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Review

Systematic analysis and interpretation of collected data for a research study: A practical methodological framework for writing research report

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Two basic data sources required for research studies have been secondary and primary. Secondary data collection helps the researcher to provide relevant background to the study and are, in most cases, available for retrieval from recorded sources. Primary data collection requires the researcher to venture into the field where the study is to take place; armed with the relevant instruments - questionnaire, interview schedules or arranged meetings with the selected population - to solicit the necessary information. Data collected assist the researcher to answer the research questions and address the research problem. The collection, treatment, analysis and interpretation of both secondary and primary data combine to make the researcher produce a report. This paper proposes to present a systematic methodological application where data collected for a research study can be conveniently treated, analysed and interpreted. Attempt to present the collected primary data in both quantitative and qualitative spheres will be made so that researchers who use either method or both are able to apply them confidently.

Key words: Research study, researchers, data, analysis, statistics.

INTRODUCTION

In any kind of research study, researchers collect a large amount of disjointed data by using the most appropriate data collection methods and techniques (Fitz-Gibbon and Morris, 1987; Morris et al., 1987; Patton, 1987). Qualitative and quantitative approaches lend themselves for application (Bryman, 2004). The choice of a methodology or multiplicity of methods for a research study has also been a major problem, especially, to beginning researchers (Boaduo, 2005, 2006). Some researchers prefer to use either a single method or a multiplicity of them, usually referred to as triangulation. Data can be statistically treated, analysed and interpreted. However, most analysis and interpretation apply the qualitative approach because it does not demand elaborate mathematical treatment and analysis.

It is very important to consider the levels of methodological dimensions in a research study. These enable the researcher to identify the most relevant and applicable methodological paradigms that will lead to the successfully completion of the study. Mouton (1999) believes that methodological paradigms – for instance those related to qualitative, quantitative and participatory action – are not merely collections of research methods with their applicable techniques. They include certain assumptions and values regarding their choice and use under specific circumstances (Figure 1). According to Boaduo (2005, 2006), at the level of a research where the researcher has to make a choice concerning methods

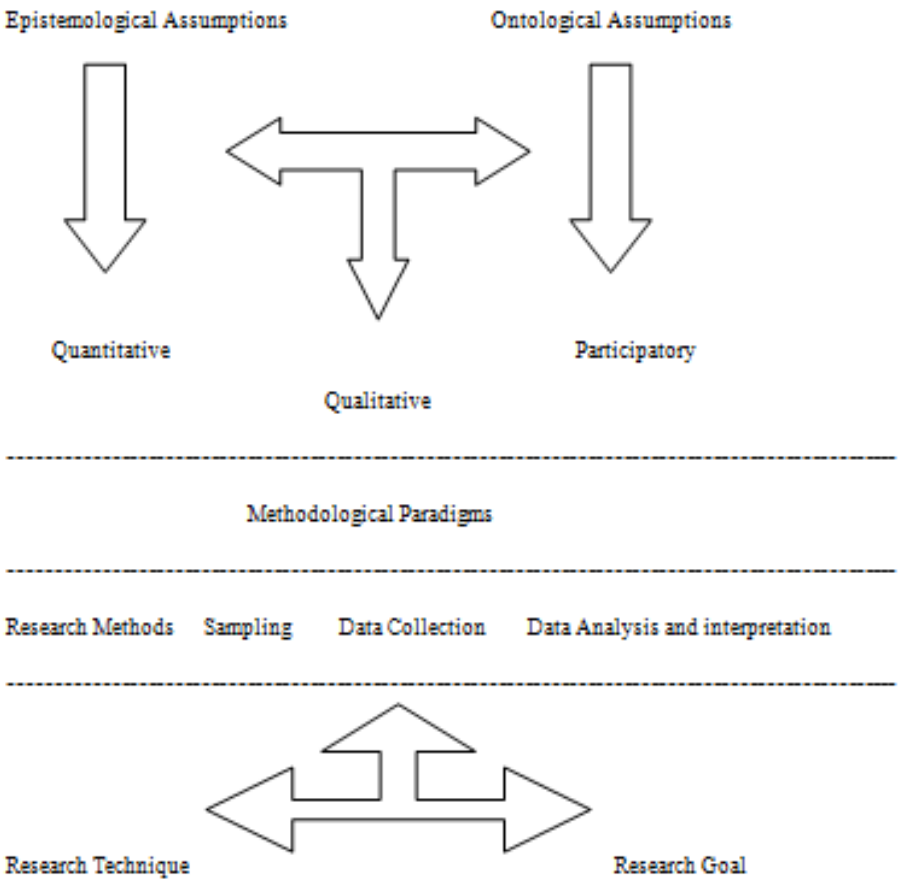

Figure 1. Levels of methodological paradigmatic dimensions. Source: Mouton (1996) with modifications by the author of article.

for the study, the researcher has to encounter both the actual applicable methods and techniques and the underlying philosophy regarding their use in the study. The philosophy will include theory of when and why to choose and apply, for instance, qualitative rather than quantitative method; and the awareness of the limitations of equally applicable and relevant various methods.

According to Boaduo (2005, 2006), the relevance of methodological paradigms pertains to the emphasis placed, with respect to the fact that:

1) Research methods and techniques are task specific and the task is often defined by the research goal.
2) Different research studies use different research paradigms, methods and techniques because they have different objectives.
3) The research paradigms, methods and techniques must be appropriate, relevant and applicable for the task under study.
4) The research paradigms, methods and techniques should apply to all the aspects of the research study, which are sampling, questionnaire, interview schedule design, data treatment, analysis and interpretation.

Data and data sources

Data, according to many authors are series of observations, measurements, facts and information that are required to be collected, systematically organised, treated, analysed and interpreted to provide the research report (Neuman, 2000; Fits-Gibbon and Morris, 1987; Wiersma, 2000; Gay and Airasian, 2000; Bryman, 2004; Baker, 1999; Miles and Huberman, 1994). The term can be used as a singular or plural (Collins English Dictionary, 2004). Data can be numerical or non-numerical forms of information and evidence that have been carefully gathered according to rules or established procedures (Neuman, 2000). Data can be grouped into qualitative and quantitative. Technique, method or strategy, applicable to particular data collection is always used in a research study. However, it is possible that a multiplicity of techniques, methods or strategies can be used in the collection of data. In all research studies the data that are to be collected should be relevant and contribute towards finding answers to the research questions that help to solve the research problem.

It is important to indicate that the technique, method or

strategy for data collection can be grouped into two categories. These are quantitative (collecting data in the form of numbers, especially statistical data) and qualitative (collecting data in the form of words or pictures). What needs to be taken into account is that some techniques, methods and strategies are more effective and efficient when addressing specific kind of research questions or topics. However, it takes knowledge and skill, practice and creativity to match a research question to an appropriate data collection technique, method or strategy (Patton, 1987; Fitz-Gibbon and Morris, 1987).

Data and measurement

A research report stands on the quality of the facts and data on which it is based. It is important to indicate that an excellent research design and a very representative sample are not sufficient to ensure good results if the analysis rests on incorrect data. The importance of constructing an appropriate and accurate instrument for measuring and collecting data is absolutely necessary. The different scales of measurement depend on the type of research and the type of data being collected. Through data collection, the researcher comes into direct contact with other human beings. It is of prime importance, therefore, that attention is drawn to some ethical considerations concerning the rights of the participants (Bless and Higson-Smith, 2004).

Facts are empirically verifiable observations. Data consists of measurements collected as a result of scientific observations. Furthermore, data are facts expressed in the language of measurement (Henerson et al., 1987). In the light of this, measurement is used in a general sense. One can measure the intensity of an attitude, perception or feeling. For instance, a person's view on an educational reform could be positive, negative or neutral. The fact that this person takes a definite position towards an issue in education becomes data once it is expressed in a measurement (Herman et al., 1987). Data therefore, can be classified according to the way in which it was collected or in terms of its intrinsic properties (Miles and Huberman, 1994; Bless and Higson-Smith, 2004).

Researchers collect their own data in the field for the purpose of a particular study; this is called primary data. Data collected in this way should be appropriate to the aims of the research and must always be directed towards answering precisely the questions raised by the researcher in the research proposal which later form the basis of the questionnaires prepared to gather additional primary data (Fitz-Gibbon and Morris, 1987).

Researchers also use data collected by other researchers in relation to other research problems as part of the usual gathering of secondary sources as in the case of population census, or the reports of other researchers or even in published and unpublished documented sources. Such data broadly constitute secondary data. Generally, the need for secondary data through the activity of literature review is to search and identify information that would enable the researcher find out about what other researchers have done, and they did not do in order to establish a gap lapse; to augment the study under investigation without repeating a study that has been already conducted (Boaduo, 2005, 2006; Bryman, 2004; Bell, 2004; Miles and Huberman, 1994).

Qualitative research and qualitative data

Generally, all data collected for any research study are either quantitative or qualitative. They may refer to essences of the researched – people, objects and situations (Berg, 1989). Miles and Huberman (1994) hold the view that qualitative research is conducted through an intense and prolonged contact with the field or real life situation. According to them these situations are typically normal ones, reflective of the everyday life of individuals, groups, societies and organizations. They further indicate that the researcher's role is to gain holistic (systematic, encompassing and integrated) overview of the context under study; its logic, arrangements, explicit and implicit rules. In this way, the researcher attempts to capture data on the perceptions of local actors from the inside, through a process of deep attentiveness, of empathetic understanding and of suspending preconceptions about the topic under study. The onus of this exposition is that reading through these materials, the researcher may, under special circumstances, isolate certain themes and expressions that can be reviewed with informants during data collection but that should be maintained in their original forms throughout the study.

Jacob (1987) in his research taxonomy lists five major qualitative research traditions. These are ecological psychology, holistic ethnography, ethnography of communication, cognitive anthropology and symbolic interactionism. He uses dimensions including assumptions about human nature and society, the focus (that examines the content at social level) and the methodology (which attend to the research design, data collection and analysis) (Miles and Huberman, 1994).

According to Tesch (1990) the main task of qualitative research is to explicate the ways people in particular settings come to understand, account for, take action and otherwise manage their day-to-day situations. Tesch holds the view that many interpretations can be accorded to the data collected which are more compelling for theoretical reasons or on grounds of internal inconsistency. The contention to this view is that relatively, little standardized instrumentation is used at the outset. In this way, the researcher is essentially the main measurement device in the study to provide appropriate interpretation. This leads to the view that

most analysis is done with words. These words can be assembled, sub-clustered and broken into semiotic segments. They can be organized to permit the researcher to compare and contrast, analyze and bestow patterns upon them making the data intelligible for use and application (Miles and Huberman, 1994). The words chosen for the description are usually based on observation, interviews or documents and according to Atkinson (1991, 1992) are texts constructed by the field worker on the basis of observation and participation. Wolcott (1992) is of the opinion that watching, asking and examining, as the collection of the data proceeds, influence, to some extent, the interpretation given by the researcher because the data collection activities are carried out in close proximity to a local setting for a sustained period of time, usually the duration of the data collection period.

Approaches to quantitative and qualitative data analyses

Fitz-Gibbon and Morris (1987) state clearly that there are three ways in which quantitative statistical techniques can be used in quantitative study. These applications are to:

i) Describe data;
ii) Generate hypotheses; and
iii) Test hypotheses.

In the description of quantitative data there is need to summarize the scores in the collected data, describe them economically and accurately. Statistics used to describe data in this format are descriptive statistics.

In the generation of hypotheses, a large amount of information-like responses from many different kinds of respondents to some questionnaire may be collected. It is ideal to use statistics to identify if there are any patterns in the data to be able to generate hypotheses. Searching through the data for relationships is sometimes tedious but can also mean a successful exploratory data analysis (Tukey, 1977). It is always necessary to recognize the generation of hypotheses and the testing of hypotheses. It is important to realize that the same procedures used to search a set of data for relationships can also be used to test hypotheses to see if there is strong evidence that a relationship is just more than a chance pattern in the data.

The need for hypothesis testing arises in a research study from the fact that researchers always work with limited data especially population sampled for the study; and hope to be able to generalize from small samples to larger samples. Researchers usually do this by drawing inferences from small samples and the statistics used to do this are referred to as inferential statistics. Statistics gives researchers some reassurance in quantitative data analysis; there may not be proof or certainty in their application (Fitz-Gibbon and Morris, 1987).

Miles and Huberman (1994) view the line of enquiry in qualitative study as “human activity or text – as a collection of symbols expressing layers of meaning”. For Dilthey (1911, 1977) and the phenomenologists Maykut and Morehouse (1994), the way to qualitative enquiry leads to deep understanding of the subjects of the enquiry. There is practical understanding of meanings and actions. To the social interactionists, interpretation comes via the understanding of group actions and interactions (Dey, 1993). They argue that they have their own understandings, convictions, conceptual orientations and are members of a particular culture at a specific historical moment. More importantly, they are affected by what they hear and observe in the field unnoticed. However, in both cases there is an inevitable interpretation of meanings for the social actors and the researcher. It is important to note that in deciding what to leave, what to highlight, what to report first and last, what to interconnect and what main ideas are important in collected data for a study, analytic choices are made continuously (Yin, 1994).

General steps in data analysis and interpretation

Yin (1994) stresses that to interpret data collected for a research study it is important to use meaningful categories to organise them in order to get precise measure of the variables concerned. Generally, problems of analysis and interpretation are pervasive in any research study which data in any category is considered (Mason, 1994; Strauss, 1993). Again in any research study, numbers (statistical data) are not enough (Boaduo, 2006). To make these quantitative numbers reasonable and useful, they have to refer to concepts established through qualitative analysis (Bryman and Burgess, 1994). While quantities are powerful because of the complex mathematical operations they permit, they mean nothing or mean very little if at all, in themselves unless they are based on meaningful conceptualization. In other words, social or scientific research based on quantitative data without qualitative data would not connect and interact well with the world. Therefore, data obtained through the instruments selected for a research study must be grouped (or categorized), analysed and interpreted in a generally or specifically acceptable manner making the findings revealed by the data and the recommendations made, based on the findings as applicable and relevant to practitioners and the public for articulation. In the analyses of data collected for a qualitative research study, two kinds of descriptions are used: These are “thin” and “thick” (Geerz, 1973; Denzin, 1978; Delamont, 1992). The “thin” descriptions merely state facts while the “thick” descriptions include information about the context of the act, the intentions and the meanings that organise the action and its subsequent evolution (Boaduo, 2006;

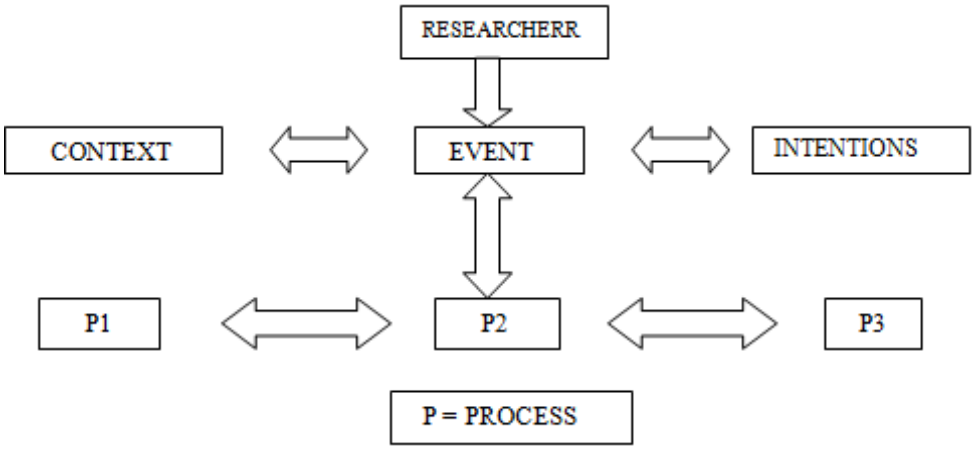

Figure 2. Three aspects of description in qualitative analysis. Source: Boaduo (2006).

Charles, 1995; Soltis, 1990). In most circumstance in a research study, qualitative analysis aims to provide thorough descriptions of the collected data to make them meaningful to readers and practitioners (Dey, 1993). Figure 2 represents the three aspects of description in qualitative analysis namely context, intention and process.

From this perspective, the analysis becomes intertwined and moves into an iterative spiral from data to classifying – describing – and connecting to an account of what the data revealed. This is represented in Figure 3. By doing this, the context of the data, intention and process of the research study and the complete classification of the data have been given the attention they need for the explicit interpretation of the collected data (Boaduo, 2006).

The need to take account of context in a research study is a recurrent theme in qualitative analysis. Context is important in qualitative analysis because it serves as a means of situating action and of grasping its wider social, economic, political, scientific and historical import. This may further require detailed descriptions of their social setting within which action occurs: The relevant social context may be a group, organization, culture, society or a system; the period within which the action takes place; the spatial context and the network of social relationships (Dey, 1993; Boaduo, 2006).

In this study, qualitative analysis aims at describing the world as different observers (researchers) perceive it. The analysis is usually concerned with how actors define situations and explain the motives, which govern their actions. It must therefore, be ensured that this relates to intentions of the actors involved in the final research study report (Dey, 1993; Boaduo, 2006; Stake, 1994; Carspecken, 1996).

Qualitative research often seeks to illuminate the ways individuals or objects interact to sustain or change social situations. Qualitative data therefore, is descriptive of social relationships and interchange, which unfold in the succession of action and events in which the actors are engaged (Dey, 1993). Data collected can themselves be conceived as interactive process through which the researcher struggles to elicit meaningful interpretation of social action and even becomes participant observer.

In all research studies, analysis follows data collection. The result of the analysis depends on and is modified by the collection and the investigation of further data if required. In this way the researcher becomes a participant in the research project. The interpretations and actions become legitimate object of subsequent analysis by other researchers. Furthermore, information on the researcher's own behaviour and thinking in the form of field notes, memos and diary can become a vital source of data for the overall analysis to augment the final report for the study (Miles and Huberman, 1994). In this way, the process shifts attention from context and intention to action and consequences (Sayer, 1992). In putting together and relating the central characteristics through a reasoned account, description acquires its unity and force. Description, according to Dey (1993) "…tells of a story about the data and uses a range of techniques such as - summarising events, focusing on key episodes, delineating roles and characters, setting out chronological sequence – to construct an illuminating narrative". According to Miles and Huberman (1994) a fairly classic set of analytic sequential move follows this pattern:

1. Affixing codes to a set of field notes drawn from observation or interviews.
2. Noting reflections or other remarks in the margins of the field notes.
3. Sorting and sifting through these materials to identify similar phrases, relationships between variables, patterns, themes, distinct differences between subgroups, and common sequences.

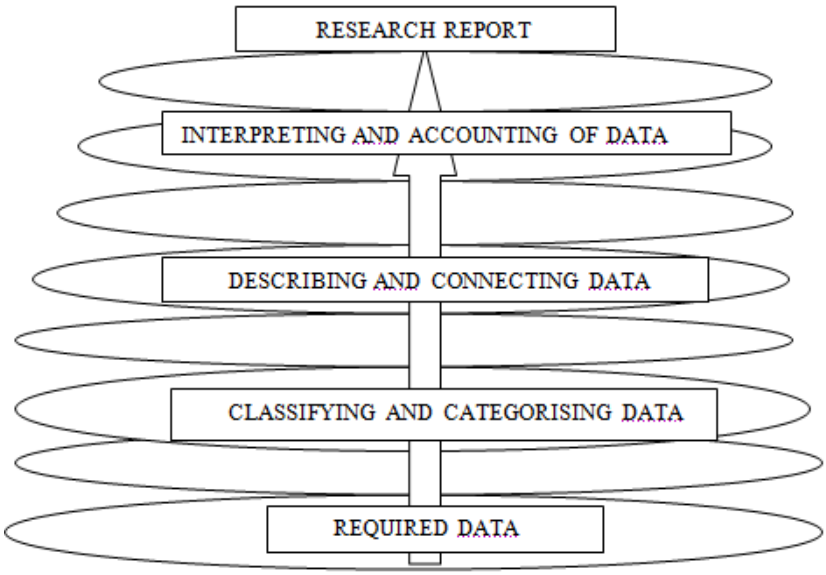

Figure 3. Qualitative analysis as iterative spiral. Source: Boaduo (2006).

4. Isolating these patterns and processes, commonalities and differences and taking them out of the field in the next wave of data collection if required.
5. Gradually elaborating a small set of generalizations that cover the consistencies discerned in the database, and finally.
6. Confronting those generalizations with a formalized body of knowledge in the form of constructs or theories.

Interpretation and explanation of data are the key responsibilities of the researcher. In all research studies, it is necessary to develop a meaningful and adequate account of what has been researched. The data collected provide the basis of analysis (Burgess, 1982; Tuckman, 1988). The collected data require the development of a conceptual framework upon which the actions or events researched can be rendered intelligible for use or replication (Yin, 1994). To explain is to account for an action. Interpretation requires the development of conceptual tools through which to comprehend the significance of social action and how actions interrelate. Interpretation therefore, makes the analysed data meaningful to practitioners and users.

Classification involves breaking up collected data and then bringing the parts logically together again into related sequence. The data then form the conceptual foundation for a specific analysis. Classification therefore, becomes a familiar process of practical reasoning. Categorising and retrieving data provide the basis for comparison. Redefining categories can produce more rigorous conceptualization. Classification, in all cases, is guided by the research objectives and once data have been classified and categorised; they lead to finding answers to the research problem or creating more confusing problems for further investigation by other researchers who may find solace in them (Dey, 1993).

Making connections and establishing relationships among data

It is very important to know and understand precisely that data collected for a research study cannot be left as the last resort of what have been found in the field by the researcher. In effect, classification helps to produce an account of analysis that can be adequately interpreted. In all forms of research, concepts are the most significant building blocks of analysis. In this case, the first major task is to make these building blocks and then put them together (Dey, 1993; Boaduo, 2006). Connecting concepts is the analytic equivalent of putting mortar between the building blocks (Yin, 1994). Generally, classification lays the foundation for identifying substantive connections. In this way associations between different variables are identified and once the data are classified, regularities, variations and singularities can be isolated and specifically defined (Figures 2 and 3).

Conclusion

A research of any kind is endlessly creative and interpretive. In the research process there is need for problem identification, statement of purpose with the most adequate and relevant critical questions that have to be answered clearly listed. Various sources of literature have to be consulted to be able to identify the “gap lapse” that has to be filled by the study being undertaken. A rationale for the study has to be stated as

well as the provision of the theoretical framework upon which the comprehensive explanation for the whole research event is dependent. The study should be put in a relevant and applicable methodological perspective philosophically. The data collection methods and techniques should be provided by considering the research parameters within which the data required for the study will be collected. A field text has to be created which will comprise field notes, questionnaire and interview schedules, observation and document review. This indexing is the basis for the final report of the study (Boaduo, 2006; Sanjek, 1990; Plat, 1990; Denzin and Lincoln, 1994; Delamont, 1992; Stouthamer-Loeber and Van Kammer, 1995). The notes are based on the field text and recreated as a working interpretation document containing all the initial and subsequent attempts to make sense of what has been learned and found in the field (Boaduo, 2006; Carspecken, 1996). The final research report is produced from the field text (notes, observations, questionnaires, interview and documents) through classification and categorization. The analysis and interpretation should focus on context, intention and process to be able to give a valid interpretation of the data obtained in the field and literature review for the study. The findings listed, the conclusions drawn and the recommendations that the researcher will provide should be based on what the collected data for the study revealed. In a nutshell, this is the essence of making sensible quantitative and qualitative data collected for a research study through the most practical, systematic, relevant and applicable methodological choice and application to produce a professional master piece of a research report.

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Full Length Research Paper

The main reasons of declining educational standards at secondary level in Karachi, Pakistan

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The cause of this investigation was to identify the main reasons which decline the educational standards at secondary level in Karachi, Pakistan. It was carried out through survey. The population of the study was both "government and private" schools students and teachers. The views of male and female students and teachers were sought out. One hundred respondents were randomly selected. The questionnaire was used as a research instrument which was consisted of 25 items. Data collected on two point scale questionnaire and was analyzed by using percentage method. Majority of the respondents had the view that the existing ineffective curriculum and evaluation system are the main reasons of declining educational standards at secondary level in Karachi, Pakistan. Many of the respondents stated that imperfect administration along with bad inspection system became its reasons. Short number of respondent opinioned that improper health facilities, lack of co-curricular activities and outmoded teaching methods caused the sub standard education.

Key words: Secondary level, standards, curriculum, evaluation system, co-curricular activities and teaching methods.

INTRODUCTION

The education is becoming one of the defining enterprises of the 21st century with the emergence of globalization and increasing global competition. Aslam (2005) describes that in the fast changing and competitive world, education and technology are the master keys for respectable survival and progress of Pakistan. Pakistan is determined to respond positively to emerging needs, opportunities and challenges of globalization. Education is being considered a key to change and progress. Progress and prosperity of the country depends on the kind of education that is provided to the people. This study was designed to explain and highlight the standards of education at secondary level in Karachi. Educational standards present criteria by which judgments can be made by state and local school personnel and communities, helping them to decide which curriculum, laws of administration, health program, staff development activity and assessment program is appropriate. Educational standards encourage policies that will bring coordination, consistency, and coherence to the improvement of the process of education. They allow everyone to move in the same direction, with the assurance that the risks they take in the name of improving education will be supported by policies and practices throughout the system. JavaScript (story print) (2004) evaluated that Academic standards describe what students should know and be able to do in the core academic subjects at each grade level. Content standards describe basic agreement about the body of education knowledge that all students should know. Performance standards describe what level of performance is good enough for students to be described as advanced, proficient, below basic, or by some other performance level.

Usually educational standard stands for quality of education. Quality has been the goal of an eternal quest through the corridors of human history. It has been the divining force of all human endeavors. Concerning standard or quality of education the Marmar (2005) clears that defining quality of education is a challenge since it deals with the most sensitive creation on earth, the human beings. Industrial products are finished goods, but

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education has no such finished product, nor even the graduates. Educational standards of Pakistan have been a burning issue among the educationalists since independence. Every member of the society has its own views concern the educational standards in Pakistan. Although, every government tried its best to raise the standards of education but their efforts were mainly limited to preparing only educational policies in papers. We could not find practical implementation of their recommendations regarding standards of education in Pakistan. In the more vast sense a standard is any thing used to measure, for example a standard of conduct, a standard of weight or length. Actually a standard is a thing which has been used as a model to which objects or actions may be compared. The standard of education is defined in Encyclopedia of Education (1985) in the following sense:

> "In the education context, then, standards should be regarded as objectives to be achieved or expectations of desirable attitude or levels of performance".

For more defining the standard of education, we actually have to provide the answers of some questions, like which types of aims regarding education are considered in the current educational system? How these aims are set? To what extent these aims are achieved? How much these aims are related with the society? Which principles are considered while planning curriculum? Which teaching method can be suitable according to the age and psychological need of the child? By providing the answers of these questions we can describe the standards of education easily. The present education system of Pakistan has failed to disclose before the new generation the founding reasons of Pakistan. Musa (2005) stated that the disastrous results of this negligence are now evident in every walk of life. The responsibility for this deterioration lies with influential factions and those in power. The most alarming aspect besides ideological confusion and moral degradation is the falling standard of education. Due to constant decay Pakistan educational document are now no more acceptable abroad. Muhammad (2009) stated that currently, the government claims that Pakistan has a literacy rate of 47%. However, independent analysts and educational organizations put the actual figure at about 20% at secondary level. Most of the private schools serve as tuition centers to prepare students for board exams, rarely providing quality education and opportunities for intellectual growth. It is noteworthy to mention here that the GDP for education was 2.4% in the 1988, while despite claiming the sky high efforts by the government in the education zone; it just succeeded to touch the 2.9% of the GDP in the budget of 2007 to 2008. This less attention of the government also declines the educational standards at secondary level. For analyzing the existing educational standards, there searchers collected the views of the students and teachers so that the main reasons of declining educational standards could come before us.

Objectives of the study

The objectives of the study were:

(i) To define the actual meaning of educational standards.
(ii) To analyze the views and opinion of students and teachers about-the main reasons of declining educational standards at secondary level in Karachi.
(iii) To give suggestions and recommendation for improving the educational standards at secondary level.

METHODOLOGY

This study depended on quantitative research, based on survey. It is a comprehensive analysis of academic performance of 30 (15+15) government and private secondary schools. The purpose is to ascertain the overall performance of the government and private secondary schools regarding standard education provided by them. The following factors are noteworthy concerning the analysis:

(i) The geographical areas of study were 05 towns, selected from 18 towns of Karachi city.
(ii) Within these geographical limits, 'government and private' secondary schools were included for collection of data and analysis.
(iii) A total number of 30 schools were selected for study using the list of schools provided by the board of secondary education Karachi.
(iv) Views and opinions of 40 male and 40 female students while 10 male and 10 female teachers were sought.
(v) The sample consisted of 80 students and 20 teachers. The total numbers of respondents were one hundred.

Research instrument

The researchers used a self constructed questionnaire, consisted of twenty five items. The information regarding this research study was collected through this questionnaire. The content validity of the instrument was certified by the experts (Teachers of Jinnah University for Women, Karachi). The research instrument consist (Appendix: Tables 1-3) of five parts containing some reasons which can be caused to decline educational standards at secondary level in Karachi. These were:

1) Defective administration.
2) Inflexible curriculum.
3) Ineffective evaluation system.
4) Imperfect inspection system.
5) Improper health facilities.
6) Lack of co-curricular activities.
7) Outdated teaching methods.
8) Unavailability of scholarships.

RESULTS

The collected data was converted into tables. Findings and conclusions were drawn in the light of these tables by the researchers.

Table 1. The ideas and views of government secondary schools male and female students regarding the main reasons of declining educational standards at secondary level in Karachi.

S.No	Description	Male (Agree) (%)	Male (Disagree) (%)	Female (Agree) (%)	Female (Disagree) (%)
1	Defective administration	70	30	90	10
2	Inflexible curriculum	80	20	80	20
3	Ineffective evaluation system	65	35	60	40
4	Imperfect inspection system	70	30	55	45
5	Improper health facilities	45	55	55	45
6	Lack of co-curricular activities	55	45	45	55
7	Outdated teaching methods	95	05	90	10
8	Unavailability of scholarships	45	55	30	70

Table 2. Private secondary schools student's views about the causes of low standard education at secondary level in Karachi were highlighted.

S.No	Description	Male (Agree) (%)	Male (Disagree) (%)	Female (Agree) (%)	Female (Disagree) (%)
1	Defective administration	60	40	70	30
2	Inflexible curriculum	65	35	85	15
3	Ineffective evaluation system	75	25	70	30
4	Imperfect inspection system	65	35	90	10
5	Improper health facilities	40	60	50	50
6	Lack of co-curricular activities	30	70	45	55
7	Outdated teaching methods	95	05	95	05
8	Unavailability of scholarships	45	55	35	65

Table 3. The views of teachers belonging to government secondary schools about the main reasons of declining standard of education at secondary level in Karachi are stated.

S.No	Description	Male (Agree) (%)	Male (Disagree) (%)	Female (Agree) (%)	Female (Disagree) (%)
1	Defective administration	60	40	40	60
2	Inflexible curriculum	80	20	80	20
3	Ineffective evaluation system	60	40	40	60
4	Imperfect inspection system	80	20	60	40
5	Improper health facilities	40	60	60	40
6	Lack of co-curricular activities	40	60	40	60
7	Outdated teaching methods	60	40	60	40
8	Unavailability of scholarships	40	60	20	80

Table 1 shows that 70% male and 90% female students viewed that declining of educational standard is due to the defective administration system of schools. About 80% male and 80% female students opinioned that decline is just because of inflexible curriculum. Up to 65% male and 60% female students had the opinion that its cause is ineffective evaluation system. About 70% male and 55% female students defined that there is imperfect inspection system at secondary level. As high as 45% male and 55% female student stated that improper health facilities caused the deterioration of standards of education at secondary level in Karachi. As many as 55% male and 45% female students were of the view that lack of co-curricular activities in schools is responsible for this decline. Up to 95% male and 90% female students had the opinion that outdated teaching methods were the main

Table 4. Private secondary schools teachers' views and opinions regarding the reasons of declining educational standards at secondary level in Karachi.

S.No	Description	Male (Agree)%	Male (Disagree)%	Female (Agree)%	Female (Disagree)%
1	Defective administration	60	40	60	40
2	Inflexible curriculum	80	20	80	20
3	Ineffective evaluation system	60	40	60	40
4	Imperfect inspection system	60	40	70	30
5	Improper health facilities	60	40	60	40
6	Lack of co-curricular activities	80	20	60	40
7	Outdated teaching methods	60	40	60	40
8	Unavailability of scholarships	20	80	40	60

reasons of low standard education. Whereas 45% male and 30% female students had the idea that unavailability of scholarships to needy and deserving students in schools actually caused the decline of educational standards at secondary level in Karachi.

The calculation of Table 2 shows that up to 60% male and 70% female students had the view that because of defective administration, educational standard decline day by day. As many as 65% male and 85% female students were of view that curriculum is not according to modern needs. About 75% male and 70% female students said that ineffective valuation system is responsible for that. As high as 65% male and 90% female had the opinion that imperfect inspection system cause the declining educational standard. About 40% male and 50% female students said that improper health facilities destroy the standards. Up to 30% male and 45% female students stated that lack of co- curricular activities caused the deterioration of educational standard. As high as 95% male and 95% female students had the idea that inappropriate teaching methods is responsible in this regard, while 45% male and 35% female students said that lacking of scholarships at secondary level is the main reason of declining educational standard at secondary level.

The numerical analysis of Table 3 highlights that about 60% male and 40% female teachers were of the view that male administration is the main cause of low standard education. Up to 80% male and 80% female teachers had the idea that curriculum is not flexible. About 60% male and 40% female teachers said that evaluation system is not proper that is why the standard of education decreases. As high as 80% male and 60% female had the view that imperfect inspection system is declining the standards. As many as 40% male and 60% female teachers stated that the schools are providing improper health facilities. About 40% male and 40% female teachers had the idea that lacking of co-curricular activities is responsible for low standard. Up to 60% male and 60% female teachers stated that non-psychological teaching methods destroy standard of education, whereas 40% male and 20% female teachers had the idea that unavailability of scholarships has decline the educational standards at secondary level in Karachi.

