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**EDUCATION FACULTY MATH CURRICULUM AND IN-SERVICE
TEACHERS NEEDS**

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ABSTRACT

This study accomplished as an education master thesis and addresses the following issue- the education faculty math curriculum in Jowzjan University in Afghanistan and the in-service teachers' needs. I conducted this study on third-year in-service teachers who are studying at the Jowzjan University in Afghanistan. This study was conducted as qualitative study; there were 11 participants from the third-year in-service teachers. The methodology system was interview with participants. Because of the lack of time I did just one time interview with the participants. There were not class observation and group discussion. The finding from this study revealed some important and significant issues which I discussed in this thesis. The finding in this study categorized in five themes and each theme separately discussed. As I stated in last chapter of this thesis, this was the first time that such research conducted in the Jowzjan University; therefore, the study highlights the way of doing research for other teachers in the Jowzjan University.

CHAPTER ONE

Introduction

Education is a primary means for self-development and for improving one's condition in the world. Governments, all over the world develop and promote their educational systems by using various methods and strategies to the social, political and economic circumstances of their people. One way to achieve such objective is by promoting education itself through the building of effective schools. Providing quality education and teaching can play a significant role in securing a better future for both students and their communities. Moreover, schools are the only place for students to gain practical knowledge, abilities, and skills. These enable the students to apply their learning effectively in the world around them.

An important factor influencing efficacy of students learning is the school curriculum. However, no curriculum can guarantee good learning without capable and responsible teachers who will implement and deliver the curriculum to the students. Therefore, Teacher Education is an integral component of any educational system. It is good responsibility of teachers to influence the culture and characteristics of a nation by preparing capable and knowledgeable students. Furthermore, teachers should have adequate professional knowledge and skills that enable them to do this. However, most of the teachers in Afghanistan's schools are not professional teachers.

This study will focus on the education faculty curriculum in mathematics and high school teachers needs. The study aims specifically to explore whether the classes that are offered by mathematics department of Jowzjan University, meet in-service teachers' needs and provide them with the needed content knowledge and pedagogical skills to teach high school

mathematics. In addition, I have compared the curriculum contents in Euclidean geometry at the mathematics department of Jowzjan University with the high school Euclidean geometry. The study objective is to explore that what are the similarities between the education faculty's math curriculum and high schools math curriculum. In what level the high school teachers who are studying as in-service students in Jowzjan University benefit from the content and pedagogical methods of the university and are able to transfer to their own schools.

Also my purpose by doing this study is to understand the way of doing research and improve my abilities for conducting a research. While doing this study, I became a little bit familiar that how to start a research and how to accomplish it. This study will be a start in doing education research for me.

It is clear that finding an exact answer for a question which would be acceptable for all people is difficult because in one answer different people see from different angle. I have tried to find exact answer for my research questions during my project. I interviewed the in-service teachers and analyze their curriculum documents in order to find answer for my research questions. I know that it needs more research and study in different schools and universities of Afghanistan in order to find qualify answers for them. However, this study is a small piece of this whole study.

Purpose of Study

This thesis will focus on whether the curriculum taught to in-service high school mathematics teachers at Jowzjan University effectively meets their learning needs, as well as the

objectives of the high school mathematics curriculum. This research study addresses the following questions:

- To what extent does the Euclidean geometry curriculum at the Jowzjan University levels meet the needs of high school mathematics teachers?
- Does the curriculum for geometry (objectives, lesson plan, and contents) integrate mathematical knowledge and pedagogical knowledge effectively?

The first question focuses both on the curriculum content in the education faculty and in high school. This question asks how the in-service curriculum prepares in-service teachers to teach high school geometry. It is important to note that these in-service teachers are already teaching in high school. Comparing these two curricula was the first priority in answering the first question.

The second question requires analysis of the effectiveness of the in-service teacher's curriculum at balancing mathematical knowledge and pedagogical methods in relation to geometry. I interviewed 10 in-service teachers and asked about pedagogical methods which they used in their geometry classes.

High school teachers who are studying in education faculty as in-service teachers are teaching in high schools at the same time. The question; therefore, is how beneficial the methods that are taught in the in-service education classes to these teachers who are teaching in high school? This was the focus of the research I conducted in Afghanistan.

This paper contains four part, background information, methodology, literature review, and findings. In background information, I provide basic information about the development of Jowzjan University since its establishment in 1988. In the section on methodology, I focus on the research methodology which I used in Afghanistan. In the literature review, I explore various issues and scholarly work that are related to teachers' curriculum and mathematics. I outline the research studies and the finding of authors on these subjects. Finally, in the conclusion I provide my finding from this research.

1.2- Background Information

I chose Jowzjan University in Afghanistan for the focus on my research because of the relatively secure status of the campus, and my own familiarity and the city in which it is located. There are a number of important issues related to Jowzjan University, including location of the university, historical background, academic and administrative structure in the university, physical structure, number of faculties and departments, the number of instructors, the education level of instructors, number of students and diversity among them, the instructors' qualifications, the curriculum being implemented and its limitations, and certain achievements by the Jowzjan University since 2001.

This background will provide information regarding the context, in which I conducted my research at the Jowzjan University and will help the readers to understand the context of study clearly.

1.2.1- Location of Jowzjan University

The University of Jowzjan is one of the twenty two public-funded universities in Afghanistan. It is located in the Shibirghan city, which is capital city of Jowzjan province. Jowzjan is one of the 34 provinces in Afghanistan, and it is located at the North of the country. Jowzjan is famous for three reasons; first it is a significant and strategic location because Afghanistan's Ring Road crosses the province. The Ring Road is the only asphalt road which starts from Kabul and it is intended to connect all the major cities in Afghanistan. The construction of this road was started during the administration of King Mohammad Zahir in 1960s but it was never completed because of civil unrest and domestic war (Synovits, October 10, 2007).

After the current government was formed in 2001, the construction of the Ring Road was resumed but it is still not completed. Various NGOs are working on it. An important priority for this province is the potential for developing natural oil and natural gas resources. A recent study conducted by USGS (United States Geological Survey) and the Government of Afghanistan Ministry of Mines and Industry determined that petroleum resources existed in the northern provinces of Jowzjan and Ser-e-pol are significant greater than previously understood. The assessment was conducted over two years, with funding provided by the U. S. Trade and Development Agency (USTDE). This study increased the estimated oil resources by 18 times and tripled the natural gas resources (USGS & Afghan government, March 14, 2006).

A third, privilege for the provinces is to share border with Turkmenistan, a central Asian country. Economic development in Afghanistan will make it possible to open a trade route to Turkmenistan, and this will improve the region's economy. All of these privileges contributed to Jowzjan University acquiring the status of a top ranking university in Afghanistan. Jowzjan University attracts students from many provinces in Afghanistan. It offers students a competitive

learning environment and relatively high standard of education. Students also hope to find employment at the University following graduation.



1.2.2- Historical Background

Jowzjan University was established in 1988, it began as a two year teacher training center for elementary and secondary school teachers in Jowzjan province. In the 1995, during the Mujahidin regime this teacher training center was transformed into a four year pedagogical institute for teacher training. Despite ongoing civil war the number of teachers in training and faculty remained consistently high. There was an estimated 30 faculty and more than 400

students. Many of the faculty possessed undergraduate degree. However, the entire faculty had many years of teaching experiences in their subject areas.

In 1998 when the Taliban occupied Northern provinces they reduced the Jowzjan pedagogical Institute from being a four year to a two years teacher training college. The number of students also decreased from 400 to 100. Most of the students left country and head to either Iran or Pakistan, or to neighboring provinces in search of jobs or to get way from the difficult situation. I was one of those students but I did not go out of the country. Instead, I worked as a tailor in my home city, Ser-e-pol, province which is located South of Jowzjan province. Many of teachers also left the country to look for jobs and to protect their lives.

Prior to the Taliban regime there were two higher education institutions in Jowzjan, Pedagogical Institute and Miner Institute. During the Taliban regime both of the institutions functioned in two years institutions. When the Karzai governments took power in Afghanistan, in 2001, these two higher education institutes were merged and become the Jowzjan Higher Educational Institute. It was not until May 2009 that the Jowzjan Higher Education Institute was re-named the Jowzjan University. The creation of the Jowzjan University was accompanied by an increase in students' enrollments. The students' population increased from 100 to 400 in 2001 (MoHE, 2005). The students' population now stands at more than 2000.

1.2.3- Academic Structure of Jowzjan University

In Afghanistan, education is free from grade one to university. Like other public university in Afghanistan, the Jowzjan University is funded by the government. The Ministry of Higher Education has responsibility for all academic, logistic and administrative matters of these universities in the country. Universities are required to provide accommodation and meals for

their students who come from villages that are least 45 kilometers away from the campus or from province other than Jowzjan.

The Jowzjan University is headed by a chancellor. The chancellor oversees all academic and administrative offices within the university. There are two assistant chancellors one of whom is responsible for academic issues, while the other deals with administrative issues. Besides these two offices, there is an office for student affairs. This office oversees students' administrative issues. There is a separate office that deals specifically with students housing. This office is responsible for student accommodation meals.

There are four Faculties and 16 Department in Jowzjan University. Each faculty is run by Dean and a staff comprising one academic assistant and one administrative affair's assistant. The Dean of faculty is responsible for all academic and administrative matter in Faculty. Each Department has a Chair. The Department Chair makes decisions about the courses that each faculty member teaches, oversees curricula and teachers' lesson plans appoints academic advisers for the students, and addresses students' academic concern.

1.2.4- Physical Structure

The history of the University of Jowzjan is marked by a series of relocation of its campus. Since its establishment in 1988 the campus has moved five or six times. Relocation has contributed too many difficulties in academic and administrative affairs of the University. For example, when the Taliban occupied Jowzjan province the University was forced to move and in the process all the books and academic documents were looted. After the new government took office in 2001 it had few resources and this was a challenging for the University. One of the

challenges that the university faced was providing adequate for each of its Faculties and Department.

This current campus is situated on a former military base. This base was used for after the Disarmament, Demobilization, and Reintegration (DDR) program that started in 2003, and which focused on former soldiers and illegal armed groups in post-Taliban Afghanistan (Salinas, July, 2004). There were 6 or 7 buildings on the military base and each building had about seven or eight rooms when the military base area was given to the Jowzjan University in 2005. The University started to use these rooms as classrooms. However, with the growing student population the lack of classrooms is posing a challenge to the University community. Recently, the Ministry of Higher Education has started to construct a building to house administrative office. The Afghanistan Higher Education Project (HEP) has also started construction of second building at the university. Completion of these two buildings will help to relieve some of the problems related to insufficient number of classrooms.

