Participatory Educational Research (PER)
Vol. 3(1), pp. 40-53, April, 2016
Available online at http://www.partedres.com
ISSN: 2148-6123
http://dx.doi.org/10.17275/per.15.48.3.1

The Weaknesses of "Using Instruments/Inventories" for Determining Multiple Intelligences Profiles

Nida Temiz *
Department of Elementary Education, Başkent University Education Faculty, Turkey

Ercan Kiraz
Professor of Curriculum and Instruction

Article history
Received:
17.12.2015

Received in revised form:
04.03.2016

Accepted:
05.03.2016

Key words:
Multiple intelligences theory, inventories, determining and assessing multiple intelligences

The current study was conducted with the purpose of discovering the incompetence of instrument/inventory usage that 1st, 2nd and 3rd grade teachers utilize to determine their students' multiple intelligences profiles. By this way, the study specifically aims to portray "what" and "what should be" for determining multiple intelligences profiles from methodological dimensions of "using instruments/inventories." The study was an action research through employing criterion sampling method. There were various groups of participants involved in this study. Interviews, observations, and written document analysis were the main data collection methods. Data collection instruments and procedures included interview logs, observation forms, observation notes, evaluation of existing instruments including the Teele Inventory for Multiple Intelligences (TIMI), Multiple Intelligences (MI) Domains Inventory for Educators, MI Domains Observation Form for Students, Multiple Intelligences Inventory for Adults, and Multiple Intelligences Checklist for Students . Descriptive and qualitative content analyses were conducted. The data analysis indicated that most of the tools currently used were demonstrated a great deal of methodological weaknesses and were not appropriate for unveiling the intelligences properly. Also, their existing applications shed light that these tools were not appropriate enough and ignored many cultural aspects in determining intelligences. On the basis of Gardner's speech and related literature, it can be expressed that intelligences could not be identified and assessed via single method, especially paper-pencil instrument formats. Nevertheless, MIT is based on a multiplicity approach and requires combining great effort to reveal intelligences in a correct manner.

Introduction

Gardner challenged the traditional singularity perspective on intelligence that accepted intelligence as a sole capacity which was measured by Intelligence Quotient (IQ) tests like the Binet IQ test. Although Gardner opposed to intelligence testing, like IQ test, there still has been a great tendency to determine and assess multiple intelligences.

* *Correspondence: ntemiz@baskent.edu.tr*

Aborn (2006) stated that knowing the multiple intelligences of their students was essential for teachers firstly to understand the principles of multiple intelligences theory; and then help their students who had learning difficulties by using their strengths as a guide for career development. Educators, researchers, and psychologists have tried to develop practical, reliable, and valid instruments to assist with instruction, counseling, and research since multiple intelligences theory was articulated (Shearer, 2005). However, actualization of the enterprises has not been easy as it was supposed to be since there have been strong issues due to the complex nature of the multiple intelligences. The complexity originated from the multiplicity and interdisciplinary approach in the root of Multiple Intelligences Theory (MIT).

Gardner used a wide array of evidence justifying the MIT. His method distinguished him from many other researchers who have studied MIT in favor of multiple intellectual capabilities. The broad evidence group included cognitive developmental psychology, neuropsychology, evolutionary biology, experimental psychology, psychometric psychology (Kornhaber, 2004), genetics, as well anthropology. Moreover, the *eight intelligences* (Linguistic, Mathematical-Logical, Visual-Spatial, Musical-Rhythmic, Bodily-Kinesthetic, Interpersonal, Intrapersonal, and Naturalistic Intelligence) have their unique identifiable characteristics which distinguish certain sets and behaviors from one another (Aborn, 2006). At this point, it is necessary to define the eight intelligences and one candidate intelligence via literature as followings:

Linguistic Intelligence: It is an ability to understand and use spoken and written communication (Moran, Kornhaber, Gardner, 2006). This kind of ability exhibited in its fullest form by poets. A specific area of brain called 'Broca's Area' is responsible for linguistic skills and if a person with a damage to this area, s/he can understand words and sentences however has difficulty in speaking (Gardner, 1993). The tasks reflecting the intelligence are like reading a book, writing a paper, a novel or a poem, and understanding spoken words perfectly (Sternberg, 2003). The professions related with linguistic intelligence are journalists, writers, lawyers, librarians, museum curators, speech pathologists, radio or TV announcers, politicians, editors (Johnson & White, 2002; Selçuk, Kayılı, Okut, 2004; Shepard, 2004; Yılmaz & Fer, 2003), poets (Moran et al., 2006), novelists, public speakers (Shepard, 2004), teachers, translators, speakers, educational scientists, and comedians (Selçuk et al., 2004).

