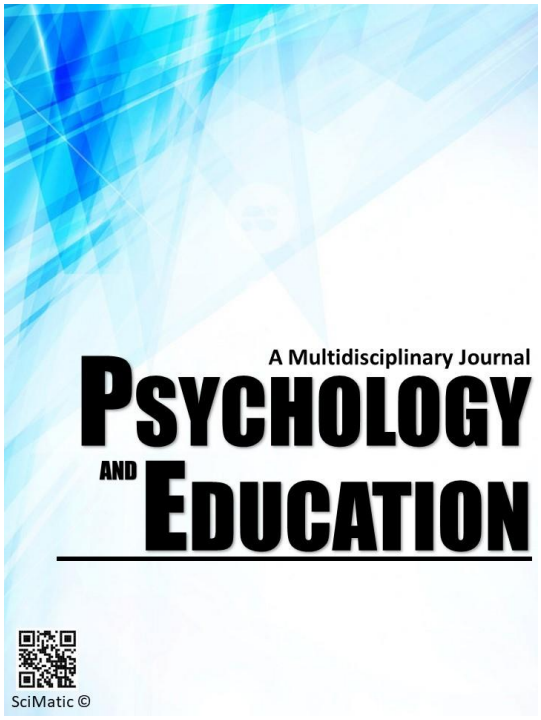
INTERNET FATIGUE SCALE FOR TEACHERS (IFST): DEVELOPMENT AND VALIDATION



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Research Article

Internet Fatigue Scale for Teachers (IFST): Development and Validation

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Abstract

From early childhood education through the tertiary, the rapid transition to online learning modality to keep students interested in continuing education has led to dramatically increased workloads for teachers to identify the content of the work. (Allen et. al., 2020). The main goal of developing Internet Fatigue Scale for Teachers (IFST) is to objectively measure the level of online fatigue they are experiencing as facilitators of learning. Data obtained from the scale was participated by a diverse population of Filipino online teachers with a total number of 119, handling students from nursery level to postgraduate studies. The final version of the scale with the item count of 20 (mean=72.40; SD=8.48) was found to be fairly reliable (a=.721; n=109). For the content validity IFST scored .99 in content validity index (CVI) which is the minimum acceptable value for five experts according to Lawshe (1975). Overall, the psychometric properties of IFST has shown to be acceptable following the norm of Filipino online teachers of any age, gender, teaching experience and level of students being taught.

Keywords: *internet fatigue, online learning, online teaching, post-pandemic, scale development*

Introduction

Modern technologies, especially the internet and social media, have made education no longer confined to the classroom. Measuring behaviors, expectations, and attempts to develop technology attitudes have become crucial to any progress in technology (Holmes & Gardner, 2006). Merits from this digital advancement were especially utilized since the onset of Corona Virus Disease 2019 (COVID-19). Immediate actions were done to control the situation such as the community quarantine. Because of the isolation, countries have switched to remote set-up to keep the educational systems going during this period (Duraku & Linda, 2020). Since then, many prestigious institutions worldwide have completely embraced online learning as a method of maintaining the continuity of education (Chung et al., 2020).

Certainly, COVID-19 pandemic had a serious influence on teachers, educators and educational organizations across the globe (Mailizar et. al., 2020) that is why it is believed that decisions taken in conjunction with the global health crisis would have long-term repercussions for the future of education (UNESCO, 2020). Having the transition made, experts contextualized online learning as knowledge and skills acquired by synchronous and asynchronous learning applications; written, exchanged, supported and mediated by the usage of internet technologies (Garrison, 2011). However, there are emerging terms with the same idea like blended learning (Deschacht & Goeman, 2015), e-learning (Keis et al., 2017) and virtual learning with the key concept that learning activities use any Internet resources with little or no physical social contact with lecturers in an informal manner (Kuo et al., 2014).

For a successful introduction of e-learning, the factors influencing successful execution must be defined and evaluated (Rasouli et al., 2016). One of those factors which is explicitly seen is the teachers' role. Aside from the competencies of an instructor in the normal classroom, teachers were demanded to upskill and learn to navigate technology beneficial to the students. In this light, it could be implied that the value of a teacher is increasing. However, in the study of Huang in 2018 wherein the aim is to investigate the students' view on their teachers' role in online settings using a 27-item and 5-Likert-scale questionnaire, the results indicated that the role of teachers as a whole had been reduced. Despite the mediation of technology the effort teachers should put is remarkable that, at some point, may cause them stress. Teachers in various parts of the world have reported heightened tension and stress as a result of calls for an abrupt change in teaching modality to an online environment (Duraku & Linda, 2020). Moreover, tenured teachers are prone to experience the difficulty of learning the basics of technology versus the young instructors. There is a real comparison with the generation and the advancement in the organization due to the digital learning gap.

