Techno-Stress Scale of Teacher Educators: Construction of the Tool

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Abstract: The primary purpose of the research is to develop and standardize the scale of technostress of Teacher Educator. The researcher had developed the draft statements to measure teacher educators' technostress based on the psychological experts' interaction and some theoretical inputs. Thirty-six items have been constructed as a preliminary draft of the tool. The study sample was collected randomly from the 150 teacher educators of Kasaragod and Kannur Districts of Kerala. The item analysis was done through the 'Cronbach's Alpha if Item Deleted' strategies through SPSS 22 Version. After finalizing the item analysis strategies the investigator prepared the final draft of the tool consists of thirty-two items in a five-point scale. The Cronbach Alpha and split-half reliability analysis strategies were used to verify the consistency of the instrument. This tool would be very much useful to measure the technological stress of teacher educators. This paper explains the procedure of technostress scale construction and standardization.

Keywords: Techno-Stress, Teacher Educators, Scale, Reliability and Validity.

I. INTRODUCTION

Advanced information technology integration in people's work, learning, daily life, and play has become the driving force in the 21st century. (Clark & Kalin, 1996). Accepting and adapting to technology is not a simple process. Each individual is having their feeling about the adaptiveness of technology integration into their life and education. Some people hesitate to use technological tools for their daily lives and their learning process. It leads to some stress to the people while adopting advanced technology. Technostress is nothing but negative attitudes towards computers and newly introduced technologies. Many researchers highlighted the technostress terminology differently, such as technophobia, cyber stress, computer anxiety, internet stress, and computer aversion. Particularly, the teachers' fraternity has to integrate much of the technological tools and devices in the competitive academic field to their academic survival. All the teachers may not be competent to utilize the technical tools for their teaching and learning process. If they are not aware of the ICT tools or cannot use the ICT tool, it makes stress to the teachers while using ICT tools (Hsiao, 2017). The impact of technology on one's life is crossing the barriers within no time. The stress provided by the usage of these technological devices affects multiple spheres of a person. Technology is dominating our education sphere. In academic or personal life, technology's effect has an immense role (Jena, & Mahanti, 2014). Particularly in the classroom, the teacher may face many difficulties while using the new technological tool or devices. It leads to stress to the teacher's community because some teachers have an inferiority complex towards their technological skills compared to their students' skills (Thiyagu, 2010). Most of the teachers are digital immigrants; they could not use technological tools or devices in the classroom in a proper manner. These are the issues that create stress for the teacher's community. Therefore, the investigator attempts to construct and standardize the rating scale of the technostress of teacher educators to measure teacher educators' stress while using technological tools or devices in their classroom.

II. OBJECTIVES

According to Tacy (2016), Techno-Stress is a modern sickness of creating stress while using technological tools. The stress may arise due to the incapability to manage modern advanced ICT tools healthily and ethically. This disease influences the teachers in the professional carriers, even in their personal life. Therefore, the investigator to fix the study's main objectives is to construct and standardize the rating scale of technostress of teacher educators to measure teacher educators' stress while using technological tools or devices in their classroom.

III. CONSTRUCTION OF THE INSTRUMENT

After a thorough and careful study of books, articles, e-journals, magazines, research publications, and newspapers report related to Technostress, the investigator prepared several items covering the tools' content, namely, "Technostress scale." The investigator prepared 36 items for rating the Technostress. The articles were edited and carefully worded with instructions that briefly indicate the nature and purpose of the tool. The final manuscript of the preliminary draft was given to education department professors and the guide. Ambiguous and overlapping items were modified based on their suggestions. After the necessary modifications, the preliminary draft was printed. As part of the tool construction and standardization procedure, the investigator was conducted the pilot study to determine the tool's quality. 150 Teacher Educators we3re involved in the pilot study in a random sampling technique from Kasaragod and Kannur districts of Kerala. Investigator disseminated the device through Google Form and the hard copy to respondents and systematically collected the data. The average duration of completed or filled the tools was 20.

