MULTIPLE INTELLIGENCE ASSESSMENT
BASED ON HOWARD GARDNER'S RESEARCH

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Abstract-**Howard Earl Gardner** (born July 11, 1943 in Scranton, Pennsylvania) is an American developmental psychologist. Howard Gardner's theory of **Multiple Intelligences** utilizes aspects of **cognitive and developmental psychology, anthropology,** and **sociology** to explain the human intellect. The theory was introduced in 1983, with Gardner's book, **Frames of Mind.**

Well publicised studies in Brain research, interviews with stroke victims, prodigies, and individuals with autism conducted by **Howard Gardner** of Harvard University, demonstrate that there are **many different intelligences** present in every human brain.

Gardner's Theory of Multiple Intelligences states that **human beings**have many **different ways to learn**and **process information.**However, it also says that these are **independent of each other**: leading to **multiple "intelligences"** as opposed to a general intelligence factor among correlated abilities.

This article is based on Howard Gardner's theory of Multiple Intelligences. According to him intelligence is located in **different areas** of the brain.Intelligences are **inter-connected** and depend on each other but can work independently if needed.Multiple Intelligences can be **developed** with the **right nine different potential**.

The **theory of "multiple intelligence"** developed by **Howard Gardner** provides **nine different potential pathways to learning** – Language, Logical / Mathematical, Visual / Spatial -Pictures & dimensions, Bodily-Hands-on / Kinaesthetic – Action, Naturalist, Musical Harmony & Rhythm, Interpersonal - Understanding and getting along with people, Intra-personal / Self Knowledge, Metaphysical.All human beings possess all 9 intelligences in varying degrees.The 9 intelligences may operate in consort or **independently** from one another.

To achieve an edge in learning, an individual can **leverage** that intelligence where he shows a strength so as to **develop** in the area where they may have a challenge.For instance, a person who is exceptionally skilled in music and not so in logical or mathematical intelligence can use music to learn mathematics.

Keywords- Howard Gardner, Multiple Intelligence theory, nine different potentials, develop strengths.

I. INTRODUCTION

Conceptualization of intelligence

Intelligence is a very broad term which can take on different meanings and has been defined in several different ways. For example, in a survey asking people to define what they meant by intelligence, respondents suggested that intelligence encompassed problem-solving ability, verbal abilities and social competence. Some others give more importance to abstract thought, capacity to learn and adjustment to environment however, to psychologists, "Intelligence is the capacity to understand the world, think rationally, and use resources effectively when faced with challenges" (Wechsler, 1974).

Psychologists who studied intelligence often disagreed on the issue of intelligence being either a unitary factor or a multifaceted factor. Those who believed that intelligence was a unitary concept such as Charles Spearman (1927), supported his G-factor theory which suggests that there is a single, broad, general intelligence factor (G) that underlay performance on any cognitive task. Many others such as L. L. Thurstone (1938), Howard Gardner (1993), Guildford, Robert Sternberg (1995) and Raymond Cattell (1963) believed that intelligence had many factors contributing to it. Unfortunately, however, neither the layperson's nor the psychologist's conception of

intelligence is of much help when it comes to distinguishing, with any degree of precision, more intelligent people from less intelligent ones. To overcome this problem, psychologists who study intelligence have focused much of their attention on the development of intelligence tests and have relied on such tests to identify a person's level of intelligence.

History of measuring intelligence

The first person to suggest that intelligence could be quantified and measured in an objective manner was Sir Francis Galton. He believed that intelligence was inherited and hypothesized that head configuration, was related to brain size and therefore related to intelligence. However, his theories were proved wrong. Alfred Binet was later, the first to develop intelligence tests.

According to him, performance could be used to distinguish more intelligent people from less intelligent ones within a particular age group. On the basis of the Binet test, children were assigned a score relating to their mental age-i.e. the average age of individuals who achieve a particular level of performance on a test. However, this did not allow adequate comparisons among people of different chronological ages.

A solution to this problem came in the form of intelligence quotient, which was the term proposed by William Stern in 1912. This score takes into account an individual's mental and chronological ages. To obtain the score, an examiner divided a student's mental age by his/her chronological age and then multiplied this number by 100. However, it is important to note that Stanford-Binet test is now in its fourth edition where the test consists of a series of items that vary in nature according to the age of the person being tested. It is administered orally and the examiner begins by finding a mental age level at which the person is able to answer all questions correctly, and then moves on to successively more difficult problems. The test will come to an end when a mental age level is reached at which no items can be answered.