1.2.5 Number of Faculties and Departments

The University has four faculties: the Faculty of Natural Science, the Faculty of Social Science, the Faculty of Chemical Technology, and the Faculty of Geological and Miner. The Faculties of Natural Science and Social Science train teachers for secondary and high school (In Afghanistan secondary school contains Grade 7 to Grade 9 and the high school includes Grade 10 to Grade 12). The two other faculties focus on producing graduates who will find employments in the area of mining.

Students' entrance to the four faculties largely depends on their success at annual country wide examination that is conducted by the Ministry of Higher Education which called Cankor examination.

The education faculties; natural science and social science faculties admit two types of students; in-service and pre-service. Pre-service students have to pass the university entrance exam (Cankor). This country wide Cankor exam takes place during the winter. Generally, students who obtain high scores they could gain entrance to a college with a high standard. Students with averaged Cankor scores study in the regular departments. Cankor grades also determine students' majors.

In-service students who study at the Jowzjan University have to pass a Cankor exam that different from the annual country-wide Cankor exam. This special exam is conducted by the Ministry of Higher Education and it usually takes place at the end of December. However, this in-service Cankor exam does not have a fixed date and it depends on when in-service teachers are ready to pass the exam. However, both pre-service and in-service teachers follow the same university curriculum and are taught by the same instructors

Students who graduate from the Faculty of Engineering and the Faculty of Chemical Technology and Geological Mineral usually find employments in two small companies that deal with oil and gas production in Jowzjan and Ser-e-pol provinces.

The job marked for university graduates in Afghanistan is relatively small. Like other university those from Jowzjan University face the same challenge of limited job opportunities. However, there are more job opportunities students who graduate from the Faculty of Educational than for graduates from other Faculties. The numbers of schools in the country are

expanding and need for education in the most regions also increasing. As a result, graduates from the Faculty of Education readily hired as teachers.

1.2.6- The Number of Instructors

The quality of teaching at a university largely depends on the level of education and the experience of the teachers. I consider these and similar issues in this sections of my thesis. I will describe the community of instructors at the Jowzjan University, their level of education, their teaching experiences in their specialization and the use of computers and the Internet within the university. There are 65 instructors in the Jowzjan University. Among these instructors 17 hold master's degree while the remainders have undergraduate degrees. Many of the instructors who have master degrees graduated from universities in the Soviet Unions and other socialistic countries during the 1980s. Some of these instructors have also received degrees from the University of Polytechnic in Kabul. Instructors who have only undergraduate degrees graduated from universities in Afghanistan. Most of these undergraduate level instructors are young, having graduated after 2001 from the Jowzjan University.

Currently, some instructors from Jowzjan University are pursuing studies at the master's and doctoral level in foreign countries. Three instructors are current doctoral students in Tajikistan and one is studying for his doctoral degree in South Korea. There are also two instructors who are in master's level program in Japan and in the United States of America (USA).

Most of the senior faculties in Jowzjan University are regarded as experts in their fields and many students express their satisfaction with their classes. But as with other institutions of

learning around the world, technology has affected the teaching and learning environment at the Jowzjan University. Faculties at the Jowzjan University are now expected to be proficient in their knowledge and use of modern technology in the classroom.

While no formal study has been done on how faculty in the Jowzjan University are using computers and the Internet. My understanding as a member of this university is that, most of senior faculties do not use these resources. However, some of young generation instructors who have graduated within recent years are more knowledgeable about this kind of modern technology. The faculty members, for example, often attend private computer courses outside of the university. The University itself has limited Internet access. Moreover, the government does not have enough resources to equip computer labs and to provide internet access to all universities around the country. Thus, the universities lack the kinds of modern equipment and faculty that are associated with technological advancement. However, Professional Development Center (PDC) which was developed by Higher Education Project (HEP) in Jowzjan University plays significant role in terms of offering opportunities to faculty members so that they can improve their understanding and use of technology as a resource for teaching and learning. Faculties in the Jowzjan University currently pursue computer studies at the PDC.

1.2.7- The Number of Students

An increase the demand for education directly affects schools and universities regardless of where these institutions are located. In 2001, after international and afghan forces, caused the Taliban to withdraw from the government power, students' population in schools and at universities across Afghanistan increased. The number of students in the Jowzjan University grew from an estimated 100 during the administration of the Taliban to around 400 in 2001.

While I was working at the University, in 2007, there were some 1000 students. The students' population has grown since then and it is estimated at 2000.

The Ministry of Higher Education tries to regulate students' placements at the various universities, especially since students' accommodation and meals are factors that have to be taken into consideration. For these reasons, the Ministry tries to send students to their provincial university following their success at the Cankor examination. In Jowzjan University most of the students are from Jowzjan Province and its districts, but some students come from Ser-e-pol a province which does not have a university. A few students come from other province of Afghanistan. In terms of accommodation, priority is given to those students who come from more distant provinces. In addition, students who are living about 45 miles from the campus have the right to have a food and shelter in the university. The daily cost for the three main meals per student is 80 US cent in Afghanistan current money is counted 40 Afghani. Most of the students are coming from poor families and these meals are all that they have to look forward to because they can not afford to eat at restaurants, hotels, or in the bazaar.



1.2.8- Curriculum and Teaching System

Curriculum in a university is like a guiding light. It shows the way for teachers as they try to improve ways of teaching and instruction. In addition, the curriculum is integral to all academic and administrative issues which exist in a university or school. For these reasons I find that it is important to understand how curriculum is defined and used at the Jowzjan University.

In general there is no one definition for the term “curriculum”. For example, Egan (spring, 2003) defines curriculum as “the study of all or any phenomena is curriculum” or curriculum is skills and knowledge that are to learn (Association for Supervision and Curriculum Development, 2000). In Jowzjan university curriculum is defined as a lesson plan, a syllabus, and the content of subjects. This understanding of curriculum at the Jowzjan University appears to be consistent with Egan perspective that curriculum is the studying of any phenomena.

Education faculty members from the Jowzjan University coordinate with Kabul Education University on academic for education. Curriculum documents consist of a list of subjects that teachers in both universities use. This list serves as a guide to faculty as they develop their own syllabus, lesson plan and lecture notes. At the beginning of each semester, faculty member in the Jowzjan University provides lecture notes for his or her students and they are used in the classroom during the semester. Each faculty makes two copies of their lecture notes; one copy is for the department and the other is for themselves. Each Department Chair is responsible for collecting all these documents from the faculty hers and for storing them. In the event that a faculty member cannot attend class, substitute faculty can use these prepared lecture notes and teach the students.

The teaching approach in the Jowzjan University follows the style of prepared lectures as well as practical demonstrations. In the lecture approach, the faculty or instructor stand in front of the chalk board and explain the lesson notes had previously distributed to the students. In this approach the faculty or instructor dominates the class session while students' participation and contribution are minimal. Students rarely share their own ideas about the lesson; instead, they listen and take notes, and they might ask clarifying questions. The practical system which are used for teaching science subjects such as Mathematics, Geometry, Physics, and Chemistry appear to be more useful than in the lecture approach.

1.2.9- Changed Since 2001

There have been many changes at the University of Jowzjan since 2001. These changes include the relocation of the campus, increase in the students' population, increase in the number of faculty members and opportunities for professional developments for faculty.

Amidst all these changes, the increase in the number of lecturers is very significant. Initially there were 14 or 15 Faculty members, but now 60 across the four Faculties. Furthermore, most of the Faculty who are hired at the Jowzjan University are students who have graduated within the past eight years.

Since 2001 the University has been addressing the problem of shortage of classrooms and offices, space for faculty and university personal. The current campus facilities temporarily offered some measure of relief and it is expected that the two building that are currently under construction-the building that is funded by the Ministry of Higher Education, and the HEP funded building will serve to further alleviate this problem.

The HEP which was initiated by the USAID is playing an important role in supporting the Faculty of Education in Afghanistan. One result of HEP's coordination with Jowzjan University is the establishment of a new office which helps university faculty for professional development. This office coordinates two programs: training computer and the teaching English for the University faculty. Education faculty members have opportunities to learn a variety of computer programs and English the PDC. These programs have assisted teachers in their efforts to improve their skills in technological and their overall professional development. In addition, the HEP has sent some faculty a broad for long term and short term study programs. All the these changes which occurred in Jowzjan University after 2001 have contributed to improving curriculum design.

1.2.10- Limitations and Challenges.

The Jowzjan University faces limitations and challenges that are similar to those faced by other universities in Afghanistan. These include the lack of highly qualified faculty, poorly equipped libraries, limited access to modern technology and equipment, and the absence of innovative teaching approaches and methods among faculty. All of these limitations and challenges prevent development and progress within the University.

The majority of universities in Afghanistan do not have lectures with doctoral degree this is same for Jowzjan University too. In some countries, universities are not allowed to hire teachers who only have masters and undergraduate degree. However, in Afghanistan this practice is prevalent. This practice affected the quality of teaching at the Jowzjan University. It is a major challenge for the University to effectively prepare its students.

The lack of equipped library within the Jowzjan University is another problem that faculty and students face. There is a small library in the Jowzjan University with approximately 4000 or 5000 books. This library includes three types of books: (i) books that are outdated useless and are not longer adequate for teaching students in the twenty-first century. (ii) new books which have been translated from English to Farsi in Iran. The academic terms which have in these books are written in Farsi, a language that is from Dari. Jowzjan University uses Dari as the language of instruction. Some teachers know these terms and are able to use these books but others are unfamiliar with them, and (iii) books that NGOs have donated or that have been brought from Kabul, and that are written in English. The problems with these books are that most of teachers and students do not know English. In addition, most of these books are not related to

the subjects that are taught at the university. So access to current textbooks and scholarly works is a problem.

Today, technology dominates all aspects of life. Without technology it is difficult to live in developing countries. Knowing how to use computer and the Internet is one door to the world of technology. Without opening this door it is impossible to enter into this world. In some countries, many people have already opened this door. However, people in Afghanistan, even in academic institutions have either no access to this door or do not know how to open it. For the community at Jowzjan University the limited access to and use of technology had a negative impact on the quality of teaching and education that the University provides to its students.

CHAPTER TWO

Research Methodology

I undertook my research project as a novice researcher. Developing effective research skills involves time and experience. Conducting research in the field often poses unforeseen challenges and difficulties but this can serve to improve and enhance researchers' skills and knowledge in specific areas. So, for me this was the first time that I was going into the field. I found everything to be new and challenging and on some occasions, even felt confused. Despite these challenges; however, I managed to collect and analyze my data.