Mathematical-Logical Intelligence: It is an ability to understand and use logic and numerical symbols and operations (Moran et al., 2006). Certain areas of the brain are responsible for logical-mathematical ability, and, for instance, idiot savants who can perform great of calculation even though they remain tragically deficient in most other areas (Gardner, 1993). Logical-mathematical intelligence is used in solving math problems, balancing a checkbook, and logical reasoning etc. (Sternberg, 2003). The professions matched with mathematical-logical intelligence in the literature are mathematicians, scientists (Johnson & White, 2002; Selçuk et al., 2004; Shepard, 2004; Yılmaz & Fer, 2003), detectives (Shepard, 2004), accountants, engineers statisticians, inventors, judges, critics, (Moran et al., 2006; Selçuk et al., 2004; Yılmaz & Fer, 2003).

Spatial Intelligence: It is an ability to orient and manipulate three-dimensional space (Moran et al., 2006), to form mental model of a spatial world, and to be able to maneuver and operate using that model. The right hemisphere proves to be the site most crucial for spatial processing. Damage to the regions causes impairment of the ability to find one's ways around a site, and to recognize faces (Gardner, 1993). The tasks reflecting the intelligence are getting

from one place to another, reading map, packing suitcases in the trunk of a car so that they all fit into a compact space etc. (Sternberg, 2003). For spatial intelligence, mostly stated professionals are sailors, sculptors, painters, pilots, decorators, engineers, topologists, architects (Selçuk et al., 2004; Shepard, 2004; Yılmaz & Fer, 2003),.

Musical Intelligence: It is the capability to understand and use such concepts as rhythm, pitch, melody, and harmony (Moran et al., 2006). Although musical skills are as not as clearly localized in a specifiable, certain parts of the brain that are responsible for musical ability also located in the right hemisphere (Gardner, 1993). Musical intelligence is used in singing a song, composing a sonata, playing trumpet, or even appreciating the structure of a piece of music, etc. (Sternberg, 2003). The certain professions matched with musical intelligence are piano tuners, musicians, music therapists, choral directors, conductors (Johnson & White, 2002), vocalists (Shepard, 2004; Yılmaz & Fer, 2003), music teachers, disk jockeys, compositors, actors/actresses (Selçuk et al., 2004), composers (Moran et al., 2006; Shepard, 2004; Yılmaz & Fer, 2003).

Bodily-Kinesthetic Intelligence: It is an ability to solve problems or to fashion using one's whole body or parts of body, and control of bodily movement is localized in the motor cortex with each hemisphere dominant or controlling bodily movements on the contra-lateral side (Gardner, 1993). The tasks reflecting this intelligence are dancing, playing basketball, running a mile, etc. (Sternberg, 2003). The professionals matched with bodily-kinesthetic intelligence are physical therapists, dancers, actors, mechanics, carpenters, forest rangers, jewelers (Johnson & White, 2002), surgeons, crafts people (Shepard, 2004), ballerinas/ballets, actor/actresses, carpenters, sculptors, choreographers, magicians (Selçuk et al., 2004; Yılmaz & Fer, 2003), and , athletes (Moran et al., 2006).

Interpersonal Intelligence: It is the ability to understand other people, what motivates them, how they work cooperatively. Damage to this intelligence that is localized in the frontal lobes of the brain can cause personality change (Gardner, 1993). The tasks reflecting this intelligence are related to other people, for example, we use the intelligence when we try to understand another individual's behavior, motives, and emotions (Sternberg, 2003). The professionals related with the interpersonal intelligence are administrators, managers, psychologists, nurses, public relations persons, social directors (Johnson & White, 2002), teachers, social workers, actors/actresses (Shepard, 2004), counselors, psychiatrists (Yılmaz & Fer, 2003), businessmen, religious leaders, organizers, anthropologists, sociologists, doctors, politic party leaders, showmen, marketing experts, social workers (Selçuk et al., 2004), politicians, and salespeople (Moran et al., 2006; Selçuk et al., 2004; Shepard, 2004).

