Translation، Validation and Evaluation of Psychometric Properties of Multiple Intelligences Questionnaire Urdu Version

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Abstract

the study is meant to translate, validate, and determine the psychometric properties of the Multiple Intelligence, which Gul (2015) designed based on Weber's (1999) multiple intelligence survey. The Multiple Intelligence Questionnaire is translated into Urdu to be used in Pakistan. It is a 45 items 4-point Likert scale. Weber's (1999) scale has 40 elements by measuring eight intelligences. Gul (2015) added five items in the scale to measure ninth intelligence of Existential Intelligence. Scale translation was carried out in accordance with criteria of Brislin (1980) translation and adaption. The items were translated in keeping with norms of Pakistani society. The translated instrument's reliability was evaluated using a sample of 50 students from higher secondary schools Sukkur. The translated version of the multiple intelligence questionnaire exhibited high level of reliability (α =.81), making it acceptable for use with Pakistani students. In addition, Confirmatory Factor Analysis was performed on a sample of 360 students to establish the factor structure. The Confirmatory Factor Analysis demonstrated that the translated scale was a viable measure for use in Pakistan. As a result of current study, this instrument is successfully translated and adapted the scale for the Pakistani community, making it suitable to be used in counseling and educational contexts.

Keywords: Multiple Intelligences Questionnaire, Higher Secondary Schools, Translation, Psychometric properties

Introduction & Background

The terms "intelligent" and "intellectus" are Latin derivatives of the verb "intelligere," which means "to understand or distinguish." Throughout the middle Ages, the Greek philosophical term nous was translated as "intellectus" and started to be employed as a sophisticated technical term meaning understanding. (Traupman, 2007). Intelligence is a critical aspect in human adaptability to the environment and consequently in how different individuals react to educational methods (Sternberg, 2019). The intelligence has evolved from a monolithic to a multidimensional concept (Gardener, 1986).

The construct of Intelligence has been explained in a variety of ways, from ability to abstract,

reason, understand, self-aware, learn, feel, plan, create, critically think, and solve problems. In a wider sense, it refers to the capacity of perceiving or deriving and storing as knowledge which may then be used to adaptive behaviors in a given place or context. (Sharma & Radha, 2008). While human intelligence has been studied extensively, it is also experienced in non-human creatures and plants, although it is debated whether certain forms of life exhibit intellect. The term artificial intelligence describes the intelligence in computers and other devices. (Wang, 2019).

Each person is born with these nine intelligences. Nonetheless, each student will bring a unique set of these evolved intelligences to the classroom (Armstrong, 2009). Gardner (1983) describes intelligence as ability to adapt appropriately to new circumstances and events as well as the capability to draw lessons from the past. Every individual is unique and each is far more complicated, mysterious, and profound than any typical test can disclose. A fascinating truth to consider is that not everyone excels in the same areas. Just as our physical appearances vary, so do our learning styles. Gardner recognized seven separate intelligences, which he coined the term "multiple intelligence." He advanced the hypothesis of MI and asserted that the seven intelligences he recognized were all separate. These are generally self-sufficient human intelligences or modes of learning. Gardner's (1983) listed seven intelligences comprised of verbal/linguistic, musical/rhythmical, logical/mathematical, spatial/visual, bodily/kinesthetic, interpersonal, and intrapersonal. Gardner (1995) added eighth intellect, dubbed Naturalistic intelligence. Existential intelligence, the ninth intelligence, is currently being considered because It has not yet fully met the empirical and neurological requirements for placement on the list of intelligences (Gardner and Laskin, 1995).

Multiple intelligences theory

Gardner (1983, 1993, 1999) created the idea of multiple intelligences grounded on his observations of numerous individuals from all segments of the society in daily states and occupations. Gardner thinks that we may improve education by addressing our kids' many intelligences. Gardner (1999) distinguishes nine distinct intelligences: logical mathematics, linguistic, visual/spatial, musical, bodily-kinesthetic, interpersonal, intrapersonal, existential and naturalist. In Frames of Mind, Gardner (1983) eplained the first seven intelligences later Gardner (1999) in Intelligence Reframed, he included the final two defines of intelligence; named as naturalistic and existential intelligence.