An important feature of Stanford-Binet and Wechsler's intelligence tests is that these tests required individualized one on one administration, which is relatively difficult and time consuming to administer and score them on a large scale basis. Thus, today we see a number of IQ tests that allow group administration as well, and are comparatively easier.

Theoretical background

After almost eighty years after intelligence tests had been developed, Howard Gardner, a Harvard Psychologist, challenged the traditional beliefs and conceptualization of intelligence. Operating on the notion that the conventional definition of intelligence was too narrow, he developed the Multiple Intelligence Theory. He defined intelligence as, "the ability to solve problems or to create products that are valued within one or more cultural settings".

Gardner felt that traditional ways of testing may be biased to certain individuals. According to him, human beings have nine different kinds of intelligence that reflect different ways in which people interact with the world. Although each individual has all nine types of intelligence, no two people possess them in the same configuration. The nine types of intelligence that Gardner referred to are Linguistic, Logical/Mathematical, Musical, Bodily-Kinesthetic, Spatial, Interpersonal, Intrapersonal, Naturalistic and Existential.

Gardner wanted to define human potential by going beyond the IQ score. His theory has led to the development of intelligence tests that contain questions for which more than one answer can be correct. This provides an opportunity for the test taker to demonstrate creative thinking. These tests are based on the idea that different types of intelligence can produce different but equally valid answers to the same question.

Characteristics of the nine types of intelligence
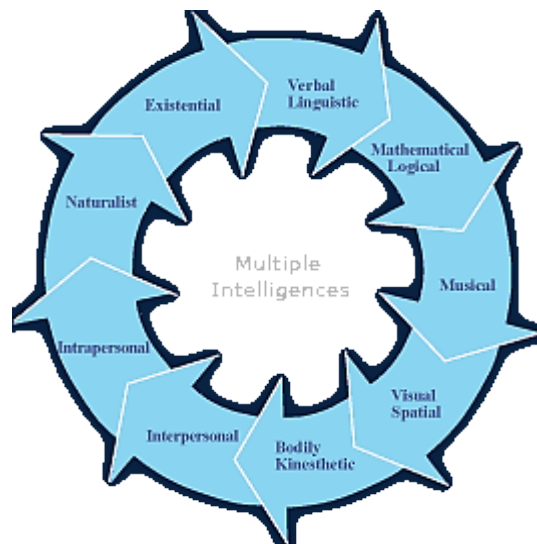
Linguistic: The capacity to use words effectively, whether orally (e.g., as a storyteller, orator, or politician) or in writing (e.g., as a poet, playwright, editor, or journalist). This intelligence includes the ability to manipulate the syntax or structure of language, the phonology or sounds of language, the semantics or meanings of language, and the pragmatic dimensions or practical uses of language. Some of these uses include rhetoric (using language to convince others to take a specific course of action), mnemonics (using language to remember information), explanation (using language to inform), and meta-language (using language to talk about itself).

Logical-mathematical: The capacity to use numbers effectively (e.g., as a mathematician, tax accountant, or statistician) and to reason well (e.g., as a scientist, computer programmer, or logician). This intelligence includes sensitivity to logical patterns and relationships, statements and propositions (if-then, cause-effect), functions, and other related abstractions. The kinds of processes used in the service of logical-mathematical intelligence include categorization, classification, inference, generalization, calculation, and hypothesis testing.

Spatial: The ability to perceive the visual-spatial world accurately (e.g., as a hunter, scout, or guide) and to perform transformations upon those perceptions (e.g., as an interior decorator, architect, artist, or inventor). This intelligence involves sensitivity to color, line, shape, form, space, and the relationships that exists between these elements. It includes the capacity to visualize, to graphically represent visual or spatial ideas, and to orient oneself appropriately in a spatial matrix.

Bodily-kinesthetic: Expertise in using one's whole body to express ideas and feelings (e.g., as an actor, a mime, an athlete, or a dancer) and facility in using one's hands to produce or transform things (e.g., as a craftsperson, sculptor, mechanic, or surgeon). This intelligence includes specific physical skills such as coordination, balance, dexterity, strength, flexibility, and speed, as well as proprioceptive, tactile, and haptic capacities.