The result of research activities depend largely on the quality of the data, so it is important for a researcher to make receive adequate training and to prepare well for data collection. During my course of study at the University of Massachusetts I took some research courses. However, I did not have any work experience in the field. Before going to the field I also reviewed articles on qualitative research methods which were related in my topic also some and on Mathematic curriculum. All of these activities helped me to design my research project and equipped me for some of my field work. For example, I was able to addresses issues relating to sampling, interview design and interviewing techniques. While the research methodology was actually quite straightforward, I discovered that self preparation was an important step in this venture.

2.1 Who am I?

The completion of thesis is a critical requirement of my master's program and I feel that is important for me to share something about myself as student. I obtain my undergraduate degree in mathematics and physics in the Jowzjan University, in Afghanistan, in 2002 and I subsequently worked as an assistant professor in the Department of Mathematics at the Jowzjan University. There, I taught Geometry for four yours to in-service teachers. In 2007, I was selected as a candidate to pursue a Master's Degree at the University of Massachusetts, Amherst (UMass) in the US. Financial support for my studies came from the Higher Education Project (HEP). HEP is a joint project between Afghanistan's Ministry of Higher Education and the United Stated Agency for International Development (USAID). HEP is funded by the USAID. I was among the batch of seven members of the Education Universities in Afghanistan who enrolled as students at UMass. At UMass, I pursued studies in International Education while

serving as an active member of the CEI. Like the rest of my batch mates, I returned to Afghanistan to conduct research for my Master's thesis.

2.2 The Reasons for Selecting This University to Do My Research

There were two reasons why I selected the Jowzjan University for my research project. First, because I am a resident of Jowzjan so I live close to the Jowzjan University. At this point in time traveling from one province to another is problematic because the lack of security in Afghanistan. So, living in this city had a real advantage for me as a researcher. The second reason related to the fact that I am a member of the Jowzjan University I felt that knowing the University environment and the community would make the research process less challenging.

2.3 Making a Plan

Planning is an exercise that is useful in almost every aspect of life. It is part of the process of setting and accomplishing goals. So, I decided to do some planning for my research before I embarked on my, before going into the field. I intend that my plan would serve as road map. I started by making notes about ways in which I could conduct my study in as effective manner. During this planning phase creating a tentative schedule was a priority. I realized that in order to accomplish my tasks, I needed to have some ideas about a time frame and the sequence of activities.

Outline clear strategies for conducting research activities was another priority. I was aware that in order to carry out my research activities at the University, I needed to permission of the chancellor and the corporation of the Chair of the Dean of the Department of Mathematics and Science, and the Chair of the Department of Education in order to get access to the in-service teachers. So one important strategy that I considered was to arrange to meet with them. I also

decided that my study sample would come from the group in-service teachers and that the sample would include the Faculty member who taught Geometry.

I also considered ways in which I would obtain curricula and other relevant data from Department of Mathematics and from high schools.

2.4 How I Conducted The Study?

I arrived in my home in Jowzjan province on June 8, 2009 and after visiting with my relatives and friends for about a week, I began to focus on my research. I had a fruitful meeting with the Chancellor of the Jowzjan University. He had been serving as the Chancellor since 2006. His major was in oil and gas engineering and he holds a Master's Degree from the Polytechnic University, in Kabul. Prior to taking up the position of Chancellor, he served as a Faculty member in the Department of Mathematics. Since we had worked together, I knew him well and was very supportive of my research plans.

My next step was to obtain the support of the Dean of Education and the Chair and other faculty of the Department of Mathematics. Although I knew all of these people well, I needed to have their official permission before I proceeded with my research. In this study I needed their help in order to find a suitable room where I could talk to students and conduct interviews in a private and confidential manner. When I talked with them they said that they were happy to assist me. I really appreciated all of the support that I received from the officials and faculty at the University.

The day after I spoke with the Dean of the Faculty of Education and the teachers in the Department of Mathematics, I decided to visit the Geometry class and talk with the in-service teachers about my proposed study. The group included in-service teachers from the two-year and

three-year programs at the University. I needed to talk specifically with the third-year in-service teachers who were studying geometry. When the Faculty Assistant and I entered the classroom in-service teachers' class was being taught geometry. When the Assistant introduced me to the class, he mentioned that I am Faculty of the University but that I was studying for my Master Degree in the United States. He mentioned that I had returned to Afghanistan to conduct research for doing my Master's thesis.

When I spoke on the teacher, I told them about my educational background, and my study program in the United States. Then I explained that as part of my research, I needed to interview some of the in-service teachers in this class. Teachers asked a range of questions about the proposed interview and they asked me to clarify some aspects of my study. Their questions included the following: What I will ask them? It is okay if I give them the questions one or two days before interview? Since I was the first person talk to them about doing research at the Jowzjan University most of them were interested to participate in the study. I told them that they should inform me within two or three days if agreed to participate in the study.

After three days I returned to the class to find out if anyone was ready for interview. 10 in-service teachers volunteered. My plan included an interview with the Faculty who taught Geometry in the Department of Mathematics. She also agreed to be a participant in and she told me that she would be proud to join in this study. At this point I felt that my research was off to a good start.

2.5 Participants

The participants in this study were the in-service teachers in the Faculty of Natural Science. This meant that while they were studying at the university they were also teaching in

the high school. Students, in the Department of Mathematics and the Faculty of Natural Science faculty, are required to take a variety of Math and other courses. However, in my study I was focused only on Euclidian geometry. I felt that conducting research that involved more than one subject would have been much too challenging for me. One reason was that I had a time constraint since I only had two months to collect data. I figured that by focusing on one subject area, I would be able to be more thorough in my analysis.

I derived the study into two categories. The subject teacher (faculty) of the Euclidian Geometry class in Department of Mathematics was the sole participant in my first category. She was a former in-service student and she graduated from the University of Jowzjan in 2007. She has limited teaching experience at the university level. The second category comprised ten in-service high school teachers. Among these 10 participants, two were males and eight were females. The participants from the in-service class had a broad range of teaching experience. For example, one participant had more than 25 years teaching experience while others had only taught between 5 to 9 years.

The interview questions were designed to allow the participants to share their experience in teaching the Euclidian Geometry and designing curriculum for this subject. In addition, I asked questions that were related to the extent to which the University courses help these teachers in their daily high school classroom activities. I also asked these teachers about aspects of their teaching experiences in the high school, and how they thought they were able to apply the skills and knowledge that they gained from their classes at the University to the classroom setting. In this regard, I asked a question about whether the University classes helped them to broaden their knowledge in Math as well as their teaching strategies.

I developed a schedule of appointment for the interviews. I did this by asking students to indicate day and time when they wanted to be interviewed. I distributed one copy of finalized schedule to each of the participant and I requested that they arrive on time for the interview. In the end, I conducted the interviews over a period of 25 days.

In keeping with the Institutional Review Board (IRB) requirements of UMass, I had prepared consent form that I needed to provide to each participant before I began the interview. However, this form and my questions were in English language. I translated the consent form and the questions in Dari over a three-day period. Then, some of my colleagues advised that I should not show the consent form for the interviewee because the interviewee might not want to proceed with interview if they had to provide a signature. The reason why some persons would hesitate to sign a document is that generally Afghans do not like to sign in a sheet of paper, and they do not like to participate in a conversation which requires their signature. So, I decided to use the option of explaining the consent form orally to the participants and to ensure that they understood rules of the interview and issues relating to their consent to participate and ask for an oral agreement from them. This approach worked well.

Before I started the interviews I invited all of the participants to a lunch. The Faculty assistant and another Faculty member who provided assistance during my field research also attended. Arranging the lunch was in keeping with the Afghan custom of eating together especially in this situation where it is very important all parties have an opportunity to speak to each other, seek greater understanding of any issues, and bond.

List of Participants (Figure 1)

NO	Male	female	Teaching Experience	Education level	High School Teacher	University Teachers
1	M		Five years	14 years	X	
2		F	Three years	14 years	X	
3		F	Four years	14 years	X	
4		F	Eight years	14 years	X	
5		F	Six years	14 years	X	
6	M		Four years	14 years	X	
7		F	25 years	14 years	X	
8		F	Six years	14 years	X	
9		F	Eight years	14 years	X	
10		F	Five years	14 years	X	
11			15 years	16 years		X

2.6- The Interview Process

I started the interview on June 22, 2009. As I stated, the room in which I conducted the interviews was situated in the office that houses the Department of Mathematics. It was only room that was available and was small and it was located in a hall with other classrooms around. I could have conducted interviews outside the university but most of my participants were females, and they were not allowed to participant in the interview outside of the university. So

this was somewhat of a limitation, but in Afghanistan the, the tradition is that female students are not allowed to go outside university or school when they are attending these institutions.

One of the challenges that I experienced in getting the interviews done related to time. For example, on one occasion I had an appointment with a participant at 1:00 pm but at 1:30 he had not arrived. I waited him about 10 more minutes and then called him on this cell phone. He responded saying that he would arrive within 10 or 15 minutes. When he arrived I asked him why he was late. He apologized and he explained that his bicycle had a problem, and he had to walk to the campus because in Afghanistan, public transportation is not readily available. But I was pleased when he agreed for me to record his voice in order to make it possible for me to transcribe the interview.

Interrupting during the interview was another challenge that I had to deal with. On many occasions, students and teachers who were passing by became curious and wanted to know what was happening here. This was a pattern that continued throughout the period that I conducted the interviews. During the interview, I allowed the interviewee to refrain responding any question that did not wish to answer. Our interview lasted about one hour. During this time I listened keenly to the participants and made relevant notes in my notebook.

In order to complete my entire scheduled interview, I often had to conduct interviews in the late evening or in the early morning. Sometimes students were not punctual and on these occasions I communicated with them on their cell phones. Sometimes I had to reschedule interviews. In the end, the interviews lasted four weeks-one week later than I had originally planned.

2.7- Collecting Data

After completing all of the interviews I proceed to collect curriculum document from the interviewees. This provide to be a somewhat challenging because most of the teachers did not appreciate when others examined their lesson plans and syllabi. The reason for this is that the most teachers either do not keep updated copies of their curriculum or they recognize that these documents are deficient in one way or another. Teachers around the country use the text books that are available in the schools and the majority of teachers rely on their daily lesson plan. When I asked the study participants for their curriculum they often showed me their daily lesson plan. So, in the absence of a curriculum, I collected the lesson plans.