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IV.   ITEM ANALYSIS PROCEDURE

The draft 36 items were collected from 150 subjects of the sample and computed the internal consistency reliability of Cronbach alpha value. Internal consistency is a reliability measurement technique to measure the internal relationship between each item of the scales. The following formula can compute Cronbach's value.

$$\alpha = \left(\frac{k}{k-1}\right)\left(1 - \frac{\sum_{i=1}^{k}\sigma_{yi}^2}{\sigma_x^2}\right)$$

Where:

- k = Total Numbers of Scale Items;
- σ_{yi}^2 = Variance related to item i &
- σ_x^2 = Variance associated with the observed total scores

Table – I

Before the item analysis – Alpha Value

Alpha Value	Cronbach's Alpha Based on Standardized Items	Number of Statements
0.942	0.953	36

From the table, the investigator interpreted that a high level of internal consistency happened among the items of scale based on the alpha value 0.942 before the item analysis.

Table - II

Item Analysis

No	Statements	Mean if Item Deleted	Corrected item-total correlation	Cronbach Alpha if item Deleted
S1	I am much dependent on the internet in my educational process.	96.08	.479	.941
S2	I feel fatigued at the end of the work day from using ICTs.	95.69	.606	.940
S3	I feel irritated to working in all days with ICT tools.	95.58	.739	.938
S4	I feel fear because digital tools were more common in the teaching and learning process.	95.77	.547	.940
S5*	Over usage of digital tools and devices in the educational environment makes me laziness in my academic work	95.77	.389	.951
S6	I am anxious that over integration of digital tools may reduce the students research aptitude.	95.92	.453	.941
S7	Use of ICT tool makes teaching more complicated.	96.96	.546	.940
S8	Academic profession is losing their values, because technology integration promotes the machinery	96.23	.690	.939

No	Statements	Mean if Item Deleted	Corrected item-total correlation	Cronbach Alpha if item Deleted
	feeling.			
S9	I am fearing about my future because of unemployment in the future due to the over dependency of ICT tools.	96.73	.400	.941
S10*	I lose my confidence in the my teaching because my co-teachers used the technology well compare to me.	96.35	.047	.953
S11	I feel isolated when I work with the technological devices	96.50	.685	.939
S12	I am very much fear about the virus and threats infection of my personal computer.	95.54	.622	.940
S13	I am having the fear about the personal privacy in the digital world.	96.00	.634	.940
S14	I am uncomfortable to utilizing the advanced technology in my teaching and learning	95.85	.597	.940
S15	I am worried about the safeness and retriveness of my data in the virtual environment.	95.73	.632	.939
S16	In the digital word, I must to remember my digital credential such as password, account number. It makes me some kind of technical stress.	95.46	.712	.939
S17	I feel fear whenever I am thinking about security and safety of technological devices in the campus.	95.88	.591	.940
S18	I worried about my privacy of personal data in the academic institutions.	96.27	.493	.941
S19	Technology makes the busy time schedules in my academic life.	96.00	.563	.940
S20	I had strained to adopt the novel technological tools to my teaching and learning process.	95.85	.583	.940
S21	I feel not happy whenever I used technology for my teaching.	96.12	.519	.940
S22	I am not having any confident about my technological competency.	95.92	.566	.940

No	Statements	Mean if Item Deleted	Corrected item-total correlation	Cronbach Alpha if item Deleted
S23	Adopting novel technology makes so much time waste in the context of teaching and learning aspect.	96.77	.556	.940
S24	Technology may be main reason to reduced the social interaction in the academic environment.	96.00	.591	.940
S25	I am nervous about the health issues due to the over dependency of the digital tools and devices.	95.00	.546	.940
S26	I often feel that, I might lose sleep because of the technology penetration.	95.81	.656	.939
S27	I am under pressure to keep my ICT skill up-to-date to keep my job.	95.96	.446	.941
S28	I feel anxious whenever I crossed the new terminology about the digital devices or tools	96.46	.531	.940
S29	I am uncomfortable while taking the classes with the use of ICT.	95.92	.708	.939
S30*	I feel pressurized by our senior faculty and colleagues to work with the computer	96.42	.326	.950
S31	I think I spent more time near to the computers. It might be hard to manage classrooms for me	96.35	.572	.940
S32	I am scaring to use the hardware due to the lack of confidence to use the tools .	95.81	.549	.940
S33	I am very much tensed about the costliness of technology tools such as repair and maintenance.	95.54	.606	.940
S34	I feel I have a high level of anxiety when technological devices are not working properly	95.46	.586	.940
S35	I felt stressed due to the overload of the e-resources in the digital world. It leads so many confusion about the originality and genuineness of the article.	95.65	.734	.938
S36*	I feel professional jealousy will arise by technological competency among colleagues	96.23	.075	.944

Note: * indicates rejected Items

This above table column presents the value that Cronbach's Alpha would be if that particular item was deleted from the scale. The item statements S5, S10, S30 and S36 would influence result in a lower Cronbach's Alpha. Therefore, the investigator decided to remove the statements S5, S10, S30 and S36. After finalizing the item analysis strategies the investigator prepared the final draft of the tool. In a 36 items, 4 items were rejected and 32 items were to be selected for the final draft of the tool. Therefore the final draft of the tool consists of thirty two items in a five point scale.