Musical: The capacity to perceive (e.g., as a music aficionado), discriminate (e.g., as a music critic), transform (e.g., as a composer), and express (e.g., as a performer) musical forms. This intelligence includes sensitivity to the rhythm, pitch or melody, and timbre or tone color of a musical piece. One can have a figural or "top-down" understanding of music (global, intuitive), a formal or "bottom-up" understanding (analytic, technical), or both.

Interpersonal: The ability to perceive and make distinctions in the moods, intentions, motivations, and feelings of other people. This can include sensitivity to facial expressions, voice, and gestures; the capacity for discriminating among many different kinds of interpersonal cues; and the ability to respond effectively to those cues in some pragmatic way (e.g., to influence a group of people to follow a certain line of action).

Intrapersonal: Self-knowledge and the ability to act adaptively on the basis of that knowledge. This intelligence includes having an accurate picture of oneself (one's strengths and limitations); awareness of inner moods, intentions, motivations, temperaments, and desires; and the capacity for self-discipline, self-understanding, and self-esteem.

Naturalist: Expertise in the recognition and classification of the numerous species—the flora and fauna—of an individual's environment. This also includes sensitivity to other natural phenomena (e.g., cloud formations, mountains, etc.) and, in the case of those growing up in an urban environment, the capacity to discriminate among inanimate objects such as cars, sneakers, and CD covers.

Existential (Metaphysical): This type of intelligence is concerned with 'ultimate issues', what Gardner considers to be the capacity to locate oneself with existential features of the human condition such as the significance of life, the meaning of death and the fate of both the physical and psychological worlds.

Each individual possesses all nine types of intelligence, albeit to different degrees. Therefore, they are not mutually exclusive. They are used simultaneously, complementing each other as people develop skills to solve problems.

II.   METHODOLOGY

Purpose of the assessment

The aim of the test is to identify the extent to which each individual possesses all nine types of intelligence. This will provide both awareness and understanding about how they think, behave and respond to their respective environments.

Target audience

The Multiple Intelligence Assessment is applicable and used by individuals from various backgrounds, with children below 8 years of age being an exception.

Applicability of the assessment

The Multiple Intelligence Assessment can be used in schools to assess how well a student can be expected to perform and to determine if special educational programs are necessary. Such intelligence tests can also be used in business, by employers to select job applicants and to predict who would learn new information required for the job or who would make "smart" decisions on the job.

Quality of the items

The quality of the assessment is enhanced as it's an easy to use intelligence assessment with the items catering to a wide range of audiences. The items do not include any racial or gender stereotyped comments, while the interpretation and scoring of the assessment is simple and easily comprehensible. The derived score is reliable, as the assessment is administered under standardized settings and extraneous variables such as instructions and the administrator have a minimal influence on the variation in scores as these are standardized across situations. The assessment also meets requisite practical aspects as it includes the following considerations:
1. The items are formulated in simple layman English
2. The assessment is legible (can be easily understood)
3. The assessment material is durable (does not change across time)

Nature of the items

All the items in the questionnaire belong to the content domain which facilitate in assessing an individual's intelligence. The 54 items are characteristic of the nine types of intelligence being assessed. These items represent the preferences of people which are subsequently linked to the respective type of intelligence. The items are standardized as they are the same for every respondent with respect to the content, form and order.

Assessment administrator qualifications

The user needs to an average of 2 years work experience in managing people, or a PG in Psychology/Sociology or an MBA.

Similarities and differences with similar assessments

Intelligence tests such as the General Mental ability test rely on language, numbers and abstractions as test items. The General Mental Ability test also assesses an individual's performance on language based problems.

Bhatia's battery of intelligence although a performance test, also measures intelligence by assessing the analytic and synthetic ability of the cognitive mind, the power to grasp relations or abstract reasoning under appropriate circumstances. Whether it is the GMA or Bhatia's battery of intelligence, the result is the same – an IQ score. This score essentially represents the intelligence level of an individual.

The Multiple Intelligence Assessment does not produce an IQ score. It only serves to indicate an individual's strengths/potentials across all nine types of intelligence. By demonstrating the extent to which an individual possesses all nine types of intelligence, direction towards suitable paths can be decided.