I examined the copies of curriculum and other materials that the study participants gave me in order to assess how relevant they were to the needs of the students and know how teachers used them in the classroom. I was interested in finding out how students benefit from these curricula and materials and how they appropriate they were to high school class sitting.

2.8 Transcription

Since I was working on tight schedule transcribing the interview was a top priority for me. As I mentioned earlier, I conducted eleven interviews altogether and these interviews varied in length. The shortest interview was about 20 minutes and the longest was 40 minutes. Some participants were more talkative than others and this affected the length of the interviews. Some interviews spoke different languages but none spoke English. However, they all knew Dari so I chose to conduct the interviews in Dari and consequently my transcriptions were in Dari. When I started the transcription process each interview took three days or sometimes four days. The reason for this was that typing in Dari was difficult for me because I was accustomed to typing English instead of Dari. Also, each interview ended up beings fifteen or seventeen pages the word

processor. At the end of July I only finished four transcriptions and this process was interrupted because I had to travel to Kabul on July 30 in order to get my visa to return to the US. However, like a few of my other CIE batch mates, I did receive my US visa until the end of October. For one month I did not work on my transcriptions because I thought that I was not going to get visa. When I came back to Amherst in October 28, 2009 it took two weeks to complete transcribing the remaining interviews and in September 8th I started analyzing the data that I had collected in Afghanistan.

2.9- Challenges and Limitations the Study

Challenges and limitations are the issues which can be found in any study or research. Therefore, my study also would not be separate from these common issues. The most important and significant issues, which doubles the quality of study, is having enough time for doing research for researchers. In addition, having enough time allows the researchers to study appropriately in the field and get the better result from the research. In the study, I conducted I had two months to work on my project, including the time we spend during our travel time from the U.S to Afghanistan and coming back to the U.S and the days I spend at home for visiting my relatives and friends. I had the chance to spent just 30 or 35 days of these two months in doing the study. Although this time is enough time for conducting a research but in Afghanistan it is not enough because people in Afghanistan mostly do not think about the importance to the time. I interviewed with each eleven in-service teachers and the one mathematics department teacher within this 35 days just for once. If I would have enough time I could interviewed at least two times the participants, and it would be helpful for me to write a better result from the study. Another important thing, I could not do because of the lack of the time, was class observation.

Class observation was very supportive for developing my study if I could be during the study and would expand the study quality.

Having less information about the research rules also prevents the researcher to conduct the research effectively and appropriately. As I mentioned in the methodology chapter, during my study in the University of Massachusetts I was not able to take the research courses in order to support me for conducting the study. Before going to Afghanistan, in May 2009, I had attended just for one week workshop which was about conducting a research in our departments in the Center for International Education (CIE).

In the Jowzjan University, there are computer lab with internet access which established by Higher Education Project (HEP). However, this computer lab does not enough the Internet speed in case of downloading some articles or journals from different websites. During my study if I had needed some any article or journal from Google, or other websites I was not able to download because of low speed internet. This was another limitation for my study that I faced while doing my study. I found and downloaded all the articles that I needed in my study after coming to the United States.

The lack of related articles and literatures in my study, in Afghanistan, was the next elements which prevented the research in a better way. Afghanistan is a war turn country and the most of the universities are new established. Most of the teachers who are teaching in the universities are not familiar to write articles or do research with high quality in order to be useful for other researchers. Therefore, it is difficult for a researcher to find articles or journals in such kinds of situation. Finding related articles would help my study for having high quality because previous researchers work and their recommendations and suggestions would improve this study

quality. With having all these limitations I started my study and finished the research within in recommended time.

Chapter Three

Literature Review

Finding scholarly publications that related to my research topic was an important aspect of my research. I began by reviewing article that dealt with ways of improving the teaching methods

and the learning environment. Eventually I found a few older publications that shed light on these subjects and helped me to think about issues that arose in my own research study. one of the first article that I reviewed was dealt with reform in the teaching of Mathematics at the tertiary level in the United States. Authors Roth-McDuffie & McGinnis (1996) examined the perceptions of professors and students on reform-style teaching of Mathematics. These authors present and analyzed the views of five pre-service teachers and their mathematics professor in their role as participants in a reform-style mathematics classroom in state of Maryland. This was a qualitative study and the research setting was an undergraduate mathematics classroom. The mathematics course was taught by an experienced university professor as part of a collaborative effort in teacher readiness in the state of Maryland. The five candidates were the first year undergraduate students. One of these participants was man and four were women and they were all pre-service teachers.

The study focuses on the perception of the per-service teachers and training during their mathematics course. The study participants described the kind of teaching and learning styles that they would like to improve in their role as upper elementary and middle level school teachers of mathematics and science (McDuffie, McGinnis & Watanabe, 1996). The study illustrate the explanation and understanding of the university instructor and the five teacher candidates who are attracting to teach and learn in a class with goals lay out by the reform documents (McDuffie, McGinnis & Watanabe, 1996).

The researchers in this study conducted individual and group interviews and they also engaged in participant observation as part of their data collection exercise. All teacher candidates and professor were interviewed individually at the beginning and at the end of the semester and

their voice were recorded. Also, during the semester, the researchers gathered data through class observation of their participants. Field notes also formed part of the data.

The author concluded that participants who attended a reform-style mathematics classroom completed the first step towards achieving the vision for reform of mathematics and creation of a primary model of teaching and learning Mathematics that embraces the ideas of the reform movement education (McDuffie, McGinnis & Watanabe, 1996). The authors explained that the study showed that classroom interactions involved five distinct elements of “regulation, conventions, morals, truths, and instructions” (p. 12). They also found that there was a strong focus on the mathematical clarifications and justifications during the classes (1996). This latter finding is consistent with the view expressed by Cobb, Wood, Yackel & McNeal (1992) expressed. In their study on classroom mathematics teaching traditions, these authors found that clarification and justifications that students request during mathematics lessons are significant element of teaching and learning. They recommended that clarification and justification by considered goals of the reform movement in mathematics education (1992), including at the tertiary level. Cobb et. al argued that teaching mathematics the first classroom (traditional) includes following procedural instructions. However, these authors argue that, mathematical clarifications and justifications should be seen as way of building a shared mathematical understanding between students’ and teacher. Authors in this article felt that this kind of shared experience helps to create conceptual mathematical phenomena (McDuffie, McGinnis & Watanabe, 1996). Similarly, in the second reform style classroom, clarification and justifications are expected and valued. Thus, when a teacher uses a more traditional style of teaching the students start to think about Mathematics as strictly procedural and rule-based. But when the teachers demonstrates their beliefs and behaviors starts in ways that support the ideas of reform-

based learning and teaching students will be on the way of changing their views of mathematics (1996). These findings helped to inform my approach to my research. So, in research study on in-service students' and their learning experiences in Mathematic at Jowzjan University, I try to understand and describe the in-service students' perceptions of various methods of teaching Mathematics and way they use these method in their classroom teaching.

My approach to my research was also influenced by the recent publication by Neubrand & Seago (2008). This paper focuses on the relationship between teachers' content knowledge and pedagogical practice. According Neubrand & Seago "content knowledge in mathematic is knowledge of concepts and a fluency of the procedures" (p. 18). These authors divide teachers' Mathematical content knowledge into "five strands" (p. 19), all of which are fundamental to students' Mathematical proficiency. These strands are "conceptual understanding, procedural fluency, strategic competence, adaptive, and productive disposition" (p. 21). Neubrand & Seago explain that content knowledge about pedagogical content knowledge in Mathematics is two other factors which affect the quality of teaching. They note these factors must be addresses in order to improve the manner in which Mathematics teachers' lessons.

Neubrand & Seago (2008) strengthen their arguments on factors that influence the teaching of Mathematics by referring to scholarly works. In their research, Leikin found that teachrs knowledge of Mathematics helped to development of their mathematical and pedagogical knowledge through teaching mathematics (Neubrand & Seago, 2008). Another researcher from Germany in his research found strong relationship between content knowledge and pedagogical content knowledge is well connected (Neubrand & Seago, 2008). Neubrand & Seago also referred to a study of Colombian Mathematics teachers' theories about their own teaching practices of beginning Introductory Algebra. This study examined the mutual influence of the

teachers' ways of knowing beginning algebra, and their conceptions of the crucial determinants of their teaching pedagogical practices (Neubrand & Seago, 2008). The authors of this study describe the factors that affect the teachers' flexibility in teaching Mathematics. They also state that teachers' pedagogical and mathematical conceptions are the factors that affect the flexibility of teachers in class. In addition, notion and awareness are other important factors that influence teachers' flexibility while teaching mathematic.

Leiking and Dinur, believe that “preliminary” factors and “momentary” factors influence teacher' mathematical and pedagogical knowledge are different each other. “Preliminary” factors include basically the teacher's knowledge, skills- pedagogical knowledge, awareness, teachers' beliefs about mathematics and mathematics teaching (Neubrand & Seago, 2008). For instance, a teacher who thinks that existing various solutions to a problem is confusing to students will act inflexibly when a solution different from one that the teacher planned is suggested by a student (Neubrand & Seago, 2008). On the other hand, a teacher who knows the importance of looking at different mathematical solution to a problem is one way of helping to develop students' understanding of arriving at mathematical solutions may increase teacher flexibility during teaching a lesson. Leikin and Dinur define “momentary” factors as the aspects of the teacher's reasoning and beneficial reactions during teaching, such as the teacher's confusion or curiosity, teachers' ability to understand the students' language, and teacher awareness from potential of language (Neubrand & Seago, 2008). These authors concluded that “preliminary” and “momentary” factors are correlated and that acquire pedagogical content knowledge through practice.

The literature that I reviewed suggest that there is need for further investigation into of how teachers learn, how this affects their teaching practices and what impact this has on their

students. One reason why additional research is important is because of the role that technology is playing in the field of education. For example, Castronova (2002) has written about of learning that is termed “discovery learning” and how it can be implemented through some special teaching methods and guided learning strategies (In her article, Castronova discusses accessibility and effectiveness of new technology in discovery learning and compare this form of technology-based learning to the use of technology in more traditional approaches to learning (Castronova, 2002).

The author explained that for the term “discovery learning” is that “encompasses an instructional model and strategies that focus on active, hand-on learning opportunities for students” (p. 23). She (/e) describes three main characteristics of discovery learning. “1. Exploring and problem solving, creating integrate, and generalizing knowledge. 2. Students driven interest-based activities in which the students determine the sequence and frequency. Activities encourage integration of new knowledge into the learner’s existing knowledge base”. (p. 16). According to the author, the first characteristic is very important. She argues that by exploring and problem solving students take an active role for integrating and generalizing knowledge and that instead of passively accepting information through lectures or drill, students establish broader application of skills via activities that encourage risk taking problem solving.