Linguistic Intelligence

It is the ability of an individual to perceive the rhythms, sounds and provide meanings to the words, as well as the various uses of language (Erlina, Marzulina, Astrid, Desvitasari, Sapriati, Amrina, & Habibi, 2019). At some level, everyone is believed to possess this intellect. Poets, novelists, orators, public speakers, and attorneys all have a high level of language intelligence. Historically, education and learning environments have identified and valued linguistic intelligence and logical-mathematical intelligence.

Logical-Mathematical Intelligence

Logical-mathematical intelligence is a term that describes a person's ability for understanding and sensitivity to logical or numerical patterns, as well as his or her ability to

deal with lengthy chains of reasoning Azinar & Munzir, (2020). These individuals enjoy conducting experiments, deciphering mysteries, and posing cosmic questions. Often, superior logical mathematical intelligence equates to superior scientific competence. In addition to encouraging students to use computer programming languages, critical-thinking activities, linear outlining, science fiction scenarios, and logic puzzles, teachers can help students develop this intelligence by teaching material in a logical, sequential fashion.

Spatial Intelligence

According to Šafranj and Zivlak (2018), spatial intelligence is the ability to effectively comprehend the visual-spatial world and to alter one's initial perceptions. These folks like to daydream, study maps, do jigsaw puzzles, and doodle. Teachers can develop this intelligence by using visual aids such as drawings, words, and physical pictures. Some examples of tools are microscopes, computer graphics software, photographs, charts, models, and graphics; three-dimensional modeling; video; videoconferencing; television; multimedia; books with illustrations, charts, and graphs; and so on.

Musical intelligence

The ability to produce and recognize rhythm, pitch, and different musical timbres, as well as the ability to recognize and value different musical expressions, are the components of musical intelligence. (Krishnan, Machleit, Kellaris, Sullivan & Aurand, 2014). These individuals may benefit from having music playing in the background as they study.

Interpersonal Intelligence

According to Herpertz, (2022) understanding and appropriately addressing the emotions, dispositions, intentions, and aspirations of others is a key component of interpersonal intelligence. These folks acquire knowledge by interacting with others. They are empathetic and have a wide range of friends. Educators can promote the growth of interpersonal intelligence by incorporating group projects, seminars, and group discussions into the classrooms. They can use variety of tool like telephone, audio conferencing, the teacher's time and attention, video conferencing, writing, computer conferencing, and email.

Intrapersonal intelligence

According to Barman and Roy (2021) the capacity to access and discriminate between one's own emotions, as well as knowledge of one's own wants, intelligences, and strengths and shortcomings, constitutes intrapersonal intellect. By assigning introspective tasks such as journal writing and individual research, teachers can foster the development of intrapersonal intelligence. They can use tools like books, creative materials, diaries, privacy, and time.

Naturalist Intelligence

Naturalist intelligence is the ability to understand, classify, organize, grasp, and clarify the occurrences seen in the natural world (Sadiku, & Musa, 2021). Teachers can support the development of this intelligence in their students by having them make connections to real-world and scientific issues through the study of relationships such as pattern recognition, comparison and contrast, and the ability to discriminate between living things (plants and animals), as well as show sensitivity to the natural world (clouds, rock formations).

Intelligence Existential

This type of intelligence is the ability to ask and reflect on existential questions, especially those about death and life. It is a matter for philosophers and religious leaders (Jaddou & Abdullah, 2018). Students that excel in this intelligence are frequently those who must place everything in a broader context, a global perspective, or a historical background.

Rationale and Purpose of the Study

Adaptation and translation relates to the practice of significantly altering a text to take into account the target audience's cultural, social, or situational context (Anastasi & Urbina, 1997). This can involve altering, adding, or omitting parts of the original content to ensure it resonates with new readers or viewers. Current study aimed to translate and modify the Multiple Intelligences (MI) scale to ensure that the scale is accurately and effectively translated into Urdu and culturally adapted for use in the Pakistani context.