Table 4 shows that 60% male and 60% female teachers were of view that defective administration is one the big cause of low standard education. About 80% male and 80% female teachers said that non modernization of curriculum is responsible for declining standard. Up to 60% male and 60% female teachers had the idea that evaluation is not properly conducted. As high as 60% male and 70% female teaches stated that inspection of schools did not held effectively. Up to 60% male and 60% female teachers opined that lacking of health facilities is the main reason of declining educational standards. As many as 80% male and 60% female teachers had the idea that lack of co-curricular activities in schools is the cause of law standards. About 60% male and 60% female teachers viewed that the teachers are not adopting modern teaching methods, while 20% male and 40% female teachers stated that unavailability of scholarships actually declining the educational standards at secondary level in Karachi.

DISCUSSION

Education is a powerful tool and fundamental force in the life of man. Deepak (2006) stated that education plays an instructional role in shaping the destiny of the individual and the future of mankind. SEAMEO-Jasper Research Award (2009) further clears that education provides opportunities to acquire knowledge and competencies to function in a global environment. The goal of building a cohesive, equitable and harmonious community, bound together in solidarity for deeper understanding and cooperation, presents new challenges for scholars and education practitioners in acquiring new concepts and innovative models for effective teaching and learning. The standard of education is direct consequence and outcome of the quality of teachers and teaching methods used by them. Society believes that competent, effective

teachers are important keys to a strong system of education. Accordingly, teachers are expected to be proficient in the use of instructional technologies and class room management techniques. They are also expected to have a thorough understanding of the developmental levels of their students and a social group of the content they teach. To maintain and extend this high level of skills, teachers are expected to be informed of exemplary practices and to demonstrate a devise for professional development. Teacher competency and effectiveness includes the responsibility to help all learners succeed. Regarding standards Seth (1970) stated that we have provided more and more money to more and more of that we may be doing poorly. We hope that we could do it better. Educationists of international distinction have suggested that it will be possible only by developing suitable curriculum and applying educational technologies to make the curriculum more effective and the school more efficient. Jalala (2004) said that on the basis of broad objectives, curriculum planning should be done and suitable subject content, behavioral outcomes and other learning experiences be put in for making curriculum comprehensive. It should be based on the findings of curriculum research and be enriched by interdisciplinary collaboration among experts on different subjects. All this would contribute to the design of a total school curriculum that is complementary as well as comprehensive. In Pakistan quality education has marked a clear line of discrimination on financial grounds, and more considerably, it is beyond the reach of many students. Muhammad (2009) declared that the saddening and deteriorating condition of educational system in the country raises many fingers on education department, whose representatives, so confidently, sing songs of success in every of their appearance. There is no accountability of the typical landlord culture, which is going on in majority of the country's institutions. If government aims to reach the sky of standard education and to provide it at doorstep of every Pakistani, it should keep its eyes open, as the written records and work in progress in the buildings named schools, are not in any convincing or assimilating position. Especially for the improvement of standard at secondary level education sufficient steps should be taken, because secondary education is connecting link between primary and high education as Srivastara (2005) stated that secondary education is often considered as the most important segment of the individual learning.

According to Water and McFadden (2003) secondary school is a place where much complex interaction takes place that has a significant impact on the identity formation of young people and the consequent success in adult life. Education is the basic right of every individual in the society but unfortunately, educational standards in Pakistan are declining fastly. One of the most important factors in standards of education is good evaluation system. Evaluation plays a great role in the achievements and learning of individual. Especially it can be helpful for teachers to analyze as Lal (2005) stated that evaluation help the teachers to improve his classroom procedures and methods of teaching in the light of feed back. Unfortunately in Pakistan imperfect evaluation system also devalue the standards of education in schools.

RECOMMENDATIONS

(i) The curriculum of secondary level should be improved according to the needs of time and wishes of the society.
(ii) Introduce high quality selection procedure for secondary level teachers and offer the candidates better incentives.
(iii) The administration of school should be effective and efficient. It should keep democratic approach.
(iv) The evaluation system at secondary level should be organized and modern techniques must be used to evaluate the abilities of a child.
(v) There should not be political interference in educational institutions.
(vi) All secondary government and private schools should be allocated with proper health facilities (neat and clean and according to the health principles food and availability of doctor or a nurse in the schools).
(vii) The only trained teachers should be appointed in schools.
(viii) The secondary school teachers should use modern teaching methods according to the age and psychological requirements of students.
(ix) There should be opportunities provided to the students for participating in different co-curricular activities.
(x) The process of inspection should be done in proper and democratic way and the concept of favors should be out of this process.
(xi) The scholarships should be provided to deserving and intelligent students at secondary level in schools.
(xii) Various teams of experts should be involved in performing the above mentioned task of improvement and formation.

Conclusion

After analyzing the results it can be easily concluded that ineffective administration, non flexible curriculum and outdated teaching methods used by teachers are the main reasons of declining educational standards at secondary level. We may say that to some extent the imperfect evaluation system and bad inspection involved in this deterioration. Improper health facilities, political interference, lacking of co-curricular activities, non availability of scholarships are also some of the factors which destroy standards of education at secondary level in Karachi.

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APPENDIX

Table 1. List of schools from which data has been collected by the researchers for research paper.

S.No	Towns	Government schools	Private schools
1	North Nazimabad Town	1) GBSS Aleemia Block A North Nazimabad 2) GGSS National North Nazimabad 3) GGSS Farhana (E.M)North Nazimabad	1) Maryam Public School R-43, 44 North Nazimabad. 2) S.M Public School Block J North Nazimabad. 3) King Edward Sec School B-259 Block N North Nazimabad.
2	Liaquatabad Town	1) GBSS Federal English No.1 Pir Colony 2) GBSS Happy Dale Nazimabad 3) GGSS Nazimabad No 4	1)Fair Field High School Block 1/C, 6/4 Nazimabad. 2)Modern Public Sec School V-E-18, Nazimabad. 3)Shaheen Sec School Nazimabad No. 1.
3	Gulburg Town	1) GBHSS Allama Iqbal F.B Area 2) GGSS Aziz National 3) GGSS Dastagir Block 9	1) Erum Sec School R-43, Block-14, F.B Area. 2)Khalid Sec School R-525, Block-14, F.B Area. 3)Sun Oxford School C-37, Block-4,F.B Area.
4	New Karachi Town	1) GBSS 11/F New Karachi 2) GBSS 5/B New Karachi 3) GGSS 5/G New Karachi	1)Candle Light Sec School Sector 5/F, New Karachi. 2)Super Sec School 1211-11-E, North Karachi. 3)Dawn Sec School 11-D, North Karachi.
5	S.I.T.E Town	1) GBSS Al-Ghazali Rexer Line 2) GGSS Metroville SITE Frontier 3) GGSS Qasba Colony	1) Shaheen Progressive School A-39,Block-4, Site 2)Standard Sec School F-71, Block-4, Site 3) Fountain English School B-135, Block-2 Site

QUESTIONNAIRE FOR TEACHERS AND STUDENTS

Particulars

NAME GENDER

CLASS_SCHOOL NAME

Table 2. Questionnaire for students.

S.No	Questions	Agree	Disagree
1	Your school provides the education of high standard.		
2	Your school has a good administration.		
3	Your school administration looks after all the important matters of school.		
4	There is a parents and teachers association in your school for observing students problems.		
5	Your administrator uses modern techniques for organizing the important issues of school.		
6	The maladministration in secondary schools is the main cause of deteriorating educational standards at secondary level.		
7	The curriculum of secondary level in your school is according to the modern needs.		
8	You observed inflexibility in the curriculum of secondary level.		
9	Your teacher completes your syllabus with in given time.		
10	You are achieving computer education as compulsory subject.		
11	Your school is providing complete health facilities to the students.		
12	Your school has appointed a doctor or a nurse regarding first aid.		

Table 2. Contd.

13	Your school is providing the facility of cafeteria to the students.
14	The food provided in cafeteria is neat and clean and according to the health principles.
15	There is a playground in your school.
16	The school is providing to you the facility of indoor and outdoor games.
17	The lack of co-curricular activities is a big reason of low standard education in schools.
18	Your school invites the other schools for participation in co-curricular activities in order to provide social training to students.
19	The outmoded teaching methods are used by teachers at secondary level.
20	Your teacher uses the audio-visual aids during teaching.
21	Your teacher uses the new and modern methods of evaluation in school.
22	Your teacher checks the achievements of students during the class.
23	Your teacher is using the diagnostic evolutional method to know the problems of students.
24	The bad inspection system at secondary level exploits the standards of education.
25	The unavailability of scholarships to the needy and intelligent students destroys quality of education.

Particulars

NAME GENDER

TEACHING EXPERIENCE SCHOOL NAME

Table 3. Questionnaire for teachers.

S.No	Questions	Agree	Disagree
1	Your school provides the education of high standard.		
2	Your school has a good administration.		
3	Your school administration looks after all the important matters of school.		
4	There is a parents and teachers association in your school for observing students problems.		
5	Your administrator uses modern techniques for organizing the important issues of school.		
6	The maladministration in secondary schools is the main cause of deterioing educational standards at secondary level.		
7	The curriculum of secondary level in your school is according to the modern needs.		
8	You observed inflexibility in the curriculum of secondary level.		
9	You complete your syllabus with in given time.		
10	You are providing computer education as compulsory subject.		
11	Your school is providing complete health facilities to the students.		
12	Your school has appointed a doctor or a nurse regarding first aid.		
13	Your school is providing the facility of cafeteria to the students.		
14	The food provided in cafeteria is neat and clean and according to the health principles.		
15	There is a playground in your school.		
16	You are providing the facility of indoor and outdoor games to the students.		

Table 3. Contd.

17	The lack of co-curricular activities is a big reason of low standard education in schools.
18	Your school invites the other schools for participation in co-curricular activities in order to provide social training to your students.

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Full Length Research Paper

Curbing examination dishonesty in Nigeria through value education

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Examination dishonesty is one of the most devastating and conspicuous forms of indiscipline in Nigeria. It has become a cankerworm in the Nigerian education system over the years. It has graduated from being an educational issue to an educational crisis. It has many forms, causes and consequences and the Nigerian government has tried on many occasions to put an end to it but to no avail. It is a hyper-dreaded monster which has to be curbed in the Nigerian educational system. This paper identifies the different dimensions, causes and consequences of examination dishonesty in Nigeria and how it can be curbed through the teaching of value education by given opportunity to students to reflect different values and the practical implications of expressing them in relation to themselves and others. Teaching them that values may vary from people to people and from culture to culture, but there are universally- accepted and cherished values such as honesty, integrity, openness and uprightness which they can imbibe. These set of universally- accepted values are recommended to be taught to children right from home, to the elementary, secondary, to the tertiary level of education in Nigeria. If this is done, there would be proper integrity in the systems of examination in Nigeria.

Key words: Nigeria, dishonesty, examination, value education, teaching.

INTRODUCTION

Nigeria has suffered huge losses as a result of endemic corruption, which is evident in high crime rate and other indices of systemic social disintegration. The unhealthy incidents of fraud, embezzlement, bribery and forgery perpetrated by Nigerians at home and abroad have earned the country the status of a pariah nation in the international community. These corrupt practices, which started right from home to the primary and secondary school levels had stalled the development of the nation.

The development of a nation largely depends on the types of values that are cherished, vigorously pursed and applied by majority of its citizens. Although, values vary from place to place, from people to people and from one country to the other, there are universal values that are recognized generally, and accepted in societies throughout the world. These include honesty, hardwork, justice and patriotism. Nigerian society has gradually relapsed in its adherence to laudable traditional values for which traditional societies of the pre-colonial era were known. Most of the traditional folklores and fireside stories contain lessons to be learnt in honesty, humility, charity to destitute and dedication. These values have been greatly eroded and many anti-social vices have emerged which are threatening to wipe out these cherished values.

Some Nigerian students in the primary, secondary and tertiary institutions are known to exhibit several unhealthy attitudes, which are reflections of a lack of moral integrity in the educational system. Such unhealthy attitudes include indiscipline, fraud and drug abuse. The most conspicuous indiscipline and devastating of these social ills in the Nigerian school system is examination malpractice. It has become a cankerworm in the Nigerian educational system over the years. It has graduated from

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being an educational issue to an educational crisis. This monster has many forms, causes and consequences. Government and school authorities have tried to curb the occurrence of examination cheating but to no avail. Decisive measures should be taken to curb its menace. The thrust of this paper is to stress how examination dishonesty can be curbed through the teaching of value education.

Statement of the problem

Many educators and educationists such as Adekale (1993), Adeyinka (1993), Adesina (2006), Anwabor (2006), Bamwo (2006), Jekayinfa (2006), and Olasehinde (1993) have written on many aspects of examination dishonesty in the Nigerian education system. However, none of them has written on how to curb examination dishonesty through the teaching of value education. This paper has attempted to fill that gap.

Purpose of study

The general purpose of this paper is to discuss how examination dishonesty in Nigeria could be curbed through the teaching and learning of values education. Specifically, the paper discusses the following issues:

(1) Examination dishonesty;
(2) Dimensions of examination dishonesty in Nigeria;
(3) Types of dishonesty perpetuated by students during examinations;
(4) Various causes and consequences of examination dishonesty;
(5) Steps taken by the government to curb examination dishonesty in Nigeria;
(6) What value education connotes; and
(7) Curbing examination dishonesty through the teaching of value education.

RESEARCH QUESTIONS

(1) What is examination dishonesty?
(2) What are the dimensions of examination dishonesty in Nigeria?
(3) What forms of dishonesty are perpetuated by students during examinations in Nigeria?
(4) What are the causes and consequences of examination dishonesty in Nigeria?
(5) What steps have been taken to curb examination dishonesty in Nigeria and how effective have such measures been?
(6) What is value education?
(7) How can examination dishonesty be curbed through value education?

The concept of examination dishonesty can also be referred to as examination malpractice or cheating during examination. Examination malpractice is embarked upon in order to obtain higher score or rating than the examinee deserves. Dishonesty in an examination setting is any activity carried out before, during or after an examination by a candidate or agents who could be parents, siblings or hired persons, aids, personnel of examination bodies or stakeholders like the school officials (examiners, invigilators and/ or supervisors) that distort the expected and valid outcomes of the examination (Anwabor, 2006). There are dimensions of examination dishonesty and they include those that occur before, during and after the examination. Each of these is explained below:

Dishonesty before examination

Examination dishonesty can happen before an examination is conducted. Dishonesty before examination undermines completely the integrity of the examination. Dishonesty before examination can include leakage of questions. This involves the granting of privy access to the contents of an examination either directly or indirectly to a candidate or a number of them or their agents. This is very serious in the sense that it renders all efforts irredeemably futile.

In this age of Information and Communication Technology (ICT), this type of dishonesty can be pervasive, covering a very wide scope of the examination. This type of question leakages does not give room for rescue intervention because live questions are usually targeted by dishonest syndicates. It completely erodes the basis of certification, which is learning and character. It also falsely confers honour on those that are not due for such honour.

Leakages of examination questions can occur from a number of sources. In public examinations, such sources include: The staffs at the production site, those who are responsible for the printing of examination questions, those who package examination materials, and those who convey the questions from the press to the examination centers because many of them have been implicated in matters of question leakages (Anwabor, 2006). In school examinations, examiners, typists and office assistants constitute major sources as questions are shown to favorable candidates for one kind of gratification or the other.

The preparation of answers, which candidates bring to the examination hall, is as a result of leakage of questions. Students who have privy knowledge of the examination, in addition to preparing answers on papers which they bring into the examination hall are known to write answer points on convenient parts of the body, covered with their clothes. Question leakages also can lead to students going to the examination venues ahead of the

commencement of the examination to inscribe answers on desks or take vantage seats in order to be able to receive undue assistance in the course of the examination. When these types of candidates are caught in the act of cheating/dishonesty; it constitutes a breach of the examination.

Another practice that is also common is for school officials (principals or proprietors) to be active participants in the examination dishonesty during public examinations. They can do this in several ways. It can be done through creation of "Miracle Centers" by school authorities who charge the students exorbitantly well above the recommended examination fees to secure the cooperation of examination officials so as to favour their examination centers thereby compromising the examination. School authorities in some instances have contracted out their examination centers to touts who perpetuate unwholesome acts of compromise of the examination hall. Some school authorities can hire subject specialists to solve leaked questions and the solutions are either dictated to the candidates in the examination hall if they had all paid the exorbitant charges, or a selected group of candidates hidden away in a private secured room. Also, school authorities, according to Awanbor (2006), are also known to have pooled money collected from students to desperately bootleg live questions from the production point. Leakages of examination questions have become a worrisome phenomenon because of the various ways this practice undermines the conduct of valid assessment of learning.

Dishonesty during examination

Examination dishonesty can occur at any stage of the examination process. Students and/or their agents after perfecting their pre-examination plans, come to the venue fully armed and ready to insult the integrity of the examination in a number of masterful ways. Reseachers and educationalists such as Adesina (2006), Anwabor (2006), Banwo (2006), Solake (1997), Olaniyan (1997) and Olasehinde (1993) have written on a number of behaviors that are exhibited by students during examinations to cheat. Some of them are also listed by Jekayinfa (2006) and they are:

Giraffing

This is an act of sticking out one's neck to see another student's answer sheet.

Abracadabra

It is a method common in rural schools. It is a magic term connoting that the more you look, the less you see. The students will use spiritual power so that when they go to examination hall with "foreign materials" which will be seen by members of the class excluding only the invigilator. Sometimes, they may use the same power to make the invigilator a living robot till the end of the examination.

Lateral connection

This is a sitting arrangement whereby the "bright" student is seated in the center flanked on both sides by other students.

Nothing-nothing

This involves the use of empty biro to trace information on a blank white piece of paper. Seeing this on the table, one would think there is nothing on the paper, but on closer observation, one would realize that the paper is well loaded with facts related to the examination.

Dubbing

This is when students copy in the examination hall either their partners' papers or the materials they brought into the examination venue.

Contract

This happens when a student's grade is influenced with the assistance of a friendly teacher.

Tattoo

This happens when a female/male student writes information on the tender part of his/her thigh where they can easily adjust to reveal the materials and can be cleared within a second when there is a problem (Samuel, 1995).

Rank xeroxing

This happens when a student collects and writes a colleague's answer word for word.

Computo

This involves the use of calculators, which have facilities for multiple entries. The invigilator may not know that it has such facilities; he may think it is an ordinary

calculator.

Missile catch

Represents answers written on a piece of paper, squeezed and thrown to a colleague while the examination is going on.

Swapping

Is an exchange answer booklets so that the bright student can write answers out for his/her colleague.

Tokens

Involves jotting of points on the mathematical set, razor blades, rulers, hankies and others of the like for referencing during examinations.

Sign language

Involves using fingers and sounds as coded for response alternative on objective tests.

Body aids

Involves jotting of answers on the underwears, underdresses or thighs for referencing during examination.

Mercenary service

Involves employing the service of another student to write the examination.

Table top

Is the writing anticipated answers on the top of a desk before the commencement of examination.

Cnn

Is the sharing of questions and answers between groups for eventual connection in the examination hall.

Time out

Is the act of going out to the 'toilet' to read up answers.

Direct access

Is an act whereby an examiner helps students during examinations.

Stroke

Is a situation whereby a student pretends to be sick during an examination in order to gain the examiner's sympathy while marking.

Post examination dishonesty

Examination dishonesty is not limited to examination time only. A lot of activities go on at short, medium or long-term range from the moment of examination, which impinge on the integrity of an examination. The following are some of the ways that cheating can take place after an examination:

(a) Students tracing their scripts to the point of the marker and seeking to and/or successfully influencing their grades. This is common with schools examinations where cash and kind are freely exchanged for marks or grades.
(b) Alteration of marks: this is a case where the initial score earned by a student is altered and raised in order to enhance the academic standing of the student.
(c) In public and school examinations, some candidates even trace their results to the last point of call, that is, the computer rooms where marks are stored for final processing and grading. Anwabor (2006), while elaborating on the wide spread nature and scope of post examination cheating, revealed that parents and/or school examination authorities go with cash in hand after examination have been written with a motive to influence the scores of their wards. He remarked that in some cases, mark sheets are blatantly mutilated, the scores altered to the bargained price and level in order to provide soft landing for the candidate in the quest for a brilliant certificate or selection into higher institution of learning.
(d) Swapping of answer scripts: The answers written by the examination mercenaries are smuggled into the examination hall in replacement of the actual scripts. This, according to Anwarbor (2006), is the most violent means of dishonesty in an examination because of the unruly atmosphere created by the candidates and their agents to execute this plan.

Causes of examination dishonesty

Many factors have been reported to cause examination dishonesty in schools. These had been discussed in various dimensions by researchers such as Ipaye (1982), Adeyinka (1993), Olasehinde (1993), Adesina (2006),

and Banwo (2006). All these causes have also been highlighted by Jekayinfa (2006) to include:

Pressure to obtain good grades;
(i) The fear of failure;
(ii) Unpreparedness by students;

Too much emphasis on paper qualification;
(iii) Desire to meet societal and parental expectation;
(iv) Accessibility to question papers;

Leakages through teachers;

(v) Inadequate time and facilities for study;
(vi) Crowded work load;
(vii) Unannounced tests;
(viii) Poor instruction;
(ix) Lack of supervision;
(x) Pressure by peers to cheat;
(xi) Unstimulating course materials;
(xii) Inability to cope with schoolwork;
(xiii) Lack of understanding of questions;
(xiv) Lack of proper supervision;
(xv) Questions not relevant to topic taught;
(xvi) Too difficult examination questions;
(xvii) Tack of confidence in one's ability;
(xviii) Self-concept and lack of control on examination cheating;
(xix) Indolence of teachers and students;
(xx) Inadequate coverage of Syllabus/course study;

Poor counseling services; and the
(xxi) Influence of peer groups.

In most of the studies conducted on examination malpractices in the Nigerian schools, there is a consensus that the two greatest causes of examination dishonesty were and still are the fear of failure and too much emphasis which the government and society attached to paper qualification.

Efforts made so far to curb examination dishonesty in Nigeria

The Nigerian government, in order to curtail the trends of examination dishonesty in schools has made some laws, some of which are:

(i) Decree 27 of 1973 on the West African School Certificate Examination (WASCE) which prescribed 2 years jail term for offenders.
(ii) Decree 20 of 1984 amended by Decree 22 of 1986.
(ii) Decree 33 of 1999 which prescribed 21 years jail term for any offender.

All these penal codes made by the military have not been implemented. No offender on record is known to have been tried under any of these decrees. It has been observed that the decrees/laws are too draconian, unreformative and hence, unenforceable. So, there is the need to curb examination dishonesty through some other ways like teaching of values education in Nigerian schools.

Curbing examination dishonesty in Nigeria through value education

Value is a predisposition to believe that something is good or bad. Values are determined by the belief people hold. They are ideas about what someone or group thinks is important in life. Values play a great role in decision-making. People express their values in the way they think and act (Lemin and Welsford, 1994).

Values are taught so that students can know in advance, the actions they can take in any given situation. Value education involves "educating for character" and for "moral values". It is the teaching of respect and responsibility to citizens for good character development and for the health of the nation. As pointed out by Dike (2005),"respect and responsibility are two fundamental moral values" that a society should teach its citizens. Other values are honesty, fairness, self-discipline, compassion, prudence and other democratic values. However, rule of law, due process, equality of opportunity, checks and balances and democratic decision-making are "procedural values". All these would enable the people to create a viable humane society and to act "respectfully and responsibly". Thus, taking responsibility for the things wrongly as well as the things rightly done is the way to move the society forward. Dike (2005) claimed that responsibility matters in all what people do.

There is increasing moral problems in the society (corruption, greed, violent crimes, political killings) and in Nigeria schools (examination dishonesty, drug abuse and other destructive behaviors) these behaviors, call for 'value education' in the schools which will spread to the larger society. Some individuals and institutions with morality problems are known to have 'aided and abetted frauds' during the Joint Admissions and Matriculation Board Examinations (JAMB), the West African Examinations Council (WAEC) and National Examinations Council (NECO), examinations leading to the frequent cancellations of results. The Daily Independent of 22nd May, 2005 reported that in the past nine years, about 'five million' results have been cancelled.

Owing to the craze to obtain certificates from institutions of higher learning, many students have been involved in examination dishonesty and have been rusticated." Moral education' or values education is essential for the success of a democratic society. This is because, the people must possess the appropriate character to

build a free and just society and the moral foundations to make democracy thrive in the society where it had never been cultivated. Good character and values education must be instilled in people at an early age. Values education or good education consists of knowing what is good, desiring what is good and doing what is good. This should be instilled in the children right from the elementary schools.

People who have good character, according to Dike (2005) act truthfully, loyally, kindly and fairly without being much tempted (or pulled) by the opposite (forces to indulge in anti-development behaviors). Value education should be planned for by the curriculum developers so that the teaching of respect, responsibility and other moral values like honesty should be in the nation's schools curricula for good character development. The alarming rate of examination dishonesty in Nigeria, calls for the teaching of value education. Children and youth must not just be educated "to know "and "to do", they must be educated "to be and to live together (Jacques, 1996).

Quality education recognizes the whole person and promotes education that involves the affective domain as well as the cognitive. Values such as peace, honesty, forthrightness, dedication and diligence are cherished and aspired by the world over. Such values are the sustaining force of human society and progress. What children and youth learn is later woven into the fabric of the society. So, positive values should be passed on to school children so as to create a better world for all.

RECOMMENDATIONS

1. Educators should give room for activities that actively engage and allow students opportunity to explore and experience their own qualities which are of crucial importance.
2. Use a child-centered approach, flexible and interactive session to make students engage in reflection, visualization and artistic expression to draw out their ideas.
3. Educators should create a value-based atmosphere in which all students can feel respected, valued, understood, loved and safe.
4. Allow students to think about and reflect on different values and the practical implications of expressing them in relation to themselves, others, the community and the world at large.
5. Inspire students to choose their own personal, social, moral and spiritual values and be aware of practical methods for developing and deepening them.
6. Let students appreciate that although values differ from people and vary from place to place, there are universal or generally accepted and cherished values in societies throughout the world which they should also imbibe. Such values are honesty, integrity, dedication and openness.
7. Educators are to utilize their own rich heritage while integrating values into everyday activities and the curriculum. In lower classes and among children ages 6-14 years, most of our traditional folklores and fireside stories that contain lessons to be learnt on honesty, values of hard work, and social service to the community, should be made use of .Stories from modern African writers and stories that have their origin in the white man's culture which highlights universal values should be encouraged.
8. Let students be aware of possible penalties and sanctions against people who depart from the cherished values of the society.
9. Let students know what lying, stealing, dishonesty and so forth, amount to, and let them know that they should be regarded as wrong or immoral
10. Teach them "knowing how". This is what researchers called procedural knowledge, knowing how to do something. For example, "knowing to be honest involves knowing that if you find someone's purse, you should return it with money and all the things you found in it intact. In such an instance, that's how to be honest.
11. Students do need assistance in developing values "know how". Assist students to develop the values of "know to" This is the type of knowledge that leads to action. A person who "knows to" can be counted upon to do particular things in specifiable circumstances. If for instance, a student "knows to" be honest, he/she will not cheat even if he can get away with it, He/she will return lost and found belongings regardless of their value, and so forth (Clabaugh, 1999).
12. Educators should conduct themselves more decently because, generally, many students who "know that" honesty is the best policy, and "knowing how" to be honest still are dishonest. This is because the students need quantum leap from the "knowing that" and ", knowing how", to "knowing to". The student can only develop "knowledge about values only when the important people in their lives live that way. The best way to really help students "how to" act more morally is for the educators to conduct themselves morally, to be people to be emulated and to be above board.

Each student is encouraged to achieve his or her potential in all respect and, through critical and creative thinking, to develop a broad understanding of his or her own values and world views.

Each student should have the opportunity to explore different values and personal value system; and acknowledge his/her own uniqueness and be encouraged to develop self respect and dignity. Each person has freedom of will, is responsible for his/her own conduct and should be encouraged to develop discernment on ethical issues and to recognize the need for truthfulness, honesty and integrity. Students should know that society has something to gain from every individual's life. They should strive to contribute good and not bad things to their society.

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Full Length Research Paper

Using student group leaders to motivate students in co-operative learning methods in crowded classrooms

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This study examines the effects of employing student group leaders on the motivation of group members during co-operative learning activities in a secondary school classroom in Turkey. The study was carried out in a period of eight weeks in biology classes during which "living things" and "ecology" topics were taught to a class of 45 students (Year 9, 14 to 15 years old) by using Jigsaw and STAD (Student Teams Achievement Divisions). Students were divided into groups of four and a student in each group was assigned as the group leader. Data were collected through interviews with group leaders and group members and through video recordings of one group continuously for eight weeks. The study revealed that student group leaders' influenced the motivation of the group members in different ways. These were called reward, relationship, role-model, emotion and learning- oriented motivational strategies.

Key words: Cooperative learning, student group leaders, active learning, secondary science

INTRODUCTION

Co-operative learning in the classroom environment has become an important way of practising constructivist educational approaches that attribute importance to discovery learning and construe learning as a social activity (De Lisi and Golbeck, 1999; Sharan, 2010). Constructivist approaches are based on the assumption that learning involves active construction by the learner, having as a source the learner's own experience, with the teacher playing a facilitatory role, providing appropriate situations, tasks, and conditions (Glaserfeld, 1995; Wood et al., 1995; Driver, 1995). In Turkey, however, these changes have only recently begun to attract attention from educational researchers (Karaoglu, 1998; Altinparmak, 2001) and a movement from teacher-centred learning to student-centred learning does not seem easy to achieve (Ekiz, 2001). The review of literature related to the Turkish context (Cakici, 2001; Ekiz, 2001; Cakicioglu and Cakicioglu, 2003) revealed that this difficulty is because:

(1) There is a lack of collaboration between the tertiary education faculties and secondary school teachers. This prevents teachers from learning new learning methods.
(2) Tertiary education faculties do not attribute sufficient attention to the teaching of different teaching methods when training student teachers.
(3) Teachers are more occupied with the heavy burden of the curriculum, living little time for trying different teaching methods.
(4) Classrooms in Turkey are too crowded to practise co-operative learning.
(5) There are physical difficulties in terms of resources (example, the presence of desks instead of tables) to practise co-operative learning methods.

As is evident from these factors, the causes behind the difficulties of employing student-centred teaching in Turkey are varied. The first two reasons are related to the lack of co-operation between tertiary education faculties and schools, and the under-emphasis of teaching student teachers different teaching methods. The last three reasons are related to problems surrounding secondary

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education in general. This study has used the context of a Turkish Biology classroom to explore a particular approach to co-operative learning. This approach involves student group leaders during group activities and investigates the student group leaders' influence during the group activities. This is an ideal situation because students and teachers have not experienced this approach before and thus it would be possible to explore the ways in which roles develop. The study is based on the proposition that employment of student group leaders in co-operative group activities can support teachers in the use of co-operative learning methods in their classrooms.

The need for student group leaders

Co-operative learning methods have been a fruitful area of theory, research, and practice (Ashman and Gillies, 1997; Johnson et al., 2000; Kagan, 1992; Lord, 1998; Sharan, 1990). A vast amount of research has been carried out across numerous subjects to search for the effectiveness of these methods (Ghaith and Bouzeineddine, 2003; Hanze and Berger, 2007; Krol et al., 2004), and areas (Gillies, 2000; Johnson and Johnson, 1990; Miller and Harrington, 1990; Watson et al., 1994), which culminated in the development of a number of new co-operative learning methods (STAD, TAI, Jigsaw, Learning Together, Group investigation and others).

Co-operative learning refers to a set of instructional methods in which students work in small, mixed ability learning teams to maximise their learning (Johnson and Johnson, 1994, 1999). The main aim is to create a learning environment in which student achievement and cognitive skills can develop (Watson, 1991). In co-operative learning, groups as well as individuals are rewarded for their achievements. Thus peer norms support rather than oppose achievement (Slavin, 1984). Social skills such as leadership are important if a successful outcome is expected from co-operative learning groups (Johnson and Johnson, 1995).

One way of providing students with the opportunity to develop leadership skills is the appointment of group leaders during group activities (Keller, 1999; Schneider et al., 1999, 2002). However, the role of group leaders in co-operative learning activities and development of this role as the group develops seems to be neglected in the literature (Karnes, 1990). Despite the importance of the contribution group leaders could potentially bring into the group activities, there seems to have been little attention paid to the role of group leaders in co-operative learning groups apart from some simple managerial roles (Hogan, 1999), such as encourager, praiser, recorder and material monitor (Kagan, 1992) that aimed at enhancing student contribution during the group activities. Aronson et al. (1978) saw the role of group leader as being almost as important as the role of the teacher in co-operative learning activities when he suggested that;

> "The role of the group leader is patterned after the teacher's role; they are both "facilitators," a term we use for persons whose function is to lead a group, help the members look at how they are working together, and examine how they can improve their interaction in order to accomplish some task (p. 49)."

In the same vein, Grobman (1999) argues that selecting group leaders from students enables us to see inside the world of groups and Hogan (1999) suggests group leaders can have a profound influence on whether other group members are included in or alienated from participating in important conceptual tasks, procedures and decisions.

Student leaders in the literature

Yamaguchi (2001) carried out a study to explore the importance of the group context in the emergence of leadership, dominance, and group effectiveness in children's co-operative learning groups. She carried out her study with 30 elementary and secondary students. In her study she compared the effectiveness of mastery condition to performance condition. Using achievement goal orientation as a framework, she asked six groups to perform the task under a mastery condition and four groups to perform under a performance condition. Mastery condition referred to the environment that favoured learning and improving and performance condition referred to the environment that favoured competition and social comparison. She found that under the performance condition, group members exhibited more dominance and negative behaviour, while displaying more leadership and positive behaviour under the mastery condition. She also found that the learning aspect of the mastery condition played an important role in the emergence of leadership, dominance, and group effectiveness.

Schneider et al. (1999) carried out an investigation to predict, understand and test the durability of leadership behaviour. They focused on five different domains of student leadership: personality, interest, motivation, behaviour, self- rated skills and academic ability. All five of these domains were measured by tests that were developed by different researchers. Students' motivation to lead, for example, was measured by using the Miner Sentence Completion Scale, which measures a person's generalised motivation to lead or manage.

Following up on this study the group carried out another study in 2002 (Schneider et al., 2002), to find whether personal attributes that are used to predict adult leadership were used by students to nominate the leaders among their peers.