Second characteristic relates to the issue of encouraging students to learn at their own pace. Learning can occur when teachers allow flexibility of sequencing and frequency with activities (Castronova, 2002). This strategy contributes to the students own learning, motivation, and their achievements.

The third attribute based on the principle of using students' existing knowledge to build new knowledge and to develop new ideas. The combination of these three attributes makes "discovery learning" different from traditional ways of learning. Cattonaova (2002) points out that the major differences between these two approaches to learning are compared to the traditional approach to learning, "discovery learning" (i)- is active rather than passive, (ii) is process oriented rather than content oriented, (iii)-recognizes that failure is important, (iv)- encourages feedback if necessary, and (v)-promotes deeper understanding of issues (Castronova, 2002). In other words, learning does not happen just by repetition and imitation, but by actively seeking new knowledge. The author notes that "discovery learning" can be facilitated by various ways or strategies and increase students' achievements when they learn new skills.

Casanova refers to a study by Mabie & Baker (1966) that looked at the relationship of "discovery learning" and students' achievement in nutrition. These researchers studied three groups of fifth and sixth grade students who were taught about food using three different methods. One group was taught through a garden project. Short, in-class projects were used with the second group, while the third group was taught using traditional methods. The researchers found that both the garden project and the in-class project group showed an improvement in pretest knowledge of 70%-80% compared to 11% increase in group taught using traditional methods (Castronova, 2002). The authors concluded that "discovery learning" is an active learning process and the student in this method is able to improve higher level of skills to build deep understanding. The author recommended that teachers should be trained to understand the theory of discovery learning in order to work effectively with children. In today's world, "discovery learning" where there is an increase in the capabilities of technology, age demand for more having technological tools will be a reason for developed education system. In the

international economy, changes in stability of jobs in the workplace, and increase in the number of careers people will have over a lifetime, “discovery learning” is likely to play an important role. In discussing “discovery; learning” Casanova’s (2002) underscores the point that teaching and instructional strategies designed by the teacher, as well as the environment that is created when such strategies are used promotes active learning. In her article Casanova reviewed literature concerning the theoretical and historical basis of discovery learning, and its practice and applications, as well as the role of WebQuests as a current technologically-based application of discovery learning. I found that the issues and methods that the author discussed applicable to various subjects, including mathematics.

The literature that I reviewed and that I have discussed covers many important issues related to learning and improving the teaching in schools and at university level. The articles that reviewed suggest that teachers in schools and at the universities have a responsibility to consider ways of implementing new methods of teaching in order to enhance the quality of learning to their students. Some important themes emerge from these articles directly relates to themes that emerge in my study. These themes include the perceptions of pre-service teachers in the university about their contribution to changing improving teaching styles, understanding the relationship between mathematical knowledge and pedagogical knowledge of teachers, and the need to promote new ways of learning. I consider all of these themes in my study while paying closer attention to issues that specifically relate to the teaching of Geometry.

Curriculum

According to the curriculum designers, there are two general definitions of a curriculum; first is the sample definitions that depends how much the education leaders use these definitions

in schools or at the universities. Based on the first definition, curriculum is skills and knowledge that are to learn (Association for Supervision and Curriculum Development, 2000). This definition includes all skills and knowledge students learn in the schools or in the universities. From this definition the reader interprets that all the skills and knowledge inside and outside the class the students learn are curriculum. Sometimes students learn in their home or in the society so according to this definition the learning which happens outside the school also should be part of curriculum.

The first definition seems to be more general and does not specify a border for a curriculum and includes all the learning environments. Based on this definition curriculum is everything, regardless of its situation. The next definition is complex and requires several sources in order to be more understandable. According to the second definition, which defined by Wilson in 2005, “Curriculum is everything that goes on within the school, including extra-class activities, guidance, and interpersonal relationships (Wilson, 2005)”. The second definition looks specific because this definition verify the location that learning happens and illustrate that curriculum is skills and knowledge that happens inside the schools or universities. According these two definitions, list of subjects in a university, lesson plan, syllabus, methods of teaching and so on are include in definition of the curriculum.

3.1 Theoretical Concept

In conducting this study, I started from the perspective that there is a need to balance mathematical knowledge and pedagogical knowledge at the Faculty of Education at the Jowzjan

University. I also believed that it was important to understand how in-service teachers facilitate pedagogical and mathematical knowledge when they teach high school students.

In Afghanistan, teachers, parents, and others who are involved with schools and the education discuss and debate issues that relate to the relationships between the Faculty of Educations' curriculum and the high schools curriculum. They articulate that the curriculum of education faculties, in Afghanistan universities, should address the needs of the high schools teachers' needs who are studying at universities in Afghanistan.

Although I was unable to find supportive documentation, the reality is that across Afghanistan, there is a lack of coordination between the various Faculties of Education and high school administration. (There is almost no attempt from government authorities to synchronize these two curricula. There is a practical reason why this situation exists. The reason is that here are two independent Ministries that deal with education in Afghanistan: the Ministry of Higher Education and the Ministry of Education. The Ministry of Higher education supports the four year universities, including four year programs at the various Faculties of Education. There are 22 universities in Afghanistan and 19 of them train teachers for secondary schools and high schools (MoHE, 2005). All of these faculties e train teachers for elementary, secondary, and high schools. The students who study at these universities are pre-service and in-service students. The pre-service students enter to universities by passing entrance exam which is conducting annually by Ministry of Higher Education. The in-service students also enter to the universities via entrance exam but this exam for in-service students is not annually conducted and it takes place at different times during the year. In-service students are school graduate students who begin to teach immediately after they graduate. They are not exposed to any teacher training courses. It is only recently that the government has begun to address the issue. They hope to improving the

quality of teaching of these teachers by offering training to them through four-year programs that are conducted by the Faculty of Education at universities across Afghanistan, and at two-year teacher training colleges.

The problem of the lack of coordination between the two Ministries extends beyond issues related to teacher training. The Ministry of Education supports schools from kindergarten to K-12. There are 37 two-year teacher training colleges in the 34 provinces of Afghanistan which are training teachers for elementary levels and are accountable to the Ministry of Education (MoE, Strategic plan, 2007). These two ministries, the Ministry of Higher Education and the Ministry of Education, have their own rules and procedures and they work separately. They also have their own curricula and overall, they conduct their academic and scholastic issues independently.

Prior to 2001, if the students who graduated from two-year teacher training colleges wanted to enter the Faculty of Education, they were accepted in the second year instead of third year. This contributed further to the confusion that existed in the system of training teachers. In 2008, however, there was an agreement between the Ministry of Higher Education and the Ministry of Education to try to work together on academic matters. They agreed that the students who graduate from two-year teacher training colleges should be accepted in the third years of teachers' training programs at the universities. In my view, a body such as a Department of Education should be created to oversee the curricula in the Ministry of Higher Education and the Ministry of Education. This department can be allowed to play an important role in guiding the program for training high school teachers. Coordination of the two Ministries of Education in Afghanistan is likely to result in improvement in areas such as the quality of education that is offered by universities and the two-year teacher training colleges, as well as in the schools. In my study I try to provide some ideas that stakeholders and policy makers of both Ministries of

Education in Afghanistan might find useful as they try to bridge these two important aspects of the education system and design curricula that fulfill the requirements of schools and Faculties of Education.

Chapter Four

Finding

Here, I will discuss key findings from this study, including elements important for improving the quality of education in education faculty of the Jowzjan University. The important themes from this study are:

- curriculum system,
- mathematical knowledge,
- methods,
- relationship between education faculties and schools,
- using computer and the Internet for developing teaching system in education faculties and at the high schools.

4.1. Curriculum

As I talked with my participants, they consider curriculum as a list of subjects, lesson plan and syllabus within a school or a university environment. One of the female participants in this study stated that the curriculum is the list of subjects conducted by school administration; in addition, teachers select their teaching subjects from these lists and create their own lesson plans. A male participant believes that the curriculum is the daily lesson plan or text books which the students use in classes. Three of the participants; one male and two females stated:

When we teach the high school students at the beginning of school year we divide all pages of geometry text books to whole school days then we conduct the daily lesson. Also, before going to the class we make lesson plan. Our lesson plan is one or two sheets of paper which show us what we should do at first and what second.

In the United States, at the beginning of each semester, every instructor prepares a syllabus in his/her teaching subject, and then distributes this syllabus to the students. By studying this syllabus students know the materials and requirements of the course. This syllabus is a tool which led the teachers and the students toward systematic teaching and learning.

My interview with participants revealed that, in the education faculty of Jowzjan University, the majority of teachers in the geometry class are not using the technique of preparing syllabus for their classes. Instead they prepare some chapter notes at the beginning of each semester and distribute them to the students. Then, during the semester, the teacher gives lecture from these chapters. One of the male participants stated that:

In geometry class, I have not seen any lesson plan or syllabus. May be our teacher has but she has not distributed to the students. Not just the geometry teacher, but all teachers who are teaching us also, have not prepared distributed their lesson plans or syllabus for the students.

The same male participant, who is in-service teacher and studying in mathematics department, believes that a well designed curriculum for advancing students learning is important. Well designed curriculum gives an opportunity for teacher to conduct his/her lesson plan in a better way and encourages the students to enhance their understanding in the subject. He believes that every teacher should distribute his/her lesson plan or syllabus to the students, and says:

In my idea, it is important for a teacher to have a lesson plan and distribute it to his/her students. However, our teacher at the university in geometry class have not distributed lesson plan for the students. She has given chapter notes of geometry for us and during the semester we follow those chapters. In my teaching, at the high school I have my own lesson plan and during the semester I follow that.

The reason for not using syllabus in education faculty, according to one of the mathematics department's teacher, is the unfamiliarity of teachers in the mathematics department with the new system of designing curriculum. She stated that the majority of education institutions were established after the new government in 2001, and the Jowzjan education institution is among them. For this reason, they face different challenges and difficulties because of lack of expert teachers and reasonable teaching resources.

The most important and significant challenge education faculty in the Jowzjan University face is the lack of enough experienced teachers, according to participants. Almost all teachers in the mathematics department of Jowzjan University are apprentice teachers. They are not trained how to design the syllabus for a course and how to use modern methods of teaching. Eighty percent of novice teachers from this faculty have graduated from the same university in which they are teaching. They do not have the experience of using syllabus and designing the new curriculum. Two of the male in-service teachers in the study pointed out that:

Our teacher in geometry class does not give specific lesson plan for the students. She just divides some chapter notes to us then during the semester she gives lecture about these chapters.