Instructions for the assessment administrator

➢ Make sure the subject is seated comfortably in a well-lit and ventilated room.
➢ Build rapport with the subject, make him feel at ease.
➢ Educate the subject on the confidentiality element of the assessment.
➢ Give instructions of the assessment (as specified below)
➢ Clear doubts if any.
➢ After assessment completion give instructions on the scoring methodology.
➢ Interpret the scores and clear doubts that may arise.

Instructions for test takers

➢ There are 54 items measured on a 4-point Likert scale that represent 9 different intelligence domains.
➢ There is no right, ideal or wrong response for any of the items.
➢ Please choose which alternative is most applicable to you
  o Very often
  o Often
  o Sometimes
  o Rarely
➢ Mark your answer with a check ☐) in the appropriate box that is either Very often, Often, Sometimes or Rarely. If you make a mistake, cross it out and check another box.

Sample item:

1.   I am able to use spoken or written words to influence or persuade others.

Very often	Often	Sometimes	Rarely
	✓		

➢ Kindly be as honest as possible and do not guess or look for a response that may seem right as there is no right or wrong response.
➢ Do not leave any items unanswered.
➢ Do not take too much time or ponder over an item, answer as quickly as you can.
➢ There are no time limits observed but the assessment takes 15-20 minutes for completion.
➢ The results of the assessment will be kept confidential and may be used for research/ career development purposes only.

III.   FINDINGS AND ANALYSIS

Scoring of the assessment
(for paper-pencil formats only, as the online scores are auto-generated)

Each statement corresponds to one of the nine types of intelligence. There are six items per domain of intelligence.

> **Step 1:** Add up the scores for all six items across the 9 domains
> **Step 2:** The minimum and maximum scores that can be obtained for each type are 6 and 24, respectively.

Sample report
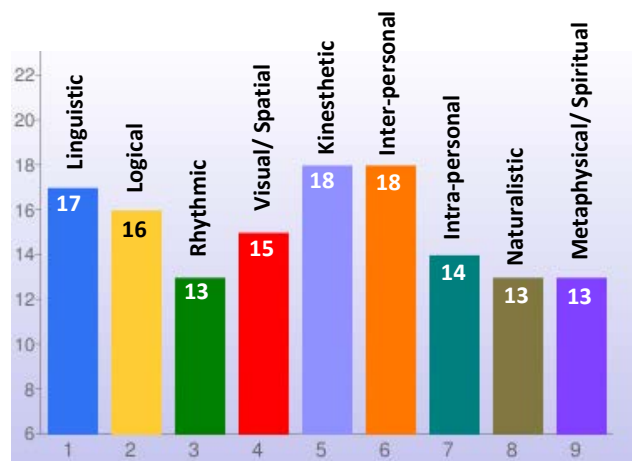
1. **Kinesthetic Intelligence –** The subject has lot of energy and tend to be quite expressive. He/She may enjoy sports and activities that provide opportunity for lots of interactivity. Thus, he/she has developed good motor skills and hand-eye coordination.
2. **Interpersonal Intelligence –** The subject's strength lies in interacting with people and expressing his/her thoughts and feelings in an open manner. He/She comes across as a friendly and approachable person who enjoys mixing with friends. He/She would use his/her charm and ability to persuade others to wield influence and win acceptance.
3. **Linguistic Intelligence –** The subject has the ability to understand and make use of words and languages to express his/her views and ideas. He/She is likely to have a reasonably well developed vocabulary, and communicate well. He/She may also be able to address large audiences and share his/her thoughts with them, especially when he/she is comfortable with the topic.
4. **Logical Intelligence –** The subject has the ability to think conceptually and is able to see patterns and connections. He/She probably likes to conduct experiments, solve puzzles and interesting problems. He/She has the ability to understand cause and effect relationship, looking to identify the source of the problem. All the same, he/she may not have an affinity for scientific and logical reasoning.
5. **Visual Intelligence -** With the ability to represent the spatial world internally in his/her mind, he/she is able to imagine things conceptually and abstractly. Thus, he/she has the potential to think in terms of pictures and images. He/She is also likely to be aware of objects, shapes, colors, etc. in the environment around them.
6. **Intra-personal Intelligence –** The Subject's score on intrapersonal intelligence suggest that he/she is likely to enjoy having his/her own space and take time to introspect. He/She may be aware of his/her own strengths and limitations. This self-awareness, may strengthen his/her ability to pursue goals.
7. **Rhythmic intelligence –** The subject may enjoy listening to music and be appreciative of the same. Although he/she may be sensitive to sounds around them, he/she may not have actively engaged his/her rhythmic abilities. Hence, may not be inclined to sing professionally or play an instrument.