Table 1. Data collection methods used in the study and the frequency and duration of using them.

Group	Data collection methods and the frequency and duration of using them.				Reasons for selection of the data collection methods and its frequency.
	Interview		Video recording		
	Frequency	Duration (min)	Frequency	Duration	
1	4	45-70	0	0	(i) Interviews enabled the researcher to learn the perceptions of the students about the issues related to leadership of student group leaders and the practice of co-operative learning methods. (ii) The frequency of interviews was based on the availability of the groups for interviews. (iii) The use of video for group nine only was due to the technical impossibility of recording many groups at the same time, the need to record student behaviour continuously and the physical position of group nine.
2	3	45-70	0	0	
3	2	45-70	0	0	
4	4	45-70	0	0	
5	4	45-70	0	0	
6	3	45-70	0	0	
7	2	45-70	0	0	
8	2	45-70	0	0	
9	3	45-70	6	80 min	

Approaches for the motivation of the group members.

There are also some studies that focus on leadership among gifted primary and secondary school students (Chauvin and Karnes, 1983; Karnes and Bean, 1990; Keller, 1999).

This study explores the effects of employing student group leaders on the motivation of the group members during co-operative learning activities in a secondary classroom. Motivation is defined as “the reason or reasons one has for acting or behaving in a particular way” (the new Oxford Dictionary of English, 1998). This definition, however, lacks willingness which is needed for it to be applied to the classroom context (Covington, 1992). As Brophy (1998), rightly suggests motivation includes students’ willingness to engage in lessons and learning activities as well as their reasons for doing so.

MATERIALS AND METHODS

Instruments

Interviews with students and student group leaders, and video recordings of one group were employed as the data collection methods.

Interviews were conducted in the form of group discussions, as the students knew each other, to investigate the influence of the student group leaders on the group members and group activities during co-operative learning group work (Table 1).

The first round of interviews was conducted on Saturday with the consent of the parents. The second, third and fourth rounds were carried out in the Guidance and Counseling room of the school every week during PE and Music classes. Students in the same groups were interviewed together. By interviewing students and student group leaders at different intervals during the study period, their perceptions of the development of practice were captured. Video recordings were used to record one of the groups during the eight weeks of the study. Video recordings provided the researcher with the following three benefits:

(1) Video recordings accumulated aspects of interaction such as talking, gesture, and eye gaze that are not easy to capture through other methods.
(2) It allowed the researcher to observe the same event repeatedly.
(3) It yielded analytical benefits because it granted access to the inspection of the antecedents and consequences of the critical events (Roshelle, 2000).

Participants

Participants of the study were from a general state school in Diyarbakir, a city in the southeast of Turkey. The school, at the time of the study had a population of 625 students. It accepts students from Year 9 to Year 11 with different backgrounds from its catchment area. The selection of the class was done through consultation with the teacher and the willingness of the students to be participants. The participants were 45 students from Year 9 (age 14 to 15) biology class within the school.

The students and group leaders were trained in a two-hour session through role play and practising working in groups prior to the study and throughout the study as roles developed.

Co-operative learning methods used in the study

STAD (Student Teams Achievement Divisions) and Jigsaw were used as the co-operative learning methods. This selection was based on the nature of the topics to be studied for the co-operative learning methods, and the appropriateness of the STAD and Jigsaw for beginners of co-operative learning.

STAD has five major components:

1. Class presentation: It involves the initial introduction of the topic by the teacher.
2. Teams: A team usually composes of a group of four or five students that present a cross-section of the class in terms of academic performance, sex, and race or ethnicity. The aim of the team is to ensure all team members’ learning and high performance on the quizzes.
3. Quizzes: After one or two periods of teacher presentation and one or two periods of team practice, the students take individual quizzes. During the quizzes students are not allowed to help each other.
4. Individual improvement score: It allows each student to attain a

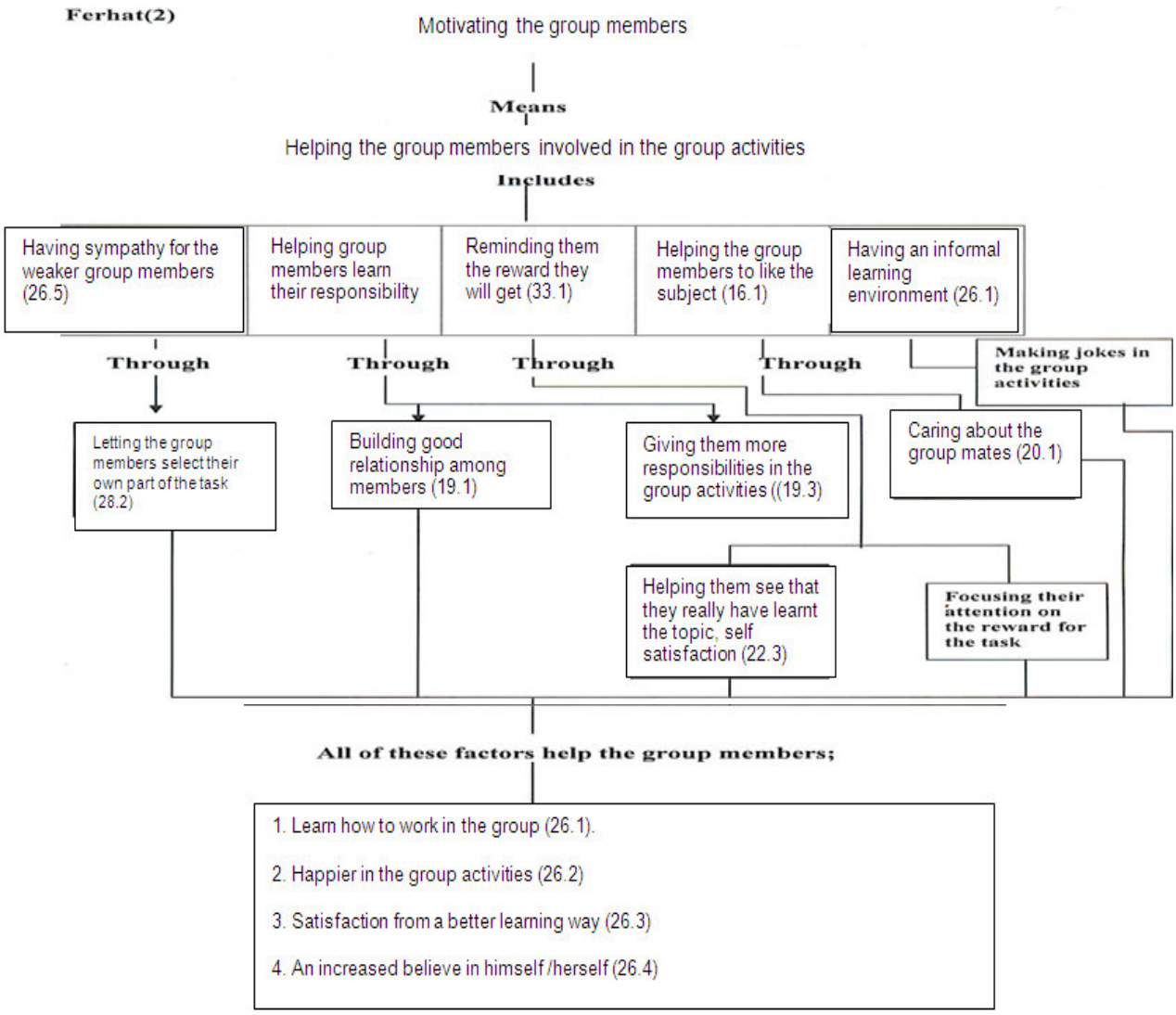

Figure 1. An example of a student group leader's cognitive map.

performance goal if he or she works harder. Each student is given a "base" score, derived from the student's average past performance on similar quizzes. According to the improvement the student make on this base score he or she contributes to the team score.
5. Team recognition: Teams may earn rewards if their average scores exceed a certain criterion.

Jigsaw also includes five steps:

1. Groups (home groups) are formed: Groups are formed exactly as in STAD.
2. Assignments of students to expert groups: The curriculum is divided into four and each student on a team is assigned one part. Students with the same part are called expert groups.
3. Expert groups: (students with the same parts) meet to learn their parts.
4. Home groups reconvene and the experts make their presentations: Each student present his or her part in home group. The group members discuss the topic and ensure that all members learn the whole topic. The group prepares their presentation.
5. Whole class presentation by groups: Groups present their work to the whole class.

Data analysis

Similar to most of qualitative studies drawing meanings from the data gathered was a long and tiring process. The method of data analysis was inspired by Cognitive maps, it involves a map displaying the subjects' representation of concepts about a particular domain and showing relationship among them, and "conceptually clustered" matrix, includes rows and columns arranged together to bring items related to each other, as suggested by Miles and Huberman (1994). Cognitive maps were created for each group leader's behaviour and strategy that was employed by the group leader during group activities. What motivation meant to a particular group leader, the ways he/ she used to motivate the group members, the reason these ways were used were searched. Transcripts of the interviews with each group were coded and mapped (Figure 1) to make a clear meaning for individual student group leader's strategy.

From these maps different categories of motivational strategies

Table 2. Motivational strategies used by the student group leaders and the main characteristics of these strategies.

Motivational strategy	Main characteristics
Reward oriented	1. Reminding the group members the reward they will get. 2. Rewards as evidence of their work in the class. 3. Rewards as their superiority over the other groups.
Relationship oriented	1. Preventing students from thinking that the leader has a power over them. 2. Treating the group members equally. 3. Creating a close relationship among the group members. 4. Making them compete with the other group members. 5. Making them that they will be belittled before the other groups in the event of failing. 6. Reminding the consequences of the disruptive behaviour. 7. Reminding the group members that they should do better than the other groups.
Role model oriented	1. Presenting him/her as hard worker for the group. 2. Tying to earn respect of the group members.
Emotion oriented	1. Helping the individual group member understand how important s/he is for the group. 2. Creating a group spirit among the group members. 3. Giving the group members the feeling that the other group members will help if anything goes wrong. 4. Increasing members' self- belief.
Learning oriented	1. Helping group members learn their responsibilities. 2. Helping group members learn the subject. 3. Reminding the value of learning of the task for the forthcoming university entrance examination 4. Helping group members like the subject.

were derived (Table 2). In order to compare the strategies employed by the individual student group leaders these maps were incorporated into matrixes after clustering them according to their relation to each other.

Validity and reliability

The data collected was analysed in its original language (Turkish) in order to eliminate any misunderstanding during translation.

In order to increase the validity of the data, triangulation is suggested (Robson, 2002; Silverman, 2000). Triangulation refers to "the attempt to get a 'true' fix on a situation by combining different ways of looking at it or different findings" (Silverman, 2000: 177). In this study two different ways of collecting data were employed (that is, group discussions and video recordings). The combination of two sets of data provided an opportunity to confirm the findings that each set of data suggested and remedy the problems caused by one set of data.

RESULTS AND DISCUSSION

In the study, motivation included student group leaders' efforts at increasing the group members' involvement in the group activities. Motivational strategy in the study means a particular path taken by a particular student group leader to enhance students' willingness to engage in lessons and learning activities as well as their reasons for doing so.

This study showed that student group leaders used five different ways to motivate group members during group activities. These were called reward, relationship, role model, emotion, and learning oriented motivational strategies.

The reward-oriented motivational strategy

During the study, in some of the weeks, sometimes after classroom presentations by several groups, one of the groups was given some rewards such as pens, erasers etc. by the class teacher to acknowledge the group's efforts. The following conversation among the members of Group 9 shows students' interest for the rewards:

"Group leader- … it is better first if everyone says what they see as important about bacteria.
1- Why can we not prepare some questions that we think are important about bacteria and than we can look for answers as we did last week?
GL- We wasted a lot of time preparing questions last week. I think we don't need to prepare questions ourselves. We will work on the worksheet anyway.
2- 1 Is right, if we finish early we can prepare ourselves for the presentation better.
GL- That is what I think.

4- We can do as well as any of the groups did in their presentation last week.
2- It is a pity we did not present our work well last week, we could have won the pens.
GL- It does not matter, let's concentrate on this week.
4- It would have been nice to show my father that I'd won it for my work in the class.
GL- You and 2 say what you think, we should know about the structure of bacteria and me and 1 will try to explain the importance of bacteria in our daily life (V.T. 3, 89-102)".

The dialogue among the group members provides an example of the value of the rewards for the students. For one of the group members, it is important to get a reward for their work in class because it provides evidence of their work in the classroom that they can share with their father in order to get their acknowledgement. This aspect of the nature of rewards is identified by Eccles and Wigfield (1985) as attainment value. According to this view, attainment value is to do with the students' need for achievement, power or prestige. In the example above, the force behind the motivation is to share achievement with parents in order to gain prestige with them. This study found that the group members were more likely to be motivated when they were presented with some kind of tangible rewards. Also it should be noted that the environment of working in a co-operative learning group was an incentive or reward in itself as the students were learning in new learning methods, which gave them freedom to interact with their group mates and express themselves freely. This can be counted as a tangible reward in itself for the students to work with enthusiasm during the group activities.

In the following extracts, the importance of having rewards is also vivid.

> "…last week we focused our attention on the pens (for the best presentation). Obviously, the material value of a pen is not much but it shows we were successful. For example, in football, a team struggles for thirty, thirty- five weeks to become successful. They do not spend that much effort for only a piece of iron…or silver… the aim there is to get that honour. Ours is like that (Group member of Group seven)".

> "…I think as students we value the existence of a reward for our work. When we prepare for the university exam, we usually prefer mock exams with rewards. I mean the ones, which offer free courses for preparation for the university exam or offer a free preparation book… (Group member of Group Six)."

The group leaders used rewards as a means to attract the group members' attention to the tasks. The rewards available for them were not totally contingent to the task success only, as the group leaders took the overall performance of the group members into account during the group activities. The intangible rewards were the group leaders' praise for the group members and tangible rewards were mainly small stationery items, such as a pen, eraser, sharpener, and so on, which were given the successful groups sometimes after the evaluations of the performance of the groups. The question of whether tangible rewards should be used to motivate students is still subject to disagreement among the researchers in this field. While some researchers seem to be in favour of employing tangible rewards because using tangible rewards, they suggest, motivate students better and have no detrimental effect on the following intrinsic motivation (Eisenberger and Cameron, 1996). While other researchers argue that using rewards can be harmful to students' learning, as student attention is likely to be distracted from learning because the effectiveness of reward is often short-lived (Stipek, 2002), and it causes students to display superficial learning behaviours, less flexible problem-solving strategies and less creativity (Hennessey, 2000; Ryan and Deci, 2000). Thus, rewards become ends rather than means.

Relationship-oriented motivational strategy

This kind of strategy is based on the relationship between the student group leader and the group members. It produced three different types of situation where the student group leaders tried to stimulate the group members' interest in the group activities.

The first of these is the situation when the student group leaders constantly reminded the group members, particularly those who were not very keen on focusing on the task; that their attitude towards doing the task would influence the whole group, that they were dependent on each other and that everyone ought to respect each other's contribution to the task. The following extract shows the student group leader's strategy for drawing the distracted group members' attention to the task:

> "…I am doing all I can do to do my duties. But sometimes some of our members do not do what they are supposed to do. For example, our friend (A) was not contributing much at the beginning. I told them it was not fair to us. Because we had to spend a lot of time doing their part as well. I think we succeed in making them aware of the need to study. Now it is much better (Group leader of Group eight)"

In the example above, the group leader involves the unwilling group member in the activity by putting pressure on him and reminding him of his responsibilities. This shows that positive interdependence, one of the important aspects that differ co-operative learning from an ordinary group work that is difficult to achieve, can in fact happen through student group leaders.

The second situation is one in which the student group

leaders made an effort to create a close relationship among the group members that led to a non-threatening learning environment, which encouraged the shy group members to participate more in the group activities. The following extract from the interview with one of the student group leaders illustrates the affect of the close relationship among the group members on the motivation of the group members;

> "… when we started work together in the first week, some group members were reluctant to participate. I realised they were not answering the questions even if they knew the answer. I tend to ask them "why do not you answer the question?" and they used to say "I do not feel comfortable."… this is because we have this habit of being afraid of giving our view in the classroom. We are afraid of getting a negative reaction from our classmates in case of making a mistake. … I arranged group meetings outside school as well. Now after few weeks of working together, D, E, F and me… we have become close to each other. We are more comfortable with each other and everyone expresses their views easier (Group leader of Group one)".

The group leader focused on building strong bonds and good relationships among the group members in order to enhance their interest in the group tasks. The group leader believed that the creation of strong bonds among group members would force students to pay more attention to each other and to each other's learning. This aspect is referred to as group cohesion in the literature (Evans and Dion, 1991; Chang and Bordia, 2001). Chang and Bordia (2001) report that the enhancement of group cohesion increases the performance of group members. The meta-analytical study by Mullen and Copper (1994) confirms the suggestion that by enhancing the feeling of closeness, similarity, bonding among the group members, the group is likely to perform better.

The third situation occurred when some student group leaders tried to enhance the group members' interest in the task by trying to draw them into competition with the other groups' members through explaining that they should be doing better than the other groups. The following extract is an example of the kind of behaviour that was displayed by a student group leader in order to increase their interest:

> "…when we were preparing for the presentation I often reminded them that we should do better than the other groups. In this way I try to create an atmosphere where our group members focus on whether we can become the best group. Thus, everyone does what they are supposed to do better. I can see every one reserving their energy for the last two hours of the day. Because we are in competition with other groups (Group leader of Group three)".

Students were most lively when the groups were presenting their work to the whole class or when the groups were evaluating the results of their work. One of the main reasons for the students to be readily inclined towards competition in their practices is probably the nature of Turkish education system. There are many entry examinations that students need to take throughout the primary and secondary education, not to mention the university entry exam. During preparation for these exams many student take private courses that are based on making students familiar with tests that are offered in the exams.

Because there are limited places and many students for special secondary schools, students need to compete with each other to get a place. This has been a part of student life for decades. Growing up with this psychology, it is not surprising to see student have a ready inclination towards competition in the classroom. The effectiveness of inter-group competition is also advocated in the literature. Mulvey and Ribbens (1999), for example, carried out a study to seek the effects of inter-group competition and assigned group goals on group's efficacy, goals, productivity, and inefficiency. Their study with 35 undergraduate business students revealed that inter-group competition significantly increased group efficacy, group goals, and group productivity, while decreasing group inefficiency.

Role model oriented motivational strategy

This strategy occurred when the student group leaders tried to set him/her up as an example for the group members by working harder and trying to impress the group members. The following extract reveals how the student group leader tried to enhance the group members' interest in the task through setting themselves up as an example;

> "…whenever we work on an activity that we need to share parts, I try to take the most difficult part and usually the bigger part. That is because I think I am the group leader, I have more responsibilities… when I want them to do something they do not object, they appreciate the work I do for the group (Group leader of Group one)"

The effect of the role model strategy studied by Gardner and Cleavenger (1998) and Rozell and Gendersen (2003). In both studies the researchers found that when the group leader present him/herself as a hard worker, it enhanced his or her image among group members and this, therefore, created positive feelings about group activities and group members' relationship with each other.

Emotion-oriented motivational strategy

This included giving a feeling of self assurance by helping group members understand that if anything went wrong, the group members would be ready for them, promoting a group spirit and having sympathy for weaker group members. The following example demonstrates one student group leader's efforts in helping less able group members in order to involve them in the task;

> "…I usually focus on A's and B's work because they are weaker than me and C. We are usually able to do our task so I pay more attention to them. I check every week if they are ready. If not I try to either help myself or ask C to help them (Group leader of Group six)".

Some of the group members appreciated the creation of an environment where they knew they had someone to support them if something went wrong;

> "…I am lucky to be in this group because you know always that there is someone who will help you, if you cannot to do something. You know you can rely on the group members. We have a good environment for co-operation (Group member of Group six)".

The creation of a group environment in which the group members relied on each other appeared to be an important aspect of working efficiently in co-operative learning groups. It contributed to the formation of interdependency among the group members through a realisation that the success or failure of a member affected the success or failure of the whole group.

Student group leaders also focused on building strong bonds and good relationships among the group members in order to enhance their interest in the group tasks. These group leaders believed that the creation of strong bonds among group members would force students to pay more attention to each other and to each other's learning. The leadership styles exhibited by the student group leader were influenced by different factors. The main factor was the co-operative learning practice that was experienced for the first time. During this experience student group leaders came to understand that promoting good relationships and maintaining strong bonds among the group members keep group members motivated for the group activities. One reason for the importance of good relationship among the group members in the group activities might be embedded in the culture in which the group leaders and the group members have grown up. This is probably the reason why student group leaders focus as much on the importance of relationships among the group members during the group activities. In Turkish culture, children learn the importance of having a good circle of friends and of caring for each other. Collective living is still prominent in Turkish society where the social bond among family members and relatives are strong and they are often dependent on each other economically and socially. These cultural norms can be used to promote effective behaviour for learning in the classroom as the current situation indicates that teachers' practices in the classroom are in conflict with them.

Socio-emotional support includes the student group leaders' influence on the group members' actions and behaviours, which stem from social and personal problems such as disruptive behaviour and group members' timidity for participating in the group activities.

Learning-oriented motivational strategy

This involved the student group leader's efforts in helping the group members develop an interest in the subject, develop study skills, and gain a sense of responsibility for learning within the task.

In the following extract the student group leader explains the strategy that was employed to help the group members do their part of the task and ensured that the group member learnt the task:

> "...When we do a worksheet if someone cannot do their part, I tell them where to look for answers. Then they go back to find the answers, come back and shares them with us. Thus, instead of telling them the answer directly, I make them find these by themselves. So, they feel they can do something, they feel useful. Therefore, when I want them to do something they would not object (Group leader of Group three)".

> "…let's say we are doing a work sheet. We do it in pairs first, if we find a question that we cannot answer properly, we then ask the person who was responsible for the part the question is related to Group leader of Group eight".

Group leaders encouraged the group members to be responsible for their own learning. The development of an interest in learning within the task was seen as important for motivation of the group members in order to ensure that the group members' participated fully and completed the task. It seemed that once the group members enjoyed working in a co-operative learning environment and the content knowledge, their participation of the task became easier. This study and the other studies (Gomleksiz, 1993; Koymen, 1992) related to the Turkish context in terms of the teaching and learning tradition found that the secondary school students in Turkish schools are bored with existing learning styles. Traditional teaching methods fail to provide opportunities to help raise students' curiosity, enthusiasm, and enjoyment for learning (Posner and Markstein, 1994). This seemed

to be one of the main reasons that students were very receptive to co-operative learning methods. This is despite the relatively higher demands of this approach where students need to exhibit more effort to take responsibility for their own learning and at the same time offering assistance to others.

Conclusion

One student group leader adhered to only one motivational strategy. The other eight group leaders used two or more motivational strategies. The motivational strategies most used were reward-, relationship- and emotional-oriented motivational strategies. Group leaders at different situations used different strategies. For example, on the one hand the leader was using reward-oriented motivational strategy by reminding the group members the value of the reward as an evidence of their work (to show their parents); on the other hand he was reminding the group members that the group would be belittled before the other groups if they fail. Thus, he was resorting to relationship- oriented motivation.

Using co-operative learning methods in classrooms is not an easy task as it demands more time for consideration such as preparation; better organisation; student involvement; power sharing and tolerance. Employing these methods in crowded classrooms needs even more efforts, as dealing with more groups requires extra time and energy. Motivating students for active involvement in set tasks, therefore, is challenging. This study looked into the effectiveness of using student group leaders to assist classroom teachers to motivate group members. The study revealed that student group leaders can motivate group members through:

(i) Using rewards.
(ii) Focusing on relationship.
(iii) Being a positive role model.
(iv) Focusing on learning.
(v) Providing, emotional support of group member.

It also showed that:

(i) Teachers are not in a position to pay enough attention to all students or allocate enough time to each individual student. By contrast, well selected and respected group leaders are likely to motivate individual group members and help them better in overcoming difficulties.
(ii) Student group leaders can create informal learning environments for their group members where students are more open to each other and express their ideas more freely.
(iii) As group leaders uses intergroup competition to motivate group members they are likely to enhance learning as well.
(iv) Group members feel obliged to work harder when they take the group leader as role model.
(v) With group leaders the inclusion of shy or weaker group members in the group activities is easier as it gives these students self- assurance.

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Full Length Research Paper

Prospective primary school teachers' misconceptions about states of matter

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The purpose of this study was to identify prospective primary school teachers' misconceptions about the states of matter. The sample of the study was 227 fourth-year prospective primary school teachers in a Department of Primary Education in Turkey. Researcher asked from every participant to write **a response to an open ended question about differences among solid, liquid and gaseous states of matter. In analyzing the research data, the researcher used descriptive analysis techniques. The findings of the research indicated that prospective primary school teachers have some misconceptions such as: The shape of solids do not change, there is no space between the particles of solids, since gases are not affected by gravity they do not fall down like the solids and liquids, the size of the particles of solids is bigger than the particles of liquids, and the particles of liquids are bigger than the ones of gases.**

Key words: States of matter, misconception, prospective primary school teacher, chemistry education

INTRODUCTION

In the last forty years, the findings of the studies carried out in science education have determined that students come to the science lessons although they have some prior science knowledge. However, these researches indicated that the views and explanations that students had in relation to the natural world were different from the views of scientists (Osborne, 1982). According to Ausubel (1968), students determined that some unwanted teaching results occurred while they were trying to digest the new information they encountered via the current knowledge structures. In this respect, it is vitally important to determine students' views and prior knowledge in relation to the subject in helping them create their scientific understanding (Talanquer, 2006).

In the literature of science education, preconceptions (Hashweh,1988), alternative conceptions (Driver and Easley, 1978; Gilbert and Swift, 1985; Schoon and Boone, 1998), alternative frameworks (Driver and Erickson, 1983; Kuiper, 1994), children's science (Gilbert et al., 1982) and misconceptions (Helm, 1980; Lawson and Thompson, 1988; Treagust, 1988; Chou, 2002; Özmen and Ayas, 2003) have been used commonly. In this study, it is preferred to using misconceptions term.

Constructivist learning theory emphasizes the importance of social interaction in learning. According to this theory, students come to classes with the misconceptions they give about the shape as a result of their interaction with the world. These misconceptions are affected by students' way of interpreting and constructing new concepts (Boo and Watson**,** 2001). On the other hand, Taber suggests that most of the misconceptions in chemistry do not result from the experiences had out of the school. According to Taber, the misconceptions in chemistry result from the situations occurring in formal learning environment such as students' misconceptions in previous science educations, the limitation of the models in science, mistakes in model applications and misleading expressions in the language used (Taber, 2001).

Primary education teachers have an important role in their students' understanding of science concepts. Because, they are also science teachers in primary education. This study is about the misconceptions of elementary education teacher candidates about the states

of matter. In science education literature, there are a lot of studies in relation to the misconceptions about the states of matter (Osborne and Cosgrove, 1983; Jones, 1984; Stavy, 1988; Jones and Lynch, 1989; Stavy, 1990; Andersson, 1990; Bar and Travis, 1991; Lee et al., 1993; Tsai, 1999; Çalık and Ayas, 2005). The findings of these studies provide us with evidence in relation to different misconceptions of science teachers about the states of matter. They help us to better understand the source and possible reasons of the problems faced by students in learning and their misconceptions (Chou, 2002).

In addition to this, the number of studies focusing on the differences between the states of matter is limited among the above mentioned studies. In this study, it was aimed at determining the misconceptions of primary education teacher candidates considering the differences between solid, liquid and gaseous states of matter.

MATERIALS AND METHODS

Sample

The sample of the study was 227 fourth-year prospective primary school teachers in the Department of Primary Education in a Turkish state University. The Department has seven or eight classes at each level. Eight classes in fourth-year took part in the study.

Process

Every participant was given a sheet of A4 paper and they were asked to write differences among solid, liquid and gaseous states of matter on it. In order to further probe the participants' understandings, also they were asked to write a response to the following question: "If you are a primary school teacher now, will you plan activities to teach your students the differences among states of matter?" Participants were allowed a 60 min time period to complete their responses.

Analyzing

In analysis of the data, descriptive analysis techniques were used (Mcmillan and Schumacher, 2001). For validity, two chemistry education experts worked analyzing and identifying the misconceptions. Initially, the data obtained from the answer sheets were read and analyzed in detail and participants' misconceptions about the states of matter were identified by two experts separately. Then, similar categories were combined and final categorization was made with its frequencies. Results were tabulated in terms of percentages.

RESULTS AND DISCUSSION

In this study, we aimed to identify prospective primary school teachers' misconceptions about the states of matter. In the end of the descriptive analysis of the data obtained from the answer sheets, participants' misconceptions were identified. Then a categorization was done. Results are presented under six main headings: weight, shape, particle, flowing, volume and others. Table 1 shows participants' misconceptions and its percentages.

The results of the study indicate that some participants have misconceptions about the weight of solids, liquids and gases. Some participants think that a solid is heavier than a liquid. They think that the gaseous state of matter is the lightest than others. Some participants in their responses stated that gases are not affected by gravity, they do not have weight and can fly. These result is similar to the findings of Ramsden (1997), Barker and Millar (1999) and Özmen and Ayas (2003).Their studies attribute this to the fact that solids are taught to be heavier than liquids. Özmen and Ayas (2003) state that

> *"These students use a naive model of matter dependent on the sensory perception of expecting solids to be heavier than liquids*".

Another similar research was made by Stavy (1990). He examined children's (ages 9 to 15) conception of changes in the state of matter. He determined that some students believed that the gaseous state of matter is lighter than its liquid and solid forms, and some students even believed that gases had no weight.

This misconception may originate from the lack of participants' understandings about properties of solid, liquid and gaseous states of matters. Considering their experiences in their daily lives, they make a wrong comparison between the macro sizes of matters (in which matters can be observed with naked eye) and the micro sizes of matters (particle size). They observe that although they have the same volume in daily life, solids are heavier than liquids and liquids are heavier than gases. These observations arouse the image that there is this weight relationship between the states of matter in micro dimension. This misconception results from their understanding of the states of matter insufficiently in terms of the frequency of particles.

This study indicates that some participants have misconceptions about the shape of solids, liquids and gases. These participants think that all solid matters have a definite shape and are hard matters. This misconception may arise from participants thought that solids are only hard objects in their environment. In a similar study, Stavy and Stachel (1985) examined the conceptions children (between the ages of 5 to 12) have of solid and liquid. Children think that substances which are not hard and rigid cannot be solids. According to them, the easier it is to change the shape of the solid, the less likely it is to be a solid.

This study also revealed another misconception related to the particles of matter. The participants state that the particles of solids cannot move, there is no space between the particles of solids and solids are completely made up of particles, but liquids and gases are not completely made up particles (contain another things).

Also they think that the size (dimension) of the particles

Table 1. Participants' misconceptions and its percentages.

Misconceptions identified	%
Weight	
Solids have more particles than liquids and liquids have more particles than gases.	15
Gases flies.	12
Since gases are not affected by gravity they do not fall down like the solids and liquids.	12
Gases do not have weight.	10
Gases are light, liquids are heavier than gases and solids are the heaviest.	5
Shape	
All solids have a definite shape.	90%
Solids are hard matters.	35%
The shape of solids does not change.	15%
Particle	
There is no space between the particles of solids.	18%
The size (dimension) of the particles of solids is bigger than the particles of liquids and the particles of liquids are bigger than the ones of gases.	15%
The particles of solids can not move.	12%
Solids are made up of the particles completely, but liquids and gases are made up the particles not completely (contain another things).	5%
Flowing	
Matters that can be poured from one container to the other are liquids.	25%
When solids are put into a container they cannot be transformed.	25%
Volume	
Although solids have volume liquids and gases do not.	28%
The volume of gases only changes when the temperature is changed, but the volume of solids and liquids not change.	7%

of solids is bigger than the particles of liquids and the particles of liquids are bigger than the ones of gases. These misconceptions stem from the lack of participants' understandings about properties of solid, liquid and gaseous states of matters. They do not know that the particles of solid matter can vibrate and have a kinetic energy.

Also these misconceptions may originate from particles drawings related to solids, liquids and gases in the texts. Because solids' molecules have been packed together and usually are seen in a regular pattern in drawings. According to the participants, since the particles of solids are bigger in comparison to others, they seem entrapped in comparison to liquids and gases with the same volume. Since the gaps between solid particles are small, the particles cannot take any substances between themselves and move in any way.

Another misconception is about the flowing of solids, liquids and gases. The participants state that matters that can be poured from one container to the other are liquids and when solids are put into a container they cannot be transformed. This misconception may originate from the fact that participants do not think some matter such as sand and sugar as solids. According to them, solids are hard matter and do not flow easily its particles cannot move.

The results of the study also indicate that some participants have misconceptions about the volume of solids, liquids and gases. Some participants think that solids have volume liquids and gases do not. And some participants think that the volume of only gases changes when the temperature is changed, but the volume of solids and liquids do not change. These misconceptions may stem from the lack of participants' understandings about volume concept. The participants think of the volume of the matter as the shape of the matter.

This research indicated that participants' misconceptions originated from the lack of understanding about states of matter. Participants' views might be affected by these preconceptions in their life due to their inadequate understanding in class. One reason of misconceptions in pupils is that their teachers (primary school teachers) also have misconceptions. Therefore it is important that prospective primary school teachers

have correct the misunderstanding about science concepts. Although the “States of Matter” is considered as a simple and well-known topic, it is found that participants have misconceptions about this idea. Since “States of Matter” is an important topic that concerns our daily life, participants’ mistakes in conception can have detrimental influence on the scientific comprehension of the other concepts. In future studies related to the teaching of this topic is necessary to focus on the misunderstood points discussed above. Therefore, we concluded that it would be beneficial to carry out more studies on methods to reduce or eliminate such misconceptions.

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Full Length Research Paper

Science student teachers' preferences for ways of learning: Differences and similarities

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Knowing an individual's learning style is considered important because it can help educators to prepare and develop learning environments in which the individual can enhance his/her learning. In this study, Biology, Physics, Chemistry and Primary science student teachers' learning styles were investigated. The participants were 387 student teachers in a teacher education course during the 2009/2010 academic year at Dicle University in Turkey. The questionnaire developed by Honey and Mumford (1992) was used as the data collection instrument. The data was analysed through SPSS 15.0 version by using t- test, correlations and ANOVA. The analysis of the data revealed that the majority of the participant student teachers strongly preferred learning styles described in the reflector, theorist and pragmatist sub-dimensions. The study found statistically significant differences among subject groups (Biology, Physics, Chemistry and Primary science) only in the pragmatist sub-dimension. Gender differences were found in the reflector and theorist sub- dimensions. Learning styles should be included in teacher education programmes in order to help student teachers to gain a better understanding of different learning preferences displayed by pupils.