Another female in-service teacher states that when she designs her lesson plans in school. The principal approves them; if not, they are not allowed to implement.

Before enter in classroom and start the lesson my own lesson plan for teaching students is ready. First I mention the previous lesson for students and give them idea about the lesson. For example, if a soldier is not armed in battle ground he won't be able to win the battle it is similar for a teacher also because without clear lesson plan no one can teach effectively in class. When we prepare our lesson plan the high school principal acknowledges this lesson plan after that we are allow to implement in class.

After establishing the new government in 2001, several projects and NGOs in Afghanistan started working to enhance teachers' professional development and capacity. These NGOs and projects goal is to improve the quality of teaching system in the universities, although their attempt and efforts, compared to damages during 30-years war in Afghanistan, are undetectable.

The Higher Education Project in Afghanistan (HEP) currently is working with education faculties in Afghanistan, trying to improve the quality of education system. Since HEP was established in 2005, this project has conducted several seminars and workshops in Kabul or the provinces in order to develop teachers' capacity and their methods of teaching. According to the one of female teachers in the mathematics department of education faculty in the Jowzjan University, who participated in my study, the teachers in this department have attended several workshops conducted by HEP. In these seminars or workshops, several topics were discussed to enhance teachers' understanding of teaching methods and designing curriculum and syllabus. She believes that still there should be more academic help for teachers in order to improve the education quality.

A university teacher who teaches differential geometry in the mathematic department states that, "at the beginning of the semester. we (teachers) get the list of content subjects from our department. Then we prepare our chapters based on this list of content. After distributing the chapters for the students I make a decision about how to conduct the chapters during whole semester: monthly, weekly or daily". When asked whether she considers the in-service teachers' needs while she is designing her lesson plan, she responded:

Yes, I have considered their needs in schools. While I was designing my own lesson plan for geometry class at the beginning of the semester, I prepared two extra chapters from

the school geometry text books to teach in class because the geometry I teach in this class, differential geometry, does not much relationship with their school geometry.

All respondents state that the curriculum, which the mathematics department in geometry class uses, is the lesson plans and chapters. There is no syllabus for students and exact curriculum of geometry which would help the in-service to design their own geometry curriculum in high school.

4.2- Mathematical Knowledge

In my study, the participants express that in-service teachers who are studying in the mathematics departments have different levels of mathematical knowledge. Some of them are veteran teachers and some are novice teachers. Their teaching experiences indicate that their mathematical knowledge is also at different levels. According to a male participant, the majority of these in-service teachers who are studying in the mathematics department are not teaching the same subjects as they are studying in the university because they feel uncomfortable teaching geometry in high school. This participant mentioned

Most of my classmates, in their schools, do not teach geometry. When the principles of the school suggests them teaching geometry they reject and claim that they shy and are not able to teach geometry. They are scared from teaching and going to 10th, 11th and 12th grade classes. Instead, they select geography, history, English and other subjects to teach because they think these subjects do not have much more requirements as geometry has.

Another male in-service teacher stated:

The number of our classmates in the geometry class is 25 people. Among this number of teachers just the six of them are teaching the mathematical subjects like geometry, trigonometry and algebra the rest of them are teaching non-mathematical subjects.

Lack of mathematical knowledge among in-service teachers in the mathematics department has caused many problems within the university classes and in high school classes. In the university, it creates problems for instructors who teach geometry for in-service teachers because teaching students with different levels of understanding requires specific methods and special knowledge for instructor. The novice teachers in mathematics department do not have these skills and qualities. In the high school, less experienced teachers may not be able to promote the high school students' improvement and thus it prevents the high school students from the effective learning.

The interview results show that the majority of the teachers who teach in the mathematics department at the university also are novice or the new hired teachers. Furthermore, these teachers do not have enough teaching experience in geometry or other subjects because they are young teachers. The participants indicated that these novice and young teachers have to teach more than two or three courses in a semester, based on the university requirements. Additionally, most of the time these courses are not related each other. Thus, teachers have to study different subjects in order to be prepared for teaching the class. There is less time to focus on the quality of the lesson in classes.

This situation in the mathematics department has become a reason for the low quality of lesson within classes and shows its bad affection to the in-service teachers' learning. For instance, the two or three courses which are taught by the mathematics teachers are totally

different in terms of contents. For instance, if one course is about geometry, the second and third is about teaching method or English.

While I was teaching in the department of mathematics, I used to teach more than two or three courses from totally different disciplines because of the lack of enough teachers in department. My teaching responsibility within one week was more than 30 hours, and now it is same for the current novice teachers. According to one of the participants, teaching more than two subjects for a novice teacher is a reason for low quality of the teaching system in the class because the teacher cannot concentrate and prepare her or himself for teaching all these three courses.

The participants state that teaching more than three courses for a novice teacher creates many problems and difficulties. The teacher, who teaches Euclidean geometry, stated that besides teaching Euclidean geometry she has to teach analytic and differential geometry also because there are no other teachers to teach these subjects.

One of the female participants who teaches in the mathematics department believes that the teachers in the university level do not have much more teaching experience to teach their students effectively. She stated that the majority of teachers in the mathematics department are young and new hired teachers. She comments:

The first priority for a better teaching in a class is that the teacher should have control on content of the subject. Having control on content allows the teacher to use different methods and control the class effectively. For instance, if the teacher have mathematical knowledge, in teaching geometry, he will be able to find teaching materials from the environment or create by him/herself from the basic tools.

This participant believes that the instructors who teach in university classes must be expert and knowledgeable teachers.

The university must hire the teachers who have enough quality of teaching. Means that, the university teacher, who teaches geometry, must know all the problems in geometry, we face as teachers in high schools.

Based on these findings, most of the teachers who teach at the university or at the high school do not have enough experience to teach their students and help them understand in a better way. The reason for this problem is that Afghanistan is a war torn country and it has suffered 30 years of war. This war has affected each part of Afghan society. This long and devastating war prevented the people of Afghanistan from improving their education system.

4.3- Methods

Methods are the way of delivering a lesson in an effective way. There are different methods of teaching in any education system. However, it is difficult for every teacher to recognize the effective and efficient methods and know ways of delivering the lesson for the students. In this section, I will try to illustrate some of the methods that the mathematics department in Jowzjan University uses to deliver the lesson to their students.

The teacher who teaches geometry courses in the mathematics department stated that she uses three systems of teaching in order to teach the in-service teachers : lecture, applied practice, and seminars. For the lecture system, at the beginning of the semester she prepares some chapter notes and divides these chapter notes for the students. The chapters are in differential geometry and she has searched different sources and libraries in order to prepare some chapters for the students. Furthermore, she said that the lack of an equipped library in the Jowzjan University

obligated her to look for other sources in other provinces to complete the chapters to fulfill the high school teachers' needs in terms of learning resources.

She then has to be prepared herself for teaching these chapters. Before going to class and starting the lesson, first she studies the lesson then explains via lecture for in-service teachers, and there are two hours of lecture during a week. In addition, she has prepared one or two extra chapters from grade 8th, grade 9th and grade 10th of school geometry text books for the students. Then during the semester she gives lectures from all of these chapters. According to her statements, the in-service teachers study two hours of differential geometry during one week.

The applied practices the second way of delivering the lesson to in-service teachers in geometry class. Based on her explanation, the in-service teachers during the applied method are given different problems and questions from the Euclidean and differential geometry. In order to solve these problems and answer the questions they are obligated to work individually or in different groups. I encourage the students to solve these problems in the class, and it is also two hours a week.

Seminars and projects, as the geometry teacher in the mathematics department stated, is the third way of improving the in-service teachers' learning in differential and Euclidean geometry. She uses this method to encourage the in-service teachers and give them ability to explain the lesson for their classmates. Based on this teacher explanation, mostly the in-service teachers are obligated to find the related topics and present in class. She stated that the in-service teachers individually take preparation about their topic then gives a seminar in class for all the students.

She feels that these methods are effective: “as I assess my students by observing their seminars and their participation in class and their response to the questions, it seems to be that they are learning well and my teaching system seems to be effective”. In her idea, 80% of in-service teachers are learning well from the methods that she uses for teaching geometry.

The in-service teachers responded to questions about the methods which their teachers use in the geometry class of mathematic department.

One male participant

Our teacher uses the teacher centered method in geometry class this means that she works on the board and we are not participating in lesson process. She does not use the group work, or other activities which involve the students in the process of learning. We as students just are looking to the teacher explanation and observing her lesson.

In the teacher centered method, which most of the universities and schools in Afghanistan use, mostly teacher control the teaching process. Students’ participation in this method is invisible. Students are just listening and observing the process of lesson.

The same participant described his own methods of teaching in geometry at the high school classes;

In geometry class, in high school for teaching my own students I use different activities like group work, peer work or individual work. These methods as I see are more effective than the teacher centered method at the university.

A female participant commented about the geometry teacher and her methods for teaching the geometry;

Our teacher in geometry uses the peer work, solving problems on the board. As the geometry is a practical knowledge and needs to be implemented practically on the board.

One female participant in the study talked about the difference between the methods used in the geometry class at the university and the methods which are used in the high school:

There is a big difference between university method of teaching and high school method. In the university classes, teacher does not have a lesson plan. When the teacher finishes her lesson asks the students if they learned today's lesson a few students response that they have learned but the big number of students are not learning because the students are in different levels in term of their mathematical background. Then one or two students go on the board and solve the problem. In the high school, we teach differently from the university. In high school, we have our own daily lesson plan and we are obligated to implement this lesson plan in class. Our teaching system in high school is students centered, the students participation in teaching process is 80% and the teacher just a facilitator.

Based on these explanations, I found the methods used in geometry class of the mathematics department, are the old system of teaching and the in-service teachers are not satisfied with these methods. The respondents show that the methods which these in-service teachers use in the high schools are up to date and seem to be more effective than the methods used in the university, in terms of improving students' geometrical abilities.

4. 4- Applicability of In-service Education to the Needs of High School Teachers

This section describes the relationship between the content and process of in-service education in Jowzjan University and the needs of the high school teachers who attend it. The research question discusses whether the in-service teachers' learning in the mathematics department in geometry class helps them in better teaching the high school students. Most

participants said that the geometry they learn in the mathematic departments helps them in better teaching in high school. There are some participants' responses;

Yes, our learning in geometry in geometry class at the university helps us in better teaching in high school. For example, in the high school geometry text books, in grade eight the author has given a brief description about two straight parallel line which the third line intersect the first two line and compose different angles. However, in the university we studied this part with more explanation and now I use my understanding from this section for teaching my students in high school. I have that ability to transfer the 70 or 80 percent of my understanding from the university class in geometry to high school.