The assessment tool of the study should be developed in a manner that it should be able to precisely measure the intended concept under examination and guarantee the significance of the research outcomes. (Sürücü & Maslakci, 2020). Current study assessesed the validity (whether it measures what it is intended to measure) and reliability (whether it produces consistent results) of the translated and adapted scale. It conducted psychometric evaluations to ensure that the scale performs as expected in the new context. It looks for primary goal of the study is to determine whether the testing tool was practical and user-friendly in our cultural. It involved evaluating the ease of administration, comprehension, and overall acceptance of the scale by respondents.

Based on the experience and learning in the process of adaptation and finding author provide recommendations for future inquiries in the subject matter. It involved suggestions further refinements to the scale or additional studies to explore its effectiveness and applicability in various contexts. By achieving these objectives, the study's purpose was to make the Multiple Intelligence Scale a legitimate and dependable instrument for assessing diverse intelligence profiles across Pakistani students and culture.

Review of the literature

Gebremeskel, Bachore, and Bushisho (2024) examined the Multiple intelligence-based tasks (MIBT) are effective in increasing university students' reading achievements and skills. With a primary focus on quantitative methods, it used a quasi-experimental design. Quantitative techniques were used to analyse the data. In comparison to traditional methods, it was discovered that giving students multiple intelligence-based reading tasks significantly affected their reading achievement levels. The impact ranged from moderate (reading for key ideas and understanding references) to strong (reading for details, guessing vocabulary, and inferring meanings from text).

A survey study included 161 Mexican pupils was carried out to examine the variations in MI among genders and school classes among Mexican elementary school students. The results showed that both genders' mean averages for eight categories of MI of students were identical; the matter of fact, the only areas where gender variances were statistically significant in intrapersonal intelligence, where male students reported greater intrapersonal

scores over female students. There were no other noticeable changes in MI were identified, and there were no interactions between gender and academic grade (González-Treviño, Núñez-Rocha, Valencia-Hernández & Arrona-Palacios, 2020).

Mansir and Purnomo (2020) did a study on Islamic education's many intelligences-based learning methodologies. The goal of this research was to investigate and find out the Islamic education learning (PAI) approach that is most compatible with students' dynamics in order to aid them in comprehending the subject and improving their accomplishment through the use of multiple intelligences. This was a case of Action Research in the Classroom. Classroom Action Research entailed the teacher's (researcher's) attempt through the lens of the learning process. The notion of validity and instrument dependability were applied throughout data collecting. This is also referred to as practical reliability and validity of this study that indicates the instrument can be used as long as the members of the action research group determine that it is consistent and valid. Islamic education learning methodologies must employ intelligence through resolving students' issues, creating new challenges to solve, and enabling them to accomplish something meaningful in their lives. The findings indicate that incorporating multiple intelligences into Islamic education is an excellent technique for facilitating the subject and increasing student progress.

Yurt and Polat (2015) performed an investigation to examine the impact of various intelligence applications on academic advancement in Turkey. A meta-analysis was conducted on various studies after meeting the criteria to be included. The study found that there is a significant and favorable impact of numerous intelligence applications on academic attainment. It was also discovered that different intelligence applications have different effects depending on when they are used. As a result, the impact of various intelligence applications increases together with the application duration. Conversely, the efficiency of the applications remains constant regardless of the research type, class level, or course type.

A study was conducted Piaw and Don (2014) to determine the multiple intelligences and how they relate to a group of Malaysian school administrators' personal characteristics. The Multiple Intelligences Test was employed to gather information from the participants. The results indicate a considerable inter-correlation between various MI abilities. The school leaders' strongest multiple intelligence talents are interpersonal and intrapersonal, while their lowest levels are bodily-kinesthetic, musical-rhythmic and naturalistic. The findings suggest that a school leader's level of developed interpersonal and intrapersonal competencies increases with their level of job experienceMultiple regression research reveals that intrapersonal and interpersonal intelligence are the two most reliable predictors of total multiple intelligence for school administrators.