Intrapersonal Intelligence: It is an ability to understand and use one's thoughts, feelings, preferences, and interests (Moran et al., 2006). This intelligence localized in the frontal lobes of the brain. Damage to the lower area of frontal lobes is likely to produce irritability or euphoria (Gardner, 1993). This intelligence is related with understanding ourselves (Stenberg, 2003). The professionals with intrapersonal intelligence are psychologists, therapists, counselors, theologians, program planners, (Johnson & White, 2002), philosophers, therapists (Yılmaz & Fer, 2003), religious leaders, researchers, theoreticians, poets,, craftsmen, artists, writers (Selçuk et al., 2004), entrepreneurs (Johnson & White, 2002; Moran et al., 2006), autobiographers, however high intrapersonal intelligence should help in almost any job because of its role in self-regulation, few paid positions reward a person solely for knowing himself or herself well (Moran et al., 2006).

Naturalistic Intelligence: It is the ability to understand nature's symbols, to respect the delicate balance that lets us continue to live (Nolen, 2003). Naturalistic intelligence is used in understanding patterns in nature (Sternberg, 2003). For naturalist intelligence, the mostly stated professionals are botanists, astronomers, wildlife illustrators, meteorologists, chefs, geologists, landscape architects (Johnson & White, 2002), geologists, farmers, florists (Yılmaz & Fer, 2003), agriculturists, gardeners, agriculture technicians, biologists, veterinarians, ecologists (Selçuk et al., 2004), zoologists (Moran et al., 2006; Yılmaz & Fer, 2003).

Existential Intelligence (candidate intelligence): It is the ability to contemplate phenomena or questions beyond sensory data, such as the infinite and infinitesimal. Although Gardner defines what existential intelligence is, it does not fully meet all of his criteria to be considered as intelligence with its current structure. Because of this, Gardner name it as "half" intelligence (Wehrheim, 2006). For the existential intelligence, mostly stated professionals are consultants, college professors, teachers (Johnson & White, 2002), cosmologist; philosopher (Johnson & White, 2002; Moran et al., 2006).

Although, there are some professions as examples for each intelligence, most professions involve more than one intelligence (Moran et al., 2006). Therefore, some of the professions stated above are matched with two or more intelligences. This can also be explained with the principals of MIT that Gardner (1983) expressed that a normal individual has all the intelligences and strengths as well as weakness in MI, but the intelligences interoperate together to perform something. There is a close relationship between intelligences and there is no single activity which contains only one type of intelligence in real life, people employ different intelligences together even when doing simplest task.

Furthermore, an individual's intelligence profile consists of a combination of relative strengths and weaknesses among the different intelligences (Gardner, 2006 as cited in Moran et al., 2006), and people use various intelligences together when doing a simple task (Gardner, 1983). In spite of the crucial issues about MIT, there have been various methods and instruments used by people to determine both their own or others' multiple intelligences.

According to Shearer (2005), Gardner thought it would be risky to conduct multiple intelligences assessments, depending on various writings of Gardner in five ways:

(1) not intelligence-fair-biased towards linguistic abilities,
(2) confounds interest with demonstrated skill,
(3) promotes labeling of the individual by self and others,
(4) encourages simplistic / superficial understanding of an individual's abilities,
(5) facilitates stereotyping of groups of individuals (p. 2).

On the basis of the above, it is apparent that determining, assessing, and evaluating multiple intelligences is not an easy task, however, there is a demand for proper identification of MI. Therefore, existing methods used to fulfill the demand should be examined; "what is" and "what should be" need to be portrait out for proper identification of intelligences. In this regard, this study aims to actualize examination of methods that related with *"usage of instruments/inventories."*

Research Question

The following research question guided this study:

What are the weaknesses of the method "using instruments/inventories" that 1st, 2nd and 3rd grade teachers utilize to determine students' multiple intelligences profiles?

Method

Having the main purpose of study in mind, an action research, one of the qualitative research types, was conducted.

Participants of the Study

As proposed by Patton (1987) criterion sampling of purposeful sampling methods was selected for this study. In this regard, six teachers who have been familiar with the MIT for at least three years, from one private and one public school, , were selected.. Moreover, the participant teachers' students in six classrooms participated in the study. Totally, 145 students were composed of 1st, 2nd, and 3rd graders involved.

The instrument developers can also be considered as participants, whose instruments have been dominantly used in Turkey, were Dr. Sue Teele who developed Teele Inventory for Multiple Intelligences (TIMI), Dr. Thomas Armtrong who developed Armstrong's Multiple Intelligences Inventory for Adults and Checklist for Adults and Checklist for Assessing Students' Multiple Intelligences.

Data Collection Methods, Sources, and Instruments of the Study

The data collection methods were interviews, observations, written document analysis and the data collection instruments were interview instruments, existing instruments used to identify intelligences, observation forms, researchers' observation notes, and examination logs.

