Teaching Socio-Scientific Issues (SSI) in Takhar Province, Afghanistan

Methods of Teaching SSI in Upper Secondary Schools

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ABSTRACT
Teaching Socio-scientific issues (SSI) has been identified as an important factor for improving students’ scientific literacy, argumentation, critical thinking, students learning interests and achievement. However, to what extent SSI is included in science teaching, how it is taught (by which methods) and if it is perceived important by teachers is unknown in an Afghan context. Hence, the general aim of this study was to investigate what methods of teaching SSI upper secondary school science teachers’ use, and if there are any methods they perceive as appropriate to use. A second aim was to investigate how teachers relate SSI to students’ real life and if they consider the teaching of SSI as relevant, and what possible barriers teachers have for teaching SSI.

The design of the study is quantitative and consists of a survey. A questionnaire instrument was developed that consist of 15 items. The questionnaire was distributed to 100 upper secondary science teachers in the Takhar province of Afghanistan. The sample was selected based on considering factors such as gender, teaching in urban and rural areas, in order to extract a representative sample from the province.

The findings show that the lecturing method was commonly used by the teachers while teaching SSI. Also group work and discussions were frequently used teaching methods, but most often the teachers did not use debate, dialogue and peer work while teaching SSI. In addition all teachers said that they relate SSI to students’ real life, but considering the teachers’ limited knowledge about students’ lives outside school this claim could be questioned. Furthermore this study revealed that a lack of appropriate teaching materials was considered the most important barrier for teaching SSI in Afghan upper secondary schools.

Based on the results Afghanistan government and international organizations should pay particular attention to improve teachers’ pedagogical knowledge and provide suitable teaching material for enabling teachers to implement other methods when teaching SSI in the classroom in order to improve students’ learning achievements and interests.
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LIST OF ABRIVIATIONS

EFA Education for All
DDT DichloroTiphenyl Trichloroethane
F Female
M Male
MoE Ministry of Education
NESP National Education Strategic Plan
SCA Swedish Committee for Afghanistan
SEE-SEP Sociology, Environment, Economy, Science, Ethics and Policy
SIDA Swedish International Development Agency
SSI Socio-Scientific Issues
TEMP Teacher Education Master Program
TTC Teacher Training College
UNESCO United Nations Educational, Scientific and Cultural Organization
TABLE OF CONTENTS

ABSTRACT ........................................................................................................................................... ii
ACKNOWLEDGEMENTS .............................................................................................................. iii
     LIST OF ABRIVIATIONS ........................................................................................................... iii
INTRODUCTION ............................................................................................................................. 1
     Problem Area ......................................................................................................................... 1
     Aim ........................................................................................................................................... 2
LITERATURE REVIEW ................................................................................................................. 4
     What is SSI? .......................................................................................................................... 4
     Importance of Teaching SSI .................................................................................................. 4
     Method of Teaching SSI ......................................................................................................... 5
     SSI Teaching Examples .......................................................................................................... 6
     Barriers of Teaching SSI ......................................................................................................... 7
     Related Subjects and Global and Local SSI ......................................................................... 8
RESEARCH METHOD .................................................................................................................. 9
     Data Collection .................................................................................................................... 9
     Research Instrument ........................................................................................................... 9
     Data Analysis ....................................................................................................................... 10
     Validity and Limitations ....................................................................................................... 10
FINDINGS .......................................................................................................................................... 11
     Respondents (teachers) Profiles ............................................................................................ 11
     Major Findings ....................................................................................................................... 11
      Methods Which Teachers Use for Teaching SSI .............................................................. 11
      Relating SSI to Students Daily Live .................................................................................. 13
      Methods Teachers Perceive as Appropriate Teaching Method for Teaching SSI .......... 14
      Importance of Teaching SSI ................................................................................................. 15
      Barriers of Teaching SSI ....................................................................................................... 16
      Summary of Findings ........................................................................................................... 16
DISCUSSION ................................................................................................................................... 18
     Methods That Teachers Use for Teaching SSI and Perceive as Appropriate Teaching Method When Teaching SSI .......................................................................................... 18
     Relating SSI to Students Daily Life ...................................................................................... 20
     Importance of Teaching SSI ................................................................................................... 20
     Barriers of Teaching SSI ......................................................................................................... 20
CONCLUSION ................................................................................................................................. 22
REFERENCES ................................................................................................................................. 244
INTRODUCTION

Education is considered being a very important factor to develop a country. Countries can develop only if they have an effective education system and try to improve the education quality. Education is investing in human resources and human resource is a more productive factor and its return rate is visible. As Unterhalter (2009) claimed that investment in education is investment in human resource which is like investing in other resources like mines or any other physical infrastructure, but investing in human resource is more productive and its return rate visible is rather than physical resources and infrastructure. When looking from a social perspective, Saha (2011) argued that educated population by using their knowledge and skills, increase productivity and improve the economy and will participate in governance wisely. Thus, education is a key factor for economic and social development of any nation.