Key words: Learning styles, science teacher education, student teachers, teaching and learning activities, attitudes.

INTRODUCTION

Learning is a dynamic process that includes the active involvement of individuals. Individuals who are involved in the process of learning often develop attitudes and behaviours that determine their preference in the way they learn. The various types of individual preferences for the most effective mode of instruction or study are referred to as learning styles (Pashler et al., 2009). Differences between individuals can be detected in many aspects of learning processes, such as, physical, behavioural, thinking styles, interaction styles, method of learning, rate of learning, and the cognitive styles that students choose when receiving new knowledge (Curry, 1990; Dunn, 1992; Keefe, 1987; Reiff, 1992).

Understanding students' learning styles is important for improving learning and developing an appropriate learning environment accordingly (Khan, 2009). Two major reasons are listed for researchers' high interest in learning styles. Firstly, more successful learning occurs when teachers' teaching methods are matched to students' learning styles (Svincki and Dixon, 1987). Secondly, by learning to use a variety of learning styles, students are able to adapt more readily to different learning situations (Dixon, 1985). Educators are seen as responsible to help students to increase their interest and inclination towards learning. Determining suitable learning styles for students can lead to an increase in students' attitude towards learning, productivity, academic performance and creativity (Griggs, 1985). According to Peker and Mirasyedioglu (2008), students' achievement is affected by their attitude towards a subject and their attitude towards a subject is influenced by their preferred learning styles. Students' preferences should be regarded during the teaching/ learning process.

Over the years various instruments have been developed by researchers to identify learning styles. Babrach et al. (1975) developed a questionnaire to identify learning styles. The questionnaire consists of 45 items that are divided into three areas: how an individual collects and

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receives information, how an individual works, and how an individual communicates. Renzulli and Smith (1978)'s Learning Style Inventory consists of 65 items that focus on nine areas: project, exercises, peer teaching, discussion, game, free learning, programmed teaching, lecture and simulation. Dunn et al. (1985) designed the Learning Style Inventory to study the learning styles students in Grades 3 to 12 in the USA. The inventory consists of 104 items and it explains students' perception based on their stimulation, surrounding, emotions and sociological and physical background. Building upon this type of work, Honey and Mumford (1992) developed a questionnaire that is based on four learning styles, and named it the Learning Styles Questionnaire (LSQ). After responding to the questionnaire items, participants reveal their preference for any or all of the four learning styles, based on their learning preferences. Depending on their preferences (as expressed by their responses), participants are classified as an activist, reflector, theorist or pragmatist or as any combination of the four learning styles. Activists are open-minded and enjoy new experiences. However, they become bored if something is repeated. They enjoy becoming involved in a discussion such as brainstorming. The teaching and learning activities that are effective for this group are providing new experiences, problem-based learning, games and group research. The teaching and learning activities that are not effective for this group are one-way lecture, passive learning, learning that involves many mixed and unarranged data, repeating the same activity.

Reflectors like to collect and analyse data and are quite careful at making decisions. They do not like to become leaders. The teaching and learning activities that are effective for this group are those that are stimulating such as watching a video as well as providing them with time to think before reacting and to provide conclusions without pressure. The teaching and learning activities that are not effective for this group are placing them in the role of leader or having them perform in front of people. They experience stress if required to perform immediately after a brief instruction. Theorists are quite objective, and they do not enjoy things that are subjective. They prefer to make conclusions based on evidence, data analysis and logic. They have clear minds. The teaching and learning activities that are effective for this group are providing them with time to organise their feelings and to ask questions and process the methodology, assumption or logic in detail. The teaching and learning activities that are not effective for this group are learning that involves emotion, feelings, and activities that are unstructured. Pragmatists enjoy considering a new idea, expanding the idea, and solving problems especially for real life situations. The teaching and learning activities that are effective for this group are demonstrating practical techniques, providing them with the opportunity to express what they have learned and focusing on the practical issues. Learning methods that are not related to immediate need and performance with no clear practice or outline are not suitable for this group.

Despite the substantial popularity of research on learning styles, many researchers question the value of understanding learning styles as they argue that there is a lack of credible supportive evidence relating learning styles and enhanced learning (Constantinidou and Baker, 2002; Massa and Mayer, 2006; Pashler et al., 2009). The current study is based on the assumption that the way in which an individual is educated affects his/her preference for a certain way of learning. Therefore, individuals who are trained to become future teachers are likely to be influenced by the way that they have been taught and reflect this influence in their teaching related activities.

The purpose of this study was to investigate science student teachers' preferences for ways of learning and examine differences among science student teachers according to their subjects.

The study is aimed at achieving the following objectives:

1. To study the differences in student teachers preferences' for certain ways of learning according to their subject.
2. To study gender differences in terms of student teachers subject groups.
3. To examine correlations among four learning styles and to suggest implications for teacher education.

MATERIALS AND METHODS

Participants

The sample comprised 387 student teachers in the first semester of 2009/2010 academic year in the Department of Secondary Science and Mathematics Education and Department of Primary Science Education at Dicle University in Diyarbakır (in Turkey). Participants were student Physics [N= 95 (24.5%)], Biology [N= 116 (30%)], Chemistry [N=91(23.5%)] and Primary Science student teachers [N= 85 (22%)]. Both genders were represented; 200 male (51.7%) and 187 female (48.3%) student teachers, using the Cluster Sampling Technique.

Instruments

In this study a questionnaire was administered as the data collection instrument. The questionnaire was divided into two main sections: A and B. In section A, there were three questions about the demographics of the student teachers. In section B, the 80 five-point scale items from the Learning Styles Questionnaire (LSQ; Honey and Mumford, 1992) were included without modification. The 80 items in the instrument include 20 items for each of the four learning styles and are essentially randomly ordered by the authors. The directions ask the participants to respond to each item by marking from "totally disagree (1)" to "totally agree (5)". The items with the highest frequency are used to represent the students' learning styles.

The LSQ by Honey and Mumford (1992) was preferred because it was reported to have high reliability and was suitable for teenagers (Riding, 1991). The Learning Styles Questionnaire includes 4 sub-dimensions, which describe the four distinct learning styles:

1. Activist sub- dimension (20 items).

Table 1. Correlation coefficients of the LSQ sub-dimensions.

	Activist	Reflector	Theorist	Pragmatist
Activist	1	0.294**	0.325**	0.482**
Reflector	0.294**	1	0.657**	0.566**
Theorist	0.325**	0.657**	1	0.705**
Pragmatist	0.482**	0.566**	0.705**	1

** Correlation is significant at the 0.01 level (2-tailed).

Table 2. Student teachers preference of learning activities identified in activist sub-dimension.

Subject	N	Mean	Std. deviation	ANOVA result
Biology	116	3.33	0.459	
Physics	95	3.20	0.474	F: 2.193
Chemistry	91	3.24	0.475	Sig:0.088
Primary science	85	3.16	0.538	P>0.05
Total	387	3.24	.487	

2. Reflector sub- dimension (20 items).
3. Theorist sub-dimension (20 items).
4. Pragmatist sub- dimension (20 items).

Each sub- dimension assesses a continuum of learning style preference, ranging from very low preference to very strong preference. High subscale scores indicate a very strong preference, whereas lower scores are indicative of a very low preference. A score from 1 to 1.80 is very low preference, 1.81 to 2.60 is low, 2.61 to 3.40 moderate, 3.41 to 4.20 strong preference and 4.21 to 5.00 very strong preference. In the current research, the reliability coefficient (Cronbach's alpha) for the total scores of the LSQ was 0.878. The Cronchbach's alphas values for the sub- dimensions were 0.683, 0.721, 0.712 and 0.691, respectively.

Data analyses

The data from Section A of the questionnaire were analysed by frequency and percentage. The data obtained from Section B of the questionnaire were analysed by using frequency, arithmetic means, correlation coefficient and t-test for differences between genders and ANOVA for determining significant differences among subject groups (Physics, Biology, Chemistry and Primary science). Analysis was carried out using SPSS 15.0 version.

Procedure

The instruments were administered during a regular class meeting and each administration of the LSQ was administered at the beginning or the ending of the class period. None of the student teachers in the classes declined to participate in the study. The student teachers spent approximately 25 to 30 min in completing the instrument, which was not timed.

RESULTS

Correlations among sub-dimensions

The correlation values of the four sub- groups suggest that activists, pragmatists, theorists and reflectors were positively correlated to each other (Table 1).

Activist

Table 2 displays the one-way ANOVA results for participant student teachers. The results do not show any significant differences (p>0.05) among Biology, Physics, Chemistry and Primary science student teachers preferences for the ways of learning that is identified as activist by Honey and Mumford (1992). When the mean scores were considered, student teachers of all four disciplines identified as moderate activists. These results imply that the participant student teachers did not mind receiving lecture- type instruction and they preferred not to become involved in discussions or hands-on activities (Table 3).

The study did not reveal statistically significant difference between male and female student teachers in terms of the ways of learning that are included in the activist sub section (p>0.05).

Both male and female student teachers moderately preferred to learn through activities included in the activist sub-dimension.

Reflector

The significant value in Table 4 is 0.117 (P> 0.05); thus, there were no statistically significant differences observed in preferred learning styles by Biology, Physics, Chemistry and Primary science student teachers in the reflector sub- dimension. When the mean scores were considered all four groups of student teachers strongly preferred learning ways identified in the reflector

Table 3. Gender preferences in activist sub-dimension.

Gender	N	Mean	Std. deviation	Result
Male	200	3.25	0.501	t: -0.323
Female	188	3.23	0.473	Sig:0.743

Table 4. Student teachers preference of learning activities identified in reflector sub-dimension.

Subject	N	Mean	Std. deviation	ANOVA result
Biology	116	3.74	0.430	
Physics	95	3.82	0.401	F: 1.978
Chemistry	91	3.66	0.428	Sig:0.117
Primary science	85	3.70	0.583	P>0.05
Total	387	3.73	0.463	

Table 5. Gender preferences in reflector sub-dimension.

Gender	N	Mean	Std. deviation	Result
Male	200	3.78	0.481	t: -1,997
Female	188	3.68	0.439	Sig:0.046

Table 6. Student teachers preference of learning activities identified in theorist sub-dimension.

Subject	N	Mean	Std. deviation	ANOVA result
Biology	116	3.72	0.441	
Physics	95	3.76	0.408	F: .918
Chemistry	91	3.65	0.454	Sig:0.432
Primary science	85	3.68	0.592	P>0.05
Total	387	3.70	0.474	

sub-dimension. According to these results, the participants of the study enjoy being stimulated by a visual presentation such as watching a video, CD or a computer simulation. The student teachers preferred to have time to think before they react. They did not like to take initiative to act as they did not like to be leaders. Teaching and learning activities that were not effective for this group were placing them in the role of leader or requiring them to perform in front of people. When gender was considered statistically significant differences in the learning styles of Physics, Biology, Chemistry and Primary science student teachers' were identified in the reflector sub-dimension (Table 5). The mean scores indicate that male students more strongly preferred learning styles identified in the reflector sub- dimension. This suggests that female student teachers are less inclined to be passive learners in comparison to male student teachers.

Theorist

Table 6 did not reveal any statistically significant differences (p>0.05) among Biology, Physics, Chemistry and Primary science student teachers' preferences for the ways of learning that are included in the theorist sub-dimension. The mean scores indicate that student teachers in all four groups strongly preferred learning activities identified in the theorist sub-dimension. The teaching and learning activities that were effective for this group was providing them with them time to organise their feelings and with time to ask questions and process in detail. The teaching and learning activities that were not effective for this group were learning that involves emotion, feelings, and unstructured activities.

Table 7 indicates significant differences in the learning styles of Physics, Biology, Chemistry and Primary science student teachers (-2.091 t- value, P<0.05) in the

Table 7. Gender preferences in theorist sub-dimension.

Gender	N	Mean	Std. deviation	Result
Male	200	3.75	0.480	t: -2.091
Female	188	3.65	0.463	Sig:0.048

Table 8. Student teachers preference of learning activities identified in pragmatist sub-dimension.

Subject	N	Mean	Std. deviation	ANOVA result
Biology	116	3.67	0.401	
Physics	95	3.69	0.387	F: 4.225
Chemistry	91	3.54	0.413	Sig: 0.006
Primary science	85	3.50	0.556	P<0.01
Total	387	3.61	0.445	

Table 9. Gender preferences in pragmatist sub-dimension.

Gender	N	Mean	Std. deviation	Result
Male	200	3.63	0.449	t: -1.052
Female	188	3.58	0.440	Sig: 0.293

theorist sub dimension according to gender. When mean scores were considered, male students were more strongly in favour of learning through activities identified in the theorist sub-dimension.

Pragmatist

Differences in the learning styles of student teachers were ascertained by F -test (Table 8). Statistical analysis showed that there were important differences among student teachers' preferred ways of learning that are identified in the pragmatist sub-dimension (P<0.01). The mean scores indicate that student teachers in all four groups strongly preferred activities included in the pragmatist sub-dimensions. The teaching and learning activities that were effective for this group were demonstrating practical techniques, providing the students with the opportunity to express what they learned and focusing on the practical issues. The teaching and learning activities that were not effective for this group included learning that is not related to immediate need and performing with no clear practice or outline. This result is justified by the fact that students preferred teaching learning activities that involved test solutions or problem solutions as the main aim of classes was to prepare students for national exams. Therefore, it is not difficult to understand student teachers' strong preference for learning activities identified in the pragmatist sub-dimension.

Table 9 did not display any statistically significant differences between male and female student teachers in the pragmatist sub-dimension. When mean scores were compared, male student were slightly stronger in their preference of learning activities identified in the pragmatist sub-dimension.

DISCUSSION

The fact that students' responses to learning styles in all four dimensions are similar in general suggests that students do not always prefer one way of learning. Rather, to a certain extent, they would prefer to through various learning activities identified in all of the dimensions described by Honey and Mumford (1992). These findings support the claims by Vermetten et al. (1995) and Slaats et al. (1999) that students use a specific learning style based on the task they are faced with at the time. Research reports individuals view of teaching or a teacher are shaped by the way they are educated. In Turkey, students are mostly educated through teacher-centred learning activities. This general view was justified by the Education Ministry in 2003 during his speech on the need for a student-centred education system.

"We have a memorisation-based education system at present in Turkey. In this system students are in passive roles. We have started to handle a situation no government

has so far dared to address. If this situation needs lancing, we will do it. In the year 2004, the information-based education system in Turkey will be replaced by a constructivist system. If we want to catch up with the world, if we want to reach (the aim of) modern education, we have to do this. When we change teaching method, curriculum and textbooks need to be changed in parallel with it (Celik, 2003)".

This announcement by the Education Minister of the time heralded a 'catastrophe in education' two weeks later when 40,500 students (6.7% of all students) scored zero (0) points on the Secondary Institutions Student Selection and Replacement Exam (OKÖSYS), which is carried out to select students for Science Schools, Anatolian Schools, Anatolian Fine Arts Schools, Anatolian Teacher Training Schools, and Vocational and Technical Secondary Schools. On the same exam, 108,545 (18%) students were successful. This exam is taken by many students in Turkey after eight years of compulsory education. The authorities were quick to argue that the poor scores were because of the fact that the exam was prepared to measure students' interpretation and problem solving skills. This argument met with an angry response from the people concerned about the education system in Turkey. Hasan Bulent Kahraman, a writer for a prominent Turkish Daily Newspaper criticised the excuses presented by the authorities in his article titled 'Catastrophe in Education' by arguing that the real problem was that the current education system is recall based and it is a flimsy excuse to suggest that the exam was prepared to measure students interpretation and problem based skills as multiple selection test is not the correct method for this type of measurement (Kahraman, 2003).

Despite the dominance of the constructivist approach in science education in many parts of the world over the last two decades, Turkish schools continue to witness the predominant practice of didactic teaching methods. Therefore, initial teacher education and in-service programs fail to include the constructivist view of learning in their courses (Cakici, 2001). According to Ersoy (1995) and Ekiz (2001) learning activities in Turkey are strongly dominated by teachers and learning mainly depends on the memorisation of topics. Thus, as Cakici (2001) argues,

"The objective of classroom teaching and learning in science education in Turkey, then, is to provide the student with as much scientific information as possible by emphasising the teaching of basic facts and definitions, and then to measure the quantities of scientifically acceptable information retained by children," (p. 9).

This type of teaching tradition is bound to fail in terms of students' cognitive development and social skills, as it perceives students as machines and not social beings. In this tradition, students are loaded with a large amount of scientific information not because they may need to use it in their life to reason about scientific developments, but because they will be asked to recall this information in exams. The focus of the national curriculum is not flexible enough to allow teachers to use teaching methods that broaden the students' perspectives and promote social development. The Turkish national curriculum includes too many topics and does not allow teachers the flexibility to select the content (Cakici, 2001). The pressure of covering all of the topics in an allocated time is a substantial burden and inhibits the exploration of different methods that focus on meaningful learning. When a teacher candidate embarks on preservice teacher education, observes school life in a classroom from a teacher perspective and becomes a practising teacher, his/her impression of a teacher begins to change. We believe that because the participant student teachers were in the above mentioned stage, they began to see the benefit of student-centred learning activities and therefore they were in a process of changing their practice or at least having a change of mind for their preferences of learning. Considering the education system that student teachers have experienced, it is not surprising to see them prefer learning ways included in the theorist sub-dimension. Experiencing an education system drowned by exams that focus primarily on students' correct answers on national exams without exception every year from year six to year twelve, student teachers prefer structured learning activities. Students primarily prefer to learn through the use of material that were previously utilised by teachers.

Conclusions

In this study, science student teachers' learning preferences were investigated according to the sub-dimensions identified by Honey and Mumford (1992). Biology, Physics, Chemistry and Primary science student teachers (N= 387) participated in the study. The study revealed that science student teachers preferred all four dimensions of the different learning styles. While science student teachers moderately preferred learning styles identified in the activist sub-dimension, they strongly preferred learning styles in the reflector, theorist and pragmatist sub-dimensions. These differences were linked to the general education system in Turkey where a strong teacher centred learning environments exists. It is argued that as student teachers have experienced an education that favoured theory rather than practice or hand on activities, it is not surprising that student teachers have a lesser preference for learning through activities that include individual active participation in the teaching-learning process. Data analysis revealed positive correlations among all four sub-dimensions of learning styles. Taking the findings into consideration, researchers suggest that as well as identifying learning styles of student teachers and providing opportunities for them to develop these styles, learning environments

should be organised to help student teachers to develop learning styles identified in all four sub- dimensions used in the study. Furthermore, learning styles should be included in teacher education programmes in order to help student teachers to gain a better understanding of the different learning preferences displayed by pupils. By knowing students learning style preferences, applying differentiation in the classroom (generally considered as a difficult practice), may become easier as identification of student preference for way of learning becomes apparent.

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Full Length Research Paper

Researching the relationship between the influence of games on elementary school students, their gender and lesson success variables and their game preferences

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This research is a descriptive research with scanning method. It aims to define the relationship between the gender and academic success of secondary school students and their play preferences. The population of the research is composed of the secondary schools of Burdur city centrum and the sample group is composed of the students who are studying at the secondary schools. The data of the research were obtained from the literary sources and through questionnaire. A questionnaire was developed according to the aim of the research. After the comprehensibility and content validity of the questionnaire were tested, it was applied to the sample group, 318 male, 287 female and totally 605 students with random sampling method. The obtained data were coded on computer environment via appropriate statistic programs. As statistical operations, frequency (f) and percentage (%), Crosstable (crosstab), X2 (X-square) were applied. The collected data showed that there is a significant difference in 0.05 significance level between the gender and academic success of students and their play preferences. According to this data we can say that male students play football more than female students do; however, female students generally do not have sportive activities but they play touch. The students who are academically successful play mostly the mental computer games and football; other students do sportive activities and fighting. In conclusion, we can say that there are statistically significant differences between the gender and academic success of students and their play preferences (P<0.05).

Key words: Secondary school, student, academicals success, play preference.

INTRODUCTION

As it is commonly known, one of the most distinctive features of children is that they are highly active. By playing with their peers thanks to their active life, children are able to develop physically, intellectually and psycho-socially.

Though seen as a trivial, time killing activity, a game is, nevertheless, the most important opportunity in which a child can best express himself, his/her feelings and improve his/her skills. Concisely, the game is the most natural and active learning way for a child (Mangır and Aktaş, 1993).

Games are like laboratories for children. They know each other, even themselves, by means of games and improve their new abilities by discovering them through games. Games are important things to which children give much value and they see it as a very important thing.

Not only does a game provide a suitable environment in which a child can express himself but it is also a means of physical, intellectual and emotional improvement for children (Avcı, 2005). Children learn socializing, having relationship with others, the sense of affection and sharing by means of games. Children, who are coming together, begin to play with each other even without learning their names first; game is their common language (Kale, 1997).

Game is an activity which enables any child to improve from every aspect and create his own personality. Game is already known to be a means of common communication among children. Game, on the one hand, develops physical and intellectual state of children; on the other hand, it is a crucial activity for

Table 1. Gender distribution of the participants.

Variable	Distribution (No.)	Distribution (%)
Male	318	52.6
Female	287	47.4
Total	605	100.0

children to interact with the world of objects, a means of gaining personality and later on, it helps any child be a social individual in the whole society (Gürün, 1984).

According to many researchers, game, itself, is a fundamental compound for children for a healthy social, physical and intellectual development. It is a physical process by which children learn by experiencing and complying with the physical surrounding. The quality level of time and energy exhausted for a game by a child is important. It has been observed that a child who has the opportunity of a qualified game has flexible approach on problem solving and better social relationships and is physically healthier (Jaspert et al., 1988; Heseltine and Holborn, 1987; Hart, 1993).

Games, occupying an important place in the development of the individuals, are classified in various ways. This classification is composed of four groups as:

(i) “No-rule games” (Cohen, 1994): Helping muscle building such as climbing, jumping, running and physical-motoric games. Such games have certain rules as in basketball and football; intellectual-knowledge requiring games including activities which use the environment and objects; and social ones including such games as role-playing and dramatic games, organized games, speaking, walking and observation (Hart, 1993). (ii) “Operational game” by which a skill compound is tested and muscles are exercised. (iii) “Dramatic game” either directed or naturally displayed. (iv) “Rule game” which is prearranged or which depend on some certain rules in intellectual game classifications.

Particularly, the increasing urbanization stemming from industrialization and the immigration which is the direct result of this have caused irregular or unplanned constructions. As a result, the playing ground for children has been greatly restricted.

Living in apartment buildings, going to school by vehicles, spending time in front of TVs or computers, a child is now longing for child-game-zones and parks due to unplanned urbanization. Thus, off-lesson sportive activities, games and physical education lessons by which children can exhaust energy and satisfy activity demands have increasingly gained importance.

Most of the students today grow up in a rather different environment than it was before. They are born in an era in which the technology and especially the computers are extensively used. They have not experienced the time when the music was not digital and there was no television at all. The most important of all is that, today’s students never know what kind of a world there could be without television, internet and computer games (Prensky, 2001).

They have always used technological devices all through their lives and this has deeply influenced their world-views, life styles and expectations.

New digital technologies and intellectual changes resulting from media have also caused changes in the needs and preferences of the young. Especially education preferences and needs of the young generation have changed (Tapscott, 1997). According to a research, today’s youth are rather different from their parents for such aspects as learning, playing, interacting, working and creating societies. This change is a big change that has never been witnessed in history. That is why; this causes differences in the play grounds and preferences of today’s children.

The research aims to present whether there is a relationship between the game preferences of children and game itself, which is so important on children’s development, and its influence on today’s children and their genders.

MATERIALS AND METHODS

The research intended to present the relationship between the effect of game on elementary school students and their gender and lesson success variables and game preferences.

The research populations is composed of elementary schools in Burdur city center, while the sample group, includes 6^{th}, 7^{th}, 8^{th} grade students chosen from 6 elementary schools according to socioeconomic and development level.

Data of the research were collected by means of literature scanning and questionnaire. It was applied to the sample group in the research area through random sampling method after their intelligence, content validity and reliability had been proved. A total of 605 students, 318 of whom are boys and 287 of whom are girls, participated in the research. Some of the participators did not give any answers. Therefore, the number of the participators seems less.

Collected data were coded on computer environment in suitable statistic program for statistical operations. As statistical operations, frequency (f), and percentage (%), cross table (Croostab), X^2 (X-Square) were applied. To determine percentage distribution and test the differences between genders for each questionnaire, comment were made taking 0.05 as confidence interval.

FINDINGS

As can be seen in Table 1, a total of 605 participants, 318 of whom are boys and 287 girls, participated in the research.

In Table 2, an inquiry was done on sportive game play status of participants. When the total answers to this question were examined, it was seen that 78.5%

Table 2. Sportive game playing percentages of participants.

Variable	Yes	No	Total
Male	290 (91.8%)	26(8.2%)	316 (100.0%)
Female	166 (62.6%)	99(37.4%)	265(100.0%)
Total	456(78.5%)	125 (21.5%)	581(100.0%)

X^2= 72.433, P= 0.000, P<0.05.

Table 3. Percentage of playing other games.

Variable	Rope skipping	Touch	Word games	Ball games	Other	Total
Male	34 (17.4%)	17(8.7%)	36 (18.5%)	16 (8.2%)	92 (47.2%)	195(100.0%)
Female	100 (48.8%)	6 (2.9%)	23 (11.2%)	38 (18.5%)	38 (18.5%)	205 (100.0%)
Total	134 (33.5%)	23 (5.8%)	59(14.8%)	54 (13.5%)	130 (32.5%)	400 (100.0%)

X^2= 71.821, P= 0.000, P<0.05.

Table 4. Types of computer games which participants play.

Variable	Mind games	Action and fighting games	Sportive games	Total
Male	144 (49.3%)	57 (19.5%)	91 (31.2%)	292(100.0%)
Female	160 (72.1%)	6 (2.7%)	56 (25.2%)	222(100.0%)
Total	304 (59.1%)	63 (12.3%)	147 (28.6%)	514 (100.0%)

X^2= 41.702, P= 0.000, P<0.05.

Table 5. Where do they usually play computer games.

Variable	Home	Internet café	School computer Lab	Total
Male	223 (71.0%)	54 (17.2%)	37(11.8%)	314 (100.0%)
Female	209 (80.1%)	18 (6.9%)	34 (13.0%)	261 (100.0%)
Total	432 (75.1%)	72 (12.5%)	71(12.3%)	575 (100.0%)

X^2= 13.813, P= 0.001, P<0.05.

of them said “yes”, while 21.5% of them said “no”. On the other hand, when we look at the answers according to gender variable, X^2 analysis value of the answers was found to be 72.433. This value is statistically significant in 0.05 significance level.

In Table 3, the percentages of participants, showing which games they play, was inquired. If we look at the total answers given to this question, we see that 33.5% of the participators said “rope skipping”, 32.5% of them said ‘other games’, 14.8% said “word games”, 13,5% of them said “ball games” and 5.8% of the participants said that they were playing “touch”. When we look at the answers given according to gender variable, comparative X^2 analysis value of the answers was found to be 71.281.

This value is also statistically significant in 0.05 significance level (P<0.05).

Computer games percentages of the participants were inquired on Table 4. When we examine the total answers given to this question, we see that 59.1% of the participants said “mind games”, 28.6% of them said “sportive games”, 12.3% said “action and fighting games”. However, when we look at the answers according to gender variable, comparative X^2 analysis value of the answers was found to be 41.702. This value is also statistically significant in 0.05 significance level (P<0.05).

The place where participants usually play computer games was inquired in Table 5. We see that 75.1% of them said they play computer games “at home”, 12.5% of them play at an “internet cafe”, and 12.3% of the participants said they play computer games at school computer labs. Nevertheless, when we look at the answers according to gender variable, comparative X^2 analysis value of the answers was found to be 13.813.

This value is also statistically significant in 0.05 significance level (P<0.05).

In Table 6, an inquiry was done on the status of participants showing how often they play computer games. We see that 52.8% of them said they play

Table 6. How often do the participants play computer games.

Variable	1 to 2 h a day	1 to 2 h in two days	1 to 2 h in a week	Total
Male	129 (40.8%)	46 (14.6%)	141(44.6%)	316 (100.0%)
Female	62 (23.2%)	38 (14.2%)	167(62.5%)	267 (100.0%)
Total	191 (32.8%)	84 (14.4%)	308 (52.8%)	583 (100.0%)

X^2= 22.500, P= 0.000, P<0.05.

Table 7. How do the games affect their lesson success.

Variable	Enhance my success	Negatively affects my lesson success	It has no effect	Total
Male	49 (15.5%)	63 (19.9%)	204 (64.6%)	316 (100.0%)
Female	28 (10.0%)	42 (14.9%)	211(75.1%)	281 (100.0%)
Total	77 (12.9%)	105 (17.6%)	415 (69.5%)	597 (100.0%)

X^2= 8.021, P= 0.018, P<0.05.

Table 8. How do the games affect the participants.

Variable	It develops my skills	I better know my friend through game	I exhaust my energy and relax	Total
Male	208 (65.4%)	18 (5.7%)	92(28.9%)	318 (100.0%)
Female	168 (59.8%)	22 (7.8%)	91 (32.4%)	281 (100.0%)
Total	376 (62.8%)	40(6.7%)	183 (30.6%)	599(100.0%)

X^2= 2.384, P= 0.304, P>0.05.

computer games “1 to 2 h in a week”, 32.8% of them play “1 to 2 h in a day”, and 14.4% of the participants said they play computer games 1 to 2 h in two days. However, when we look at the answers according to gender variable, comparative X^2 analysis value of the answers was found to be 22.500. This value is also statistically significant in 0.05 significance level (P<0.05).

The status of the participators showing their views on how games affect their lesson success was inquired in Table 7. If we closely examine the given answers, we see that 69.5% of them said “it has no effect”, 12.9% said “it affects the lesson success negatively, and 17.6% of the participants replied that it enhances his/her lesson success. However, when we look at the answers according to gender variable, comparative X^2 analysis value of the answers was found to be 8.021. This value is also statistically significant in 0.05 significance level (P<0.05).

In Table 8, the question “how do the games affect the participants?” was addressed to the participants. When we examine the given answers, we see that 62.8% of them said “it develops my skills”, 30.6% said “I exhaust my energy and relax”, and 6.7% of the participants replied that “I know my friend better through game”. However, when we look at the answers according to gender variable, comparative X^2 analysis value of the answers was found to be 2.384. This value is not statistically significant in 0.05 significance level (P>0.05).

In Table 5, lesson success and sportive game playing status of the participants was inquired. If we closely examine the given answers, we see that 78.5% of them said “I play sportive game”, 21.5% said “I do not play sportive game”. However, in the comparative statistical evaluation of the answers according to gender variable, comparative X^2 analysis value of the answers was found to be 27.432. This value is also statistically significant in 0.05 significance level (P<0.05).

Lesson success and other game playing status of the participators were inquired on Table 5. If we closely examine the given answers, we see that 32.8% of them said “rope skipping”, 32.8% said “other”, 14.9% said “word games”, and 13.6% said “ball game” and 5.8% of the participants replied that they play “touch”. However, when we look at the answers according to gender variable, comparative X^2 analysis value of the answers was found to be 24.008. This value is also statistically significant in 0.05 significance level (P<0.05).

Lesson success and internet game preferences of the participators were studied in Table 11. If we closely examine the given answers, we see that 38.1% of them said “mind games”, 28.7% said “sportive games, 20.8% of them said “strategy games”, and 12.5% of the participants replied that they play “action and fighting games”. However, when we look at the answers according to gender variable, comparative X^2 analysis value of the answers was found to be 31.251. This value is also statistically significant in 0.05 significance level (P<0.05).

DISCUSSION AND CONCLUSION

A total of 605 students, 318 of whom are male and 287 females, participated in the research aiming at determining the relationship between elementary school students' gender, lesson success and their game preferences (Table 1).

While 78.5% of the participants said they play sportive games, 21.5% of them said no. On the other hand, when we look at the answers according to gender variable, X^2 analysis value of the answers was found to be 72.433. This value is statistically significant in 0.05 significance level ($P<0.05$) (Table 2). So, there are significant differences among sportive game playing status of the participants. When given answers are examined in detail, it is seen that male students play more than female students.

33.5% of the participators play "rope skipping", 32.5% of them play "other games", 14.8% play "word games", 13.5% of them play "ball games" and 5.8% of the participants said that they were playing "touch". When we look at the answers given according to gender variable, comparative X^2 analysis value of the answers was found to be 71.281. This value is also statistically significant in 0.05 significance level ($P<0.05$). Therefore, there are statistically significant differences among sportive game playing status of the participants. When given answers are examined in detail, it is seen that female students mostly play "rope skipping"; while boys play different games other than those mentioned above.

Of the computer games, 59.1% of the participants play "mind games", 28.6% of them play "sportive games", 12.3% said "action and fighting games" (Table 4). However, when we look at the answers according to gender variable, comparative X^2 analysis value of the answers was found to be 41.702. This value is also statistically significant in 0.05 significance level ($P<0.05$). When given answers are examined in detail, it is seen that female students mostly play "mind games"; while boys prefer "action and fighting games".

75.1% of the participators said they play computer games "at home", 12.5% of them play at an "internet cafe", and 12% of the participants said they play computer games at "school computer labs". Nevertheless, when we look at the answers according to gender variable, comparative X^2 analysis value of the answers was found to be 13.813. This value is also statistically significant in 0.05 significance level ($P<0.05$). In the detailed analysis of the table, girls play mostly "at home"; while boys play "at internet cafes".

The status of participants showing how often they play computer games was inquired. It was seen that 52.8% of them said they play computer games "1 to 2 h in a week", 32.8% of them play "1 to 2 h in a day", and 14.% of the participators said they play computer games 1 to 2 h in two days. However, when we look at the answers according to gender variable, comparative X^2 analysis value of the answers was found to be 22.500. This value is also statistically significant in 0.05 significance level. ($P<0.05$). That is, there is a statistically significant difference of opinion between genders about how often they play computer games. If we examine the table in detail, female students mostly play 1 to 2 h in a week while male students play 1 to 2 h a day.

