learning through networking with e-resources, etc. ICT should be integrated with education in this modern world. Therefore, the implementation of ICT knowledge in teaching will make an effective teaching and learning process in school education.

3.2. Higher Secondary School Teachers:

The Corporation's Higher Secondary School Teachers handle class 11 and class 12 in the Chennai district. This study includes all the subject teachers of class 11 and class 12.

4. Review of Related Literature:

Indian Studies:

Ajay Kumar Singh & Mukesh Kumar Meena(2022) investigated on Challenges of virtual classroom during COVID-19 pandemic: An empirical analysis of Indian higher education. Higher education institutions (HEIs) usually work open throughout the academic session. In the COVID-19 pandemic time, all the HEIs were also closed temporarily. The study examined the major challenges faced by the teachers and students from the virtual classroom during the nationwide lockdown. Due to the nationwide lockdown and lack of funding, convenience sampling and snowball sampling techniques were used for data collection. A total of 893 responses were analyzed for this study. Data was collected through a structured questionnaire on a Likert scale from 305 teachers and 588 students of higher education institutes from the entire India. Network connectivity was the major challenge faced by the faculty members (mean value of 3.68) followed by 3.17 mean value for lack of professional environment at home, 3.03 for lack of teaching material at home, 2.92 for lack of personal computer/laptop. Lack of professional environment at home (mean value of 3.59) was the major challenge faced by the students followed by 3.57 for lack of teaching material at home, 3.35 for network connectivity, 3.31 for lack of personal computer/laptop. Virtual classrooms have challenges such as poor internet connectivity, non-availability of appropriate electronic devices, lack of a teaching environment at home, less information and communication technology (ICT) knowledge among students and teachers. It implied less engagement of students and teachers in the teaching and learning process.

Amutha S (2016) investigated on Information and Communication Technology Awareness among Teacher Educators. Information and Communication Technology (ICT) has influenced all aspects of life. Processing the knowledge of ICT is really the need of the hour. This paper describes the ICT awareness among teacher educators. The framework raises important questions of how teachers use technological devices in their teaching learning process in order to understand the concept in a better way. It also emphasizes teachers to integrate technology into the instruction in the 21st century. The aim of the present study is to appraise the awareness among teacher educators in Tiruchirappalli district in India. The sample of the present study consists of 42 teacher educators. Descriptive analysis were used to analyze the data. The results indicate that Indian teacher educators awareness towards ICT differs regarding gender and subject. When compared with M.Ed. and M.Phil. scholars, Ph.D. scholars surpassed the M.Ed. and M.Phil. scholars in terms of ICT awareness in different dimensions. Indeed in India teacher educators' awareness on ICT integration needs to be strengthened.

Foreign Studies

Jose Maria Fernandez-Batanero and et.al.(2022) investigated on Are primary education teachers trained for the use of the technology with disabled students?. Incorporating information and communication technology (ICT) in inclusive classrooms requires competent teachers, both technological and pedagogical. To contrast these theoretical assumptions, this study aims to identify the level of training and technical knowledge of primary school teachers in Spain regarding the use of ICTs for supporting students with special needs. The research methodology used was a mixed research design (quantitative and qualitative method), analysing 777 questionnaires supplied to primary school teachers and 723 interviews conducted with key informants (members of management teams, ICT coordinators, directors and technological advisors of teacher training centres). The results informed teachers' knowledge about ICT and disability and barriers or obstacles to their training. Among the conclusions, teachers' inadequate training regarding ICTs for students with special needs stands out and the lack of training experiences in this field.