The types of the interviews conducted were semi-structured. Thus, the questions of the interview conducted with the instrument developers were;

- How do you develop your inventory to determine multiple intelligences? - Developing process?
- What do you think about the risky points stated by Shearer (2005)?
- How did you overcome the risky points when developing your inventory?
- What do you think about the ways to determine multiple intelligences? Which one do you prefer mostly? Why? Advantages and disadvantages of the ways; - Inventory - Questionnaire - Observation - Interview with others - Checklist – Others
- What do you think about the origin (cultural aspect) of a way to determine multiple intelligences? - Is it an important aspect or not? - Can a way be international for the purpose of determining multiple intelligences? Why?
- What do you think about the ways to determine multiple intelligences in terms of age, gender, culture, and nationality of the user?
- How do you evaluate existing ways that are easily available via internet, books and other ways? How do you interpret the enterprises and tendencies to determine multiple intelligences? - Reasons? - Results? - Necessity? - Possibility to determine?
- How do you make decision to determine multiple intelligences?

Besides, the related questions of the interview conducted with the teachers were;

- What do you think about the existing ways (- Inventory - Questionnaire - Observation - Interview with others - Checklist – Others) to determine multiple intelligences? – Accessing ways (Internet etc.) – age, gender – origin -
- What do you think about the ways you used to determine your students' multiple intelligences? Efficiency and effectiveness in terms of reaching the goal of determining their multiple intelligences

Observations were conducted by the researcher when the teachers were applying the existing instruments including TIMI and Multiple Intelligence Domains Observation Form using observation form. The observation form included the following items;

- The type of the instrument; - inventory - questionnaire - observation form - test - interview etc.
- Instruction; - teacher instruction – students' implementation of the teacher's instruction - students' questions about the instruction - requirement of extra explanation - intelligibility of the instruction Teacher's role - asking questions - reader of the questions of the questionnaires - marker of the students‟ answers - etc. Students' role - answerer - marker - chooser - etc.
- Materials and documents; - materials students use - materials teacher use - inventory requirements - worksheet - answer sheet - paper - pencil - answer sheet - technology (TV, DVD, projector, overhead projector, tape etc.) - booklet - visual materials - auditory materials
- Communication and interaction patterns; - teacher-students - students-students
- Evaluation and assessment; - evaluation and assessment the teacher conducts - evaluation and assessment the students conduct

As written documents, TIMI, Armstrong's MI Inventory for Adults and Checklist for Assessing Students' Multiple Intelligences, Multiple Intelligence Domains Inventory for Educators and Multiple Intelligence Domains Observation Form for Students were examined. In terms of the principles of MIT and risky points stated by Gardner and Shearer, all the instruments were examined by the teachers and the researchers using the examination log. The examination log included the following items;

- Title of the inventory
- Developer
- Origin (country)
- Implementer (teacher, student etc.)
- Evaluator or Assessor (teacher, student, center etc.)
- Implementation Time
- Materials
- Examination notes in terms of the principles of Multiple Intelligences
- Examination notes in terms of the risky points expressed by Gardner and Shearer
- Examination notes in terms of the 1st, 2nd, 3rd grade students characteristics
- Examination notes in terms of cultural aspects

Analysis of Data

The overall design of the study was constructed in a qualitative manner. The qualitative data were subjected to descriptive and content analysis techniques with the help of the steps constructed on the basis of the descriptions stated by Yıldırım and Şimşek (2003) and Strauss and Corbin (1990). The four main steps are as follows;

(1) Data Coding: Initially, the researcher located the pre-codes. Next, the data was reviewed and divided into its consequential parts and marked in accordance with the pre-codes decided earlier. The researcher then formed the extra code list and coded the data in the light of the complete code list.

(2) Generating Categories: The researcher reviewed the codes all together and found common features among them. The next step was the creation of categories by commonality. Then, umbrella terms of categories were developed in order to systematize the data collected.

(3) Organization and Definition of Data by Codes and Categories: The data were defined and put in order according to the predetermined arrangement by quoting and presenting findings.

(4) Conclusion from Findings: In this step, relationships built through findings were interpreted.