In their answers showing their views on how games affect their lesson success, 69.5% of the participators said "it has no effect", 12.9% said "it affects the lesson success negatively, and 17.6% of the participators replied that "it enhances his/her lesson success" (Table 7). However, when we look at the answers according to gender variable, comparative X^2 analysis value of the answers was found to be 8.021. This value is also statistically significant in 0.05 significance level ($P<0.05$). That is, there is a statistically significant difference of opinion for the respective gender variable. If the answers are examined in detail, it is seen that male students have the majority in the choice noting that it negatively affected their lesson success. For the overall answers, students are on the opinion that it has no effect at all (Roe and Muijs, 1998; Aktaran, 2004; Mitchell and Savill-Smith, 2001; Özmenler, 2010). In their research, they found out that children who are playing computer games have less interest in school and their time is limited for their lessons, the game affects their academic success negatively and lowers lesson success level; these findings are parallel with those in our research.

About the question on "how do the games affect the participants?" we see that, 62.8% of the participants said "it develops my skills", 30.6% said "I exhaust my energy and relax", and 6.7% of the participants replied that "I know my friend better through game." (Table 8) However, when we look at the answers according to gender variable, comparative X^2 analysis value of the answers was found to be 2.384. This value is not statistically significant in 0.05 significance level ($P<0.05$). That is, we can say that there is no statistically significant difference of opinion. Depending on these data, it can be said that computer game are beneficial for the development of the individuals (Mangır and Aktaş, 1993). They stated that game provides such benefits as searching for knowledge, observing, developing new abilities, and moreover, students who play games with his/her friends learn to share, have positive interaction with the environment, respect for the rights of the others and taking responsibility. In Becta (2006) report published in England, stressed that computer games are very important for children even for the adults (Akbaş et al., 2009). Besides, they are on the opinion that computer games cause such benefits as thinking critical, providing to visual memory and long-lasting learning. (Inal and Çağıltay, 2005).

Despite these benefits of computer games, according to a research conducted by (Horman et al., 2005) most of the students using internet and spending their time playing computer games have a tendency towards weaning social development at a considerable rate, self-reliance of these children are low, social uneasiness and aggressive attitudes of them are at an high level.

When we closely examine the lesson success and

Table 9. Table of lesson success and sportive game playing status of the participants.

Variable	I play sportive game	I do not play sportive game	Total
85-100=5	172 (69.6%)	75 (30.4%)	247(100.0%)
70-84=4	214 (88.4%)	28 (11.6%)	242(100.0%)
55-69=3	50 (73.5%)	18 (26.5%)	68 (100.0%)
45-54=2	14 (87.5%)	2 (12.5%)	16 (100.0%)
Total	450 (78.5%)	123(21.5%)	573 (100.0%)

X^2= 27.432, P= 0.000, P<0.05.

Table 10. Lesson success and other game playing status of the participants.

Variable	Rope skipping	Touch	Word games	Ball game	Other	Total
85-100=5	62 (34.8%)	10 (5.6%)	31(17.4%)	32 (18.0%)	43 (24.2%)	178 (100.0%)
70-84=4	52 (32.7%)	8 (5.0%)	22 (13.8%)	14(8.8%)	63 (39.6%)	159 (100.0%)
55-69=3	10 (21.3%)	3 (6.4%)	6(12.8%)	6(12.8%)	22 (46.8%	47 (100.0%)
45-54=2	6 (50.0%)	2(16.7%)	0 (0.0%)	2 (16.7%)	2 (16.7%)	12 (100.0%)
Total	130 (32.8%)	23 (5.8%)	59 (14.9%)	54(13.6%)	130 (32.8%)	396 (100.0%)

X^2= 24.008, P= 0.020, P<0.05.

Table 11. Lesson success and internet game preferences of the participants.

Variable	Mind games	Strategy games	Action and Fighting games	Sportive games	Total
85-100=5	102 (48.6%)	47 (22.4%)	18 (8.6%)	43(20.5%)	210(100.0%)
70-84=4	62 (28.4%)	44 (20.2%)	33 (15.1%)	79(36.2%)	218(100.0%)
55-69=3	21(33.9%)	14(22.6%)	8 (12.9%)	19(30.6%)	62(100.0%)
45-54=2	8 (50.0%)	0 (0.0%)	4(25.0%)	4(25.0%)	16 (100.0%)
Total	193 (38.1%)	105 (20.8%)	63 (12.5%)	145 (28.7%)	506 (100.0%)

X^2= 31.251, P= 0.000, P<0.05.

sportive game playing status of the participants, we see that 78.5% of them said “I play sportive game”, 21.5% said “I do not play sportive game” (Table 9). However, in the comparative statistical evaluation of the answers according to gender variable, comparative X^2 analysis value of the answers was found to be 27.432. This value is also statistically significant in 0.05 significance level (P<0.05). That is, there is a statistically significant difference of opinion for the respect of lesson success and playing games. When we examine the table in detail, it is seen that most of the students follow a sportive game, while successful students play less than those who are unsuccessful.

If we closely examine “lesson success” and “other game playing status” of the participants, we see that 32.8% of them said “rope skipping”, 32.8% said “other”, 14.9% said “word games”, and 13.6% said “ball game” and 5.8% of the participants replied that they play “touch” (Table 10). However, when we look at the answers according to gender variable, comparative X^2 analysis value of the answers was found 24.008. This value is also statistically significant in 0.05 significance level (P<0.05). That is, there is a statistically significant difference of opinion for the respect of game types and playing games. When the given answers were closely examined, there is a linear parallelism between lesson success and game type and playing games. In the research, those having lower grade averages do not play word games, as the lesson success increases, it is seen that the possibility of playing word games also increases.

If we closely examine the given answers on lesson success and internet game preferences of the participants, we see that 38.1% of them said “mind games”, 28.7% said “sportive games, 20.8% of them said “strategy games”, and 12.5% of the participants replied that they play “action and fighting games” (Table 11). However, when we look at the answers according to gender variable, comparative X^2 analysis value of the answers was found to be 31.251. This value is also statistically significant in 0.05 significance level (P<0.05). According to this outcome, there is a significant relationship between lesson success and internet game playing status. If we give a detailed examination on the table, it is seen that there are differences among those children, who have medium success level, lower grade averages and who have higher grade averages, in terms of playing game and game types. For the success levels, every student plays sportive games, those with lower grades play action and fighting games; student with higher grades play strategy games and all students play mind games

at all.

As a result of all these collected data, we can say that:

(i) In general, participants play sportive games; however, boys play sportive games more than girls, while girls mostly play rope skipping.
(ii) Of the computer games, mind games mostly preferred, according to gender differences, girls play mind games more than boys and boys play mostly sportive games, they usually play these games at home or on computer environment in school labs, they play usually 1 to 2 h a week; while according gender variable, boy play 1 to 2 h a day and girls play 1 to 2 h a week.
(iii) The games do not affect their academics either positively or negatively, but they help them develop their abilities and relax them by exhausting their energies.

For the respect of lesson success; on the other hand, most of the students play sportive games; they also play various games of other types; there is a linear parallelism between lesson success and game playing; that is, as lesson success increases, the number of those playing games also increases. Students, who have low lesson success, do not play word games. In terms of lesson success, most of the students play sportive and mind games of computer games; students with lower grades play strategy games.

SUGGESTIONS

The importance of game on the development of the children should be presented through various workshops, written and visual media.

Educative play grounds for children in various grounds in the cities should be built.

Various educative games should be used in education institutions as a means of education.

Game equipments should be presented for children so that they can develop in terms of physical and psychological, intellectual, psycho-social aspects.

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Full Length Research Paper

Evaluation of elementary school inspectors' occupational helps and guidance to teachers about new curriculum

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In this research, ministry inspectors' occupational helps and guidance to the teachers regarding a new primary school curriculum's implementation were assessed. For this purpose, a semi-structured questionnaire has been developed to gather data. It was applied to the teachers working in the Ministry of National Education owned and operated public schools by the researcher. The data was interpreted by analyzing frequencies and percentages information. According to the results, ministry inspectors' occupational help and guidance to the teachers about the new curriculum's implementation are insufficient.

Key words: Elementary inspectors, occupational help, guidance, new curriculum implementation.

INTRODUCTION

Education is a process that improves the personality of a person in different areas such as knowledge, skills, understanding attitude, character, and positive behaviors in the society. There are many functions of education such as social, personal, economic, political, and cultural for both individuals and society. For individuals, it is to reveal the potential of the individual and to make them reach a higher standard of life. For society, the function of education is to improve the society and to increase the level of welfare. Change is a phenomenon that encompasses all spheres of life. This change is one of the most important tools for education. According to Ergun (2003), reform is necessary to keep up with the requirements of the changing world, public life, and to be able to use education more efficiently to solve problems. Education is one of the areas that lots of reforms are performed.

The first education reform effort in Turkey, in other words, the efforts to develop a new education program began in 1924. Additional efforts for curriculum development in 1926, 1936, 1948, 1962, 1968, and 1984 were done as a result of the understanding that, they were not sufficient enough according to developments both in Turkey and around the world. The efforts have been continued to search for the program development (Ozden, 1999). The latest program change in Turkey in 1990 was based on a protocol signed between Turkey and the World Bank. This National Education Development Project aimed at increasing the quality of primary and secondary education, enhancing the quality of teacher education, and developing new educational management strategies.

Today, in our country especially some fairly comprehensive changes in social life and social systems are necessary in order to adjust the European Union, which is a new political, economic, and cultural formation, making structural arrangements in the stages of education and in accordance with the regulations, there has been the need for the development of education programs (EPODR, 2005; EPO, 2005). As a result of all the requirements earlier stated, Turkish, Mathematics, Science and Technology, Social Studies programs, which would be taught in the grades from 1 to 5 in primary

schools, to be implemented from academic year of 2005 to 2006 was adopted on July 12, 2004 (Yildirim, 2008). With the initiatives in this direction, it was tried to develop an understanding based on multiple causes and multiple outcomes rather than uniform logic, that constitutes the intellectual foundation of our educational system. In this context, from the understanding of a theoretical background of our education program, which is based on solid behavior, to enter into a conversion, including a constructivist understanding and designed to perform this transformation (MNE, 2005) focused on understanding the adoption of constructivist learning approaches such as multiple intelligences and active learning (Gunes, 2004).

So far today, the major learning theories of the behavioral approaches are “Pavlov’s classical conditioning,” “Watson and Guthrie's contiguity theory,” “Thorndike's bond theory,” “Skinner’s operant conditioning theory,” and “Hull's systematic theory of behavior” (Senturk, 2007). According to the behavioral approach, knowledge is a phenomenon existing in the universe. If this knowledge is taught to a student and becomes a behavior, then it is considered as learned. There is no need to deal with the production of the knowledge and someone already teaches the existing knowledge (Turhan, 2005). According to the methods of this theory, known as “traditional teaching,” stereotypical knowledge is transferred to students with strict curriculum in a teacher-centered learning environment. Individuals study alone and the evaluation is result based (Gurol, 2002; Tezci and Dikici, 2003). As a result, students are “unable to apply their information and proceduralized skills to real-world situations” (Gredler, 1997: 57)

Contemporary learning theories are based on cognitive approach that defines learning, and they are “Constructivist learning theory,” “Gestalt theory of learning,” and “Information processing theory” (Senturk, 2007). It would be more accurate to interpret Constructivist approach as knowledge/learning theory rather than a theory of knowledge (Hosgorur, 2002).

The constructivist theory deals with knowledge, the nature of the knowledge, how we know, the process of knowledge construction, and what affects this process (Acikgoz, 2005). Thomas and David (1992) assert that “meaning is imposed on the world by us, rather than existing in the world independently of us. There are many ways to structure the world, and there are many meanings or perspectives for any event or concept. Thus, there is not a correct meaning that we are striving for” (p. 3).

Together with the constructivism, for the first time since the 1940s, an international comparative total change has been projected in Turkey. Not only teaching, but also education was emphasized. It was adjusted for the eight-year uninterrupted elementary education. The European Union’s and international norms of education were taken into account while it was being created. Sports culture, health, environment, guidance, career, entrepreneurship, and disaster awareness were placed on the backbone of the program with an interdisciplinary approach. Knowledge, skills, understanding, and attitudes were put into the program instead of the expression of superficial behaviors.

The principle of mutual causality was pro-posed rather than dominant-linear thinking. The creation of awareness and consciousness of Turkish language and history were among the main objectives of the program. In constructivism, the interaction between student and teacher, who is the vital element of education programs, is extremely important. In traditional approaches, the teacher is the source of the knowledge, the transmitter, and the person, who makes assessment. Because of this, teacher is compelling, restrictive, and oppressive (Tezci and Dikici, 2003). On the other hand, in constructivism, “learners do not just take in and store up given information. They make tentative interpretations of experience and go on to elaborate and test those interpretations” (Perkins, 1992: 49).

New teaching program attributed new roles to teachers such as “environment regulator”, “router” and “facilitator” instead of “instructor”. The main role of the teacher is to organize the teaching and learning environment and to guide students in activities. Teacher is also given other responsibilities such as providing collaboration, helping students, facilitating learning, self-developing, planning, routing, valuing individual differences, and providing health and safety (Askar et al., 2005). The teacher, whose role has been changed with the new curriculum, should know his/her new role in the program very well. The responsibility of he training of qualified teachers in implementing the program belongs, especially, to the teacher training institutions. It’s important for teachers to renew themselves for the program which was the result of scientific, technological, and social developments and it is necessary to educate in-service teachers to make them recognize, evaluate, and implement the program better. The researches (Can, 2004a; Demirel, 1998; Terzi, 2002) made for the development of teaching profession states that, to have better education and better schools, occupational or professional education is necessary. Teachers, who have a better occupational education, can provide a positive learning condition to their students. For qualified teachers and quality teaching, it is important to provide teachers continuous support for professional development. For this reason, in-service training programs, inspectors’ guidance, occupational benefits are needed in order to have teachers with qualifications prescribed for the new curriculum.

One of the sources for teachers to receive professional guidance and help is the ministry inspectors. The most

important aspect of inspection in primary education is professional assistance and guidance of teachers. As a result of the need of providing continuous renewal and improvement in education, the importance of inspection services is increasing. Duties of inspectors in primary education can be, as stated in the regulations, categorized in four areas:

1. Review–research,
2. Institution and course inspection,
3. Investigation, and
4. Guidance-professional help and education (Taymaz, 2002: 47).

Among the duties of inspectors in primary education are guidance and professional assistance, which consist of assistance to teachers to adapt to their environment (Korkmaz and Ozdogan, 2005). In ministry inspectors' regulations, we see that inspection and auditing come to the fore. Even, the audit in practice is perceived as if it is the foremost and most important task of the ministry inspectors.

However, professional assistance and guidance have not been fulfilled by the inspectors or they could not have enough time to do it. According to Aydin (2000), the inspection applications in Turkish National Education System are largely about conservation of the existing structure, guideline provider, and a kind of investigation-management mixture in nature. Teachers are supporting this view and state that inspectors mostly work on review, investigation and audit, not on guidance. Although, it is not high as teachers' view, it is also shared with supervisors. According to the teachers, inspectors take the regulations and theory as basics and there are not enough inspectors, as a result, they could not spend enough time with teachers (Can, 2004b).

Ministry of Education has worked to reflect the changes and diversity in the field of education to the programs and revised the curriculum by considering the contemporary criteria since 2004. Changed programs and developments in the world, naturally, attributed the different tasks to education managers and inspectors. The success of the new programs requires innovative leadership that supports the application process and increases the momentum of change (Rencber, 2008). In order to achieve the desired outcomes from the new curriculum, introduced to the 1st level of primary education (1, 2, 3, 4, 5th grades) in the academic year of 2004 to 2005 and to 2nd level of primary education (6, 7, and 8th grades) in the academic year of 2005 to 2006, the teachers, who are the practitioners, must have an in-service education. In this context, ministry inspectors have an important duty because one of the basic tasks of the inspectors in primary education is to provide occupational guidance and assistance to teachers. This guidance and occupational help includes educational programs and planning. This study was conducted to evaluate ministry inspectors' guidance and professional assistance to teachers about the new primary education curriculum by a questionnaire developed by the researcher.

Objectives of the study

The purpose of this study was to evaluate adequacy of the professional guidance and services provided to teachers by ministry inspectors in the implementation of the renewed primary education curriculum. For this purpose, the following questions guided the study:

1. How do teachers perceive the guidance and professional assistance of ministry inspectors on understanding the basic philosophy of the new primary education program?
2. How do teachers perceive the ministry inspectors' guidance and professional assistance about "the new curriculum's objectives, contents, teaching-learning experiences, and evaluation techniques"?
3. How do teachers perceive ministry inspectors' professional help and guidance about "how to guide students according to the new curriculum"?
4. How do teachers perceive the ministry inspectors' guidance and professional assistance about "classroom management" according to a new curriculum?
5. How do teachers perceive the ministry inspectors' the guidance and professional assistance about "activities, their selection, and using appropriate materials for the activities" according to the new curriculum?
6. How do teachers perceive the ministry inspectors' the guidance and professional assistance about "modern assessment techniques such as performance, assignments, project assignments, and portfolio assessment"?
7. How do teachers perceive the ministry inspectors' the guidance and professional assistance about "preparation and implementation of social activities and club activities"?

METHODOLOGY

The method of this research is "descriptive-survey" and it has a scanning model in nature. According to Merriam (2001), qualitative research in education, simply "seek to discover and understand a phenomenon, a process, or the perspectives and worldviews of the people involved" (p. 11). Based on the opinions of teachers, it was attempted to assess the effectiveness of activities of guidance and professional helps about the new curriculum that ministry inspectors provided to teachers working in the primary schools.

While the research was being conducted, the following were made, the literature has been scanned for the new curriculum and ministry inspectors' guidance and occupational help to the teachers. Based on literature review, a semi-structured, eight-item questionnaire was developed to be applied to the teachers in primary

Table 1. Teachers' views about the guidance and professional assistance of ministry inspectors about understanding the basic philosophy of the new primary education program.

Teachers' views	(N)	(%)
Yes, it was provided	11	18
It was provided, but not enough	21	35
Never provided	28	47
Total	60	100

schools. In the questionnaire form, necessary arrangements were made after expert opinions had been received. Later, the researcher himself went to the schools and available teachers, filled up the questionnaire in their break time. The semi-structured questionnaire consisted of the following items:

1. What do you think about the ministry inspectors' guidance and professional help about understanding the basic philosophy of the new primary education program?
2. What do you think about the ministry inspectors' guidance and professional help about the new curriculum's objectives, contents, teaching-learning experiences, and evaluation methods?
3. What do you think about the ministry inspectors' guidance and professional help about how to guide students according to the new curriculum?
4. What do you think about the ministry inspectors' guidance and professional help about classroom management according to a new curriculum?
5. What do you think about the ministry inspectors' guidance and professional help about the activities, their selection, and using appropriate materials for the activities?
6. What do you think about the ministry inspectors' guidance and professional help about the modern assessment techniques such as performance assignments, project assignments, and a portfolio assessment?
7. What do you think about the ministry inspectors' guidance and professional help about the preparation and implementation of social and club activities?
8. Is there anything you wish to add other than these questions?

Recorded teacher comments were divided into three groups according to their response and opinions, from positive to negative. The three groups are:

1. "Yes, it was provided"
2. "It was provided, but not enough"
3. "Never provided"

When the quotes were added to this report, in order not to give personal information or any other identifiers, the participants were coded as "Teacher A," "Teacher B," "Teacher C," and such.

Participants

The participants of this research were selected from the Ministry of National Education (MNE) owned and operated public schools in 2008 to 2009 academic year in Kilis, a city on the Southeastern part of Turkey with the population of 80,000. The total classroom population of all the participants was more than 2,000 students, including branch teachers'. 60 teachers were randomly selected. The data were tabulated using frequency and percentage calculations. Then, they were decoded and interpreted.

RESULTS AND INTERPRETATION

After reading and examining the views of teachers on the questionnaire forms, the groupings were formed by bringing together the similar answers. Teachers' answers to the questions were collected in three categories:

a) No guidance was provided
b) Guidance provided, but not enough
c) Sufficient guidance was provided.

Teachers' opinions were sorted into three groups. The data of the sub-problems, stated in the purpose of the study, was arranged as tables. The results were interpreted by comparing the findings of other studies in the field. The research finding for each sub-problem was been written into a table and comments were made under each table.

Sub-problem 1

How do teachers perceive the guidance and professional assistance of ministry inspectors about understanding the basic philosophy of the new primary education program?

When Table 1 is examined, it can be seen that 18% of teachers find the guidance and professional assistance of ministry inspectors about understanding the basic philosophy of the new primary education program 'enough', 35% of teachers find it 'not enough'. 47% of them stated that they 'took no guidance'. Teachers' opinions about this problem are given below in the order of the following categories: "it was provided," "it was provided, but not enough," and "never provided":

"They emphasized that the basic philosophy of the new primary education program is constructivism and it means that, students are on the center and teacher is only a guide. They answered our questions about this. I find their guidance enough (Teacher A)".
"Guidance was made as a group in teachers' room. They told us that constructivism was the basic philosophy of the new primary education curriculum and teacher should be a guide for students to access the information but they never talked about the details. In my mind there is still uncertainty about how the teacher would be a guide (Teacher B)".
"Inspectors have never mentioned this issue, neither do they come to inspect nor for guidance, are they only interested in inspection. I have learned it by searching on the net by myself (Teacher C)".

Table 2. Teachers' views about the guidance and professional assistance of ministry inspectors about the new primary school program's objectives, contents, teaching-learning experiences, and evaluation methods.

Teachers' views	(N)	(%)
Yes, it was provided	9	15
It was provided, but not enough	15	25
Never provided	36	60
Total	60	100

Table 3. Teachers' views about the guidance and professional assistance of ministry inspectors about guiding students according to the new curriculum.

Teachers' views	(N)	(%)
Yes, it was provided	8	13
It was provided, but not enough	12	20
Never provided	40	67
Total	60	100

Sub-problem 2

How do teachers perceive the guidance and professional assistance of ministry inspectors about the new primary school program's objectives, content, teaching-learning experiences, and evaluation methods?

In Table 2, frequencies and percentages show that while 9 teachers (15%) find the guidance and professional assistance 'adequate', 15 teachers (25%) find it 'inadequate'. 36 teachers (60%) who filled out the questionnaire form stated that, they had 'no guidance'. It is understood from the data that ministry inspectors could not provide sufficient guidance to the teachers about the elements of the new curriculum. Most of the teachers who said the guidance provided on this issue reported that, the guidance was mostly about measurement and evaluation as the following quotes show:

"I have taken the guidance during inspection. Inspector mentioned about the contents and changes of objectives in my field and gave information about the course. He answered my questions about the measurement tools. I think that I have got enough guidance (Teacher D)".
"The changes in measurement and evaluation were mentioned. The inspector said that now there was not only the written exam but also other alternative measuring tools. He tried to explain these tools but I can't say the guidance was enough (Teacher E)".
"I have not received any guidance on this subject. When Inspectors come to our school they only attend my class and look at my files (Teacher F)".

Sub-problem 3

How do teachers perceive the guidance and professional assistance of ministry inspectors about "How to guide students" according to the new curriculum?

According to Table 3, 13% of teachers find the guidance and professional assistance of ministry inspectors about guiding students according to new primary education program 'enough', 20% of teachers find it 'not enough'. 67% of them stated that they have got 'no guidance'. Teachers' opinions about this problem are given shortly in the order of following categories: "it was provided," "it was provided, but not enough," and "never provided":

"Inspectors said that we should guide students based on their interests and needs. They mentioned the occupational, educational, and personal guidance (Teacher E)."
"They only talked about guidance of students and occupational guidance. I can't say that they made adequate guidance (Teacher G)."
"We get help from our school counselor on this subject. I haven't taken any guidance from inspectors (Teacher F)."

As it can be understood from Table 3, ministry inspectors did not provide enough occupational help to the teachers about guiding their students according to the new curriculum, which is student-centered, and it is the basis of Constructivist ideals.

Sub-problem 4

How do teachers perceive the guidance and professional assistance of ministry inspectors about classroom management according to the new curriculum?

According to Table 4, 17% of teachers find think that they did 'not get enough' guidance and professional assistance from ministry inspectors about classroom management stated in the new curriculum. Although 23% of them find it 'not enough', a very large number of teachers (60%) state that they 'have not been provided the guidance'. The following teachers' quotes show their opinions very clearly: "They said that classroom had to be a democratic environment and we should allow students to tell their ideas clearly and freely. I think it's an adequate guidance (Teacher H)". "They talked about the reward and punishment issues but they did not tell much about the classroom management that constructivism

Table 4. Teachers' views about the guidance and professional assistance of ministry inspectors about classroom management according to new curriculum.

Teachers' views	(N)	(%)
Yes, it was provided	10	17
It was provided, but not enough	14	23
Never provided	36	60
Total	60	100

Table 5. Teachers' views about the guidance and professional assistance of ministry inspectors about the activities, their selection, and using appropriate materials for these activities.

Teachers' views	(N)	(%)
Yes, it was provided	24	40
It was provided, but not enough	16	27
Never provided	20	33
Total	60	100

Table 6. Teachers' views about the guidance and professional assistance of ministry inspectors about the modern assessment techniques such as performance assignments, project assignments, and portfolio.

Teachers' views	(N)	(%)
Yes, it was provided	26	43
It was provided, but not enough	20	33
Never provided	14	24
Total	60	100

requires (Teacher I)".
"I think the inspectors also inadequate in this regard. I have not received any guidance on this subject (Teacher K)".

Sub-problem 5

How do teachers perceive the guidance and professional assistance of ministry inspectors about the activities, their selection, and using appropriate materials for these activities?

When Table 5 is examined, it can be understood that 40% of teachers think that, the guidance and professional assistance of ministry inspectors about the activities, their selection, and using appropriate materials for these activities were 'enough'. 27% of teachers find it 'not enough', and 33% of them expressed that they took 'no guidance'. Teachers' opinions about this problem are given below in the order of following categories: "It was provided," "it was provided, but not enough," and "never provided":

"I think that the area the teachers need most help is designing activities and inspectors are aware of this. I asked questions about how to do the activities, materials to be used and duration of the activities. I believe that I received adequate guidance with the answers to my questions (Teacher B)".
"Inspector who came for guidance told me that we should do activities and keep a portfolio. He didn't talk about the activities in detail (Teacher L)".
"I have been teacher for a few years now and not only about the activities but also I haven't received any guidance. I can say that I need guidance especially about activities (Teacher M)".

Sub-problem 6

How do teachers perceive the guidance and professional assistance of ministry inspectors about the modern assessment techniques such as performance assignments, project assignments, and portfolio assessment?

According to Table 6, for the guidance and professional assistance of ministry inspectors about the modern assessment techniques such as performance assignments, project assignments, and portfolio assessments, 43% of teachers find it 'enough' and 33% of teachers find it 'not enough'. The percentage of teachers who stated that they have 'never received' guidance is 24. The following quotes can be examples of teachers' views about ministry inspectors' guidance and professional assistance about modern assessment techniques, that should be used in teaching and learning process as stated in constructivist based new curriculum:

"The most important innovation of the new primary education program is contemporary assessment methods. I think the inspectors especially should provide guidance on this issue. Inspectors, who came to our school, stressed this issue. They told it in details. I think it was very good (Teacher N)."
"The inspector, who was checking me, talked something about performance assignments and project assignments. I think it was not an adequate guidance because I have learned something about it from the Internet by myself, and from my friends (Teacher B)".
"I have not received any guidance from inspectors. I try to learn by searching but I believe that I still have deficiencies about it (Teacher F)".

Table 7. Teachers' views about the guidance and professional assistance of ministry inspectors about the preparation and implementation of social and club activities.

Teachers' views	(N)	(%)
Yes, it was provided	5	12
It was provided, but not enough	13	22
Never provided	42	66
Total	60	100

Sub-problem 7

How do teachers perceive the guidance and professional assistance of ministry inspectors about the preparation and implementation of social and club activities?

When Table 7 is examined, it can be understood that, about the guidance and professional assistance of ministry inspectors about the preparation and implementation of social and club activities, 12% of teachers find it 'enough', 22% of teachers find it 'not enough', and 66% of them state that they received 'no guidance'. Teachers' opinions about this problem are given below in the order of the following categories: "It was provided," "it was provided, but not enough," and "never provided":

"They said that students are active in constructivism, in social activities or club activities students should take part in actively. They also mentioned that social activities should meet students' interest and needs. They answered our questions. I think the guidance was adequate (Teacher D)".
"I have received a little guidance during inspection. The inspector looked at the file of club activities and suggested something about what I should do for social and club activities (Teacher O)".

Conclusions

The results of the research indicate that, the ministry inspectors could not perform the role of guidance and professional assistance as expected. According to the respondents of this study, ministry inspectors have achieved the role of professional assistance and guidance "inadequately" in terms of the stated seven different dimensions. The perceptions of the teachers show that, inspectors have mostly helped them about activities, their selection, using appropriate materials for these activities, and the modern assessment techniques. 40% of the teachers who took part in this study answered the question, "What do you think about the ministry inspectors' guidance and professional help about the activities, their selection, and using appropriate materials for these activities?" as "yes, they did it adequately" and again 43% of teachers answered the question, "What do you think about the ministry inspectors' guidance and professional help about the modern assessment techniques such as performance assignments, project assignments, and portfolio assessment?" as "Yes, they did it adequately".

According to the participants of this research, ministry inspectors provided minimum professional assistance and guidance about teachers' role on guiding students and social club activities. While 67% of teachers responded to the question, as stated in the third item, "What do you think about the ministry inspectors' guidance and professional help about how to guide students according to the new curriculum?" as "No, they did not do it adequately," 60% of teachers responded to "What do you think about the ministry inspectors' guidance and professional help about the preparation and implementation of social and club activities?" as "No, I do not find it adequate". It was also found from the perceptions of the teachers that inspectors did not make enough guidance and professional assistance about the philosophy of the new curriculum, it's objectives, contents, teaching-learning experiences, assessment methods, and classroom management methods, which are main elements of new program because the questions related to these areas were responded positively only by 15% of the participants, who think they got adequate guidance and professional assistance.

One of the issues that teachers complain about is divergence of opinion among ministry inspectors. For example, a teacher who met two different inspectors got different information about the same subject. This quotation from that teacher clearly tells us the situation: "I asked a question about the modern assessment to the inspector and the answer was satisfying. But the other day at the general meeting with the inspectors held in the teachers' room, a friend of mine asked the same question to another inspector but he answered it in a completely different way and I got confused. Then I searched on the Internet and learned the correct answer." This and similar occasions hinder the confidence of teachers on ministry inspectors. So, there must be an agreement among inspectors' views about the philosophy, activities, and assessment techniques of the new curriculum. The other issue that teachers complain about is that, inspectors visit the school only for 'inspection' not for the guidance. Teachers think that inspectors do not have time to guide all teachers. They have limited time and they use it mostly for 'inspection' because they have only an hour for each teacher. Most of the teachers stated that they cannot get the adequate guidance and cannot ask the questions they have. Moreover, in some schools we visited, teachers complained that inspectors had come to their school only in the seminar period and that was why

they have waited for an inspector to ask the questions about the program for a year and half. This quote clearly tells us the teacher's view:

"I have been a teacher for a year and half at this school but I have not met any inspectors because this year the inspectors have not come to our school. Last year they came in the seminar period and they neither guide nor inspect us, they only dealt with school management. As a result I have not taken advantage of the inspectors".

Branch teachers also complained that most of the inspectors were originally primary school teachers and they do not have enough information about specific fields, so the branch teachers cannot get adequate professional assistance and guidance from them especially teachers of English language and information technology.

It also should be understood from this study and other similar studies (Arslantas, 2007; Sinkinson, 2004; Unal, 1999) that ministry inspectors cannot make adequate guidance and professional assistance to the teachers because of different reasons. It is only possible to get the expected results from the new implemented program when the teachers, who are the implementer of the program, should be inserted on-the-job-training or should get adequate guidance. It is obvious, according to the results of this study that, teachers cannot get adequate assistance about the new curriculum.

SUGGESTIONS

1. The inspector assistants should be trained according to the constructivist curriculum and primary school inspectors should be taken into an in-service-training program about the new curriculum. The training program of the inspector assistants should include some courses related to the stages of new curriculum and as a result the inspectors can be expected to guide teachers about new constructivist curriculum better. In this regard, they should cooperate with universities, especially Department of Educational Sciences in the Faculty of Education.
2. While selecting ministry inspectors, secondary school teachers should be taken into consideration and more branch inspectors should be trained; because almost all in-service inspectors were originally primary school teachers, not branch teachers; this situation causes problems while providing the occupational help and guidance to the field-specific subjects.
3. The number and duration of visits of ministry inspectors for guidance to teachers should be increased. It is expected that, if the duration of visits is increased, the sharing of information between the inspector and teachers will increase, and perhaps the inspector would have to teach a lesson to the teachers about the new curriculum.
4. According to the number of in-service ministry inspectors and teachers, the inspector-to-teacher ratio is very high. The number of teachers per inspector responsible is even far above the number required by the regulation. In order to increase teacher-inspector ratio to a reasonable level, adequate numbers of inspectors should be trained by taking into account the branch teachers of the secondary schools.

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Full Length Research Paper

Speaking and speaking education as physical process in Turkish education

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Speaking is sending the message which is desired to be transferred to another one with vocal organs and produced by complicated operations in the brain. Speaking, which is a complicated process, is the most common and important means of communication among people. Speaking, which has essential place both individually and socially, affects success and failure in people's lives. In this study, sound and phonation; which form the physical process of speaking, are emphasized and the features that should be in a fine speaking sound will be explained.

Key words: Turkish education, speaking, speaking education.