In these unique times, failure to completely and effectively adapt to the academic demands online may lead to stress encounters. "Internet fatigue" is used to describe the exhaustion and excess stress levels from overusing the internet platforms. Due to extra stress levels, internet fatigue has set in among students, bank employees, software professionals and teachers.

(Garari, 2021). Going digital in every aspect of what we normally do, made a huge impact on performance, and even in well-being. The Internet offers an array of benefits but many professions are exposed to working conditions that are unprecedented. In the working industry, teaching is one of the age-flexible professions in the country sadly, those who cannot stay with the pace were forced to leave their work. Allen et al. in 2020 asserted that from early childhood education through the tertiary, the rapid transition to online learning modality to keep students interested in continuing education has led to dramatically increased workloads for teachers. They were also pushed to strive not only to move teaching content and materials into the online environment, but also to become adequately skilled in managing the necessary software such as learning management systems (Allen et. al., 2020).

Essentially, students are the frequent subjects evaluated for research related to virtual learning and flexible home-based modality. The main goal of developing an instrument for internet fatigue exclusive for teachers is to objectively measure the level of fatigue they are experiencing as facilitators of learning. This test will also show the behind factors of fatigue and contribute to improving the virtual learning environment. Finally, to encourage teaching professionals to be openly honest when discussing their thoughts and personal experiences in handling online classes and for the users to find ways to reduce and eliminate unnecessary stress factors.

Literature Review

Resilience, Education and COVID-19

Online education has been researched for decades and successful online education is the product of diligent training and preparation (Hodges et al., 2020). However, as a consequence of the global health crisis, most of the teaching setting all over the world had to switch from the traditional teaching set-up to an online learning delivery in the middle of the academic year. Kemp et. al., (2019) dedicated a time to study the models of acceptance of technology. Eventually he developed a taxonomy of factors affecting the attitudes of the general education body in higher education institutions towards the use of technology-assisted learning. This taxonomy includes seven primary categories: a) attitude, effect and motivation; b) social factors; c) usefulness and visibility; d) educational attributes; e) perceived behavioral control; f) cognitive engagement; and g) system attributes. In connection with acceptance is the construction of teachers' resilience, Bruneau et al. (2003) conceptualized resilience as having technological, operational, social and economic aspects, where the technical component refers to the ability of physical structures to operate efficiently in the face of danger (e.g. IT systems, telecommunications service); capability is the organizational dimension. The institution's decision-making and efforts to minimize the negative effects of the crisis is imperative in the process. Bonanno et. al. (2007) submitted that individuals with high resilience levels show just moderate, temporary disturbances of everyday life after injuries and manage to function in an almost regular and balanced way.

Motivation and Online Learning

Learners are involved in the process of assessing learning goals, tasks, needs and levels of effectiveness in the self-directed learning process and taking more responsibility for self-learning (Oh, 2006). In order to meet the needs of the students, a lot of teachers would need to spend longer hours in creating teaching instruments in the time of pandemic. Motivation is an important aspect of the learning experience in the distance learning process, as it is in formal education, because the framework of online education programs is substantially self-directed (Khan, 2009). In a series of adult online learning surveys, Kim (2004, 2005, 2006, 2009) concluded motivation to be an imperative part of adults' performance, while others found this to be true of online student demographics ranging from high school students (Kim et. al., 2015; Lin et. al., 2012; Scribner, 2007) to undergraduate students (Huett et al., 2008; Kim & Keller, 2008; Kang & Tan, 2008). Clearly, motivation is a key factor in perseverance and persistence in education, same goes with teachers.