Results

Weakness 1: Not Enough

The data analysis of the study indicated that the method of "using inventories/ instruments" was not comprehensive enough to determine students' multiple intelligences profiles. Dr. Armstrong emphasized that

I believe that the results of any multiple intelligences inventory should be viewed with caution and some skepticism, since a paper and pencil inventory can only give us a limited amount of information about the child's learning needs; it is one tool among many that we should use (Thomas Armstrong, personal communication, December 24, 2007).However, the analysis of the data indicated that instruments including inventories were accepted by most of the teachers as evaluative material presenting quick scientific results without the skepticism expressed by Dr. Armstrong. The following excerpts taken from the informal conversational interviews with teachers; "…I do not understand why I need to use another method to determine my students' multiple intelligences because the inventory was developed by doctors holding Ph. D. degrees" (TC). "I thought that the inventories presented not on the Web but in the books like Saban's book were perfect; however, Armstrong said that we should examine inventories with skepticism ...." (TA).

Analysis of Dr. Armstrong's "Checklist for Assessing Students' Multiple Intelligences" and Saban's "Multiple Intelligences Domains Observation" by the teachers showed that both developers presented the materials in their books about Multiple Intelligences. Moreover, the materials were presented by them in a chapter about determining multiple intelligences and the chapter included various additional methods including the materials themselves. In this regard, the teacher TC expressed that the authors expressed various methods for determining the multiple intelligences such as the checklists and the observation forms. TC also concluded that "since both authors confess that there is no single method appropriately determines MI and requires many other instrument usage in this regard…Therefore, the existing inventories were not sufficient to determine students' multiple intelligences for the authors themselves and for us, I think." Moreover, Teacher TB similarly expressed that had the checklist and the observation form been enough to determine students' multiple intelligences, the developers of

them would not have explained the importance of employing other methods including observation, collecting documents and so forth.

Weakness 2: Not Intelligence-Fair

Gardner (1993) stressed that most testing instruments are biased towards two intelligences; linguistic and logical mathematical. Gardner also proposed a solution to develop instruments that were intelligence-fair by activating all intelligences. The analysis of the existing instruments indicated that TIMI, Dr. Armstrong's Multiple Intelligences Inventory for Adults and Checklist for Assessing Students' Multiple Intelligences and Multiple Intelligence Domains Inventory for Educators, and Multiple Intelligences Domains Observation Form in Dr. Saban's book "Multiple Intelligences Theory and Education" were not intelligence-fair. The analysis indicated that the inventory and checklist developed by Armstrong and the inventory and the observation form developed by Dr. Saban were mainly *linguistic* and the inventory developed by Teele was mainly *visual*.

Data analysis indicated a dilemma about the examinations of Armstrong's Checklist for Assessing Multiple Intelligences and Saban's Multiple Intelligences Domains Observation Form. The dilemma was about who the real user of materials. In addition, most of the teachers stated that the inventories were not intelligence-fair. In fact, they mostly address that both instruments were focused on linguistic and logical intelligences. However, the analysis of their examination logs and interviews conducted with the teachers while the teachers were examining the actual materials indicated that they examined the materials as though the users of the materials were the students. After the analysis appeared, the researcher had to convey the teachers about the real users of the materials. The teachers did not realize the point before the researcher's warning about examining the materials again. It was evident that teachers definitely had some difficulties to understand the usage of those materials.

After explaining the dilemma teachers faced, researchers analyzed examination logs and interview transcripts which conducted when the teachers' were actively examining and employing the forms. The analysis showed the teachers themselves were the actual users of the materials. In this regard, they added that the predicating students' multiple intelligences determination solely on *teacher-directed-observation* were not applicable in many classroom settings. Moreover, the data analysis also showed that some teachers' thoughts emerged from their examinations that intelligence fairness teacher directed issue. In this regard, the teacher TB stated,

> The checklist and the observation form are verbal materials, according to teachers. If an instrument should be intelligence–fair with regard to users, the checklist and the observation form are not proper materials because they require reading and marking…However, if the focus here is students, the materials could not be examined in terms of intelligence fairness for students.

After examining the instruments, the teacher TC said that Armstrong's and Saban's materials are not intelligence-fair because it only activates the linguistic and logical intelligences of the users. Furthermore, the teacher TD expressed that Saban's and Armstrong's materials are not for students' usage, instead, teachers make decisions about their students' intelligences on the basis of their knowledge about them…She followed, in this regard, the teachers use their own linguistic, logical, interpersonal and visual intelligences when completing the materials on behalf of their students…

Moreover, the observation forms showed that there were similarities and differences while the teachers were focusing on intelligence fairness. In this regard, the analysis of observation notes showed that although both Saban's observation form and Armstrong's checklist included items for all intelligences, the analysis of instruments showed that many items were problematic. In fact, the developers themselves had stated that *reliability and validity* issues and scientific development process of the instruments were not conducted.