INTRODUCTION

Speaking which is one of the fundamental qualities that makes people as a real individual has various definitions. 'Speaking' shortly is an oral explanation of thoughts and emotions. It is described in 'Turkish Dictionary' (TDK, 2005: 1212) that 1) Work of speech' 2) Talking, consulting, discussing. 3) Speech, lecture that are given to audiences in order to inform them about science, literature art and etc....' While some describe speaking as using sounds and body gestures in order to send our thoughts, ideas and dreams to our audiences (Kantemir, 1995: 51), the others describe it as reflecting oneself to others by using one's own experiences with a perfect expression (Ağca, 1999: 71). Gürzap (2003: 33) describes it as composing the whole thoughts emerged from human brain from the simplest to most complex one by giving them various colours and depths. And according to Özdemir (1995: 215) 'speaking is a means which builds connections between us and our environment and leads our relationships. Speaking has an essential place in expressing our loves, friendships, angers and enmities and in being understood by other as well. As can be seen in those descriptions, speaking has a wide sense. Conceptions such as sound, pronunciation, expression, understanding, agreement, communication that are interlaced can be included in the description of speaking.

The physical dimension of speaking is mostly about sound. 1) The vibration that is hearable by ears. 2) The vibration made by the air that comes from the lungs' (TDK, 2005: 1739). That voice is an indication that reflects personality is a determination which is popularly accepted nowadays. Producing a sound can be possible with working many organs in our body harmonically. Sound is produced and formed by the flow of the air which is taken into the lungs and goes through abdomen, diaphragm, chest, chest-bone, trachea, vocal cords and mouth. In shaping sounds, especially the organs in throat and mouth are very effective (Özbey, 2005: 116).

Producing speech sounds

Speaking is a detailed work about many organs of which main functions are different. For example, larynx produces sounds in speaking in fact its function has nothing about speaking. The main function of lungs; which work as a pair of bellows, in order to activate vocal cords in larynx, is to absorb oxygen. Speaking is only its secondary duty. The gaps in head that rise and reflect the sound are for absorbing the food and air into the body. In producing sounds, nasal passage, tongue, lips and muscles of throat play an important role in providing cork and rubbing mechanism. Yet, this isn't their real function,

it is an additional one (Cole and Morgan, 2001: 316). In similar way, the organs which play a significant role in producing sounds, such as chin, teeth, palate, nose and etc... do not perform their own duties. Even though these organs are used to produce sounds, speaking is a secondary function of them (Taşer, 2000:74).

Speaking first of all, is a unity of sound and producing sound. Hearing the vibration in the air is called as sound. Every sound is not a speech sound. It is necessary for air to hit the vocal cords just as it is coming out from the lungs (Çelik, 1998: 61). The organs that provide the production of speech sounds are vocal organs. There can be seen three stages in producing human voice: aspiration, sounding, articulation.

Aspiration

The lungs that work as a pair of bellows push the air from trachea into the mouth by pressing enough amount of air. This is a raw material of the sound. Its difference from breathing is that; breathing isn't willingly, but natural and obligatory. Aspiration which will produce the sound depends on demand and unnatural.

Sounding

The air which is pushed into the mouth meets vocal cords at larynx that exists at the end of the trachea, and they sound as they are separating from each other more or less. As a result of this the air becomes sound condition.

Articulation

The air which has become vibe arrives at the crossroad of cavity and nasal passages while going through vocal passages. There is a uvula at this crossroad. Uvula opens way either for mouth passage by closing nasal passages or for nasal passages by closing mouth passages together with tongue. If the air which has become sound goes to nasal passage, it produces nasal sounds. And if it goes to cavity, it is articulated and reached the desired form.

Speech organs

While people are speaking, breath goes out by hitting these organs: lungs, trachea, larynx, vocal cords, uvula, cavity, nasal cavity, nasal passage, palate, gums, teeth, tongue and lips. The way which goes through thoracic cavity to lips and nose is called as vocal way. The organs which are arranged around vocal way and have function in speaking are also called vocal organs. The natural functions of them are totally different. For example, the function of lungs is to clean up the blood, the function of tongue is to taste and to help to swallow foods. Producing sound is their secondary function. These organs must work in a harmony to create speaking. These organs are classified differently in many sources. Şenbay (1997) investigates these organs in three groups by calling them as 'vocal means':

1. The organs in which sound occurs (larynx)
2. Air pipe with a pair of bellows (lungs and trachea)
3. Mouth, throat and nose which can enlarge the same sound with resonance spaces.

In other source, physical organs which produce sound are classified into two: (Erem and Sevim, 1947: 80-89).

1. The organs of breathing (lungs, diaphragm, trachea)
2. Speech organs
a) Larynx (cartilages, vocal cords, glottis, epiglottis)
b) Mouth (pharynx, soft palate, uvula, hard palate, tongue, lips, and lower chin)
c) Nose

If we take a look at the essential speech organs one by one;

Diaphragm

Diaphragm has a body which separates abdomen and thoracic cavity, becomes thinner at its centre and becomes thicker at its sides. It is one of the primary organs which regulates our breathing. It lets the air come into by widening itself with the movements of its muscles and again by the help of these muscles it becomes narrower and pushes the air into our trachea. There is a direct relationship between our ability to control our diaphragm and our speech order. If we have the ability to control our aspiration much longer and regularly, we can speak continuously and fluently. For this reason, all of the speaking practises have diaphragm control exercises. When diaphragm has a natural deficiency or isn't trained well, it can cause some kinds of speaking disorders. Diaphragm has a great influence on articulating and intonation and also on fast or slow speaking.

Chest

Chest is an important speech organ too. In form of a chest, there is a working order that provides both healthy breathing and regulates our speech rhythm. There is no front connections of some chest bones and this connection are ensured by a cartilaginous tissue among them. It lets the side of the chest towards abdomen move like an arch. Some disorders in chest may cause speech disorder. The harmony between diaphragm, chest and chest muscles makes the air we take in goes to our trachea regularly and rhythmically (Yalçın, 2002).

Vocal cords

Vocal cords in larynx consist of muscles like fibres. Vocal

cords come closer to each other and stretch while speaking. The air meets an obstacle vibes. This little sound becomes a hearable sound after becoming bigger in cavities. The length of vocal cords is 20 to 25 mm in men and 16 to 20 mm in women. If we do not care about vocal cords, it can cause important disorders in speaking (Şenbay, 1997: 12). Vocal cords open and close regularly as breathing. From the beginning of sending a message from our brains into our bodies, vocal cords contribute to produce a desired voice by shaping itself appropriately for each sound, intonation and stress. We know that physical features of vocal cords determine our voice, and its thickness or fineness. And again some disorders in them can cause speaking disorders as well.

Back palate

The other point in which sounds are produced is called as back palate where mouth and throat meet. The sound that has got a shape by hitting vocal cord then has got a brand new shape by hitting back palate with the movements of our tongue. The sounds called as velar consonants (g, ğ, and k) arise in this way (Yalçın, 2002: 103).

Tongue

Except for the vowels, our tongue is a very essential organ which we inevitably use to produce all sounds. Tongue has an important function in especially some sounds. Tongue should move easily within mouth. Tongue should touch the root and upper teeth and upper lips by being twisted. Tip of a tongue should be stretched and twisted easily. If we aren't able to rule over our tongue, we see that our sounds are hoarse. If we succeed in improving usage of our tongue in general, this ability helps us to overcome pronunciation issue while learning a foreign language. The sounds which are influenced by tongue laziness much are: 'c, ç, d, j, l, n, r, s, ş, t, and z' (Bozdağ, http://www.yetenek.com).

Chin

The role of a chin is very significant in fine speech. In all languages, all letters are voiced by using chin. Chin has to perform different movements one after another in a fast way while speaking. Chin opens, closes, becomes narrower and widens. Lower chin moves forward and backwards. The build of the bone in which our upper teeth take place is stable. Therefore all of these movements are performed by the muscles that control the lower chin. We can face some problems in using our chins, this causes speech disorders as well. We aren't able to perform various movements regularly and when chin muscles are not developed and conditioned. In such a situation, some movements disappear and this causes a loss in sounds too. If we do not use our chin healthily, we experience some problems in producing sounds (Bozdağ, http://www.yetenek.com).

Lips

It is exactly impossible to produce some sounds in a situation that lips aren't used. People who have labial apathy encounter problems in sounds that are produced by using lips. The sounds in Turkish depend heavily on using lips are: 'b, f, m, o, ö, p, u, ü, and v. If there is an obscurity and lack of clarity, the reasons depend on labial apathy. In addition, lips take certain positions with certain sounds. From this point of view, for example, while producing the sounds like 'ı, i' contribution of lips must be taken into consideration. These sounds can be pronounced without support of lips, but they cannot be qualified enough (Bozdağ, http: yetenek.com). In constructing sounds, there are other organs such as larynx, lungs, trachea, cheek, and nose. Here we emphasize the most important organs in producing sounds.

The features of speech voice

Articulation

Articulation is to build syllables clearly. Most of the people speak without using their lips. And most of the audiences cannot understand what this kind of people said. When we usually say, 'please speak louder' this warning is not that this person speak low, but for he/she can't articulate the words in a desired quality (Şenbay, 1997:50). Being heard able clearly of words depends on articulating of syllables correctly rather than speaking loudly. In dictation training which builds the dimension of physical education of voice, articulation practises has got a great importance. We can say that it constitutes the art of diction. Before starting to train voice, there should exactly be practises to control breathing. Because that speaker gives the control of his/her own breathing under the authority of his/her will rather than randomly, is an essential training which makes speaking fluent and be appropriate for pauses (Yalçın, 2002). If breathing and aspiration which depend on moving in a harmony of chest and diaphragm are not healthy, articulation will not be, of course, at expected level. At almost all of the jobs that require speaking, in speech training, the most important matter undoubtly is articulation practises.

The main aim of articulation training is to give the correct and effective sound of each word. We can express the difference between one who had an articulation training and other one who didn't have it like

that; we can understand almost all of what they say even though they speak with very low voice. And the other cannot be understood well enough; even though they speak very loudly. In addition we become annoyed; because of loud voice. As speakers in first group had articulation training before, the every word they said is quite and perfect. The speakers in other group speak loudly but they do not produce the sound in a correct order that is expected to be, and also quietly and perfectly. Therefore, every sound comes out by mixing into each other. And audiences try harder to recognize these mixed sounds one by one (Yalçın, 2002).

One of the most important elements of fine and effective speaking, articulating sound effectively, correctly and adequately. For this reason, the students who have incapacity in these subjects should be practised with some tongue twister.

INTONATION

Sound tracking; which consists of simple and periodical movements, that is to say, vibes that repeats themselves within a certain period in a certain order is called as tone. Phonemes, syllables and words arrange like a chain in speaking. The sounds which come after one another are never in the same level and colour. Sound continuously falls and rises, becomes soft, hard, fine and thick. These sound changings are called intonation. The audio level of the sound is its volume. The audio level depends on width of its vibration. If vibes are fast, tone of sound rises. This is called rise tone. At pronouncing of a word, because of the changings in sound rise and harmony, there exist some sound waves and these are called sentence tone (Parlakyıldız, 2001: 54).

Intonation which is about pronunciation part of speaking should be done correctly and perfectly for effective and fine speech, as intonation has got strength to shift the meaning of a word. Tone; in other words intonation is about psychological condition of a person. It adds some details such as softness, hardness, enthusiasm, anger, certainty, ambiguity and etc... to expression. For example news about death can not be said in the same intonation with a news of a birth. Let us take ‘yes’ and ‘no’ words to discern the shift in meaning by different intonations. These examples and words can be increased (Çelik, 1998: 67).

Evet: Şimdi sizi dinliyorum. (Yes: Now, I’m listening to you)
Evet: Kabul ediyorum. (Yes: I agree)
Evet: Meraklandırma insanı söyle. (Yes: Do not make me wonder, say)
Evet: Allah cezanı versin, söyle. (Yes: God damn you! Say)
Evet: Tamam. (Yes: Okay)
Hayır: Kesinlikle ben yapmadım. (No: Exactly, I didn’t do it)
Hayır: Kaç defa söyledim, olmaz. (No: How many times I said, no)
Hayır: Bu sorunu çözmem gerekli. (No: I have to solve this problem)
Hayır: İşim yok. (No: I have no duty)

Pause

We need breathing to produce sounds. We can lengthen our voice for a while; but at the end, our breath expires, we stop and have to breathe again. Therefore, we need some pauses while speaking in order to reply the need of breathing. All of these pauses constitute punctuation in speaking. The pauses; which are also called as speech punctuation, explain the stopping points in speaking. They are generally done in three ways as short, normal, and long (Parlakyıldız, 2001: 55). Breathing and pausing are done within a natural course of speech. Speech without breathing and pausing is both monotonous and has got lack of comprehensiveness. Every part of text and every phrase have got integrity in meaning in themselves. These integrities in meaning should be separated from each other and related to each other. In texts, pauses are shown with some punctuation marks; for example, ‘.’, ‘,’, ‘;’, ‘:’, ‘-‘, ‘( )’. In some texts, punctuation marks are enough for breathing and pausing. Yet, there are clear differences between spoken language and written language. Using the pauses of written language in spoken language in the same way can harm clarity and also it can be impossible in practise. In such a situation, pauses should be placed according to the course of speech. If we do not consider about pauses and often make short pauses while speaking, we need to take a deep and big breath.

This of course causes us to breathe noisily. In fact, breathing noisily is a deficiency. It is necessary to prevent it. So, we should breathe periodically, fast, not in a demonstrative way and waiting it to be expired. But this can not be done randomly.

Stress

All syllables of words are not said in the same intonation and stress during speaking. Different syllables of words in all languages are stressed and these stresses build a natural side of speech. Consider a course of monotonous speaking that has the only one intonation. If you have ever listened to texts records from computer, you can have the chance to observe this monotonous stress. Our voice sometimes falls and rises to make our emotions vivid and to influence audiences. Stress is pronouncing some syllables in two or more syllable words and some words in word groups more emphasisingly and clearly (Parlakyıldız, 2001: 52). Stress points in words can

be different in any languages. Some rules in Turkish which will help us to find these stress points are (Bozdağ, yetenek.com):

1. There is exactly a stress on one syllable of each word. For example, in the word 'heyecan', the stress is on last syllable.
2. Being the stress on last syllable in Turkish is a rule. Except for some special examples, stress usually shifts to last syllable when a new syllable is added to word.
'hece, heceler, hecelerde, hecelerdeki'
3. Sometimes stress is on the syllable that is the previous of the last syllable. Below some examples are shown: Stress is on first syllable in adverbs and conjunctions 'niçin, ancak, önce, sonra, ayrıca, yalnız, belki, henüz, ansızın, nasıl, hangi'. Some suffixes which Turkish take shift to stress to previous syllable. These are 'ca / ce, la / le, ma / me, sa / se, im / sin', 'sence, benimle, okuma, yazdırma, gidrese, bilirsin'.
4. In Turkish 'ğ' usually, 'y' sometimes makes a change similar to stress. Consonant 'ğ' causes the vowel before itself to lengthen in the syllable. This is the same for 'y' consonant. This emphasized lengthening reflects like stress in sounding. (two vowels together are used to express stress). With 'ğ' consonant, 'yağmur=yaamur, öğretmen=ööretmen, öğle=ööle, ağabey=aabey, koğmak=koomak' With 'y' consonant : 'böyle=bööle, söylemek=söölemek, öyle=ööle'
5. Some consonants that make noise while producing (ç, p, k, r, ş, and z) carry the stress to the syllable they are in. For this reason, mentioned consonants must be the last letter of the syllable. Kaçtım, yokmuş, saptı, ordu, şaştı, and ezdi.
6. Some syllables which are used for exaggeration take stress upon themselves. 'sımsıkı, koskoca, büsbüyük, büsbütün, bambaşka, and binbir'

Rhythm

There is no monotony in saying the parts of sentences with regard to duration. There exist short or long breaths sometimes after a word or a word group and sometimes after a phrase. Therefore speech becomes meaningful and it is divided by pauses. With a simplest description, rhythm is called dividing a sentence into the meaningful pauses. The term rhythm is about saying or reading sentences but, not about syllables or words. Speaking well means to use words as clear, correct, meaningful and lovely, to give correct stress on words and sentences and to make correct intonation and rhythm (Parlakyıldız, 2001: 55).

Tune

Tune belongs to sentence. Each language has its own tune. Somebody can recognize that whether French or German is spoken even if he /she does not know any of these languages. Mistakes made in intonation and stress spoil the tune of that language. There are three kinds of tune (Ergenç, 1995):

1. Ending tune which occurs with falling intonation at the end of the sentence in order to express the sentence and message have come to an end. 'Bunu beğenmedim. Çocuklar sinemaya gittiler.'
2. The tune which remains with the same or two pitches higher than the top of the tune in order to express the message is going on. 'Geldim, gördüm, and yendim'
3. When the audience is asked to respond, interrogation tune which occurs with a rising intonation at the end of sentence. 'Geliyor mu?' 'Yazacak mısın?'

Liaison

Liaison is one of the most important elements that makes speech fluent. Liaison is saying a consonant at the end of a word by connecting with the first letter –it has to be a vowel of course- of the other word. This provides fluency in speaking. Speeches in which no liaison is made even if it is necessary become monotonous and boring. The most important qualification of people who are said to be a good lecturer is using liaison very well. There are different types of it (Tunali, 2007: 76):

1. The last letter (consonant) of a word is pronounced together with the first letter (vowel) of another word. 'Bir sıfır olsun bizim olsun.' 'Bir sı-fı-rol-sun-bi-zi-molsun / Bir sıfırolsun bizimolsun.
2. In Turkish, when a word ending with a consonant is pronounced with a word begging with 'h' letter, the letter 'h' drops. Misafir+hane misafirane / mi-sa-fi-ra-ne/ misafirane Ders+hane der-sa-ne/ dersane.
3. As some words in Turkish are from foreign languages, while they are being adapted to Turkish, they become harder. That is to say; the letters 'b, c, d, and g' turn into 'p, ç, t, and k' Of course this is only in written language. But, in spoken language, when the letters that became harder combine with the other letters, they are pronounced softly like before. 'Mahmut ayaklandı birden. / Mah-mu-da-yak-lan-dı-birden. / Mahmudayaklandıbirden.' Kendime kitap aldım. / Ken-di-me-ki-ta-bal-dım. / Kendimekitabaldım.
4. If first word of two is one-syllabled, the vowel drops to make a liaison in pronouncing. In this way, two words combine and liaison occurs. 'Ne için? / Niçin? / Noldu?

Conclusion

It has been seen that our body works as a machine or orchestra in order to make a sound which a normal human being produce in a shorter time than a second; that cannot be measured in fact, and to bring together in a harmony and meaningfully. The studies about the physical

features of speaking is becoming a different discipline and art. This education which is called as a diction art is done to make speaking better (Yalçın, 2002: 103). The fundamental aims of fine and effective speech training well known as diction art are; to be able to speak in front of people with having no anxiety and loss of concentration, relaxingly, with preparation or without it, to apply the main concepts and rules of fine and effective speaking, to express own thoughts and feelings fluently, comfortably by using correct sounds and body gestures and being aware of the rules of that language, to use speech organs correctly and appropriately while producing sounds and to be able to speak considering the features of sounds such as intonation, articulation, stress, liaison.

'Happiness and success' depend to a great extent on us and our ability to make relationships with others in our lives as a different individual. Therefore, fine and effective speech training in our schools should be given much more importance.

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Full Length Research Paper

The influence of self-compassion on academic procrastination and dysfunctional attitudes

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In the present study, aims were (1) to determine gender differences in self-compassion, academic procrastination, and dysfunctional attitudes and (2) to examine the relationships between selfcompassion, academic procrastination, and dysfunctional attitudes. Participants were 251 university students who completed a questionnaire package that included the Self-Compassion Scale, the Academic Procrastination Scale, and the Dysfunctional Attitudes Scale. Results showed that there were no significant gender differences in self-compassion, academic procrastination, and dysfunctional attitudes. In correlation analysis, self-compassion correlated positively with academic procrastination and negatively with dysfunctional attitudes. Similarly there were no significant relationships between academic procrastination and dysfunctional attitudes.

Key words: self-compassion, academic procrastination, dysfunctional attitudes, university students.

INTRODUCTION

The construct of self-compassion, recently defined and operationalized by Neff, offers an alternative approach to thinking about psychological well-being. Neff (2003b) conceptualized self-compassion as involving self-kindness, mindfulness and awareness of common humanity. Self-kindness is related to reacting with kindness and understanding towards oneself when experiencing negative events, mindfulness is related to holding emotions in nonjudgmental awareness and common humanity related to viewing one's life as part of the larger human experience and realizing that everyone goes through difficult times (Adams and Leary, 2007). Self-compassion involves being touched by and open to one's own suffering, generating the desire to alleviate one's suffering and to heal oneself with kindness, it also involves offering nonjudgmental understanding to one's pain, inadequacies and failures, so that one's experience is seen as part of the larger human experience (Neff, 2003b). Self-compassion predicted emotional and cognitive reactions to negative events in everyday life, buffered people against negative self-feelings when imagining distressing social events, moderated negative emotions after receiving ambivalent feedback (particularly for participants who were low in self-esteem).

Finally, self-compassion leads people to acknowledge their role in negative events without feeling overwhelmed with negative emotions (Leary et al., 2005). It helps buffer against anxiety when faced with an ego-threat in a laboratory setting and increases in self-compassion occurring were associated with increased psychological well-being (Neff et al., 2007). As measured using Neff's Self-Compassion Scale, it demonstrates positive associations with current markers of psychological well-being, such as self-acceptance, life satisfaction, social connectedness, self-esteem, mindfulness, autonomy, environmental mastery, purpose in life, personal growth, reflective and affective wisdom, curiosity and exploration in life, happiness, and optimism (Kirkpatrick, 2006). Research indicates that self-compassion is significantly associated with positive mental health benefits and adaptive functioning (Neff, 2004), life satisfaction and social connectedness (Neff, 2003a), well-being (Neff et al., 2008), mastery goals and emotion-focused coping strategies (Neff et al., 2005), social identity strength (Williams, 2005), social supports, academic success (Conway, 2007), happiness, optimism, positive affects, wisdom, personal initiative, curiosity and exploration, agreeableness, extroversion, and conscientiousness (Neff et al., 2007).

Self-compassion was also found to be a stronger predictor of psychological health than mindfulness (Rendon, 2007). Self-compassion is negatively associated with self-criticism, depression, anxiety, rumination, thought suppression, and neurotic perfectionism (Neff, 2003a;

Kirkpatrick, 2006), negative affect and neuroticism (Neff et al., 2007), performance goals, avoidance-oriented strategies (Neff et al., 2005), anxiety and cognitive interference and in addition the magnitude of these correlations was greater under threatening conditions than under non-threatening test conditions and self-compassion was unrelated to race-based rejection sensitivity (Williams, 2005). Procrastination has been defined as the tendency to delay initiation or completion of important tasks (Lay, 1986), a self-regulation style that involves delay in the start and/or completion of a task (Ferrari and Tice, 2000), or to delay tasks to the point of discomfort (Solomon and Rothblum, 1984). Generally, procrastination is explained as a lower-order personality trait in the literature, related to a lack of conscientiousness (Van, 2003). Five different kinds of procrastination have been investigated, the first two referring to task avoidance, and the others to decision avoidance: Academic procrastination, general or life routine procrastination, decisional procrastination, neurotic procrastination and compulsive or dysfunctional procrastination defined as decisional and behavioral procrastination in the same person (Milgram et al., 1998).

Academic procrastination includes failing to perform an activity within the desired time frame or postponing until the last minute activities one ultimately intends to complete (Wolters, 2003). According to Ferrari (1994), behavioral procrastination was related to failing task completion, rejecting well-minded others, feeling guilty after a positive event, and choosing handicapping situations, while decisional procrastination was related to failing to complete crucial tasks, inciting anger in others.

However, self-defeating tendencies of failure to complete crucial tasks and rejecting oppurtunities for pleasure were significant predictors of decisional, behavioral, and overall dysfunctional procrastination. Interpersonal dependency also was a significant predictor of both decisional and dysfunctional procrastination, while self-esteem predicted behavioral procrastination. While decisional procrastination concerns dilatory behavior in making important decisions (Ferrari et al., 1995), avoidant or behavioral procrastination is the tendency to delay task performance in order to avoid aversive tasks or performance failures (Ferrari and Emmons, 1994; Milgram et al., 1998).

Research results demonsrated that procrastination correlated with diffusion and moratorium (Shanahan and Pychyl, 2007), perfectionism (Walsh and Ugumba, 2002), discomfort intolerance and low self-esteem (Harrington, 2005; Ferrari, 1994), problematic internet use (Thatcher et al., 2008), present-hedonist (Ferrari and Diaz-Morales, 2007) fear of failure (Alexander and Onwuegbuzie, 2007; Solomon and Rothblum, 1984), health problems (Sirois, 2007), perceived stres (Sirois et al., 2003), and the neuroticism facets-anxiety, depression, self-conscious-ness, impulsiveness, vulnerability (Watson, 2001; Johnson and Bloom, 1995; Schouwenburg and Lay, 1995). On the other hand, procrastination negatively related to self-efficacy (Van, 2003; Sirois, 2004), ego identity development and achievement (Shanahan and Pychyl, 2007; Harrington, 2005), and conscientiousness (Van, 2003; Johnson and Bloom, 1995; Lay et al., 1998; Watson, 2001; Schouwenburg and Lay, 1995).

However, the factors of extraversion, openness to experience, and agreeableness were not significantly correlated with procrastination (Johnson and Bloom, 1995).

Procrastination studies related to sex revealed that procrastination was positively related to test and class anxiety and interpretation anxiety for males and statistics anxiety for females (Rodarte-Luna and Sherry, 2008). On the other hand, fathers' authoritarian parenting style was significantly negatively correlated with daughters' procrastination (Ferrari and Olivetti, 1994) and also there was a significant negative relation between maternal authoritative parenting and procrastination. However, for females a significant negative relation was found between self-worth and procrastination (Pychyl et al., 2002). Procrastination may be associated with poor family relations and disrupted or dissatisfying social relationships (Ferrari et al., 1999; Ferrari and Patel, 2004).

Trait procrastination is a strong predictor of students' dilatory behaviors (Lay and Schouwenburg, 1993). Trait adjectives highly related to trait procrastination included 'undisciplined', 'lazy', and 'disorderly'. Trait procrastination was highly related to lower scores (Schouwenburg and Lay, 1995). Procrastination was related to college students' self-efficacy and work-avoidant goal orientation and, to a lesser extent, their use of metacognitive strategies (Wolters, 2003). Student researches revealed that procrastination was associated with increased anxiety, delayed writing behavior, and lower grades (Fritzsche et al., 2003), mastery-avoidance goal orientation, greater disorganization and less use of cognitive and meta-cognitive strategies (Howell and Watson, 2007), task aversiveness, proneness to boredom (Blunt and Pychyl, 2000), and pre-examination dejection (Lay and Silverman, 1996).

Procrastination related negatively to mastery-approach goal orientation (Howell and Watson, 2007) and test performance (Moon and Illingworth, 2005). Beck (1967, 1983) hypothesizes that depressive schema are typically organized as sets of dysfunctional attitudes. This schema are activated following the occurrence of negative life events. Negative errors in thinking increase the probability that an individual will develop the negative cognitive triad. Beck defines the negative cognitive triad as negative views of the self, the world and the future. Providing partial support for Beck's theory, Abela and Sullivan (2003) reported that dysfunctional attitudes interacted with the occurrence of negative events to predict increases in depressive symptoms and major depressive episodes (Lewinshon et al., 2001). Dysfunctional attitudes played a moderating role in the relationship between life stress and depressive symptoms for both men and women (You et al., 2009). Recent research has also indicated that dysfunctional attitudes are related to mood-state (Miranda and Persons, 1988; Roberts and Kassel,

1996), depression (Miranda et al., 1998), maladaptive coping and negative mood (Kahler et al., 2003).

Most studies in the literature are concerned with self-compassion, dysfunctional attitudes and procrastination of students, related to studying and behaviour in school or university. The performance measures included grades, missing deadlines, the time spent on preparing a task, and completing tasks, such as assignments. However, there wasn't any study about related to relation between self-compassion, dysfunctional attitudes and academic procrastination. Summarizing, the aim of this study is reveal inbetween relations of self-compassion, dysfunctional attitudes and procrastination.

MATERIALS AND METHODS

Participants were 251 educational faculty students at a 4-year undergraduate college in Turkey, of which 129 (53%) were females and 122 (47%) were males. Ages ranged from 17 to 26 years (M = 21.72). Questionnaires were completed by students at the beginning of a workshop conducted by the author.

Measures

Self-Compassion Scale (SCS)

Self-compassion was measured by the Self-Compassion Scale (Neff, 2003b). Turkish adaptation of this scale had been done by Akin et al. (2007). The SCS is a 26-item self-report inventory and consists of six subscales; self-kindness, self-judgment, awareness of common humanity, isolation, mindfulness, and over-identification. Each item was rated on a 5-point scale (1 = strongly disagree to 5 = strongly agree).

Academic procrastination

Academic procrastination was measured by the Aitken procrastination ınventory (API) (Aitken, 1982). The API is a self-report inventory measuring trait procrastination among students. Turkish adaptation of this scale had been done by Balkis (2006) and it contains 16 items (for example, ''I delay starting things so long I don't get them done by the deadline'') that use a 5-point scale ranging from 1 (False) to 5 (True). The scale was scored such that high scores identified students who were chronic procrastinators.

Dysfunctional attitudes

The dysfunctional attitudes scale (DAS) (Weissman and Beck, 1978) is a 40-item measure that assesses attitudes and beliefs that are thought to predispose individuals to depression. Turkish adaptation of this scale had been done by Sahin and Sahin (1992). Items such as 'If others dislike you, you cannot be happy', and 'If I fail partly, it is as bad as being a complete failure' were rated on a seven-point scale, ranging from totally agree (1) to totally disagree (7). Total scores can range from 40 to 280, with higher scores indicating greater endorsement of maladaptive beliefs. Coefficient α was 0.85 in the present sample.

RESULTS

Descriptive data and inter-correlation

When Table 1 is examined, it is seen that there is a correlation between self compassion, academic procrastination and dysfunctional attitudes. Self compassion related positively to academic procrastination (r = 0.32). But there were no significant correlations between self compassion and dysfunctional attitudes and between academic procrastination and dysfunctional attitudes.

Gender differencies

When Table 2 is examined, there were no significant gender differences in selfcompassion, academic procrastination, and dysfunctional attitudes.

DISCUSSION

The aim of this study was to determine whether there were gender differences inbetween variables and to investigate the relationships between self-compassion, academic procrastination and dysfunctional attitudes. Results showed that there were no significant gender differences in self-compassion, academic procrastination and dysfunctional attitudes. Similarly, there were no significant relationships between self-compassion with dysfunctional attitudes and between academic procrastination with dysfunctional attitudes. On the other hand, findings have demonstrated that there is significant relationships between self-compassion and academic procrastination. Firstly, results of this study demonstrated that self-compassion was related positively to academic procrastination. As self-compassion is regarded as positive and academic procrastination is negative feature, it could be presumed that there is no relation between self-compassion and academic procrastination. But contrary to expectation, in this study a significant relationship was found between self-compassion and academic procrastination.

Researches supported these results. Researches indicates that self-compassion leads people to acknowledge their role in negative events without feeling overwhelmed with negative emotions (Leary et al., 2005), helps buffer against anxiety when faced with an ego-threat setting (Neff et al., 2007). Self-compassion is significantly associated with adaptive functioning (Neff, 2004), emotion-focused coping strategies (Neff et al., 2005). Self-compassionate people have been shown to possess many psychological strengths, such as greater happiness, optimism, positive affect (Neff et al., 2007). This study makes several contributions. Firstly, it demonstrates that selfcompassion is associated with academic procrastination. Secondly, this study was the first to examine the relationships between self-compassion,

Table 1. Descriptive statistics, and inter-correlations of the variables.

Variable	1	2	3
1. Self compassion	1		
2. Academic procrastination	32**	1	
3. Dysfunctional attitudes	0.12	0.03	1
Mean	77.59	51.50	164.81
Standard deviation	9.31	5.82	21.55
Range	26-130	16-80	40-280

** p <0.01.

Table 2. Gender differences in self-compassion, academic procrastination and dysfunctional attitudes.

Variable	Female (n=129)		Male (n=122)			
	M	SD	M	SD	t	p
Self compassion	78.34	9.31	76.79	9.27	-1.31	0.189
Academic procrastination	51.07	6.42	51.95	5.08	1.20	0.231
Dysfunctional attitudes	165.91	22.54	163.65	20.46	-0.83	0.408

academic procrastination and dysfunctional attitudes. However, participants were university students only; so generalizability is limited.

Replication of this study could target other populations in order to generate more solid relationships among constructs examined in this study.

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Full Length Research Paper

The Turkish geography teaching program (2005) and technology use in Geography courses: An overview of high school teachers' approach

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This study aims at assessing the importance and use of technology in geography courses, what the 2005 geography teaching program changed in terms of technology and some of the factors preventing the effective use of technology from teachers' perspectives. The research outcomes suggested that, despite the fact that there is a common consensus among geography teachers that the use of technology is highly beneficial for teaching and learning processes and the use of technology must be maximized for ideal geography education, there are some gaps that must be addressed by all shareholders in geography education; about half of the respondents suffer from a lack of technological infrastructure in their schools and almost one-third of them disagree with or are noncommittal about the suggestion that they have enough knowledge to integrate the necessary competences in the use of technology. The results indicated however, that the 2005 program affected geography education in a positive way, by encouraging the use of technology in geography courses especially in the public schools. Additionally, increasing English level of the teachers also affects their beliefs about the importance of technology use in geography courses and their competence in using technology in an affirmative way.

Key words: Geography teaching program, technology use, high school geography, geography teachers.

INTRODUCTION

Rapid and vast expansion of various technologies in the teaching and learning of geography throughout the world is evident. Kent emphasized how rapidly, information and communication technologies (ICTs) have developed and been incorporated by education in the last few decades and will probably develop at the same speed in the coming decades (Kent, 2003: 337-340). Prensky assessed the use of technology in education from a student's perspective and called the new generation "digital natives," that is those who were born in a digital age amid technologies including digital games, email, internet, cell phones and many others which are fundamental to their lives. He also called "digital immigrants" those who were not born in the digital world but to some extent have adapted to these technologies. He emphasized the difficulties of teaching such a generation of "digital natives" and underlined the importance of maximizing the adaptation of technologies into education as "digital immigrants" (Prensky, 2001: 1-2).