Multitasking and Productivity

The influences of technology have become ubiquitous in almost every aspect of our current society, including in our educational systems (Alquizar, 2018). The assumption and expectations have risen within online learning for teachers, and the sudden implementation into the academic world greatly affected teachers' tasks. Research on multitasking in the contemporary setting commonly asserts many undesirable outcomes that heightened destruction, hindered learning, and hampered teachers' performance and students' achievements (Terry, 2016). However, as stated by Shutti (2014), switching focus from one task to another very quickly can be detrimental and may significantly affect teachers because this can lead to poorly doing what is needed to be attended to and

attention is elsewhere. A study conducted by Stewart (2015) that teachers' multitasking decreases the productivity of the task and trouble individuals in paying attention and switching from another task. In online learning, there are many tasks to work on. Completing one task at a time can slow down our work and the difficulty of finishing it on time. There are many tasks to perform, especially for teachers, which leaves them more tired and even frustrated.

Methodology

The specific objective of this research was to develop a method for evaluating how teachers perceive online fatigue with education in digital learning era. Scales are utilized when it is necessary to measure phenomena that are believed to exist theoretically but cannot be measured directly. Therefore, a scale development model is applied in this work.

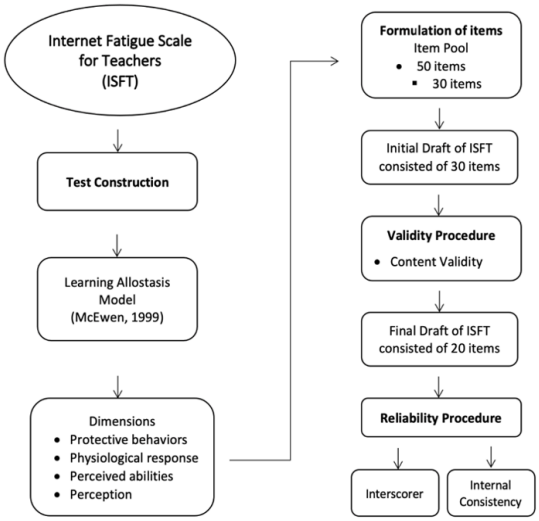
Participants

Data obtained from the scale was participated by a diverse population of Filipino online teachers with a total number of 119, handling students from nursery level to postgraduate studies. There were 86 females (72.3%) and 32 males (26.9%). Also, 33.6% of the participants are with 1-3 years of teaching experience, 16% are with 3-5 years of teaching experience and 12.6% are teaching more than 15 years. Most of the participants are elementary teachers (40.3%), 35 participants are college instructors (29.4%) and 34 participants are teaching in junior high school (28.6%). Inclusion criteria were also set allowing only participants who experience the sudden online learning transition (e.g. online classes, blended learning, flexible home-based learning) therefore, educators who are teaching in pure modular and/or face-to-face modality are excluded.

Procedure

The researchers came up with the term internet fatigue to describe their feelings and sentiments about the transition of events from in-person work, face-to-face education, etc., to pure online modality. The researchers looked further into the term and its scope. Internet Fatigue scale was theoretically grounded by the Learning Allostasis Model (McEwen, 1999). From the major dimensions of the model namely: Protective behaviors, Physiological response, Perceived abilities and Perception. Initial item blueprints were made considering the specific constructs. Statements were hypothetically created based on the observed behavior of teachers which mainly suggest issues, interests and experiences in online learning platforms. In addition, random unstructured interviews were done and participated by basic to tertiary educators to develop the item pool. From 100 statements, researchers exhausted the items into 50 for the experts to validate. Proposed 50-item scales were scored and scrutinized by tenured education and psychology practitioners. Upon establishing the Content Validity Ratio, items were further deduced to 30 and were recommended for a test run to estimate the reliability. A flow chart representing the process in constructing the Internet Fatigue Scale for Teachers (IFST) is shown in figure 1.

Figure 1. *Flow chart of the process used to validate Internet Fatigue Scale for Teachers (IFST).*



Results

This section presents the findings according to the study's research questions. To compare the mean and find out the significance between variables, multiple linear regression was computed using IBM SPSS 26.0.

Findings related to reliability

Internal consistency

The statistical treatment, Cronbach's alpha was determined through the Statistical Package for Social Sciences (SPSS). The final version of Internet Fatigue Scale for Teachers (IFST) with the item count of 20 (*mean*=72.40; *SD*=8.48) was found to be fairly reliable (a=.721; *n*=109). Ideally, the closer Cronbach's alpha coefficient is to 1.0 would mean excellent inter-item

consistency of the scale (Rouquette & Falissard, 2011). The mechanism of controlling the target alpha coefficient suggests that as the number of items decreases, internal consistency increases. However, too much test homogeneity can be questionable in the sense that items might be having the same context or in a simpler context, the case of redundancy. Thus, IFST did not further deduct items to achieve a higher alpha value. Furthermore, it is important to take note that some items are negatively constructed (i.e. items 5, 6, 14, 18, 19, and 20) affecting the overall alpha coefficient which is still an acceptable estimate of inter-item consistency. Depicted in table 1, is the item statistics and the possible result if specific items are further deleted.