Additionally, the analysis of the observation notes indicated that the problematic items resulted in the negative effectiveness in their intelligence fairness aspect. Moreover, the analysis pointed out that there was no balance among the items in terms of various aspects including (1) the items composing more than one intelligence equally, (2) the items starting with manipulative words such as enjoy, like; and included interest dimensions, (3) the items inquiring specific points almost all 1st, 2nd and 3rd grade children exhibit. In this regard, the items of the instruments were explained under these aspects.

(1) the items composing more than one intelligence equally

The analysis of observations indicated that the teachers faced difficulties to mark some of the items of the checklist. For instance, only four teachers attempted to use checklist for determining students' multiple intelligences profiles. Of the four, two were able to comprehend the original checklist in its English version. Therefore, the researchers translated the items to the teachers. Teachers' examination proved that many items included more than one intelligence aspect. For example; one of the items belonging to linguistic intelligence was that *"having a good memory for names, places, dates, or trivia,"* the examination of the item indicated that the places aspect might relate with visual spatial intelligence and the date aspect might relate with the logical mathematical intelligence.

The analysis also showed that there were some items composing more than one intelligence respectively in the observation form that presented in Saban's book. The teacher TB stated that "…actually, the item of linguistic intelligence includes not only linguistic characteristics, but also logical and spatial intelligence characteristic."

(2) the items starting with the word; enjoy, like and including interest

The analysis of notes displayed that three of four teachers expressed the items including words such as "enjoy and like" resulted in some skepticism about whether the behaviors implied specific intelligence. Those three teachers mentioned their ambivalence when completing the checklist for determining some of their students' intelligence whether, enjoying, liking or being interested implicated as intelligence. For example, two of the items which belonged to logical mathematical intelligence were *"enjoying playing chess, checkers, or other strategy games,"* and *"liking to do experiments in science-related subjects."*

When completing the checklist, one of the teachers thought aloud "…actually enjoying is different from doing well, I think. Also, I think the item could be one that focuses on playing chess, checkers or other strategy games well and successfully instead of asking enjoyment…" (TC). When completing the checklist, for the item *"loves to take things apart and put them back together again"* would be behavior related with enjoying originated from various reasons…Another teacher also said one of the reasons was that the item might originate from the student's wanting to take attention …. (TB).

Moreover, the analysis indicated that not only the checklist, but also the observation form had

the items focusing and including the words like, love, enjoy, interest. In this regard, the excerpts were as follows,

> …Like the Armstrong's checklist, the observation form includes items related with loving, liking, and enjoying. The item *"like math course very much"* is presented in the part of logical math intelligence. I do not believe that liking math course is one of the signs indicating dominant logical mathematical intelligence (TC).

When thinking on the item "likes films, slides and other visual presentations" for one student, the teacher TE said "lets look at the item. How can I decide on the item for the student? I ask the question to myself because the student does not like them but he learns with visual presentations well. I cannot understand why "liking."

(3) the items almost all 1st, 2nd, and 3rd grade children enact

The researcher's observation and examination notes indicated that some of the items in the checklist included behaviors exhibited by almost all 1st, 2nd and 3rd grade children and when observing the implementation process of the teachers. The researchers took notes during the teachers' think aloud process. Following are excerpts indicate this issue:

Some of the items included by some of the intelligences had things that are liked shared by almost all children. For example, *"likes to view movies, slides, or other visual presentations"* is one of the items for the spatial intelligence part. However, almost all children like to view movies, slides and other visual presentations. Another example was related with bodily kinesthetic intelligence part. The item *"enjoys running, jumping, wrestling, or similar activities."* This behavior is also enacted by all children (TB)…Most of the items of bodily kinesthetic intelligence part were exhibited by almost my all students. For example, the item *"moves, twitches, taps, or fidgets while seated for a long time in one spot."* And the item *"enjoys working with clay or other tactile experiences (e.g., finger-painting)*" (TE)…I see the item related with math games for mathematical logical intelligence. However, the item also included phrase "computer games." I think all students like computer games. Computer games are not limited to logical mathematical intelligence (TD).

The analysis also indicated that some of the items included behaviors exhibited by most of the 1st, 2nd and 3rd grade students. Data analysis show that there were items criticized as too general in the observation form. In this regard, the teacher TF, for the item *"pronounce word appropriate to their age level accurately,"* stated that "the characteristic is general for all children. Today's children speak fluently and have good pronunciation. I do not understand why the item is put in the part of the linguistic intelligence."

The teacher TB also said "the item is very general because the 1st, 2nd and 3rd grade children like running, jumping and acting" for the item "likes running, jumping and such physical behavior very much" in the part of bodily kinesthetic intelligence.