Othman (2013) outlines a study that investigated how incorporating the elements of multiple intelligences to learning and teaching affected students' performance based on gender. The study included 47 male and 55 female students from a selected Malaysian National Primary School. The intervention took the form of teaching and learning activities that incorporated components of multiple intelligences. The study's findings indicate that incorporating multiple intelligences into teaching and learning activities results in a substantial lack of gender bias among students in terms of gaining science knowledge and developing science process skills. As a whole, this study's findings indicate that teaching and learning activities that incorporate aspects of MI have a beneficial effect on democratically upgrading students'

accomplishment and are free of gender prejudice among students.

Martin (2003) conducted a study to ascertain whether Gardner's theory of multiple intelligences may be used as a framework to identify different types of knowledge among business students and whether this knowledge improves the ability to identify oneself and others as possible information sources. Depending on the responses of business students with extended work histories, the Multiple Intelligence Preference Inventory provides a credible and trustworthy indicator of their preferred intelligences. The finding is related to identifying oneself as a possible source of information for others, and then identifying others as potential sources of knowledge. The results lend support to more study into the application of the multiple intelligence theory questionnaire and knowledge as a tool for recognizing, appreciating, and benefiting from workplace diversity, as well as part of student knowledge identification and sharing program. This is regardless of the constraints of a limited and interrupted sample number, continuing need for item refining.

Method of the study

This study aimed at translation of Multiple Intelligences Survey by weber (1999) in Urdu and adaptation of the Multiple Intelligences Scale in Pakistani culture.

Objectives

Two primary objectives that guided this study:

1. Urdu translation of Mutiple Intellegence Questionaire based on Weber's (1999) Multiple Intelligences Survey and Mutiple Intellegence Questionaire by Gul,(2015)
2. Determine the psychometric properties of translated version of the scale, such as reliability and validity.

Measurement

Multiple Intelligence Questionnaire

The Multiple Intelligence Questionnaire consisted of 45 items that assessed nine different intelligences. The MI questionnaire relies on 40 items from Weber's (1999) Multiple Intelligence Survey evaluating 8 intelligences, plus five items from Gul's (2015) MI Questionnaire. Multiple intelligence questionnaires. The Multiple Intelligence Survey (Weber, 1999) included 40 questions for eight intelligences, and respondents were asked to identify at least 15 items that best represented them. The number of choices for each kind of intelligence was then tallied, with the greatest total being the desired intelligence. Gul (2015) modified the original Instrument for the current study to acquire a precise score for each of the nine intelligences, allowing the researcher to investigate differences among the numerous intelligences. The researcher questionnaire included five items for each of the nine intelligences.

The Multiple Intelligence Questionnaire assessed pupils' level of multiple intelligences. A Likert scale of 4-point was employed to score 45 questions on the questionnaire, which were ranked in the following order: 1 for strongly disagree, 2 for disagree, 3 for agree, and 4 for strongly agree. Currently, a lot of various multiple intelligences inventories are being generated. Armstrong (1999) and Silver (1997) claimed that the tool is valid for measuring multiple intelligences. The author with the permission of authors generated an Urdu version

of questionnaire by using multiple intelligence survey inventories and multiple intelligences questionnaire.

Translation and Adaptation of the Questionnaire

The translation and adaptation standards provided by Brislin (1980) were adhered for translation and scale adaptation. To translate the questionnaire, following procedures were used:

Step 1: Asking for approval. The copyright of the scale is owned by the authors. It was crucial to get their approval before translating the scale. The author was consulted to get permission and author provided permission for the translation and adaptation of the instrument

Step II: Forward translation (English to Urdu). This step was comprised of translating of Multiple Intelligence Survey into Urdu from its originating language, English. The scale was translated using the recommendations made by Brislin (1980), which included translating the questionnaire without adding or removing any items and optimizing the material in a way that was comparable to the original in both the target language and the original language.