The second participant, who teaches planet geometry in high school, believes the geometry contents in the mathematics department all are the high school geometry repetition. We are in fifth semester and studying the differential geometry which I have not studied this part in the school. She said;

Yes it helps with most of issues we studied in geometry class in the mathematic departments we already knew. We studied all the school geometry issues within first, second, third and fourth semesters in the university. Now are in fifth semester do not study the school geometry themes.

One participant, who teaches in elementary school, stated that:

I am teaching the six and seventh grades geometry. The geometry in these grades includes the principle of geometrical. The issues we are studying at the university mostly related to the secondary and high school geometry. When I am encountering in a geometrical problem during teaching in the high school the geometric lessons which I have learned in university help me for solving that problem. I solve the most of my teaching problem at the university when I have in the high school. In the school, there is not body to help me for solving these problems.

The fourth participant is a young female teacher who teaches planet geometry in high school since 2006:

After attending in the university as an in-service student I found the ability to solve my geometrical problems by coordination of the university teacher. The 90% of geometrical issues which I am learning at the university are applicable at the school. For example, the geometrical problem, which you solved last week to my sister, one example of applicability of university geometry in high school. It was a big challenge for us since three years and no one in our school or other private schools was able to solve this problem....The geometrical contents at the university and in the schools almost are the same. The issues we study at the University for Geometry Class we teach at the school to our students.

Another participant believes that, of the geometrical issues they are studying at the university, 70% are applicable for the high school.

The elements I learn in geometry class in the university 70% are applicable for the school geometry. The issues I do not know from the school I learn at the university class by teacher coordination.

Another participant is a principal in a female high school, and she stated that she does not teach geometry but she helps the teachers who do. Her work experience is more than 25 years.

1- I am not teaching geometry but I can help the other teachers in high school for better teaching by using my understanding from the university class.

A young male in-service teacher who is teaching geometry in a high school says that the geometrical contents that they are studying at the university are not related in high school geometry.

2- The issues I learn in geometry class at the university are at the higher level than high school geometry which I teach my students in high school.

These comments indicate the relationship between course material taught at the mathematics department and at the high schools. However, these responses do not address the

significant items or issues which help the in-service teachers for enhancing their teaching methods or teaching abilities. For instance, there is no attempt in the mathematics department to conduct special workshops or seminars in order to teach high school teachers how to design effective curriculum and lessons. Also, there is not any professional development or training for education faculty to advance better ways of teaching for in-service teachers.

4.5- Using Geometrical Models, Computer and the Internet for Improving Teaching

Findings about Utilizing the computer, Internet, and geometrical models to show visual images in geometry class or find helpful items from the Internet in order to improve the students' abilities also emerged from this study. Applying the geometrical models is another way of teaching in the geometrical class. Applying these instruments give students an opportunity to participate in lesson process and improve their learning. The participants—a professor from the mathematics department and the in-service teachers-- mentioned that there are no computers or Internet access for enhancing the teaching in geometrical classes in the university or high school. Instead, teachers in the university and high school use the simple and basic teaching materials in their lesson for the students. One participant, a male in-service teacher who teaches in a rural area's high school, stated that:

I am not familiar with using computer or the Internet in my teaching. I prefer to use some geometrical models like; model of pyramid, glop, cone, cylinder or other requirements models.

Second number of the participant is a female in-service teacher; she is a young and smart teacher teaching in a high school. She says using computer in geometry class is necessary.

The teaching materials in our university class are just chalk, board and paper, not other models which support the teaching process and help the students learning.

In our class the teacher in the geometry class not using computer programs which help the students learning.

According to this participant's idea the materials which are used in the University for Teaching Geometry are old. She believes that using computer and visual images in class during the teaching geometry encourages students to participate in the lesson and improve their understanding.

I have not seen any computer program which would be used by our teacher for developing my understanding in geometry class. There are the simple and basic materials in geometry class.

Another participant is teaching since 2004 in high school; she has attended university after finishing two years teachers' training college in Jowzjan province. She said that the geometry lessons they are studying at the university are not helping them in teaching their students in high school. In addition, she added that she is preparing the simple teaching environmental materials. She says:

When I am teaching geometry for my students in high school, I bring different environmental examples to enhance the students understanding; like the height of the class door as vertical line, the bottom of door as horizontal line, the corner of the class as angle.

Two of the participants had the same explanations, one female and one male. The female in-service teacher teaches in high school and the male in-service teacher teaches in the secondary school. In Afghanistan, usually the elementary, secondary and high school students are studying

in one area because of the lack of enough space and classroom. So these two in-service teachers are teaching in one school.

Studying at the university helped me to solve the problems which I had in high school. Before, our school did not have a laboratory for experimental work for students. In recent years, our school established a laboratory for physics, biology, chemistry and geometry. Now, when I am teaching geometry in high school I use this laboratory and use the geometrical models. There are some geological models like cylinder, pyramid, cone and some other geometrical models.

One in-service teacher who participated in this study believes that the teachers should be creative and prepare the teaching materials from the sources they have at hand, in their environment. She says if the teacher is creative, she can discover new ways of teaching that improves the students' geometrical knowledge.

When a teacher teaches geometry, it would be helpful if, she draw the geometrical figure on the board. Or prepare some carton and scissor and give them for students to cut carton and make geometrical shape. By this way students would be able to learn effectively.

The geometry teacher who teaches the differential geometry in the mathematic department states that there is not enough teaching resources or teaching materials in the Jowzjan University which would be useful for teaching in-service students. In her idea, existing expert teacher, equipped library, evaluable computer lab, and easy access to the internet would improve the quality of teaching in the geometry class and other classes as well.

In mathematics department, teachers encounter with the lack of teaching resources like lack equipped library, less accessibility for the computer lab and lack of access to the Internet. Sometimes if I need a book I can not find from university library, and I have

search this book in other libraries out side of the university. Also, if I encounter a geometrical problem there is no body in the university in order to help me because all the mathematics department teachers are novice and inexpert teachers.

From all these explanations, I conclude that the lack of equipped library, equipped computer lab, and access to the Internet, besides the lack of expert and proficient teachers, are the main challenges that the University of Jowzjan faces. The existence of such equipment and resources in a university would advance teachers' professional knowledge and the students' abilities and learning.

4.6- Implication

In this thesis, I revealed some of the issues which exist in the mathematics department of Jowzjan University in Afghanistan. . My attempt was to understand, from the perspective of the in-service teachers, what their needs are, how well their needs for learning how to improve their teaching are met through their in-service program, and how the mathematics curriculum should be designed to better serve their needs. Clearly, more research and study is needed to reveal all determinant elements.

Overall, the findings indicate some of the implications for changes in practice that the university should do. I would propose that the university, in its in-service program, should:

- improve its curriculum so that it better matches the math that in-service/high school teachers need to teach;
- seek ways to incorporate the kinds of active learning methods in the in-service classes that they want the high school teachers to use in their high school math classes;

- teach professors how to develop a syllabus that incorporates peer teaching, project learning, and more activities beyond lecturing and reading chapters (in other words, model the pedagogy that they want the high school teachers to use);
- perhaps assess the math skills of in-service teachers so that teachers with more math background can help teachers with less math background (in other words, focus on teaching math content appropriate to in-service teachers' levels)
- continue to seek ways to bring computers, internet, and modeling into the university classrooms.

I look forward to continuing my research in the future and finding important themes in order to improve and help the education system in Afghanistan.

4.7- Conclusion

Conclusion is a closing part of my research paper; also this is one of the most thought-provoking steps for writing my thesis. Here, I am trying to briefly discuss the issues which I wrote in this thesis. Here, I tried to reveal some of the issues which are existed in the mathematics department of Jowzjan University in Afghanistan. My topic was the education of faculty math curriculum and the in-service teachers need. Although, in this research, my attempt was to find important and relevant elements and show these elements for the reader that what the in-service teachers needs are and how the mathematics curriculum should be designed in order to fulfill their needs. However, I think there should be more and more research and study

in order to reveal all determinant elements. My study frame was qualitative study the participants were the in-service teachers and university teacher.

My purpose from this study was to know about the connection which existed between the high schools and the education university in the Jowzjan University. In this regard, I decided to focus in some specific subject and select five or six themes and explained them for the readers. Here I want to mention two or three themes that I think are important for my study. The first was the curriculum; collecting the curriculum documents from the mathematic department of education faculty and the curriculum documents from the in-services teachers, who are teaching in the high school, and comparing these two curricula in order to find some relationship among them, was the first thing which I did in this study. As I compared these two curriculums from the education faculty and high school I could not find connection between these two. The in-service teachers who are studying at the mathematics department are not taught how to design curriculum and how to design the syllabus for their classes. I could not find any document or written curriculum, standards or criteria which would be stated that how the in-service teachers' curriculum should be designed. I ask several teachers in the mathematics department about curriculum they told it is the responsibility of each subject teacher to teach anything they want for their students and there is not exact curricula document which lead the teachers for better teaching.

The second theme which I thought is important for mention is the teaching method for the mathematics departments. The interview with participants showed that the methods which are implementing in the mathematics department are mostly teachers centered and the students are not participant in the teaching process. Still there is the lecture system, sometimes even the students are not getting the lecture notes because of lack of equipments and resources for the

students to print or make copy. Usually the teachers in the mathematics departments print the chapters and distribute for the students. According to my participants in the study the methods which are implementing at the school are most the students centered and mostly the students' participation the lesson process visible.

The mathematical knowledge of teachers, using the mathematical understanding from the university to the schools, teaching materials, using geometrical models and using computers and access to the Internet were the other themes which I found some answer for them in this study. My recommendation for improving the quality of future researchers' work will emerge at the end of the conclusion part.

After collecting data I needed to transcribe the data and translated some important parts to the English because the participant did not know the English. After finishing my transcription and data analysis I started to write the report of study. I framed my thesis in four section; introductory chapter, methodology chapter, article review chapter and finding and conclusion chapter. In the introductory chapter, I included brief summary of my work purpose statements, research question, and background. In background, I gave short explanation about my study context, which is Jowzjan University, its history, number of students, number of teachers, academic structure, and its changes since 2001.