Table 1. *Item Total Statistics*

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Q1	68.3211	71.127	-.018	.232	.736
Q2	68.7431	79.952	-.473	.436	.772
Q3	68.5138	61.752	.664	.642	.682
Q4	69.8807	71.717	-.072	.397	.749
Q5	69.3670	61.827	.408	.555	.698
Q6	68.4771	63.437	.343	.363	.705
Q7	68.2661	66.290	.346	.389	.707
Q8	68.4771	64.455	.481	.559	.697
Q9	68.2385	65.683	.357	.385	.706
Q10	69.0183	62.259	.488	.513	.692
Q11	68.4495	61.009	.752	.698	.677
Q12	68.4128	66.634	.315	.558	.709
Q13	68.7248	64.016	.448	.418	.698
Q14	69.2477	62.725	.382	.549	.701
Q15	68.6697	66.945	.254	.386	.713
Q16	68.7156	61.761	.627	.600	.684
Q17	68.1193	66.513	.348	.475	.707
Q18	69.5229	63.844	.314	.288	.708
Q19	69.0367	65.425	.286	.304	.711
Q20	69.4679	69.640	.044	.362	.734

Inter-scorer reliability

There were three interrater reliability evaluators who scrutinized the scoring and interpretation of the test. First is a professor with a doctorate degree in psychology. The second evaluator is a licensed professional teacher and a registered psychometrician. The last expert is a licensed Psychologist and a Registered Psychometrician. The initial presentation of the test merits a general recommendation of revising the statements in order to determine the negative items that are essential in reverse scoring. After careful consideration of the points for revision, the scoring and interpretation of the Internet Fatigue Scale for Teachers (IFST) were unanimously approved, earning commentary from one of the evaluators:

Items in every dimension are in place. They are in line with the expected outcomes or targets and are direct. Overall, the instrument, novel at that, is a great contribution to the field, timely as it is, essentially relevant and scholarly.

Mean limits of 1-1.80, 1.81-2.6, 2.61-3.4, 3.41-4.2 and 4.21-5.00 were also approved as it enables the composite score to be placed in one of the scales, setting the classification of the test taker.

Findings related to validity

Content Validity Ratio (CVR) was established with five experts scoring and scrutinizing the initial 30-item pool. Two of the raters are Senior Education Program Specialists, School Management Monitoring and Evaluation, and Division and Testing Coordinator at Department of Education (DepEd) Ilocos Norte and Professor with a doctorate degree in Psychology. The other two are with Master of Arts in Psychology, Registered Psychologists and Psychometricians. Lastly, one expert is a tenured public-school educator with professional teaching license and also a registered Psychometrician. The initial 30-item pool with five dimensions were reduced to 20 items with four dimensions; items that failed to meet the minimum value of CVR were mostly eliminated. In order to achieve the number of items to be retained for the initial test run, few items required revision in order to have the consensus of all experts marking each item as "essential". Illustrated in the table 2, the final version of IFST with 20 items was scored .99 which is the minimum acceptable value for five experts according to Lawshe (1975).

Table 2. *IFST Content Validity Estimate*

Indicators	*CVR*
1. I spend time familiarizing myself with using technological tools.	.99
2. I usually experience headache, body pain and dizziness after online classes.	.99
3. I have quickly adapted myself with online teaching.	.99
4. I usually ask help from my colleagues on how to manipulate the desktop/laptop.	.99
5. I cannot focus on online teaching because I am also engaged with other tasks at home.	.99
6. I sometimes cancelled my online classes due to too much frustration in online learning delivery.	.99
7. I believe that online learning is a strategic way of delivering education in the new normal.	.99
8. I am very much confident in utilizing technology in online teaching.	.99
9. I make sure to reward myself for accomplishing tasks.	.99
10. I easily recover from stress and regain energy for the rest of the day.	.99

continuation…

11. I am flexible in online learning and teaching.	.99
12. I can easily solve minor technical glitches during online class.	.99
13. I am positive with the outcome of online teaching.	.99
14. I don't have energy to do anything after utilizing the internet.	.99
15. I remain composed whenever technical glitches happen during online classes.	.99
16. I am satisfied with my work as a teacher in online classes.	.99
17. I appreciate my efforts in preparing for online classes.	.99
18. I cannot bring out the best in me as a teacher in online classes.	.99
19. I am not comfortable with technology mediating education.	.99
20. I refrain from using gadgets after a long exposure to online activities.	.99
Content Validity Index	.99