V. RELIABILITY ANALYSIS

Reliability refers to consistency throughout a series of measurements (Best, Khan, & Jha. 2006). Reliability measures the respondent's consistency in a particular item in the two-time spans or the respondent's feeling or opinion in the two different items of the same natures. If the respondent is changing his views or responses to the tool's same item, then the consistency will be lost logically. Generally, the researcher may apt any kind of reliability techniques to measure the reliability analysis as part of the research tool's standardization. The investigator has employed two reliability techniques such as the split-half and Cronbach's alpha value, in the current study.

A. Cronbach's Alpha Value based Reliability

Table - III

Cronbach's Alpha Value after the item analysis

Cronbach's Alpha	Number of Items
.953	32

From the above table, the investigator concludes that the tool's high level of internal consistency from the Cronbach's alpha value .953 after the item analysis process. In this manner, the investigator has evidenced the reliability of the tool.

B. Split Half Method of Reliability

The investigator has also attempted a split-half method to establish the reliability of the tools. The split-half method assesses the internal consistency, such as psychometric tests and questionnaires (Jaggi, 2012). The split half method measures the reliability of a tool in which all the tool parts equally contribute to what is being measured. The investigator may divide the tools into two equal half in the split-half method and compare the two equal half using the Spearman-Brown formula. The high value of the correlation value replies to the high level of reliability of the tool. In this present study, the investigator divided the 32 item statements into two half based on odd and even items. Based on the respondent's odd and even items' responses, the investigator has employed the Spearman-Brown calculation. The value of the Technostress scale tool is .919 in the spearman Brown Calculation. In this way, the investigator established the reliability of the instrument once again.

VI. VALIDITY OF THE INSTRUMENT

Research validity of an instrument is measures of what it is intended to measure. There are many ways to establish the validity of the tool.

The investigator has confirmed the validity of the instrument through content validity by getting a consultation and suggestions from psychological experts, technology experts, senior teachers of the computer science department, and senior teacher educators. The experts went through the study's aims and each part of the scale and expressed their opinion that the Rating scale measures what it is intended to a very high degree of satisfaction.

Their suggestion was incorporated as part of the validation process of the technostress instrument.

VII. FINAL DRAFT / SCORING PROCEDURE

Scoring of the response sheets were done as per the scoring scheme. All favorable statements were awarded scored from a maximum score of five to a minimum score of one to each of categorization. Final draft of the tool consists of 32 items. The scoring procedure of the tool is described below:

Table - IV

Scorring Pattern of rating scale of Technostress

Response	Scores
Strongly Disagree	1
Disagree	2
Neutral	3
Agree	4
Strongly Agree	5

The strongly agree response of the favorable statement should be assigned with a score of 5, agree response with a score of 4, undecided with a score of 3, disagree with 2, and strongly disagree with 1. The respondents were asked to read each item carefully and put a ($\sqrt{}$) mark in the cell provided. The investigator computed all the scores for the items for each respondent. The total score of all the items were calculated and finalized as the individual's score.

VIII. CONCLUSION

Technostress is stress or illness related to mind and body caused by working with computer, internet, and mobile technology daily (Thiyagu, 2010). Based on the study's objectives, the investigator wished to develop a five point rating scale to measure the level of techno-stress of teacher educators. The item analysis was done through 'Cronbach's Alpha if Item Deleted' calculation with the use of SPSS 22 Version. After finalizing the item analysis strategies, the investigator prepared the final draft of the tool consists of thirty-two items on a five-point scale. The tool's reliability has established by Cronbach's alpha (0.953) and Split Half (0.919) techniques. The reliability of both techniques described the high level of internal consistency of the tool; similarly, the tool established the tool's validity with the content validity method. Hence, from the item analysis, reliability, and validity, the tool is useful to measure teacher educators' stress while using technology in their teaching and learning process. It can be utilized and extended for further research in the same field.

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