Periods of war, especially during the last two decades in Afghanistan, has destroyed the social and economic infrastructure, including education. The education system has been influenced and changed by changing political regimes and each regime changed the curriculum and education system according to their beliefs and expectations as well as parents’ believes and wishes for educating their children (Samady, 2007). I was a witness for some of those issues to which Samady (2007) accounts for when I was a student. For example, during the Taliban regime when I was a student, Islamic education was their main focus and was in top priority rather than science and social issues. We were studying science subject once or twice a week, but we had to study Islamic subjects almost every day (six times a week). On the other hand, the resources were mostly spent in military purposes during last three decades of war. Thus, the last periods of war strongly affected education systems and it caused Afghanistan education system to be far from achieving the EFA (Education for All) goals. These goals should be met by the year 2015 in the whole world, but Afghanistan has a prolonged period until 2020, but as Karlsson and Mansory (2007) claimed it is not possible to obtain the EFA goals in Afghanistan even with the extended time limit to 2020 when considering the poor state of Afghanistan educational system.

According the Ministry of Education (2010) the education system improved after establishing a new government in 2002 when they enrolled more children in schools. They also employed more teachers and increased the numbers of general schools, technical schools and teacher training colleges, which haven’t happen ever before in Afghan education history. These factors all represent quantitative development. But only quantitative developments are not enough. Besides quantitative development qualitative development is very important for improving an education system. One aspect that can improve education quality is teaching of Socio-scientific issues (SSI). For example, how to encourage students to think critically, make informed decisions and enhance their scientific literacy is related to teaching SSI. As Balgopal & Wallace (2013) stated, effective instruction of students in writing activities about SSI attracts and improve students’ interest and lead them to greater scientific literacy. Consequently, this thesis studies what methods of teaching SSI teachers use and what methods they perceive as the appropriate teaching methods. This study also aims to investigate how teachers relate SSI to students’ real life and if they consider teaching SSI is of importance and what possible barriers teachers have for teaching SSI.

Problem Area

In the past decades several researchers have investigated the usefulness of teaching SSI in school and the plethora of methods that can be used doing so (e.g. Sadler, 2004). First, the advantages of
including SSI in school will be presented, followed by a rationale on why methods of teaching SSI in Afghan secondary school has been chosen as a topic in this thesis.

Chang and Chiu (2008) explained that argumentation has been an important aspect of science education to understand how people make decision and behave to promote individual thinking. It is noticed that the aim of science education is not just learning particular scientific knowledge, but also promoting skills of scientific thinking. In addition, Christenson et al. (2011) stated that in school education it is vital to guide students to find opportunities to transfer their school knowledge to daily life and including SSI in the science classroom is a good way to make this possible.

In 2001, by establishing new transitional government, dramatic changes occurred in the education system of Afghanistan by the presence and cooperation of the international community. In 2001, schools reopened for children (boys and girls) once again. Millions of children enrolled in school and thousands of teachers were employed for teaching (Samady, 2013). In 2002 government of Afghanistan established independent commission of education with support of UNESCO. The purpose of making this commission was to make policies and strategic plan to improve education quality and develop the education system. Ministry of education with support of UNESCO and other international donors prepared a strategic plan to develop the education system. Educating teachers and teachers educators were on top priority in the strategic plan (ibid). During the forthcoming decades, thousands of teachers graduated from teacher training colleges. A National academy established for teacher educators to educate school teachers’ new teaching methods and enhance their professional knowledge was established. Hundreds of teacher educators have thereafter been educated in Afghanistan and outside Afghanistan to learn methods of teaching, modern education which they supposedly should pass on to Afghan schoolteachers (ibid). As it is stated in the 12th article of Afghan education law, it is the responsibility of the Ministry of Education to “ensure equal right of education and training for the citizens of Islamic Republic of Afghanistan through promotion and development of universal, balanced, equitable educational manner” (Ministry of Education, 2008, p. 1). When considering the features and possible outcomes of SSI in education it could be one way to contribute to equitable, qualitative, and developed education. According to Eilks & Feierabend (2010) SSI enables students to act as responsible citizen, within society. According to Chang Rundgren and Rundgren (2010) SSI helps students to transfer their scientific knowledge to real life, enable and motivate students to handle science issues, enable them to think critically and promote their learning interests. According Christenson et al. (2011) SSI is a good and suitable context to transfer their knowledge to real life. So for having an effective and qualitative education system teaching SSI could be considered a feasible teaching approach within science education.