8. **Naturalistic Intelligence –** While subject may have a basic understanding of flora and fauna, he/she is not very excited or fond of exploring "nature". He/She may not show interest in learning about different species of plants / animals or gardening. He/She may only explore outdoor/natural surroundings when accompanied by friends.

9. **Metaphysical Intelligence –** The subject comes across as a broad-minded person who is open to new and novel ways of working. He/She likes to contemplate about abstract topics like, the meaning of life, death, etc. Being curious he/she tends to ask a lot of questions about these abstract topics. He/She may enjoy taking part in religious activities when he/she finds them to be meaningful.

Norms

Norms are standard models or patterns regarded as being typical. A norm of one type or the other is a basic requirement of all tests. A norm-referenced test / NRT is a type of test, assessment, or evaluation which yields an estimate of the position of the tested individual in a predefined population, with respect to the trait being measured. This estimate is derived from the analysis of test scores and possibly other relevant data from a sample drawn from the population. The test was administered on a sample of 1247 students, aged between 13-19 years from both public and private schools across different cities in India and Singapore. The items of the assessment were subjected to quantitative analysis using WINSTEPS (based on Rasch's model) to assess the suitability of items and the differential functions based on gender, race and field of study during the academic year 2010.

Reliability & Validity

Establishing reliability, validity and norms of an instrument is extremely essential for any psychometric instrument as it ensures that the results are consistent with the person's true behaviour. Therefore, the data collected through research enables one to establish sound psychometric properties of assessments, irrespective of the construct they are designed to measure.

Data analysis – Stage 1

Data are analyzed using Rasch model with the application of WINSTEPS to test the validity and reliability of the instrument. The Rasch model also takes into account the ability of the candidate or the respondent who answered questionnaires, tests or instruments as well as the difficulty of each test item or items (Rasch, 1980). Smith (1992) suggests using item fit statistics to evaluate the extent to which items are tapped into the same construct and places test-takers in the same order to assess the items' technical quality empirically in the Rasch analysis. He argues that test-takers should be ranked consistently by items measuring the same construct. Otherwise, the misfit items (items that measure a different construct compared to other items in the test) should be revised or eliminated.

Table 1 shows the criteria used as benchmarks for determining the validity of the instrument. According to Wright and Stone (1979), the conditions to produce a useful measurement are:
1. use of valid items in the measurement process to determine the construct measurement,
2. definition of concepts and constructs are clear and consistent with the supporting theory,
3. testing item on appropriate individuals provides results that are consistent with the purpose of measurement, and
4. the application of valid response patterns. Without a valid response pattern, the individuals cannot be defined precisely.

Criteria	Statistical Information	Results
Item Validity	a. Item Polarity	PTMEA CORR > 0 (positive value)
Item 63 Item Misfit = 09	b. Item Fit	Total mean square in-fit and out-fit of 0.6 - 1.4
	c. Separation (SE)	All items show • 2.0
Reliability	d. Person reliability	Value close to 0.8 value (0.62 < x <0.78)
Reliability	e. Item reliability	Value > 0.8

Table 1. Summary of item validity and reliability in the multiple intelligences instrument using Rasch model

Reliability

Reliability refers to the consistency of a test, or the degree to which the test produces approximately the same results over time under similar conditions. Ultimately, reliability can be seen as a measure of a test's precision. The reliability of the respondents indicates that the interpretation is equivalent to that of Cronbach's alpha or KR-20 (Wright and Masters, 1982). The respondent's reliability index of 0.98 is a good value (Pallant, 2001) for the expected consistency on the log-it scale for the answers on different sets of items that measure the same construct (Wright and Masters, 1982). Linacre (2007) stated that the reliability of respondents of • 0.8 and respondents' separation index of • 2.0 as good indices. The statistics generated by Rasch analysis estimate the degree of items suitability that measure latent variables, assuring the item-fit of the instrument are within an acceptable range. There are 09 items removed because the mean square in-fit and out-fit radius are outside the range of 0.6 to1.4 as proposed by Bond and Fox (2007).