Mwema M. Warioba and et.al.(2022) investigated on Adoption of ICT as a pedagogical tool in community secondary schools in Tanzania: Possibilities and Constraints. The paper explores possibilities and constraints for adopting Information Communication Technology (ICT) as a pedagogical tool among teachers and students in community secondary schools (CSSs). The study used five CSSs located in rural peripheral in Serengeti District. Simple random and purposive sampling procedures were used to select a sample of 210 respondents including 180 students and 30 teachers. Data were primarily collected through standardized questionnaire and structured interview. The results revealed several possibilities for ICT adoption in some of CSSs namely, presence of electricity; presence of ICT devices; presence of technical support and positive attitude toward ICT use. Furthermore, the results showed several constraints for ICT adoption including insufficient of ICT devices: lack of technical support and lack of ICT skills and knowledge. The study findings suggest that teachers and students have positive attitudes towards the technology use. They are passionate and ready to use ICTs in teaching and learning because since other schools have possible determinants for ICT adoption likes electricity power and few ICT gadgets. The recommends the government to invest adequately in CSSs residing in rural areas to reduce the digital divides between schools and/or teachers and students in the use of ICT as a pedagogical tool.

Melchor Gomez-Garcia and et.al. (2020) investigated on the training and use of ICT in teaching perceptions of melilla's (spain) mathematics teachers. Currently, information and communication technology (ICT) has acquired an important role in education. The incorporation of ICT by mathematics teachers has been a challenge as it requires an improvement in their knowledge of the use of new technologies. We aimed to examine the most relevant items of the indicators related to teaching mathematics and ICT, to estimate the relationships between teachers individually and by clusters, and to analyze the incidence of age variables, teaching experience, and gender in this study. A total of 73 high school teachers were included in this cross-sectional study. A validated questionnaire was used to assess mathematics and teaching practice, use,

resources, and domain of ICT. Principal component analysis (PCA) was applied to determine the associations among variables of the present study. The application of ICT to teaching was associated with the use of ICT resources in the classroom and indicated that teachers made more choice in selecting a variety of software than electing different hardware devices. Teachers combined technology with educational platforms to improve student learning in mathematics. The general perception of mathematics teachers about their digital competence does not match with models employed in the classroom. Gender was not an influencing factor.

5. Pilot Study:

The Information and Communication Technology (ICT) Knowledge Scale of 50 statements intended for the pilot study was administered to the sample of 100 Corporation Higher Secondary School Teachers working in the Chennai district. Then their responses were scored carefully and the marks secured by all the Corporation Higher Secondary School Teachers were arranged in descending order from the highest score to the lowest score. Then they were subjected to the statement analysis.

6. Construction of ICT Knowledge Scale:

The investigator constructed the ICT Knowledge Scale for Corporation Higher Secondary School Teachers. The scale used for the pilot study consists of 50 statements. All the 50 items were with five-point scales, such as Strongly Agree, Agree, Uncertain, Disagree, and Strongly Disagree. The statement of the scale consists of factors related to Classroom Environment, Effective Teaching, Attitude thoughts, Economic Impact, and Creative Thinking. The tool was validated with the help of 100 Corporation Higher Secondary School Teachers. Each statement has been scored as 5 for strongly agree, 4 for agree, 3 for uncertain, 2 for disagree, and 1 for strongly disagree for all the positive statements only. There are 15 negative statements in the ICT knowledge scale which are 6,9,12,16,25,30,34,36,37,41,42,43,44,45,49 and these were scored reversely. The total scores secured from the sample were calculated by using Cronbach's Alpha method to identify the reliability of the tool. The statement which has a value greater than 0.3 was selected for the final study.

Thus, out of 50 statements, 42 statements were selected for the final study. The final studies of the ICT Knowledge Scale of Corporation Higher Secondary School Teachers of the pilot study show the selected statements by using Cronbach's Alpha are given in Table 1.

Table 1. Statement Analysis for ICT Knowledge Scale of Corporation Higher Secondary School Teachers and selection of statements for final study