Bilinguals provided the translation. The translation procedure involved the participation of five Subject Matter Experts: three of them have expertise in English, one in Psychology and Urdu each. The translators met the requirements set forth by Brislin (1980), which included having a firm grasp of the source language, having a high likelihood of locating an easily accessible equivalent in the intended language so that the translator does not have to utilize foreign vocabulary, as well as producing target language items that respondents can readily grasp. Translators were required to read the text as correctly as possible, highlight any items that had no relevance to Pakistani culture, and recommend the best substitute.

Step III: Committee approach. The translated versions were presented in front of a committee to choose the most accurate and suitable translation. The committee included a PhD in Psychology, an MPhil Psychology research scholar, and the researcher. The committee took great care to ensure that every translated item conveyed the same meaning as those in the original scale. Only translations that expressed a sentimental meaning rather than the exact word meanings were selected. In addition, they assessed the translated items based on context, grammar, and language; however, the focus was primarily on conceptual equivalency to establish a shared understanding and fair comparison between the source and translated text. A few of the questions were reworded to improve understanding.

The fourth step is back translation. After being correctly translated, every item was collected and sent to multilingual specialists for back translation. Among the five multilingual experts were two M.A. (English), one PhD scholar and two MPhil (Psychology). Original version of the instrument was unknown to all of them. Each expert was given instructions to back translate the items into English while maintaining the same level of content in both translations.

Step V: The committee method. The committee was presented with the back-translated items for ultimate selection. The committee was made up of a MPhil research scholar in psychology, a PhD scholar psychology and researcher. The committee evaluated the consistency between each item's back translation and original English version after receiving both the original and back translated versions. The original authors of the scale were also provided with back translations, and once they were satisfied with every item, the Urdu translation was approved.

Item-Total Correlation

After the translation of instrument, a sample of 40 higher secondary school students was recruited to examine the instrument's internal consistency. The instrument was administrated on respondents, and was questioned for feedback if they had any difficulties comprehending the items. The item-total correlation and alpha reliability of the scale were calculated, and the results are presented in the table below.

Table 1

Item-total correlation of Multiple Intelligences Questionnaire (N = 50)

Items	*r*	*Items*	*r*
1	0.81	24	0.76
2	0.66	25	.76
3	0.67	26	0.75
4	0.64	27	0.68
5	0.74	28	0.74
6	0.77	29	0.82
7	0.78	30	0.72
8	0.72	31	0.77
9	0.76	32	0.75
10	0.69	33	0.76
11	0.81	34	0.69
12	0.75	35	0.82
13	0.77	36	0.73
14	0.82	37	0.77
15	0.83	38	0.81
16	0.68	39	0.82
17	0.67	40	0.68
18	0.76	41	0.68
19	0.73	42	0.69
20	0.78	43	0.77
21	0.77	44	0.74
22	0.82	45	0.67
23	0.74		

**p < .01

Table 1 displays item total correlation of the Multiple Intelligences Questionnaire. t shows that there is a strong positive association.

The scale showed strong reliability (α =.81) according to alpha reliability analysis.

Confirmatory Factor Analysis

Confirmatory Factor Analysis (CFA) of the Multiple Intelligence Questionnaire was performed and alpha reliability coefficient was measured. The sample size for CFA was 50. The sample was students taken from various higher secondary schools of Sindh in order to psychometrically validate the translated version of the MI Questionnaire. The CFA findings

validated the translation instrument's usability and validity in the Pakistani community. The elements are shown visually below, together with their factor loadings and a table of model fit indices.