Validity

Validity refers to the degree to which a test measures what it claims to measure. A test is valid to the extent that inferences made from it are appropriate, meaningful and useful. The statistics generated by Rasch analysis estimate the degree of items suitability that measure latent variables, assuring the item-fit of the instrument are within an acceptable range. There are 09 items removed because the mean square in-fit and out-fit radius are outside the range of 0.6 to1.4 as proposed by Bond and Fox (2007).

Structural Equation Modeling was used to assess the quality of the instrument while Confirmatory Factor Analysis was used to assess construct validity of the items. The CFA shows that all 54 constructs of the online instrument fits the empirical data based on the Comparative Fit Index (CFI) of 0.9, and the Tucker Lewis Index (TLI) of 0.9. The results of the analysis indicate that the instrument is deemed acceptable according to Arbuckle and Wothke (1999).

The Multiple Intelligences Psychometric Assessment is made of 54 perception items of four-point Likert scale that represent nine different intelligence domains. It uses a quantitative methodology that involves the collection of data using both a paper and pencil as well as an online questionnaire. The benefits of the On-line assessment are rater-free automated scoring, quick feedback, and easy accessibility. Benefits associated with educational assessment include the ability to process detailed data and the potential to build tasks that assess skills that cannot be easily done by other means of assessment (Zoanetti, 2010). The remarkable advantage of internet is the effortless access to information that has led to a new, fast and handy range of tools and capabilities for innumerable fields of activity (Boboila&Boboila, 2007). The instrument is administered on a large sample of 1247 students aged 13 to 19 by random sampling across private and public schools in different cities of India and Singapore. Items are quantitatively analyzed using WINSTEPS that is based on the Rasch model to assess the suitability of items and the differential functions based on gender, race and field of study during the academic year 2010.

Data analysis - Stage 2

To ensure accuracy and consistency of this finding, we conducted yet another study using the same instrument and data, applying the Structural Equation Modelling (SEM) using AMOS. Items that have been tested on the validity and reliability form a model representing each construct. SEM is an approach to measure the quality of instruments whilst Confirmatory Factor Analysis (CFA) is an approach to measure the validity of construct items. The application of SEM over CFA helps to assess the validity of the main structural factors. A measurement model that is assessed by CFA would link factors in a model (Kline, 2005). Modification indices provided by AMOS suggests that improvement in model fit could be made by allowing several measurement errors to correlate (Byrne, 2001; Joreskog, 1993).

The following shows the suitability index for both hypothesized and revised model for every nine constructs that have gone through the CFA application. The constructs are:

1. Logical-mathematical intelligence (LoM),
2. Verbal-linguistic intelligence (VeL),
3. Visual-spatial intelligence (ViR),
4. Musical intelligence (MuZ),
5. Bodily-kinaesthetic intelligence (KiB),
6. Interpersonal intelligence (InE),
7. Intrapersonal intelligence (InA),
8. Naturalistic intelligence (NaR), and
9. Spiritual intelligence (KeR).

Hypothesized Model:
LoM   .74 & .55
VeL   .43 & .18
ViR   .73 & .53
MuZ   .44 & .20
KiB   .61 & .37
InE   .69 & .48
InA   .56 & .33
NaR   .53 & .28
KeR   .51 & .26

Chi Square/df – 3.085, P-000, RMSEA - .106, CFI – 875, TLI - 833

Revised Model:
LoM   .74 & .55
VeL   .44 & .20
ViR   .73 & .53
MuZ   .44 & .15
KiB   .62 & .38
InE   .71 & .50
InA   .57 & .33
NaR   .53 & .28
KeR   .47 & .22

Chi Square/df – 1.415, P-078, RMSEA - .048, CFI – 976, TLI - 967

The overall results of analysis proof shows an overall fit and are deemed acceptable according to Arbuckle and Wothke (1999). The CFA shows that all 54 constructs of the online instrument fits the empirical data based on the Comparative Fit Index (CFI) of • 0.9, and the Tucker Lewis Index (TLI) of • 0.9. Meanwhile, the Root Mean Square Error of Approximation (RMSEA) of 0.08 is at an acceptable index, and the Chi-Square value of <2.0 or <3.0 indicates an acceptable fit between the model and the data. Result of the study shows that the good psychometric properties can be used to obtain the multiple intelligences profiles of teenage students.