Dimensions Correlation

Relationships among dimensions in Internet Fatigue Scale for Teachers (IFST) were calculated in order to establish the basis for scoring, presented in the table 3. Upon computing for the Pearson correlation coefficient wherein the relationship is significant at alpha level 0.05, there was a significant relationship among Protective behavior (PB20; M=3.56; SD=.49), Perceived Ability (PA20; M=3.89; SD=.49) and Perception (P20; M=3.67; SD=.66). In addition, there is also a significant relationship among Physiological Response (PR20; M=3.31; SD=.57), Perceived Ability and Perception. However, it should be noted that there is negative association between Physiological Response and Protective behavior.

Table 3. *Pearson correlation among IFST Dimensions*

		PR20	PB20	PA20	P20
PR20	Pearson Correlation	1	.149	.436**	.546**
	Sig. (2-tailed)		.122	.000	.000
	N	109	109	109	109
PB20	Pearson Correlation	.149	1	.273**	.318**
	Sig. (2-tailed)	.122		.004	.001
	N	109	109	109	109
PA20	Pearson Correlation	.436**	.273**	1	.601**
	Sig. (2-tailed)	.000	.004		.000
	N	109	109	109	109
P20	Pearson Correlation	.546**	.318**	.601**	1
	Sig. (2-tailed)	.000	.001	.000	
	N	109	109	109	109

Discussion

The purpose of the current study is develop an instrument that can be useful for educators are front liners in delivering education amidst adversities, especially in times of pandemic. It is noteworthy that teachers are the most crucial part of students' learning hence, measuring how they are susceptible to internet fatigue may grant actions in improving their mental health in their profession. The findings suggest that IFST has good and acceptable reliability with Cronbach alpha coefficient of 0.721 as measure of internal consistency, which falls near to suggested excellent measure of a=1.0 . In addition, inter-scorer reliability rate for IFST was considerably accepted after series of revisions and consultations with professionals and other practitioners related to the instrument. Moreover, mean limits and interpretation which is grounded by the Load Allostasis Model of Stress (McEween, 1999) was unanimously approved. On the other hand, content validity ratio (CVR) was utilized for the validity estimate of IFST, the content validity index (CVI) of 0.99 is the accepted measure for five (5) experts who scored each item which means the overall 20-item measurement of internet fatigue will elicit result that are consistent with online stress and fatigue-related phenomenon within the bounds of virtual teaching. With alpha level of 0.05, Pearson correlation among IFST dimensions were also measured, the results show that teachers who have any means to prepare for impeding stressors (e.g. I spend time familiarizing myself with using technological tools) are not susceptible to physically feel tiredness or exhaustion in online classes (e.g. I usually experience headache, body pain and dizziness after online classes**).** Physiological response being not significantly related with protective behavior is consistent with the study of Shutti (2014), which emphasized that being reactive to multiple stressors including online and offline multitasking may draw online teachers to be more tired. Overall, the psychometric properties of IFST has shown to be acceptable following the norm of Filipino online teachers of any age, gender, teaching experience and level of students being taught.

Conclusion

The primary purpose of IFST is to expand the data to get a better understanding of educators' mental health position in the online learning environment, as well as the ongoing challenges of teaching in the post-pandemic era. Instructors respond rapidly to the ever-changing learning requirements of their students from academic preparations to lesson execution. Therefore being aware of their psychological needs necessitates fast action, such as programs aimed in resisting psychological tiredness in and out of the online platform. The IFST assesses educators' online fatigue in the context of delivering virtual classes, and it

includes four dimensions based on McEwen's (1999) Learning Allostasis Model: protective behavior, perceived ability, perception, and physiological response. Although it is beneficial in many respects, the scale cannot be utilized for therapeutic or clinical reasons; nonetheless, it is advised that the approach be developed further to increase its value among teaching professionals.

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