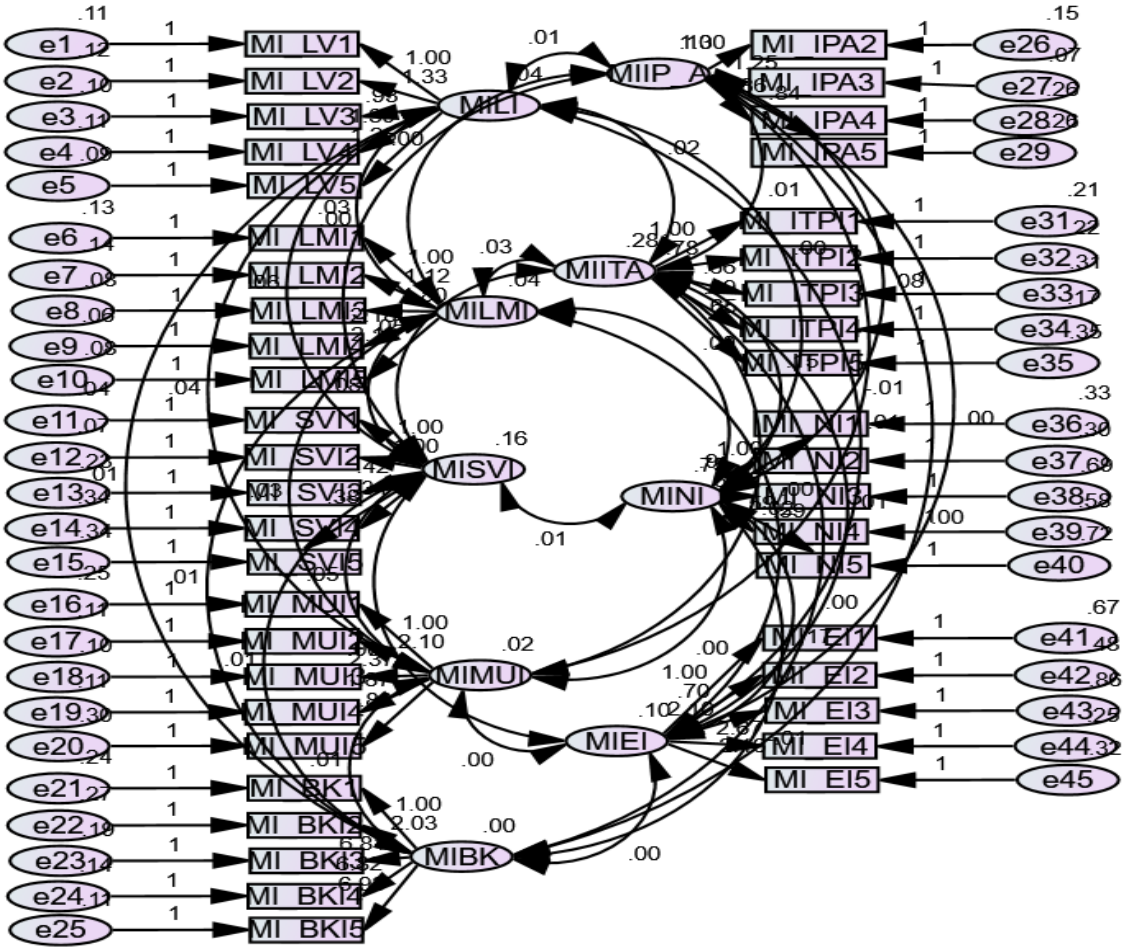

Figure1. CFA model of Multiple Intelligence Questionnaire

Figure1 shows the items corresponding to the scale as well as obtained factor loadings of each item in the respective dimension. Each item has factor loadings greater than.60 and are within acceptable limits (Field, 2009). Figure 1 shows that the items fit the scale, and factor loadings were measured for each item in the appropriate dimension.

Table 2
Confirmatory Factor Analysis of Multiple Intelligences Questionnaire

Model	CMIN	CMIN/DF	IFI	T L I	CFI	RMSEA
Model 1	2800.807	3.234	.741	.714	.738	.079
Saturated model	.000		1.000		1.000	
Model 2	8332.163	8.808	.000	.000	.000	.147

Table 2 represents the model fit indices of *Multiple Intelligences Questionnaire*. It shows that model 1 had with values of .738, IFI = .741 and RMSEA = 079. Additionally, an alpha reliability analysis of the measure revealed an excellent reliability of.81.