The validity and reliability of each item in the instrument are essential. Data is also important and the accuracy of data entry needs to be ensured as it contributes to the validity and reliability of the results.

When the validity and reliability of the instrument is proven high, it can be construed that the instrument is valid and reliable. Although the pen-and-paper version had been tested on the validity and reliability by previously, the instrument is yet retested since inferences obtained earlier were only suitable for a certain purpose and sample especially when the analysis were done using the

classical test theory (CTT). The item response theory (IRT) with the application of the Rasch model using WINSTEPS should indicate high item reliability index and person reliability index.

The second analysis using the SEM approach is in line with Stapleton (1997) who explained that the CFA method is suitable for testing a model developed based on theories, where the researcher starts with a hypothesized model before the analysis is conducted. The hypothesized model determines which indicator or variable are associated with latent variables. A set of measurements are done to assess the goodness of fit. The Multiple Intelligence assessment indicates that the items contribute to the measurement of each construct, while all the nine constructs show high construct validity. Thus the structure of nine constructs containing 54 items produce a valid measurement model and is deemed effective in assessing the level of multiple intelligences.

The findings of an assessment will inform the relevant parties in an educational institution on the possibilities of implementing interventions that can enhance students' competencies and skills described by the multiple intelligences. Students should also be made aware of their performance and tendencies, and the opportunity to improve themselves to a level of excellence before they embark on future undertakings.

IV.   CONCLUSION

Benefits of the assessment:

- The assessment helps individuals realize their unique talents and boosts confidence.
- It can be used to enhance the academic performance of students.
- The assessment scores serve as a foundation for examining suitable careers for people.
- It enables employees to ascertain their strengths and weaknesses, thereby, highlighting areas of improvement.
- Training, development, mentoring and educational inputs – discover the sort of instruction and teacher or mentor a person is likely to benefit most from, what activities he/she will best respond to.
- Selection and placement – helps in evaluating an individual's suitability to positions, organizations and work environments.
- Helps create competent teams with balanced talent mix for efficient completion of   specific assignments.

V.   REFERENCES

Arbuckle, J.L &Wothke,W. (1999). Amos user's guide version 4.0, Chicago, IL: Small

Bond, T. & Fox, C. (2007). Applying the Rasch model: Fundamental measurement in the human sciences (2nd). Mahwah, NJ: LEA.

Cattell, R. B. &Scheier, I. H. (1963). *Handbook for the IPAT Anxiety Scale Questionnaire.* Champaign IL: Institute for Personality and Ability Testing

Copenhagen: nielsen&Lydiche. Reprinted 1980 by MeSA Press, Chicago. Spearman, C E (1927). *The Abilities of Man: Their Nature and Measurement.* London: Macmillan.

Feldman, S.R. (2004) "Understanding Psychology" (6thed.). New Delhi: Tata McGraw Hill Publishing Company Ltd.

Gardner, H. (1993). Frames of mind: a theory of multiple intelligences. New York: Basic Books.

Gardner, H. (2006). The development and education of the mind: the selected works of Howard Gardner (pp.50). New York: Routledge.

Linacre, J. M. (2007). From Microscale to Winsteps: 20 years of Rasch Software development. Rasch Measurement Transactions, 17(4), 958.

Pallant, J. (2001). SPSS survival manual: a step by step guide to data analysis using SPSS for windows. (Ver.10). Illinois: Allen & Unwin

Rasch, G. (1980). Probabilistic Models for Some Intelligence and Attainment Tests.

Smith, R.M. Sternberg, R. J., &Lubart, T. I. (1992). Defying the crowd: Cultivating creativity in a culture of conformity. New York: Free Press.

Thurstone, L.L. (1938). Primary mental abilities. Psychometric Monographs (no. 1)

Wechsler, D. (1974). Manual for the Wechsler Intelligence Scale for Children—Revised. New York: Psychological Corporation

Wright, B.D. & Masters, G.N. (1982). Rating scale analysis. Rasch measurement. Chicago: Mesa Press

Wright, B.D. & Stone, M.H. (1979). Best test design. Chicago: MESA Press.

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