Moreover, Van Der Schee stated that although the accessibility of the new technologies in geography teaching has increased and many governments are trying to incorporate them in education, there are still many areas of the globe which do not accept digital literacy (Van Der Schee, 2006: 190). Concerning the use of technology in geography in Turkey; Doğanay reported that the technology provided by the National Ministry of Education is not sufficient to realize the objectives of geography education and for ideal geography teaching and learning, the full integration of educational technologies must be implemented (Doğanay, 2002:193). As regards the benefits of using technology in education, many studies have noted that it:

1. Provides an active learning environment (Ateş, 2010:

409; Smeets, 2005: 343; Jonassen et al., 1998: 30; Keeler, 1996: 329-331);
2. Increases learning, teaching, student success, student inquiry, critical thinking, motivation, and problem-solving (Lambert and Balderstone, 2000: 148-149; Rüzgar, 2005: 114; Scheffler and Logan, 1999: 305-310; Susskind, 2005: 203; Fitzpatrick, 1993: 156; Demirci et al., 2007: 38-39; Muir-Herzig, 2004: 111; Nellis, 1994: 36-37; Demiralp, 2007: 374; Hassell, 2000: 81; Hassell, 2002: 149),
3. Has a positive effect on the cognitive attitudes towards the courses (Waxman et al., 2003: 1)
4. Provides student-centered education (Scheffler and Logan, 1999: 305-310; Smeets, 2005: 343-345), and
5. Changes the role of teachers and students in classrooms (Dooley, 1999; Ruthven et al., 2005: 2-3; Seal and Przasnyski, 2001: 33-34).

Many barriers impeding the effective use of technology in the classes were also determined; however, including the lack of physical infrastructure, unreliability of technology, inadequate technical support, negative attitudes of some teachers to technology, lack of computer skills, etc. (Zhang, 2007: 301-303; Hew and Brush, 2007: 223; Keengwe and Onchwari, 2008: 560; Unwin and Maguire, 1990: 77-78).

Background

The whole Turkish education system has been undergoing reform since 2002; the secondary geography curriculum was radically revised by the Ministry of National Education, the changes taking effect in the academic year 2005 to 2006. The new curriculum introduced in 2005 brought about important changes in organization and content, teaching methods, teaching hours, and educational technology based on a constructivist approach. The geography program of 2005 emphasizes the adoption of technology (İncekara, 2010: 553; Demiralp, 2007: 376; İncekara, 2007: 123). As a result of these developments, many studies have been conducted on technology in geography curricula and in the classroom environment. In this context however, we must ask three critical questions:

1. Do we (instructors and students) have enough skills to use that technology?
2. Does the use of this technology improve teaching and learning? and
3. To what extent do developing countries have a chance of taking advantage of such technology? (Houtsonen, 2003: 47).

A few more questions also arise if we are to understand the place of technology use in geography courses, especially in a fast developing country such as Turkey:

1. Do the geography curriculums encourage technology use?
2. Does the physical infrastructure of schools allow the maximum use of technology?

The Turkish literature partially answers these questions. For instance, Özel stated that social studies and geography teachers did not use educational technologies in their activities very often, and they self-reported that, they were partially adequate in using these technologies. He also found that most teachers use educational technologies including computers, VCD players, and multimedia projector in just a few lessons a week (Özel, 2007: 3228). Another study on teacher approaches to new technologies revealed that up-to-date technologies such as LCD projectors and computers have already replaced old ones; however, most of these educational technologies were not available in their schools (Demirci, 2009: 48). Some other studies also indicated that, the lack of educational technology in schools has a negative impact on the teaching of geography and suggested the maximum technology adoption in service training for geography teachers because most of the technology is unknown to them (Sönmez et al., 2009: 213; Demirci et al., 2007: 38). In a study on the attitudes of geography teachers to technology, it was revealed that the teachers are aware of the importance of educational technologies but have not been able to apply these technologies to their courses (Taş et al., 2007: 31). Yaşar and Şeremet found that, in higher education, the instructor tends to use visual course materials frequently (Yaşar and Seremet, 2010: 675).

METHODS AND PURPOSE

It is clear that geography teachers are at the center of the issue of adopting technology, since it cannot be isolated from the requirements imposed on them. It has to be asked:

1. Whether they believe in the benefits of using technology in their courses;
2. Whether they have learned how to conduct this technology in their courses;
3. Whether they have enough knowledge and skills for pedagogical use of this technology;
4. Whether they have established their own teaching models and methods by using technology;
5. Whether they have been provided with the necessary technology in their schools and whether the curriculum supports the full use of technology in their courses (Houtsonen, 2003: 47; Van der Schee, 2006: 188; Van der Schee, 2003: 209; Kent, 2003: 341; Gersmehl, 2008: 138) and
6. Whether the incorporation of technology by teachers is affected by demographic features including gender, age, professional experience, working conditions, degree held, and English language competence.

Data collection and analysis

Based on the aforestated issues, which also constitute the research goals of this study, a 14-item “Technology in geography education”

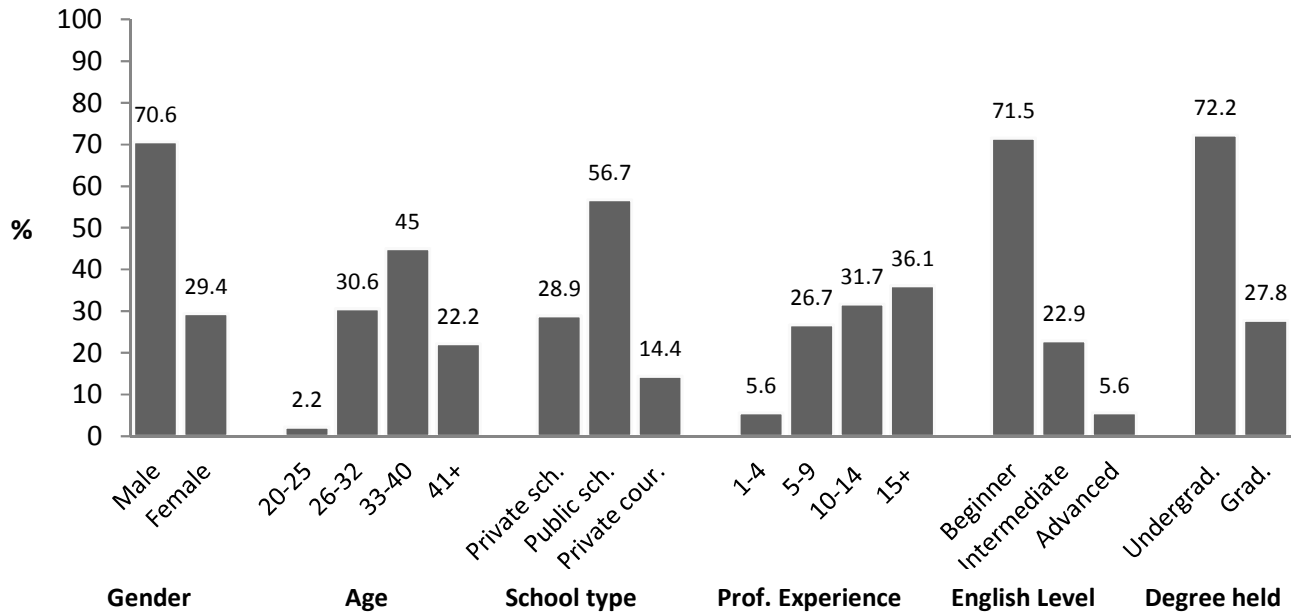

Figure 1. Distribution of teachers by gender, age, school type, professional experience, English level, and degree held.

questionnaire was prepared and distributed to 180 geography teachers working in 48 different provinces of Turkey who voluntarily agreed to participate. The questionnaire was developed in three parts:

1. Demographic questions: This section was designed to elicit inter alia the gender and age of the respondents;
2. Questions oriented to the profession: This part included items regarding the school type (public schools, private schools, and private courses) the province, professional experience, weekly work load, class size, educational level, and the level of foreign language (English) of the teachers. Private courses are the educational institutions preparing students for different exams, including university and high school entrance exams;
3. Statement section: This section was designed to investigate the approach of geography teachers to use of technology in their courses.

Five questions asked the respondents about the place of technology in the 2005 geography course teaching program, the use of technology in their course, whether they believed in the benefits of using technology in their courses, whether the physical infrastructure of schools is a barrier to the effective use of technology, and the skills of incorporating the technology into a class environment. The questions were on a five-point Likert scale (1 = “Strongly disagree,” 2 = “Disagree,” 3 = “Neutral,” 4 = “Agree,” 5 = “Strongly agree”). In this study, in addition to the descriptive statistics which were used to analyze the demographic data, the statistically significant differences between the independent (gender, age, school type, professional experience, degree held, and English level of the respondents) and dependent variables (attendance level points of the respondents regarding the given statements) were investigated. The reliability coefficient was 54.4% based on the factor reliability analysis (Cronbach’s alpha coefficient: 0.544). Since the data did not have a normally distributed interval variable ($p<0.005$) based on a one-sample Kolmogorow-Smirnov test, nonparametric tests such as Mann-Whitney U and Kruskal-Wallis H were used for the inferential statistics throughout the study.

FINDINGS

According to the demographic analysis of the data, the majority of the teachers were male (70.6%, n=127) and 29.4% of them (n=53) female (out of 180 teachers). 45% of the teachers were between 33 and 40 years of age, and 30.6% of them were between 26 and 32 years old (22.2%: 41+, 2.2%: 20 to 25). More than half of the respondents were employed in public schools (56.7%, n=102), 28.2% worked in private schools (n=52), and the remaining 26 teachers were employed to teach private courses (14.4%). As regards professional experience, they were quite experienced in that, almost 68% of the participants had more than 10 years of professional experience as geography teachers (36.1%: 15+, 31.7%: 10 to 14). More than 70% of the teachers were beginners in terms of English level and the remaining 28.5% were either intermediate level (22.9%) or advanced (5.6%). A large majority of the geography teachers (72.2%) had an undergraduate degree and the rest had graduate degrees (27.8%) (Figure 1).

In the second part of the survey, respondents were provided with five statements regarding the 2005 geography course teaching program and technology use, teachers and use of technology, the necessity of technology use in geography courses, limited infrastructure of schools impeding use of technology, and teaching skills required for using technology in the courses (Table 1). According to the analysis of the teachers’ agreement with the given statements, a large majority of teachers agreed or strongly agreed that, the geography program of 2005 supports the greater use of technology in geography education (84.4%). Similarly,

Table 1. Opinions of geography teachers about the use of technology in geography education.

Statements			Level of agreement			
			Strongly disagree/ Disagree 1/2*	Neutral 3*	Agree/ Strongly agree 4/5*	Total
1	The 2005 geography teaching program supports the greater use of technology	n	12	16	152	180
		%	6.7	8.9	84.4	100
2	I utilize the technology more in my courses with the 2005 geography teaching program	n	17	18	145	180
		%	9.5	10	80.5	100
3	Technology must be used for ideal geography teaching	n	12	8	160	180
		%	6.7	4.4	88.9	100
4	The limited facilities of the school prevent me from using technology sufficiently	n	68	22	89	179
		%	37.9	12.3	49.7	100
5	I have enough knowledge about how to incorporate technology into my courses	n	29	29	120	178
		%	16.3	16.3	67.4	100

*1: Strongly disagree; 2: Disagree; 3: Neutral; 4: Agree; 5: Strongly agree

slightly more than 80% of the respondents stated that, after the initiation of the 2005 program, they had started to use technology more than before. It is very encouraging that almost 90% of geography teachers recognize the importance of educational technologies in an ideal geography course. Almost half of them, however, stated that the limited facilities of their school prevent debar adequate use of technology in their courses. Slightly more than 67% of them indicated that, they have enough knowledge of how to incorporate technology into their courses (Table 1). If we look at the mean scores of the teachers' agreement levels, we see that the score corresponds to "Agree" or respondents agreed to all statements except for the fourth one, which is "The limited facilities of the school prevent me from using technology sufficiently." Therefore, according to the mean scores of this statement, the teachers remained neutral in response to it (Figure 2). The average score, 3.86 out of 5, corresponds to "Agree," to investigate the significance between the gender and age of the respondents and their statements Mann-Whitney U tests were performed. Results indicated that there were no significant differences between these dependent and independent variables ($p<0.005$). Kruskal-Wallis tests revealed, however, that there were statistically significant differences among the three school types in Statements 1, 2, 3, and 4 (Table 2).

Three post hoc Mann-Whitney tests compared which pairs of school types were significantly differentiated on the first, second, third, and fourth statements. The outcomes indicated that there was a significant difference in Statement 1 between the public schools and private schools and between the public schools and private courses. According to the statistics, the mean ranking of geography teachers employed in public schools (82.70, n=102) was significantly higher than those employed in private schools (67.30, n=52) for Statement 1 (z= -2.205, p=0.27). Also, the mean rankings of teachers employed in public schools (69.64, n=102) was higher for the first statement than those of teachers employed in private courses (44.33, n=26) (z= -3.371, p=0.001). A hundred and two public school teachers had higher means on the second (69.68) and third statements (67.66) than did 26 private course teachers (44.17, 52.10) (z= -3.413 and p=0.001 for Statement 2 and z= -2.183 and p=0.029 for Statement 3). Additionally, 102 public school teachers and 26 private course teachers had significantly higher mean rankings (87.75 and 46.90) on the fourth statement than did teachers employed in private schools (55.49, 34.97) (z= -4.370

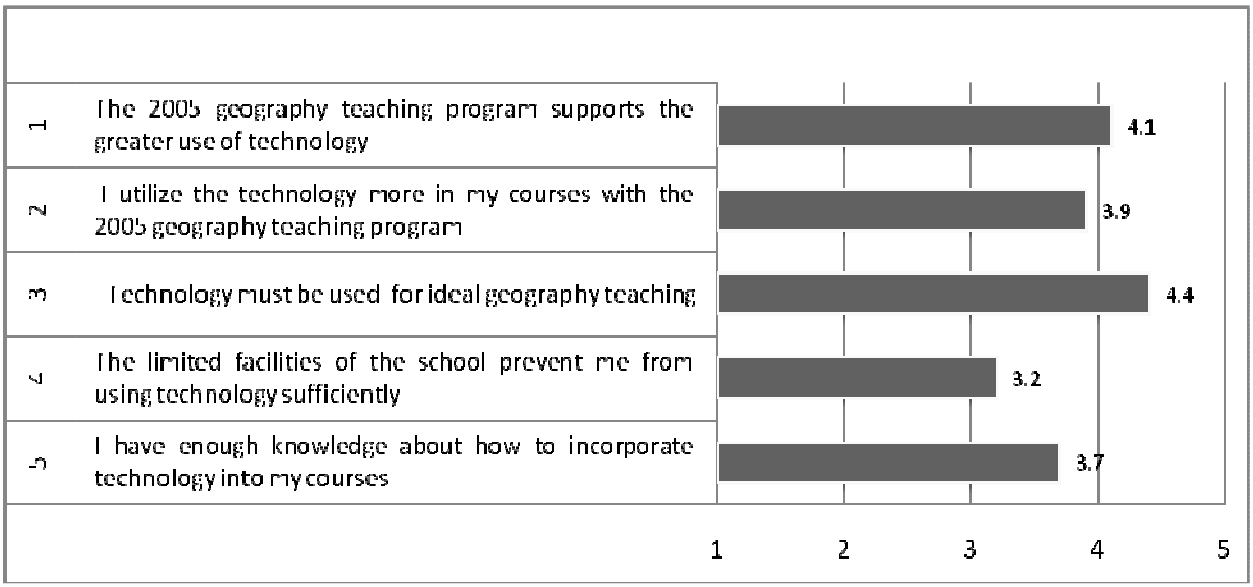

Figure 2. Geography teachers' level of agreement on the use of technologies in geography education.

Table 2. Kruskal-Wallis H test results for statements of teachers about technology based on "type of school."

Statements*	School type	N	Mean ranking	df	X^2	p
1	Private schools	52	82.97	2	13.464	0.001
	Public schools	102	100.84			
	Private courses	26	64.98			
2	Private schools	52	85.66	2	12.080	0.002
	Public schools	102	99.66			
	Private courses	26	64.23			
3	Private schools	52	83.75	2	6.082	0.048
	Public schools	102	97.63			
	Private courses	26	76.02			
4	Private schools	51	64.46	2	20.412	0.000
	Public schools	102	103.39			
	Private courses	26	87.58			

*See Table 1 for statements.

and p=0.000 in the private school and public school comparison and z= -2.303 and p=0.021 in the private school and private courses comparison) (Table 3).

Other Kruskal-Wallis analysis of variances did not indicate statistically significant differences between the professional experience of the teachers and the level of agreement but there was a significant difference between the English level of the teachers on the third ("Technology must be used for ideal geography teaching") and fifth ("I have enough knowledge about how to incorporate technology into my courses") statements (Table 4). Three post hoc Mann-Whitney U tests were performed to investigate which of the English levels had significantly different means for the third and the fifth statements. The outcomes suggested that, 41 teachers at intermediate and 10 teachers at advanced English level had significantly higher mean rankings (102.40 and 97.50) on Statement 3 than teachers with beginner level English (79.43 and 67.31, n=128) (z= -2.920 and p=0.004 in the intermediate-beginner comparison and z= -2537, p=0.011 for advanced-beginner comparison). In addition, the mean rankings of intermediate and advanced level

Table 3. Post hoc Mann-Whitney U test comparing three school types employing geography teachers for Statements 1, 2, 3, and 4.

Statements	School type	N	Mean ranking	Sum of rankings	U	Z	p
1	Private school	52	67.30	3499.50	2121.500	-2.205	0.027
	Public schools	102	82.70	8435.50			
	Public school	102	69.64	7103.50	801.500	-3.371	0.001
	Private courses	26	44.33	1152.50			
2	Public school	102	69.68	7107.50	797.500	-3.413	0.001
	Private courses	26	44.17	1148.50			
3	Public school	102	67.66	6901.50	1003.500	-2.183	0.029
	Private courses	26	52.10	1354.50			
4	Private school	51	55.49	2830.00	1504.000	-4.370	0.000
	Public school	102	87.75	8951.00			
	Private school	51	34.97	1783.50	457.500	-2.303	0.021
	Private courses	26	46.90	1219.50			

*See Table 1 for statements.

Table 4. Kruskal-Wallis H test results for statements of teachers about technology based on the English level of the respondents.

Statements*	English level	N	Mean ranking	df	X^2	p
3	Beginner	128	82.24	2	13.620	0.001
	Intermediate	41	106.54			
	Advanced	10	121.55			
5	Beginner	126	81.69	2	12.209	0.002
	Intermediate	41	102.04			
	Advanced	10	127.65			

*See Table 1 for statements.

geography teachers also had statistically significantly higher means (98.44 and 101.40) on the Statement 5 the beginner level geography teachers (79.30 and 65.89) (z=2.332 and p=0.20 in the intermediate-beginner comparison and z= -2.913 and p=0.004 in the advanced-beginner comparison) (Table 5).

DISCUSSION AND CONCLUSION

The literature reviewed in the early part of this study revealed that there is a broad-based consensus that, the use of technology in education, specifically in geography education, has various benefits including an active learning environment and student-centered education: the benefits apply to learning, teaching, student success, student inquiry, critical thinking, motivation, etc. (Smeets, 2005; Lambert and Balderstone, 2000; Fitzpatrick, 1993; Muir-Herzig, 2004; Hassell, 2002). Some research indicated, however, that lack of physical facilities, unreliability of technology, inadequate technical support, negative attitudes of teachers to technology, lack of skills needed for using technology, etc. are among the most serious barriers impeding the effective use of technology (Zhang, 2007; Keengwe and Onchwari, 2008; Hew and Brush, 2007; Unwin and Maguire, 1990).

Especially after the Ministry of National Education initiated the new geography course curriculum in 2005, many questions have been raised in academia regarding whether it supports wider use of technology, whether the tendency of teachers to use technology has increased, what are the impediments to the use of technology, and the required skills of teachers using technology. This study seeks answers to these questions from the perspectives of geography teachers who are the sole implementers of the curriculum. According to the outcomes

Table 5. Post hoc Mann-Whitney U test comparing the three English levels of teachers for statements 3 and 5.

Statements	English level	N	Mean ranking	Sum of rankings	U	Z	p
3	Beginner	128	79.43	10166.50	1910.500	-2.920	0.004
	Intermediate	41	102.40	4198.50			
	Beginner	128	67.31	8616.00	360.000	-2.537	0.011
	Advanced	10	97.50	975.000			
5	Beginner	126	79.30	9992.00	1991.000	-2.332	0.20
	Intermediate	41	98.44	4036.00			
	Beginner	126	65.89	8302.00	301.000	-2.913	0.004
	Advanced	10	101.40	1014.00			

*See Table 1 for statements.

of the research, it is quite encouraging that almost 90% of geography teachers surveyed believe that, for ideal geography teaching technology must be utilized at a maximum level (average score is 4.4 out of 5). Moreover, slightly more than 80% of the teachers indicated that, they have been utilizing technology more after the inception of the 2005 curriculum. The 2005 curriculum, clearly plays an important role in the adoption of technology into geography education. The high level of agreement of the teachers to the statement "The 2005 geography teaching program supports the greater use of technology" (84.4% and the mean score is 4.1 out of 5) also supports this idea (Table 1, Figure 2). These results support the previous studies (Taş et al., 2007; Demirci, 2009) on technology use in geography courses. Almost half of the respondents agreed or strongly agreed, however, that the limited facilities of their schools prevented them from using technology sufficiently in their courses, and 37.9% of them disagreed or strongly disagreed, the remaining 12.3% remaining neutral. Considering that most of the public schools and private courses agreed with this notion, it is fair to say that public schools and private courses in particular have difficulties integrating technology in their classes owing to the limited facilities of these educational institutions. It is quite encouraging, however, that more than 67% of the teachers stated that they know how to incorporate technology into their courses; the remaining 32.6% either disagreed/strongly disagreed or stayed neutral (Table 1, Figure 2). The agreement levels of the teachers to these last two statements also suggest that, the sufficient integration of technology will take some time.

As regards the statistical differences between the independent variables and the agreement level of the geography teachers, there were significant differences among the school types where the teachers were employed and their English level. Research outcomes showed that the public school teachers tend to support the idea that, the 2005 program supports more use of technology than do private school and private course teachers. Also, the higher mean rankings of the public school teachers on the use of technology in their courses under the 2005 geography teaching program showed that, the 2005 program affected geography education most in public schools. Moreover, public school teachers are more positive than private course teachers about the notion that "Technology must be used for ideal geography teaching." The level of agreement of the geography teachers on the statement "The limited facilities of the school prevent me from using technology sufficiently" revealed that public school teachers and private course teachers suffer the most from the lack of infrastructure, in using technology in geography courses compared with private school teachers (Tables 2 and 3). One may wonder why students are paying high fees for private courses, why they have limited technological facilities. We believe however, that the problem is not related to finance but rather to the system applied. Since these institutions offer courses lasting for one academic year only, they have to fit in four or five years of school geography content, so can only afford to provide the basics of geography. This very limited time does not allow them to benefit much from using technology.

The results of the study revealed very interesting results regarding the effect of teachers' English level on their belief about the importance of technology use in geography education. According to the analyses, the belief of geography teachers with intermediate and advanced level English about the importance of technology use is stronger than that of beginners. The outcomes also suggested that English level, plays an important role in their competence in using technology in their courses, since the teachers at intermediate and advanced levels of English are more competent in incorporating technology into their courses (Tables 4 and 5). Finally, it can be stated that, despite the fact that there is a common consensus among academia and geography teachers that technology provides numerous benefits for teaching and learning processes and must be used for ideal geography education, there are some gaps which must be filled by all shareholders: about half of the respondents suffer from the lack of technological

infrastructure in their schools and almost a third of them disagree or are neutral in response to the suggestion that they have enough knowledge about how to integrate technology in their lessons. The results indicated that, the 2005 program changed geography education in a positive way, especially in public schools. Additionally, the higher the English level of the teachers the stronger their belief about the importance of technology use in geography courses and their own competences.

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Full Length Research Paper

An examination of multiple intelligence domains and learning styles of pre-service mathematics teachers: Their reflections on mathematics education

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The present study aims to identify pre-service mathematics teachers' multiple intelligence domains and learning style profiles, and to establish relationships between them. Employing the survey model, the study was conducted with the participation of 243 pre-service mathematics teachers. The study used the "multiple intelligence domains inventory for educators" and "learning style inventory" as the data collection instruments. The results of data analyses demonstrated that most of the pre-service mathematics teachers preferred "converger" and "assimilator" learning styles. The same analyses also revealed that the pre-service teachers had "logical-mathematical" and "visual-spatial" as their dominant intelligence domains. The results suggest that most pre-service teachers have "moderate" and "advanced" levels of intelligence domains. Level differences observed in non-dominant learning styles and intelligence domains were assumed to indicate individual differences. In the study, a high-level correlation was not found between learning style dimensions and multiple intelligence domains.

Key words: Multiple intelligence, learning style, individual differences, pre-service mathematics teachers.

INTRODUCTION

The concepts of multiple intelligence and learning style are widely encountered and used today in education, business, arts and other areas of daily life. There is a substantial research on multiple intelligences and learning style in different fields and with different purposes. In particular, as individual differences were shown to constitute a significant factor in learning process, there has been a parallel increase in the emphasis on multiple intelligences and learning style in the field of education. Ensuring students to achieve full learning in line with the desired objectives of the learning process requires identifying their individual learning styles and multiple intelligence domains.

In order to contribute to effective learning in a learning environment, teachers should inevitably possess sufficient knowledge about the learning styles and multiple intelligences of their students and plan the learning process accordingly. These two theories are helpful in the helpful in the attempts to interpret individual differences, and thus, design education models. As suggested by an assumption, combining individual multiple intelligences and learning style in education may help students learn in fields other than those in which they are strong (Silveret al., 1997). Although, because these two theories are regarded as different approaches, they do not contain mutually exclusive contrasts. Despite their differing theoretical structures, they share similar results in practice (Guild, 1997).

Multiple intelligence is a concept introduced by Gardner. He argues that high scores in mathematics and language tests cannot alone serve as a proof of human intelligence. Intelligence is something beyond the scores made in standard paper-and-pencil tests used to estimate success at schools. In other words, traditional intelligence tests cannot measure the abilities of a chess player, an athlete or a violinist. Gardner (2004) maintains that intelligence incorporates too many abilities not to be explained by a single factor. He describes intelligence as the capacity of an individual to create products that are valued in one or more cultural setting, his/her skill to produce effective and efficient solutions to problems in daily life and also his/her ability to discover new and complex

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problems demanding solutions (Saban, 2004). Furthermore, both Gardner and Sternberg argue that intelligence cannot be based upon a single structure.

Gardner first defined seven different types of intelligence and then introduced "naturalistic intelligence" as the eighth type. Regarded as the ninth intelligence type, "existential intelligence" is still under discussion and investigation (Saban, 2004; Checkley, 1997; Gardner, 2004). The "theory of multiple intelligences" is now widely accepted with several revisions and developments in the years until now. For the theory argues:

"Individual differences result from the difference in their capacity to use their intelligences. Humans have different types of dominant intelligences, and each individual's intelligence consists of different combinations of intelligences at certain levels".

So it is assumed that individuals do not possess a single type of intelligence but different people have different levels of dominant types of intelligence, which brings us to the multiple intelligence domains. These dominant intelligence domains in the theory of multiple intelligences may vary among all individuals in terms of their types, levels and capacity of use. To put it differently, along with his/her dominant intelligence, an individual also possesses non-dominant intelligence domains. Different intelligences could be independent and an individual may well lack any ability in a specific domain, while possessing a very high level of ability in another. Here we should adopt the view that "all intelligence domains are important*"* (Gardner, 2004).

One should consider the effects of dominant and non-dominant intelligence domains upon individuals' learning processes. Intelligence domains and related abilities of students should be incorporated into the learning process. Therefore, it seems inevitable that the theory of multiple intelligences will influence curriculum, learning approaches and assessment-evaluation processes. For the display of high levels of cognitive, affective and psychomotor behaviors by students in the learning process as well as their active participation is to a certain extent related to the integration of their intelligence domains and learning process. On the other hand, learning styles of individuals originate from their perceptional preferences and difficulties, motivational differences, psychological differences and individual differences resulting from practices of processing knowledge.

The concept of learning style underlines the ways individual receive, interpret and organize knowledge and the ways and characteristics of their thinking. In other words, learning style could be defined as:

"The set of factors that determine how an individual psychologically perceives his/her learning environment and the way s/he interacts with and responds to his/her environment".

Defining learning styles as the ways of focusing on learning and processing knowledge, Dunn associated learning with environmental stimuli. In her model, the stimuli preferred by individuals reveal the differences in their learning styles. Dunn's model of learning styles has its roots in cognitive style and brain lateralization theory (Dunn, 1983). She argues that learning style is a preferred way of focusing on, processing, absorbing and starting to recall new and different academic contents. The learning style model is composed of five main internal and external stimuli with their sub-dimensions and includes a total of 21 elements. Although no one is influenced by all 21 elements, everybody is influenced by at least few of them (Dunnet al., 2001).

One of the leading figures of the field, Kolb developed a learning style model which is based on his "experiential learning theory". The theory particularly underlines the effect of experiences in the learning process, and maintains that learning occurs by transforming knowledge and experience. It further argues that the learning process includes two dimensions called perceiving/ comprehending and processing/transforming (Kolb, 1984). These two dimensions are independent but support each other. Kolb's learning style model consists of four main categories, which are "concrete experience (CE)", "reflective observation (RO)", "abstract conceptualization (AC)" and "active experimentation (AE)".

What is highlighted in these dimensions are learning "by feeling" for concrete experience, "by watching" for reflective observation, "by thinking" for abstract conceptualization and "by doing" for active experimentation. In the theory, learning is perceived as a cycle. At times, one of these four categories gains priority over others for the individual, who inevitably repeats this cycle countlessly throughout his/her learning experience. Students are classified according to which category they prefer in this model:

Concrete experience or abstract conceptualization (how they perceive and comprehend knowledge) and active experimentation or reflective observation (how they transform and internalize knowledge) (Felder, 1996).

In identifying students' learning styles, one element does not alone reveal the individual dominant learning style. Learning style of every individual is determined by a combination of the aforementioned four elements. Integrated scores show different individual preferences from abstract to concrete (AC to CE) and from active to reflective (AE to RO). These two groups of learning styles form the basis of Kolb's two-dimensional learning styles. A combination of the four elements under two dimensions helps determining which of the four dominant learning styles an individual prefers. These include diverger, assimilator, converger and accommodator learning styles. The categorization defining these four basic learning styles is briefly summarized as follows (McCarthyet al.,

Table 1. Similarities between the theories of multiple intelligences and learning styles (Guild, 1997; Silver et al., 1997; Dunn et al., 2001).

	Similarities
Theories of multiple intelligences and learning styles	1) They argue for a change in traditional education. 2) They are learning and learner centered. 3) Teacher is reflective and the decision-maker. 4) Student is reflective and plays an active part in the process. 5) Association with daily life is important in the learning process of students. 6) Instead of the standard curriculum, they propose a comprehensive approach with essence, depth and quality. 7) They promote individual difference. 8) They interact with various disciplines.

2006):

Divergers (AE + RO) rely on active experience and process these experiences in a reflective manner; assimilators (AC + RO) rely on theory and conceptualize reflectively-processed knowledge in an abstract way; convergers (AC + AE) rely on an abstract conceptualization of the world, performing active processing; and accommodators (CE + AE) rely on their own concrete experience, which they actively process.

In one or more stages of the learning process, an individual's preferences may differ from those of others. This difference is the learning preference adopted by an individual. Every individual has a dominant learning style. Along with a dominant learning style s/he also possesses a non-dominant learning style (secondary, tertiary and so on) (Denig, 2004). Therefore, s/he may display various approaches at any stages of learning process. An individual's dominant learning style involves different elements; for example, active experience and reflective observation (Kolb, 1984). It is misleading to discriminate between learning styles by selecting only one style as the best or correct.

The soundest approach is to identify an individual's dominant and non-dominant learning style and extensively use this multiple approach in the learning between the theories of multiple intelligences and learning styles by considering what they have in process. One could also speak of possible relationships common. Although they seem to be different, the theories of multiple intelligences and learning styles share many similarities (Tables 1 and 2). In contrast, Dunn et al. (2001) and Denig (2004) underline the differences between multiple intelligences and learning style. Gardner noted in an interview that learning styles and types of multiple intelligences are not the same (Checkley, 1997). He highlights the fact that a learning style can be associated with multiple intelligence domains and the theory of multiple intelligences differs from style-based approaches. However, it is known that there are approaches which interpret multiple intelligences and learning styles by establishing close connections between the two or treat multiple intelligence similarly to learning style (Armstrong, 2000; Campbell, 1994). Likewise, some refer to multiple intelligences as eight ways of learning, considering each domain as a learning style (Özden, 2009). On the other hand, Klein (2003) acknowledges the differences between individuals' cognitive abilities; however, he sees no connection between the theories of learning style and multiple intelligences in educational terms.

As a result of all this discussion, it is clear that the two theories in question are different despite their similarities and the majority believes that it would be effective to treat them together in the learning process. Silver et al. (1997) noted that combining the two theories would benefit students, reduce constraints, improve their strengths and provide teachers with some practical suggestions. As argued by Guild (1997), a teacher engaged with learning style and multiple intelligences can discern the unique qualities in his/her students and adopt a suitable approach and attitude for them by focusing on the way they learn. Most of the studies that deal with combining and treating together intelligence and learning styles (Silver et al., 1997; Dunn et al., 2001; Denig, 2004; Snyder, 2000; Vincent and Ross, 2001; Mokhtar et al., 2008) are based on Gardner's theory of multiple intelligences. Yet, they differ in their approaches towards learning style.

Silver et al. (1997) adopt a three-step approach to combining these theories. The first step involves defining the skills required for the four learning processes for each of Gardner's intelligence types and the four learning styles. At the second step, there is a list of professions that people like to choose, and specific intelligence and learning style profiles are provided. The last step of the intelligence-learning style menu includes the definitions of products under each intelligence and style that one can create using his/her power. In his model of combining multiple intelligences and learning style, Denig (2004) offers a two-dimensional definition. In the model, eight multiple intelligence domains form the horizontal axis of the system, while the vertical axis is made of Dunn's 21

Table 2. Differences between the theories of multiple intelligences and learning styles.