Discussion

The objective of this study was to validate the Multiple Intelligence Questionnaire on Pakistani students by translating and adapting it to the Urdu language. Gul (2015) developed the Multiple Intelligence Questionnaire, based on the Weber (1999) Multiple Intelligence Survey. Multiple Intelligence Questionnaire originally has 40 items to measure eight intelligences. Gul (2015) added five items to measure Existential Intelligence. The parameters set by Brislin (1980) were adhered to for the purpose of translation. After receiving the final translated Urdu version of Multiple Intelligences Questionnaire, it was administrated on a size of 50 from Higher Secondary Schools of Sukkur. The participation in the study was volunteer after the consent of the students. During the tryout phase, the sample provided feedback to ensure the face validity of the questionnaire. The Participants read the statements from the questionnaire and determined whether it properly measured the necessary components.. The students were questioned if they had trouble understanding any statements. After the completion the questionnaire by the student, alpha reliability of the scale was assessed and it exhibited dependable scores. In the final step, the scale was administered by applying it on a bigger sample of 360 students. The data was analyzed with SPSS Version 22. The alpha reliability coefficient was calculated. The scale has a strong internal consistency (alpha reliability =.81). Confirmatory Factor Analysis was conducted using IBM Amos, which validated the translated scale's factor structure. All factor loadings were within acceptable limits, and no items needed to be deleted. Hence, in the CFA scores indicate that the theoretical framework used to build the Multiple Intelligences Questionnaire is valid and reliable in Pakistani population. The translated version allows researchers to do more in-depth research on the issue in the Pakistani community.

This work aimed to develop a measuring instrument to assess the multiple intelligences of students of higher secondary schools of Sindh. Research in the realm of learning over the last few decades has resulted in the development of the Theory of Multiple Intelligences (Christison & Bassano, 2005). In short, this theory holds that every person has different intelligences and distinctive learning styles that they used in their daily lives. Some people learn best in a language context (writing and reading), others gain more from education focused on mathematical logic. Certain people benefit from Body-kinesthetic intelligence learning by doing. Each individual possesses some of each intellect; there is always a major,

or more dominant, intelligence (Tamilselvi & Geetha, 2015). Multiple intelligences study began in the early 1980s with Howard Gardner and continues to this day. As a result, the current investigation was done to ascertain the unique outcomes. The findings of the study served the purpose of measuring the multiple intelligences of students in our Pakistani setting.

The study mean to translate the constructs, and response options are correctly translated into Urdu, preserving their original meaning and intent. It involves both linguistic translation and conceptual equivalence. The study focused at cultural relevance of the concepts and the measurement tool to fit the cultural context of the higher secondary student of Sindh. It modified and contextualized the items so that they are culturally appropriate and relevant, without altering the underlying constructs of multiple intelligences. Factor loading and reliability measures shows the fitness of the scale and confirms the test is a reliable and valid measure of multiple intelligences.

Implications

This study attempted to translate and validate the Multiple Intelligences Questionnaire in Urdu. Until that, there was no scale in Urdu available for measuring various intelligences. There are very few research undertaken in Pakistan on multiple intelligences. As a result, this translated instrument will not only add the body of knowledge but it will assist counselors and guidance professionals in assisting their clients, as well as teachers in incorporating multiple intelligences into their teaching approaches to benefit pupils.

Recommendations

Here are the few recommendations suggested on the basis of the study:

1. The reliability of the measure need to be measured again and again to confirm whether the instrument is still a reliable measure of the construct.
2. 2. The recommendation is to undertake cross-language validation tests on the translated version to establish credibility.
3. More researches should be performed to compute multiple intelligences of students to grow in their academic and professional lives.

Conclusion

Current study focused on the translation and validation of the Multiple Intelligences Questionnaire in order to reliable and valid measure of multiple intelligences in Urdu to be applied in Pakistani context. It is encouraging that study translated the scale in accordance to norms of Pakistani society. The questionnaire provided an opportunity to study the multiple intelligences in local population.

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