In the methodology chapter, I explained the methods of doing my study. The methodology includes all the process of doing research in the Jowzjan University in Afghanistan. In article review chapter, I tried to find related articles about my topic in order to support my research questions. Although finding the related articles in my topic, I thought, was difficult because I could not find any related articles for my topic from Afghanistan. After searching several days in

different web sites and googling finally I found some articles to support my topic. In the finding chapter, as I mentioned my study was a qualitative study and the number of participants also was not appropriate. For this reason, it was difficult for me to write a lot and expand the finding chapter. Still, I tried to illustrate to important details which my participant stated in the interview. Doing this study encouraged me to continue my research in the future and find important themes in order to improve and help the education system in Afghanistan.

4.8- Strengths

Regardless of its limitations, this study had some strengths points also which improved its efficiency. First, this was the first time that a study was conducting in the history of the Jowzjan University since its establishment. Doing this study, in the Jowzjan University gave idea for other teachers who are teaching in the University for doing such kind of research inside the university. Second, the issues which I found in this study are important because it will be the first time that the Jowzjan University authorities will know about them. Before also they knew what are needed in the University for improving the teaching quality; however, there was not any study to reveal them. The third point which is necessary for mention is developing my experience for doing other researches in the future. This study will help me to conducting my other studies in the future in a reasonable way. The fourth element which helped this study to be conducted in a appropriate way was my familiarity with the Jowzjan University personals. As I stated in earlier chapters I used to teach in this university, and I knew all the teachers in the university. For example, the teachers coordination in the mathematics departments for

conducting the study, preparing room for interview, helping to talk with in-service teachers and so on, are the most important issues which helped me for conducting the research.

4. 9- Recommendations

As I stated earlier each study has its own limitations and weakness which prevent study from being a qualified and acceptable by all readers. This study also had some limitations which would be considered before starting the research. In order to have a qualified study and acceptable result for the future study it is important to keep these elements in mind; in this study, I selected the qualitative approach; however, later I understand that just the qualitative approach is not able to reveal all the problems in such kind of context. There should be mixed approach- qualitative and quantitative approach.

Selecting the sample for study is also important besides having mixed methods. There were just eleven participants, in my study, which was enough for finding reasonable answer. If I do such kind of research in the future, again, I prefer to select more people for interview. Selecting more participants for interview give you opportunity to find appropriate answer for your questions and also you will have chance to compare different answer from different participants and select the best one.

In the study I did, the observation from the university classes and school classes were not included. It would be much more effective, if the future researcher consider the class observations in their studies in the future. By observing the classes the researchers know that how the methods are implementing and how the students' learning going under these used methods by in-service teachers.

The time is another important and significant component of each study. Having enough time for doing a research allows the researchers to get better and effective result. As I expressed before, for doing my research I did not have much more time for class observation, doing more interview and having conferences in order to create an effective result. if I have chance in the future to do such kind of research again I will definitely consider for having enough time to get excellent result from the study. These were the recommendations which I suggest for those educators or researchers to keep in their mind while they are doing such kind of research in the education especially in Afghanistan.

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Annexes

پلان درسی ساعتوار مکتب (لیس میرورس سیر) اسم معلم ([REDACTED]) (روز (دوشنبه) وقت (صبح از ظهر) تاریخ ۱۳۸۸ / ۴ / ۳

ساعات	مقطع	موضوع	هدف	تولید انگیزه	باز	مراحل اساسی	فعالیت ها	میتود	مواد	تاریخ نگارش	کارهای
۱	۹ (ب)	هنرمندانه	شناخت	شناختن اشکال و اشیای مشابه	نشان دادن رسم	۱: مقدمه و آماده گی : - سلام و احوال پرسی - دین نظافت ، گر قن حضری - ترتیب و تنظیم صنف و شکر دان - دین کار خانی و آرزایی - درس گذشته - تولید انگیزه به مدت (۱۱) دقیقه	خواهون میتون درس خودتون رو تشریح و توضیح بدین و منظمه سلام و شکر دان	انفرادی جوره	کاغذ قلم و کلمه شایه رسم نما کنه	۱۳۸۸ / ۴ / ۳	از ششم تا نهم
۲	۱۱ (الف)	هنرمندانه	زاده در حقیقی	شناختن زاده در حقیقی	نشان دادن زاده در حقیقی	پیشکش و انگشانی درس - معرفی عنوان - فعالیت های معلم و شاگردان با استفاده از میتود های متنوع در درس - استفاده از مواد درسی مطابق موضوع - استیکام درس جدید به مدت (۱۵) دقیقه	خواهون میتون در لیس در حقیقی و توضیح سوال و جواب ب منم نما کنین و صواب ب منم	انفرادی جوره	کاغذ قلم و کلمه شایه رسم نما کنه	۱۳۸۸ / ۴ / ۳	از ششم تا نهم
۳	۱۰ (الف)	هنرمندانه	روایای حقیقی	شناختن روایای حقیقی	نشان دادن روایای حقیقی	خاتمه درس (بستن درس) : - خلاصه و منجم ساختن درس جدید - آرزایی درس جدید (تمرینات) - دادن کار خانی - دادن عنوان درس آینده - نصاب تریبی به مدت (۹)	خواهون میتون در لیس در حقیقی و توضیح سوال و جواب ب منم نما کنین و صواب ب منم	انفرادی تشریح خوره	کاغذ قلم و کلمه شایه رسم نما کنه	۱۳۸۸ / ۴ / ۳	از ششم تا نهم
۴	۸ (ب)	هنرمندانه	تقدیم چهارم	تقدیم چهارم	تقدیم چهارم					۱۳۸۸ / ۴ / ۳	از ششم تا نهم
۵											
۶											

قرار شرح فوق پلان درسی روز (دوشنبه) تاریخ ۱۳۸۸ / ۴ / ۳ طبق تقسیم اوقات یومیه جهت تدریس بهتر و آماده گی لازم ترتیب شد صحت است.

نکات مهم و ضروری :
ارزیابی :
تیسره :

وزارت تحصیلات عالی ج-ا-ا
انستیتوت تحصیلات عالی جوزجان
یونانی علوم اجتماعی
دیپارتمنت (رایس)

پروگرام و مفردات مضمون (نوروزی) برای فاکولته علوم (طبیعی)

تهیه کننده :

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شیرخان

اوقات زمانی تدریس مضمون (مورد تدریس) مجموعاً (64) ساعات ، از جمله (32) ساعت
 لکچر و (16) سمینار . 16 ساعت

ساعات علمی	ساعات سمینار	ساعات لکچر	محتویات درسی	سمینار (موضوع)
16 ساعت	16 ساعت	32 ساعت	<p>مفاهیم قطبی ، معرفی مفاهیم قطبی و خصوصیات آن مفاهیم نقطه در مفاهیم قطبی ، ارتباط آن با سیستم مختصات و فرم دیفرانسیل ، شکل معادلات قطبی و شکل معادلات در مختصات قطبی ، تبدیل سیستم قطبی به مختصات و فرم قائم و برعکس آن ، ترسیم خطوط و دایره در مفاهیم قطبی ، دایره و دایره آرخیمیدس ، ترسیم یک معادله قطبی ، کاربرد معادله های ترسیم شکل در مفاهیم قطبی ، تقاطع اشکال در مفاهیم قطبی . خطوط مماس بر منحنی های قطبی ، دریافت خط مماس بالای منحنی و ترسیم گراف منحنیات و سایر حل شده معرفی انحنای و تاب یک منحنی ، طول قوس و مشتق آن ، دریافت انحنای شعاع انحنای انحنای یک منحنی که معادله آن به شکل پارامتری باشد ، انحنای منحنی که معادله آن به شکل قطبی باشد مفاهیم مشتق انحنای یک منحنی ، دریافت شعاع انحنای در یک نقطه جوهلی یک توپوسفر</p>	سمینار (موضوع)
			16 هفته در هفته (2) لکچر و (2) سمینار علمی	

اوقات زمانی تدریس مضمون (صورتی) (مجموعاً 64) ساعات، از جمله (32) ساعت
 لکچر و (16) سمینار. 16 ساعات

ساعات	ساعات	ساعات	موضوعات درسی	سمینار
16 ساعات	16 ساعات	32 ساعات	<p>مفاهیم قطبی، معرفی مفاهیم قطبی و خصوصیات آن مفاهیم نقطه در مفاهیم قطبی، ارتباط آن با سیستم مختصات و ضمیمه دیگران، شکل معادلات قطبی و شکل معادلات در مختصات قطبی، تبدیل بین سیستم قطبی به مختصات و ضمیمه قائم و برعکس آن، ترسیم قطره و درایر در مفاهیم قائم و قطبی و درایر آبیض، ترسیم یک معادله قطبی، کاربردهای ترسیم شکل در مختصات قطبی، تقاطع اشکال در مفاهیم قطبی. خطوط مماس بر منحنی های قطبی، دریافت خط مماس بالای منحنی و ترسیم گراف منحنی های دایره ای و بیضی معرفی انحنای و تاب یک منحنی، طول قوس و مشتق آن، دریافت انحنای، شعاع انحنای، انحنای یک منحنی که معادله آن به شکل پارامتری باشد، انحنای منحنی که معادله آن به شکل قطبی باشد مفاهیم مشتق انحنای یک منحنی، دریافت شعاع انحنای در یک نقطه، خواص یک بیوسفر.</p>	سمینار (صورتی)
				16 هفته در هفته (2) لکچر و (2) سمینار عملی

ساعات درسی	نوع ساعات	هفته ها
هفته اول		
2	لکچر	تجربات قطبی، حسی و فضا قطبی و خصوصیات آن
1	سمینار	
1	عملی	
هفته دوم		
2	لکچر	ویژگیات لایتم در فضاهای قطبی ارتباط آن با سیستم کمان و رژیم دلگاری
1	سمینار	
1	عملی	
هفته سوم		
2	لکچر	سختی مواد از قطبی و شکل مواد از رژیم و رژیم گرم در یافتن فورمول فریب یک زاویه خط مماس بر منحنی داره بره
1	سمینار	
1	عملی	
هفته چهارم		
2	لکچر	ترسیم یک مدار قطبی و کاربرد های شکل در فضاهای قطبی حل کنایه با استفاده از قضایای داره بره برای ترسیم تناظر مدار
1	سمینار	
1	عملی	
هفته پنجم		
2	لکچر	لغای استمال در فضاهای قطبی حل کنایه برای تعیین معادلات دردی لراکها
1	سمینار	
1	عملی	
هفته ششم		
2	لکچر	خطوط مماس بر منحنی های قطبی
1	سمینار	
1	عملی	
هفته هفتم		
2	لکچر	در یافتن خط مماس بالای منحنی
1	سمینار	
1	عملی	
هفته هشتم		
2	لکچر	ترسیم لراک حل سوال ها و تمرینات
1	سمینار	
1	عملی	