Statement Number	Item Total Cronbach's Alpha Correlation	Selected / Not selected
1	0.552	Selected
2	0.582	Selected
3	0.518	Selected
4	0.091	Not selected
5	0.137	Not selected
6	0.509	Selected
7	0.425	Selected
8	0.338	Selected
9	0.239	Not selected
10	0.466	Selected
11	0.391	Selected
12	0.254	Not selected
13	0.375	Selected
14	0.312	Selected
15	0.457	Selected
16	0.206	Not selected
17	0.491	Selected
18	0.585	Selected
19	0.462	Selected
20	0.457	Selected
21	0.176	Not selected
22	0.439	Selected
23	0.418	Selected
24	0.323	Selected
25	0.484	Selected
26	0.459	Selected
27	0.448	Selected
28	0.262	Not selected
29	0.496	Selected
30	0.377	Selected
31	0.444	Selected
32	0.508	Selected
33	0.401	Selected
34	0.255	Not selected
35	0.396	Selected
36	0.458	Selected
37	0.418	Selected
38	0.381	Selected
39	0.451	Selected
40	0.519	Selected
41	0.401	Selected
42	0.409	Selected
43	0.387	Selected
44	0.323	Selected
45	0.410	Selected
46	0.397	Selected
47	0.399	Selected
48	0.435	Selected
49	0.467	Selected
50	0.512	Selected

6.1. Description of the ICT Knowledge Scale:

The ICT Knowledge Scale was constructed and validated by the investigator. The investigator constructed this tool on the basis of the literature review with regard to ICT Knowledge of the Corporation Higher Secondary School Teachers and its dimensions are Classroom Environment, Effective Teaching, Attitude thoughts, Economic Impact and Creative Thinking. Totally 42 statements were finalized on the basis of the dimensions of ICT Knowledge.

6.2. Dimensions of ICT Knowledge Scale:

ICT Knowledge Scale for Corporation Higher Secondary School teachers consists of five dimensions namely, Classroom Environment, Effective Teaching, Attitude thoughts, Economic Impact, and Creative Thinking. Initially, 50 statements were arranged according to the dimensions such as Classroom Environment has 12 statements, Effective Teaching has 13 statements, Attitude thought has 15 statements, Economic Impact has 5 statements and Creative Thinking has 5 statements. After the pilot study, 42 statements were finalized on the basis of the dimensions of ICT Knowledge as shown in Table 2.

Table 2: Dimensions wise distribution of selected items in ICT Knowledge Scale of Corporation Higher Secondary School Teachers

S.No	Dimensions	Questionnaires	Total
1	Classroom Environment	1,2,3,6,7,8,10,11	8
2	Effective Teaching	13,14,15,17,18,19,20,22,23,24,25	11
3	Attitude Thoughts	26,27,29,30,31,32,33,35-40	13
4	Economic Impact	41,42,43,44,45	5
5	Creative Thinking	46,47,48,49,50	5
Total No. of Statements			**42**

6.3. Scoring Procedure:

The tool consists of 42 statements that reflect the ICT Knowledge of the Corporation's Higher Secondary School Teachers. The respondents were asked to put a tick ✓ mark against each statement under one of the five responses such as Strongly Agree, Agree, Uncertain, Disagree, and Strongly Disagree. Each statement has been scored as 5 for strongly agree, 4 for agree, 3 for uncertain, 2 for disagree, and 1 for strongly disagree for all the positive statements only. There are 11 negative statements in the ICT knowledge scale [6, 25,30, 36,37,41,42,43,44,45,49] and these were scored reversely. The ICT Knowledge of Corporation higher secondary school teacher's score of the subject gives the sum total of statement scores of all 5 dimensions. As a result, the range of scores is high from 1 to 210, showing the higher score of ICT Knowledge of corporation higher secondary school teachers.

7. Reliability:

A reliability coefficient measures the accuracy of a test or measuring instrument obtained by measuring the same individuals twice and computing the correlation of the two sets of measures by Cronbach's alpha method. Therefore, the reliability value is 0.892.

8. Validity:

Validity was established by circulating the roughly drafted ICT Knowledge Scale and carrying out all the suggestions specified by the professors in the Department of Education.

9. Conclusion:

The investigator is hopeful that this scale would be helpful in measuring the level of ICT Knowledge of Corporation higher secondary school teachers. Hence, the constructed ICT Knowledge tool will be very useful for the investigator to measure the extent level of ICT Knowledge of Corporation higher secondary school teachers in their future teaching profession.

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