Multiple intelligence	Learning style
1) It focuses on what an individual can learn (product).	1) It focuses on how an individual can learn (process).
2) It suggests changing education by drawing upon students' abilities.	2) It suggests changing education by drawing upon students' learning styles.
3) It argues that some students learn intuitively.	3) It argues that some students are intuitive, while other are not, and that they need structure and supervision.
4) Multiple intelligences proponents advocate making changes in the methodology used in the classroom, but most emphasize using students' talents in the same way, at the same time, and in the same amount of time.	4) They argue for the need to exploit different educational resources in harmony with in what way students with different learning styles learn best.
5) It is not different for kinesthetic and tactile students.	5) It differs for kinesthetic and tactile students, arguing for a different teaching for them.
6) There is limited empirical research.	6) There are researches based on strong evidence.

learning style elements. The model emphasizes the need for investigating whether there are any relationships between the elements of learning style and multiple intelligence that could help individuals to improve all eight intelligence types.

Deemed as important in evaluating individual differences in education, the theories of multiple intelligences and learning style make substantial contributions in terms of an individual's learning process. Despite their differences, these two theories are not contradictory. For instance, does a maestro, artist, composer and a music critic all possess the same musical intelligence? Individuals with a specific intelligence type inevitably have individual differences. A lack of individual differences implies an idea of uniform human and intelligence, which could be misleading for our understanding of individual differences and intelligence. For even if individuals have the same type of intelligence, it is natural for them to display differences in their processes of perceiving, processing and responding to knowledge. Nevertheless, the theory of learning style highlights individual differences, the individual learning process and the way one learns.

Do individuals with the same learning style have the same intelligence type and capacity to use intelligence? Although it is quite difficult to come up with a definite answer to this question, one should acknowledge the fact that an individual's intelligence and learning style are closely related, and should be considered together. Thinking of these two theories in a combined fashion gives a composite picture of individual difference. The learning process should be simplified by thinking together students' multiple intelligences and learning styles. Thus, one should first identify which student possesses which intelligence type and learning style. Next, by collectively thinking of these two theories, one should ascertain how to simplify an individual's learning environment and learning process and how to make use of them. In the light of this approach, connections to be established between students' multiple intelligences and learning style dimensions could offer important clues.

Specifically speaking, it should be considered that the differences between students' learning styles and intelligence domains can influence their process of learning mathematics. The goal should be to identify their dominant intelligence domains and learning styles, and to carry out the learning process in line with the theories in question. To this end, one should comprehensively examine the multiple intelligence domains and learning style profiles of in-service and pre-service mathematics teachers, and reveal their potential relationships. This preliminary study is assumed to positively contribute to mathematics education and a better understanding of pre-service teachers' learning processes. In fact, there is a great deal of descriptive and empirical research on the theories of learning style and multiple intelligences conducted with pre-service teachers but independently treating these theories. On the other hand, studies collectively dealing with both theories are quite limited.

Demir (2010) and Can (2007) examined the learning styles and multiple intelligence domains of ninth-graders, their relationships and to what extent students' multiple intelligence domains predict their learning styles. Snyder (2000) investigated the relationship between high school students' learning styles, multiple intelligence domains and academic achievement. Wu and Alrabah (2009) identified students' dominant learning styles and multiple intelligence domains, interpreting the relationships between

the two. Yenice and Aktamış (2010) identified the dominant learning styles and multiple intelligence domains of pre-service teachers at the departments of primary, science and social science teacher education. Perry and Ball (2004) investigated the learning styles, personality types and multiple intelligence domains of pre-service teachers from various fields in terms of the variables of gender and discipline. In mathematics education, various studies have also been conducted to identify the learning styles (Peker et al., 2004; Orhun, 2007; Elçi, 2008; Peker, 2009; Küçükkaragöz et al., 2009; Fer, 2003) and multiple intelligence domains (Güneş and Gökçek, 2009, 2010; Oral, 2001) of pre-service mathematics teachers. However, there is still limited research that comprehensively identifies and examines the relationships between the multiple intelligence domains and learning style profiles of pre-service mathematics teachers.

The present study aims to help compensate this lack of research, and extend the horizons of mathematics education through its results. The study particularly aims to identify the multiple intelligence domains and learning style profiles of pre-service mathematics teachers and to reveal the relationships between them. For this purpose, we intend to employ the data to be obtained from the participants concerning the following sub-problems:

1) What are the multiple intelligence domains and learning style profiles of pre-service mathematics teachers?
2) What are the advancement levels of multiple intelligence domains of pre-service mathematics teachers according to their learning styles?
3) Do multiple intelligence domains of pre-service mathematics teachers significantly differ according to their learning styles?
4) Is there a significant relationship between the multiple intelligence domains and learning style dimensions of pre-service mathematics teachers?

METHODS

The present study is a descriptive research. Such research is carried out to shed light on a given situation, to present evaluations in line with standards and to reveal relationships between phenomena (Çepni, 2009). One of the descriptive research models, the survey model aims to describe a past or current situation as it is. The essence of the research is to define an event, individual or object of study as they are in their own conditions (Karasar, 2008). In each and every stage of the present study, the procedures were performed under natural conditions. Theoretical conditions were followed in identifying the multiple intelligence domains and learning style profiles of pre-service mathematics teachers at different grades, the relationships between which were determined on the basis of these data.

Participants

The study was carried out with a total of 243 pre-service mathematics teachers studying in the Department of Secondary Mathematics Teachers Education at a public university. The participants were randomly selected from different grades. The underlying assumption in selecting 1st, 2nd, 3rd, 4th and 5th graders was that it would make the highest contribution to comprehensively identifying the multiple intelligence domains and learning style models of the pre-service teachers. Of the pre-service mathematics teachers participating in the study, 112 (46.1%) are male and 131 (53.9%) are female. 40 (16.5%) are first-graders, 58 (23.9%) are second-graders, 50 (20.6%) are third-graders, 59 (24.3%) are fourth-graders and 36 (14.8%) are fifth-graders.

Instruments

Two instruments were used to collect data about the multiple intelligence domains and learning styles of the pre-service mathematics teachers in the study. Developed by Armstrong (2000) and translated into Turkish by Saban (2004), “multiple intelligence domains inventory for educators” was employed to identify the participants’ multiple intelligence domains. The inventory consists of a total of 80 statements, including 8 statements about each intelligence domain in the theory of multiple intelligences under each of the 10 sub-sections. The items are rated on a five-point rating scale including “fits me not at all”, “fits me slightly”, “fits me moderately”, “fits me very well” and “fits me extremely well”. Determined by administering the multiple intelligence domains inventory to the study group, the Cronbach’s alpha reliability coefficient was calculated to be 0.90 for the entire inventory. On the other hand, reliability coefficients for each of the multiple intelligence domains were 0.59 for verbal-linguistic intelligence, 0.73 for logical-mathematical intelligence, 0.64 for visual-spatial intelligence, 0.87 for musical-rhythmic intelligence, 0.68 for bodily-kinesthetic intelligence, 0.64 for interpersonal intelligence, 0.53 for intrapersonal intelligence and 0.79 for naturalistic intelligence.

In order to identify the learning styles of pre-service mathematics teachers, the study employed the “learning style inventory –version 3.1” developed by Kolb (2005). The inventory contains twelve fill-in items, each of which consists of four choices. For each given situation, an individual is asked to rate the most suitable statement with “4”, the second most suitable with “3”, the third most suitable with “2”, and the least suitable with “1” point. Each choice contains statements representing the four learning preferences (concrete experience, reflective observation, abstract conceptualization and active experimentation). As for the organization of “learning style inventory – LSI version 3.1”, the items and rating are the same with LSI 3 (Kolb, 1999), the new version introduced new norms and different interpretation (Kolb and Kolb, 2005). Gencel (2007) performed validity and reliability studies of the Turkish version of the inventory. The studies set the reliability coefficients of the inventory dimensions as 0.61 for concrete experience (CE), 0.76 for reflective observation (RO), 0.66 for abstract conceptualization (AC) and 0.69 for active experimentation (AE). As it has been used in several studies, the inventory is considered as valid and reliable.

Data analyses

We computed the pre-service mathematics teachers’ scores on the items representing eight intelligence domains to identify their multiple intelligence domains. When evaluating the scores for each intelligence domain, those with a total score between 32 to 40 were described as having “highly advanced”, those with scores between 24 to 31 as “advanced”, those with scores between 16 to 23 as “moderately advanced”, those with scores between 8 to 15 as “slightly advanced” and those with scores between 0 to 7 as having “unadvanced” intelligence levels. Thus, the researchers interpreted the advancement levels of intelligence domains (Saban, 2004). By rating the twelve items in the learning style inventory, the

Table 3. Pre-Service mathematics teachers' mean scores in learning style dimensions.

Learning Style Dimensions	Mean	SD	Minimum	Maximum
Concrete experience -CE	22.81	4.89	13	40
Reflective observation -RO	27.54	6.55	14	46
Abstract conceptualisation -AC	35.53	5.26	18	48
Active experimentation- AE	34.11	5.61	19	46
AE to RO	6.56	10.61	-24	32
AC to CE	12.72	8.20	-18	32

Table 4. Distribution of the pre-service mathematics teachers according to their learning styles.

Learning styles	f	%
Diverger	33	13.6
Assimilator	86	35.4
Converger	96	39.5
Accommodator	28	11.5

participants obtained a minimum score of 12 and a maximum score of 48 for each learning preference. After the rating, composite scores were computed for use in identifying an individual's learning style.

Composite scores were calculated in two categories, which are abstract conceptualization (AC), concrete experience (CE) (perceiving knowledge) and active experimentation (AE), reflective observation (RO) (processing knowledge). AC to CE and AE to RO composite scores ranged between -36 and +36. The obtained composite scores were placed in the coordinate system given in the "learning style type grid" (version 3.1). The score obtained with AC to CE was placed on the "y" axis, while the score obtained with AE to RO was placed on the "x" axis, and the resulting area of intersection for these two scores was identified to indicate an individual's learning style (diverger, converger, assimilator, and accommodator) (Kolb and Kolb, 2005). Frequency, percentage and mean among descriptive statistics were used to examine the pre-service teachers' multiple intelligence domains and learning style profiles.

One-way analysis of variance (ANOVA) was employed to determine whether there was any statistically significant difference among the multiple intelligence domains according to learning styles, while correlation analysis was used to examine the presence of any significant relationship between learning style and multiple intelligence domains.

RESULTS

In this part, data obtained with the aim of identifying pre-service mathematics teachers' multiple intelligence domains and learning style profiles were analyzed and findings of the study were discussed with respect to the research problems. Table 3 presents the pre-service mathematics teachers' mean scores in learning style dimensions. As seen in the table, the pre-service teachers have the highest average in the dimension of abstract conceptuali-zation among the learning style dimensions, while they have the lowest mean score in the dimension of concrete experience. Their mean composite scores were M= 6.56 for AE to RO (processing knowledge), and M= 12.72 for AC to CE (perceiving knowledge). Similarly, as for the frequency and percentages concerning the distribution of the pre-service teachers according to their leaning styles, the largest group (39.5%) possesses the converger learning style, and the smallest group (11.5%) has the accommodator learning style (Table 4).

The data about the pre-service mathematics teachers multiple intelligence domains were obtained by using the mean, standard deviation, and minimum-maximum scores (Table 5). It was found that pre-service teachers had the highest mean score in logical-mathematical intelligence domain and the lowest mean score in musical-rhythmical intelligence. The obtained mean scores suggest that they have advanced levels in logical-mathematical, visual-spatial, bodily-kinesthetic and interpersonal intelligence domains and moderate advancement levels in verbal-linguistic, musical-rhythmical, intrapersonal and naturalistic intelligence domains. For a detailed examination of the distribution of intelligence domains according to advancement levels, frequency and percentage levels were computed for the advancement levels of each intelligence domain, which are presented in Table 6.

As is clear from the table, there are pre-service teachers with all levels from "unadvanced" to "highly advanced" in musical-rhythmical, bodily-kinesthetic and naturalistic intelligence domains. In the remaining intelligence domains, on the other hand, the pre-service teachers have at least "slightly advanced" level and higher levels. The pre-service teachers with "highly advanced" levels do not form the majority in any of the intelligence domains. In order to indentify the advancement levels of the pre-service mathematics teachers' multiple intelligence domains according to their learning styles, the frequencies and percentages were computed for their advancement levels in each intelligence domain to form Table 7. As revealed by an examination of the table, the pre-service teachers with "highly advanced" levels of verbal-linguistic intelligence possess assimilator and converger learning styles. All of the students with "slightly

Table 5. Descriptive statistical data on the multiple intelligence domains of pre-service mathematics teachers.

Statistic	Verbal-linguistic	Logical-mathematical	Visual-spatial	Musical-rhythmical	Bodily-kinesthetic	Interpersonal	Intrapersonal	Naturalistic
Mean	20.34	28.23	24.89	20.05	24.63	24.12	23.72	20.15
SD	4.81	4.98	5.31	8.17	5.48	5.28	4.91	6.78
Minimum	9	14	9	2	5	9	9	3
Maximum	36	40	39	39	40	37	37	37
Level	Moderately advanced	Advanced	Advanced	Moderately advanced	Advanced	Advanced	Moderately advanced	Moderately advanced

Table 6. Advancement levels of the pre-service mathematics teachers' multiple intelligence domains.

Multiple intelligence domains	Highly advanced		Advanced		Moderately advanced		Slightly advanced		Unadvanced	
	f	%	f	%	f	%	f	%	f	%
Verbal-Linguistic	6	2.5	51	21.0	151	62.1	35	14.4	-	-
Logical-Mathematical	57	23.5	139	57.2	46	18.9	1	.4	-	-
Visual-Spatial	24	9.9	130	53.5	77	31.7	12	4.9	-	-
Musical-Rhythmical	19	7.8	65	26.7	85	35.0	57	23.5	17	7.0
Bodily-Kinesthetic	24	9.9	125	51.4	81	33.3	11	4.5	2	0.8
Interpersonal	14	5.8	129	53.1	83	34.2	17	7.0	-	-
Intrapersonal	16	6.6	107	44.0	107	44.0	13	5.3	-	-
Naturalistic	11	4.5	71	29.2	101	41.6	50	20.6	10	4.1

advanced" levels of logical-mathematical intelligence have assimilator learning style. 12.1% of the pre-service teachers with "slightly advanced" levels of visual-spatial intelligence have diverger, 5.8% have assimilator, and 3.1% have converger earning styles.

The pre-service teachers with "unadvanced" musical-rhythmical intelligence possess diverger, assimilator and converger learning styles. On the other hand, those with "slightly" advanced levels of bodily-kinesthetic, interpersonal and intrapersonal intelligence domains do not fall into the category of accommodator learning style. The category of accommodator learning style does not contain any pre-service teachers with "un-advanced" level of naturalistic intelligence. Table 8 presents the mean and standard deviation values obtained from the multiple intelligence domains of the pre-service mathematics teachers according to their learning styles. One-way analysis of variance (ANOVA) was performed to answer the 3rd sub-problem:

"Do multiple intelligence domains of pre-service mathematics teachers significantly differ according to their learning styles?"

The values obtained as a result of the analysis are given in Table 9. As seen in the table, the pre-service mathematics teachers significantly differ in their logical-mathematical and interpersonal intelligence domains according to their learning styles. Multiple comparisons were performed to determine which groups significantly differed. The

Table 7. Advancement levels of the pre-service mathematics teachers' multiple intelligence domains according to their learning styles.

Advancement level	Multiple intelligence domains	Verbal-linguistic		Logical-Mathematical		Visual-spatial		Musical-rhythmical		Bodily-kinesthetic		Interpersonal		Intrapersonal		Naturalistic	
	Learning styles	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%
Highly advanced	1	-	-	5	15.2	6	18.2	1	3.0	4	12.1	2	6.1	2	6.1	1	3.0
	2	2	2.3	20	23.3	6	7.0	7	8.1	8	9.3	6	7.0	6	7.0	2	2.3
	3	4	4.2	26	27.1	11	11.5	10	10.4	10	10.4	5	5.2	8	8.3	6	6.3
	4	-	-	6	21.4	1	3.6	1	3.6	2	7.1	1	3.6	-	-	2	7.1
Advanced	1	12	36.4	17	51.5	14	42.4	10	30.3	13	39.4	16	48.5	17	51.5	13	39.4
	2	16	18.6	51	59.3	40	46.5	20	23.3	39	45.3	38	44.2	36	41.9	22	25.6
	3	20	20.8	53	55.2	58	60.4	24	25.0	55	57.3	54	56.3	39	40.6	29	30.2
	4	3	10.7	18	64.3	18	64.3	11	39.3	18	64.3	21	75.0	15	53.6	7	25.0
Moderately advanced	1	16	48.5	11	33.3	9	27.3	14	42.4	13	39.4	11	33.3	9	27.3	12	36.4
	2	52	60.5	14	16.3	35	40.7	32	37.2	33	38.4	34	39.5	38	44.2	39	45.3
	3	59	61.5	17	17.7	24	25.0	33	34.4	27	28.1	32	33.3	47	49.0	38	39.6
	4	24	85.7	4	14.3	9	32.1	6	21.4	8	28.6	6	21.4	13	46.4	12	42.9
Slightly advanced	1	5	15.2	-	-	4	12.1	5	15.2	3	9.1	4	12.1	5	15.2	7	21.2
	2	16	18.6	1	1.2	5	5.8	22	25.6	5	5.8	8	9.3	6	7.0	19	22.1
	3	13	13.5	-	-	3	3.1	20	20.8	3	3.1	5	5.2	2	2.1	18	18.8
	4	1	3.6	-	-	-	-	10	35.7	-	-	-	-	-	-	6	21.4
Unadvanced	1	-	-	-	-	-	-	3	9.1	-	-	-	-	-	-	-	-
	2	-	-	-	-	-	-	5	5.8	1	1.2	-	-	-	-	4	4.7
	3	-	-	-	-	-	-	9	9.4	1	1.0	-	-	-	-	5	5.2
	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	3.6

(Learning styles: 1. Diverger, 2. Assimilator, 3. Converger, and 4. Accommodator).

differed. The comparisons de-monstrated that there was significant difference in logical-mathematical intelligence domain between the pre-service mathematics teachers' diverger-assimilator, diverger-converger, and diverger-accommodator learning styles. The pre-service mathematics teachers with diverger learning style have lower mean scores in the logical-mathematical intelligence domain when compared to other learning styles (Table 8). In the inter-personal intelligence domain, on the other hand, there is a significant difference between the diverger- accommodator, assimilator-converger and assimilator- accommodator learning styles.

Likewise, the mean scores of the pre-service mathematics teachers with diverger and assimila-tor learning styles in the interpersonal intelligence domain are lower when compared to their scores

Table 8. Descriptive statistical data on the pre-service mathematics teachers' multiple intelligence domains according to their learning styles.

Multiple intelligence domains	Learning style	N	Mean	SD
Verbal-Linguistic	1. Diverger	33	20.90	5.18
	2. Assimilator	86	19.83	4.94
	3. Converger	96	20.61	4.91
	4. Accommodator	28	20.28	3.56
Logical-Mathematical	1. Diverger	33	25.93	5.08
	2. Assimilator	86	28.10	5.04
	3. Converger	96	29.04	4.81
	4. Accommodator	28	28.57	4.59
Visual-Spatial	1. Diverger	33	24.12	6.72
	2. Assimilator	86	24.02	5.26
	3. Converger	96	25.80	5.17
	4. Accommodator	28	25.37	3.49
Musical-Rhythmical	1. Diverger	33	19.57	8.21
	2. Assimilator	86	19.79	7.67
	3. Converger	96	20.23	8.86
	4. Accommodator	28	20.78	7.44
Bodily-Kinesthetic	1. Diverger	33	23.96	6.19
	2. Assimilator	86	24.01	5.72
	3. Converger	96	25.19	5.39
	4. Accommodator	28	25.39	3.87
Interpersonal	1. Diverger	33	22.90	5.41
	2. Assimilator	86	23.13	5.79
	3. Converger	96	24.90	4.84
	4. Accommodator	28	25.92	4.14
Intrapersonal	1. Diverger	33	23.27	6.45
	2. Assimilator	86	23.38	4.71
	3. Converger	96	23.97	4.85
	4. Accommodator	28	24.46	3.57
Naturalistic	1. Diverger	33	20.87	6.00
	2. Assimilator	86	19.06	6.98
	3. Converger	96	20.65	7.19
	4. Accommodator	28	20.92	7.05

in the converger and accommodator learning styles (Table 8). As for the final sub-problem, we investigated whether there is a significant relationship between the pre-service mathematics teachers' learning styles and multiple intelligence domains. Table 10 shows the correlation coefficients calculated for this purpose between the pre-service mathematics teachers' scores in the learning style dimensions and their scores in multiple intelligence domains. Given the computed correlation coefficients, there is a statistically significant, positive and a low level of correlation between the pre-service mathematics teachers' learning style dimension of concrete experience and the intrapersonal intelligence domain ($r=0.15$; $p<.05$), and naturalistic intelligence domain ($r=0.20$; $p<.01$). Ano-ther result of the study indicates a statistically significant, negative and low-level relationship

between reflective observation, a learning style dimension of the pre-service teachers, and both logical-mathematical intelligence ($r=-0.12$; $p<.05$) and interpersonal intelligence ($r=-0.16$; $p<.01$).

DISCUSSION AND CONCLUSION

The present study aimed to comprehensively determine the pre-service mathematics teachers' multiple intelligence domains and learning style profiles, and to reveal the relationships between the two. Thus, as suggested by the results obtained from Kolb's learning style inventory, the pre-service teachers more often prefer learning by "abstract conceptualization" in perceiving knowledge, and learning by "active experimentation" in processing knowledge. In general, an examination of the scores of pre-service teachers in perceiving knowledge and processing knowledge and their learning styles shows that they prefer converger, assimilator, diverger and accommodator learning in descending order. Studies conducted to identify the learning styles of pre-service mathematics teachers also reported similar results (Peker et al., 2004; Orhun, 2007; Peker, 2009; Küçükkaragöz et al., 2009). The previous research reported the most preferred learning style as assimilator, converger, and the least preferred learning style as accommodator, diverger. Our results also indicate a similar phenomenon.

A great majority of the pre-service teachers (74.9%) prefer converger and assimilator learning style, while other favor diverger and accommodator learning styles. Although such differences are natural in the preferences of pre-service teachers for learning styles, the relatively low preference percentages for certain styles are striking. A combined examination of the mean and composite scores in the learning style dimensions makes it clear that the pre-service teachers do not often prefer modes of "feeling", "intuition", "envision" in perceiving knowledge and "observing" and "watching" in processing knowledge. This could be attributed to the effects of the Turkish education system, and particularly our learning-teaching approaches. An important factor here is believed to be the teacher-centered quality of mathematics learning process, which highlights procedural instead of conceptual knowledge. Furthermore, student preferences are also influenced by the system's lack of concern for questioning, feeling, imagining and being creative, and also its lack of encouragement of students towards these modes. The priority should be given to questioning this phenomenon in the education system. Nevertheless, if a decision is made to implement new learning approaches and curricula, one should remember that it would take time to eliminate the old negative effects.

In a similar way, Perry and Ball (2004) found that pre-service science-mathematics teachers had higher mean scores in the dimensions of abstract conceptualization and active experimentation and significantly differed from, other pre-service teachers. Kolb (1984) argues that the converger learning style involves practical application of thought, and is a composite of abstract conceptualization and active experimentation. The particular preference of pre-service mathematics teachers for this learning style might be a result of the fact that they attach greater importance to procedural knowledge, and perceive mathematics as a discipline which is more suitable to calculation and application rather than comprehension. This approach neglects or largely overlooks skills such as comprehension, thinking, imagining and searching for and improving what is different in the process of learning mathematics. It could be considered as a natural result that the pre-service mathematics teachers have the highest mean scores in the logical-mathematical intelligence domain and the lowest means in musical-rhythmical intelligence domain among multiple intelligence domains.

Likewise, the high mean score in the visual-spatial intelligence domain is another expected result. In fact, similar results were also obtained in the previous research on identifying multiple intelligence domains (Oral, 2001; Güneş and Gökçek, 2010, Perry and Ball, 2004). Moreover, it was also found that the pre-service mathematics teachers have "advanced" levels in logical-mathematical, visual-spatial, bodily-kinesthetic and interpersonal intelligence domains, and "moderately advanced" in verbal-linguistic, musical-rhythmical, intrapersonal and naturalistic intelligence domains. A combined look at the results of the present and previous researches suggests that an advancement occurs in the intelligence domain most often used by pre-service teachers, which then evolves into moderate and higher levels in terms of advancement level (Güneş and Gökçek, 2010; Hamurcu et al., 2002; Perry and Ball, 2004; Durmaz and Özyıldırım, 2005; Ocak et al., 2005; Korkmaz et al., 2009; Yenice and Aktamış, 2010). Most previous studies demonstrate a relation between the discipline and dominant multiple intelligence domain. For pre-service mathematics teachers, the logical-mathematical and visual-spatial intelligence domains are more dominant. Yet, as argued by Gardner, this does not necessarily mean that these pre-service teachers lack or never use other intelligence domains, because the theory of multiple intelligences speaks not of a single intelligence, but of a combination of multiple intelligences. Therefore, it would be most useful to discuss the process of mathematics education from a multi-dimensional perspective.

The study results clearly indicate individual differences among the pre-service mathematics teachers in multiple intelligence domains and their advancement levels. In the light of this fact, students in the process of learning mathematics should be provided with opportunities to discover not only their dominant intelligence domains, but also their potentials and abilities in their non-dominant intelligence domains. The advancement levels of the pre-service teachers' multiple intelligence domains according

Table 9. The ANOVA results on the pre-service mathematics teachers' multiple intelligence domains according to their learning styles.

Multiple intelligence domains	Source of variance	Sum of squares	df	Mean square	F	p	Sig.
Verbal-linguistic	Between groups	39.748	3	13.249	0.568	0.637	-
	Within groups	5576.902	239	23.334			
	Total	5616.650	242				
Logical-mathematical	Between groups	241.002	3	80.334	3.332	0.020*	1 to 2.1 to 3.1 to 4
	Within groups	5762.627	239	24.111			
	Total	6003.630	242				
Visual-spatial	Between groups	170.081	3	56.694	2.031	0.110	-
	Within groups	6673.137	239	27.921			
	Total	6843.218	242				
Musical-rhythmical	Between groups	31.807	3	10.602	0.157	0.925	-
	Within groups	16126.497	239	67.475			
	Total	16158.305	242				
Bodily-kinesthetic	Between groups	94.527	3	31.509	1.048	0.372	-
	Within groups	7183.876	239	30.058			
	Total	7278.403	242				
Interpersonal	Between groups	281.979	3	93.993	3.463	0.017*	1 to 4. 2 to 3.2 to 4
	Within groups	6487.066	239	27.143			
	Total	6769.045	242				
Intrapersonal	Between groups	38.269	3	12.756	0.525	0.666	-
	Within groups	5807.805	239	24.300			
	Total	5846.074	242				
Naturalistic	Between groups	159.448	3	53.149	1.156	0.327	-
	Within groups	10988.610	239	45.977			
	Total	11148.058	242				

*:p<.05

Table 10. Correlation coefficients between pre-service mathematics teachers' learning style dimensions and multiple intelligence domains.

Learning style dimensions / Multiple Intelligence domains	Concrete experience (CE)	Reflective observation (RO)	Abstract conceptualisation (AC)	Active experimentation (AE)
Verbal-Linguistic	.08	-.01	-.08	.02
Logical-Mathematical	.00	-.12*	.09	.05
Visual-Spatial	.05	-.08	.02	.02
Musical-Rhythmical	-.01	.04	-.04	.00
Bodily-Kinesthetic	.11	-.10	-.02	.03
Interpersonal	.084	-.16**	.01	.11
Intrapersonal	.15*	-.11	.09	-.08
Naturalistic	.20**	-.06	-.02	-.08

**:p<.01; *:p<.05.

according to their learning styles are an indicator of individual differences or diversity. However, the greater number of pre-service teachers with "converger" and "assimilator" learning style were influential on our examination of multiple intelligence domains according to their advancement levels. There is a small number of pre-service teachers with advancement levels of multiple intelligence domains lower than the moderate level. In other words, all the pre-service teachers have a certain potential and ability in the intelligence domains, which is a significant result that deserves elaboration.

The presence of individuals under a moderate level of advancement in certain intelligence domains (musical-rhythmic, naturalistic) could be attributed to the lack of use for abilities specific to that domain. In order to become qualified and effective teachers, the potentials and abilities of pre-service mathematics teachers in these multiple intelligence domains they possess should be certainly discovered and perfected. The pre-service mathematics teachers mean scores in the logical-mathematical and interpersonal intelligence domains significantly differ with their learning styles. Pre-service teachers with the diverger learning style have lower mean scores in the logical-mathematical intelligence domain when compared to those with other learning styles, which could be due to the perception that there is a single correct way in our approach to learning-teaching mathematics. For individuals with diverger learning style perceive knowledge through concrete experience, and process it by reflective observation. Nevertheless, learning of mathematical knowledge in Turkey has never been based on active experience until now. In addition, the modes of discussion, interpretation and sharing knowledge have never been used in processing knowledge. This approach in mathematics education and pre-service teachers trained by a similar understanding might be the underlying reasons for the lower mean scores of pre-service teachers with diverger learning style in the logical-mathematical intelligence domain when compared to other learning styles. The mean scores in the interpersonal intelligence domain point out to a significant difference according to learning styles, which could be attributed to the lower mean scores of those with diverger and assimilator learning style than those with converger and accommodator learning style. No high-level relationships were found between the multiple intelligence domains and learning style dimensions of the pre-service mathematics teachers. A positive low-level relationship was found between concrete experience and intrapersonal and naturalistic intelligence domains, while there was a negative low-level relationship between reflective observation and logical-mathematical and interpersonal intelligence. There is a highly limited research that examines the relationships between multiple intelligence domains and learning styles, which is due to the still ongoing discussion about whether the theories of learning style and multiple intelligences are similar or different theories.

On the other hand, certain theoretical studies argue for thinking together or combining these two theories (Denig, 2004; Silver et al., 1997). Yet, in one particular study on the relationships, Demir (2010) found a positive moderate-level relationship between ninth-grade students' learning styles and multiple intelligence scores; specifically between visual learning style and visual- spatial intelligence domain, between bodily-kinesthetic learning style and bodily kinesthetic intelligence domain, and between auditory learning style and verbal-linguistic intelligence domain. Similarly, learning

(2007) underlines that learning style and multiple intelligence domains are two different things with significant relationships between each other. Furthermore, Wu and Alrabah (2009) report that there is consistency between students' visual learning styles and visual-spatial intelligence, between extrovert learning and interpersonal intelligence domains, and between hand-on learning style and bodily-kinesthetic intelligence domain. Although low- and moderate-level correlations were found between the theories of multiple intelligences and learning style, in similar to the results of the present study, evidence of any high level relationship is yet to be found. It is natural to ask questions concerning whether there is any relationship between these two theories or whether it would be correct to search for any. For it has been a recent idea to think and treat the two theories together, however, arriving at a definite conclusion requires exhaustive trials.

As stated by Gardner, it may seem natural that the two theories are different, similarities are only of moderate- and low-level, and their relationship is only between similar pairs. Yet, it would be wrong to look for a high-level relationship and analogies between the two. When thinking together, combining or associating the theories of multiple intelligences and learning style, the main question is "in what way does it contribute to learning?". It could be useful for learning to treat in a combined fashion these two theories with learning-related similarities and differences in theoretical stage and in-classroom practice. And this may reduce students' limitations in the learning process, improving their strengths (Silver et al., 1997). Because thinking of learning style and multiple intelligences together may contribute to students in the learning process not only in the areas they are already strong, but also through numerous ways and a comprehensive approach.

In other words, it could encourage students to employ their secondary or tertiary learning styles, through which they could put to use their abilities in their non-dominant intelligence types, along with their dominant intelligence and learning styles, and to display a comprehensive approach in the learning process. To sum up, by taking into account multiple intelligences and learning styles in the learning process, students are given the opportunity both to improve their strengths and to reduce their limitations. Attaching importance to individual intelligence and learning style in the process of learning mathematics serves as a catalyst for meaningful learning and success as well as a comprehensive approach.

SUGGESTIONS

It is an indispensable must for mathematics teachers to recognize and pay attention to individual differences in learning, and realize the learning process accordingly. The first correct step to take for a teacher would be to promote individual differences in the learning process, and thus, to display a positive attitude and approach. Nevertheless, along with the influence of students' dominant intelligences and learning styles, their non-dominant intelligences and learning styles also play a part in training individuals with high level of knowledge, skills and abilities. Therefore, it will be useful for a teacher to perform activities that aim to improve their students' non-dominant intelligences and learning styles. Teachers should be able to acknowledge that not all students have similar traits, but they have different intelligences and learning styles, and provide specific guidance to facilitate the learning process and encourage their students' improvement in accordance with these facts.

In brief, a teacher should pay attention to the main following points in thinking the two theories together (CIDI, 2006):

1) Students' dominant intelligences and learning styles should be identified.
2) Learning activities emphasizing different intelligences and learning styles should be developed.
3) Activities should be created that allow using abilities in multiple intelligence types and at the same time consider learning styles in courses.
4) In a learning environment that draws upon the theory of learning style and encourages the use of multiple intelligences, strategies that allow effective classroom management should be employed.

It is of course important to identify and know what intelligence types and learning styles students have. However, the theories of multiple intelligences and learning style are not simply used to classify students. The main purpose here is to find ways of using both theories to facilitate individual learning, particularly in the process of learning mathematics. Thus, the learning process should be facilitated by treating students' intelligences and learning styles in a combined way. To put it differently, awareness about students' multiple intelligences and learning styles could serve as a significant supportive tool in the learning environment, curriculum, and assessment-evaluation in teaching, which are the main elements of education.

Mathematics instruction based on the intelligence domains and learning styles of students make it easier not only to improve abilities but also to acquire positive cognitive and affective behaviors and skills. Since the main purpose of learning is permanent behavioral change, it is important to know the individual, and to design and create a learning environment that facilitates the learning process that is appropriate for his/her intelligence and learning style to achieve this purpose. These two theories should be considered in setting goals, performing suitable activities and developing learning tools, all with influences in an individual's learning process.

Empirical and descriptive studies should investigate the

effects of combined treatment of multiple intelligences and learning styles theories upon the process of learning-teaching mathematics, and the relationships between the two.

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