Weakness 3: Cultural Difference

One of the questions in the formal interview document prepared by the researcher for the participants of the study was related with the importance of the cultural aspect. The analysis of the answers to the question in the interview document showed that Dr. Armstrong agreed with the importance of the cultural aspect and emphasized the effects of culture in determination process of multiple intelligences. He stated that

> This is interesting given the chapter I've just written on cultural issues around MI; I think the idea of creating paper and pencil "tests" is a very western-European idea; other cultures determine competency in very different ways, especially through active demonstration of a competency (e.g. the old apprenticeship system, whereby the apprentice must make a boot, or table, or necklace, or spear, as well as the master). (Thomas Armstrong, personal communication, December 24, 2007)

Dr. Teele had thoughts opposite to Armstrong's about the possibility of an international way. For, Dr. Teele, the cultural aspect was very important; however, she stated that it was possible to determine multiple intelligences using an international method. She stated that

> … What I have focused on with my instrument being used in 35 countries is that there are both commonalities and differences in how individuals learn in different countries. The instrument is more difficult if it is linguistic as language interpretation becomes a variable. (Sue Teele, personal communication, January 7, 2008)

Dr. Armstrong stated that

> No, I don't believe there would be one international way to determine multiple intelligences; I think the "international way" would be to gather together assessment approaches from many different cultures, and use the best elements of each. (Thomas Armstrong, personal communication, December 24, 2007)

Although Dr. Armstrong stressed the cultural aspect as inventory developer and expert. The analysis of the existing and mostly used instruments including inventories in Turkey showed that the inventories originated in foreign countries did not take cultural aspects of Turkey into consideration. The analysis of the observation conducted when TIMI was applied to the students showed that the students had difficulties in understanding some pictures in TIMI. The result of the data implied the importance of cultural differences. For example, TIMI as a written document showed that the inventory did not include naturalistic intelligence. However, naturalistic intelligence was added by Gardner as an intelligence to multiple intelligences in 1997. Although, TIMI did not include naturalistic intelligence, five pictures of 56 pictures suggested naturalistic intelligences according to analysis of TIMI. The codes of the pictures were 6B, 13A, 20B, 23B, 24B. The analysis of the observations conducted during the implementation of TIMI in the classrooms also supported this result. During the implementation of TIMI, teachers as implementers asked the children to express their reason of choosing the specific picture. Most of the children explained their reasoning as the pictures' relation with the nature.

Furthermore, during the implementation of TIMI in the classrooms indicated that mostly 1st grade and 2nd grade students and some of 3rd grade students asked the same question: "Which bear should I think?" The pictures were 3B, 4A, 10B, 15A. Moreover, the analysis of the observation displayed that most of the 1st and 2nd grade students did not choose the picture 21B. The students' stated reason was that there was a depressing atmosphere in the picture. In addition, all students put various meanings on the picture 25B. However, none of the questions was related with intrapersonal intelligence, but they were related with interpersonal intelligence.

The analysis showed that nine 1st, eight 2nd and twelve 3rd grade students said that the panda bears in picture 25B were playing a game. One of the 1st grade students stated that the panda bears were government employees and they were going to have lunch together in the lunch break.

The data analysis of the study showed that the picture 8A was criticized by one of 3rd grade students who stated that "I like reading and books; however, the panda bear sits on the books. The bear shows misbehavior, so I did not select the picture." Most of the students participating in the study asked the researcher to explain the pictures 11A, 12A, 12B, 18B because of English sentences integrated in the pictures. Some of them have chosen the pictures while some have not even after the researcher's explanation.

Discussion, Conclusion, and Suggestions

In order to determine or assess multiple intelligences profiles, there were various methods and instruments in media including books, magazines, internet etc. Armstrong (2000) gave a warning that educators should be skeptical about the computer-scored test that in fifteen minutes could provide a bar graph displaying eight intelligences of each students in class or school saying that "There is no "mega-test" on the market that can provide a comprehensive survey of your students' multiple intelligences" (p. 21). Not only Armstrong, but also Gardner and Shearer stated risky points of the materials including tests, inventories etc. had been used by educators regardless of examining them in terms of being scientific, reliable, and valid. Such demanding actions displayed by educators including teachers without questioning might be defined as interesting and also indicate that there has been a need "to determine multiple intelligences profiles appropriately."

In this study, the method "using instruments/inventories" were examined. According to results, the weaknesses of the method were definite as not being intelligence fair, not being enough by itself, and not taking cultural aspect into consideration.

When the weaknesses are examined in-depth and detail, it is seen that the weaknesses are inevitable. One of the weaknesses resulted from the study was "not being intelligence fair." Gardner's following speech explains the weakness. He expresses the importance of the enormous changes in the conceptualization of intellect that have emerged in recent years from the new fields of cognitive science, neuroscience, and artificial intelligence (Gardner, 2004) said,

> These disciplines now recognize a multitude of intellectual capacities, each entailing its own processes and its own neural representation. Developed over the last 25 years, my own theory of multiple intelligences (MI) attempts to incorporate findings from these and other disciplines. It posits a set of eight or more separate intellectual capacities, each of which has at least some independence from the others. The degree of autonomy is difficult to establish because we lack "intelligence-fair" measures: So long as all intelligences are assessed via identical paper-and-pencil formats, there may be an inflated correlation among them (2004, p. 4).

Furthermore, Multiple Intelligences Theory explained the results related with "not being enough by itself," and "not taking cultural aspect into consideration." Theory was based on the multiplicity approach. The most popular intelligence definition done by Gardner was "…is the ability or set of abilities that allows a person to solve a problem or a create product that is of value in one or more cultures" (1983, p.x). In this regard, it can be said that

intelligence(s) was/were displayed via various ways. The results of this research expressed that MIT should be based on a multiplicity approach since intelligences are very complex constructs and identifying and assessing those via one specific method, especially through paper-pencil instrument formats, is impossible.

Acknowledgments

This article is a part of the doctorate thesis "An Action Research on Program Development Process for Determining Multiple Intelligences Profiles of 1st, 2nd and 3rd Graders"

References

Aborn, M. (2006). An intelligent use for belief. [Electronic version]. *Education, 127*(1), 83-85.

Armstrong, T. (2000). *Multiple intelligences in the classroom* (2nd ed.). Alexandria, Virginia: ASCD.

Gardner, H. (1983). *Frames of mind.* New York: Basic Books.

Gardner, H. (1993). *Multiple intelligences: The theory into practice.* New York: Basic Books.

Gardner, H. (2004). Audiences for the theory of multiple intelligences. *Teachers College Record, 106* (1), 212-220. doi: 10.1111/j.1467-9620.2004.00329.x

Johnson, K. & White, J. T. (2002). The use of multiple intelligences in criminal justice education. *Journal of Criminal Justice Education, 13* (2), 369-386. doi: 10.1080/10511250200085531

Kornhaber, M. L. (2004). Multiple intelligences: from the ivory tower to the dusty classroom - but why? *Teachers College Record, 106*, 67-76. doi: 10.1111/j.1467-9620.2004.00319.x

Moran, S., Kornhaber, M. & Gardner, H. (2006). Orchestrating multiple intelligences. *Educational Leaderships, 64* (10), 22-27. Retrieved from Academic Search Complete database.

Nolen, J. L. (2003). Multiple intelligences in the classroom. *Education, 124* (1), 115-119.

Selçuk, Z., Kayılı, H. ve Okut, L. (2004). *Çoklu zeka uygulamaları* [*Implementations of Multiple Intelligence*] *(3rd ed.)* Ankara: Nobel.

Shearer, C. B. (2005). Which multiple intelligences assessment is appropriate for your purposes? Retrieved January 24, 2009, from

http://www.miresearch.org/files/Is_MIDAS_Appropriate.doc

Shepard, J. S. (2004). Multiple ways of knowing: fostering resiliency through providing opportunities for participating in learning. *Reclaiming Children and Youth, 12* (4), 210-216. Retrieved from Academic Search Complete database.

Strauss, A. & Corbin, J. (1990). *Basics of qualitative research. Grounded theory procedures and techniques*. Newbury Park, California: Sage.

Sternberg, R. J.(2003). *Cognitive psychology (3rd ed.).* Belmont: Thomson Wadsworth.

Yıldırım, A. ve Şimşek, H. (2003) *Sosyal bilimlerde nitel araştırma yöntemleri.[Qualitative research technique in Social Science] (3rd ed.).* Ankara: Seçkin.

Yılmaz, G. & Fer, S. (2003). The students' opinion and achievement concerning instructional activities based on multiple intelligences theory. *Hacettepe Üniversitesi Eğitim Fakültesi Dergisi, 25,* 235-245.Retrieved from ULAKBIM Turkish National Databases

Wehrheim, A., C. (2006). Current research in learning, the brain, intelligences, and bullying. *The Clergy Journal, 82* (4), 9-10. Retrieved from Academic Search Complete database.