Considering the spent resources and time allocated by the Government of Afghanistan and international donors for developing the education system of Afghanistan together with the reported advantages of including an SSI approach in school, this made me interested to investigate how teachers teach SSI in upper secondary schools in Afghanistan, what methods do they use, do they relate SSI to students real life and what teaching method do teachers perceive as most appropriate when teaching SSI and why and what are possible barriers for teaching SSI in Afghanistan secondary schools?

**Aim**

The aim of the study was to investigate what methods of teaching SSI Afghan secondary teachers use and what teaching methods they perceive as the appropriate. This study also aims to
investigate how teachers relate SSI to students’ real life and if they consider teaching SSI is of importance and what possible barriers teachers have for teaching SSI. The research questions guiding this study were:

- What methods are used by Afghan upper secondary science teachers when teaching about SSI?
- Does Afghan upper secondary science teachers relate to students real life when teaching SSI, and if so – how?
- What teaching methods do Afghan upper secondary school science teachers perceive as most appropriate when teaching SSI and why?
- What possible barriers for teaching SSI do Afghan upper secondary school science teachers experience?
LITERATURE REVIEW

What is SSI?
According Chang Rundgren and Rundgren, (2010) SSI has emerged in recent decades in science education. It has potential to play an important role in science education and its instruction has been important for teachers to enhance students’ scientific literacy and empower their ability in science subjects. Furthermore, in the past two decades there has been a focus on the skills of informal reasoning and argumentation in research about the use of SSI in school education.

Research has shown that including SSI and practicing argumentation on SSI in school have many advantages including improvements of student’s scientific literacy, which in turn is considered a vehicle for teacher to improve students’ social and intellectual growth and enable students to handle science issues (Sadler, 2004). SSI are issues that emerge in society and have a scientific base (Christenson et al., 2011). They sometimes include a controversy and these issues often emerge within the fields of environmental science or genetics, but that doesn’t have to be the case (Albe, 2008; Kolsto, 2001). SSI can be global, such as the issue if nuclear power is a good energy resource – the consequences of a possible nuclear accident won’t just affect the country where the power plant is placed (Christenson et al., 2011). SSI can also be a local issue such as if the municipality is going to be allowed to build a power line through a village. There are contradictory reports from scientific studies where some says that living nearby such a power line could cause child leukemia, but other researcher says there is no risk at all (Kolsto, 2001). SSI can be issues with direct effect on people like screening for genetically disorders or indirect like global warming and its effects (Sadler, 2004).

Importance of Teaching SSI
There are many advantages by including SSI in school curriculum which will be in focus in the next paragraphs. According Eilks & Feierabend (2010) one of the most important objectives of teaching SSI is to enable pupils to act as responsible citizen within the society. So teaching societal aspects remains one significant aspect of contemporary education, also in science education. In addition, Chang Rundgren and Rundgren (2010) states that SSI could help students to transfer scientific knowledge to real life. Through this, students can understand the importance and impact of scientific and technological development in the society. Furthermore, Chang Rundgren and Rundgren (2010) explained that teaching about SSI in school promotes the ability of students’ scientific communication. Informal reasoning and argumentation are closely connected to SSI instruction since by using SSI instruction students could learn how to make good argumentation. Teaching SSI in school could include methods like presenting models of argumentation, using dialogue and discussion, group work and role play. Through these approaches students also find chance to present their idea clearly and improve their ability in science subjects.

According Able (2008) teaching SSI provides opportunities to improve student’s ability to make arguments. This is considered very important in order to motivate students and increase their interests for science education by teaching SSI in the class. In democratic societies it is important for the young generation to understand social and scientific issues and to be able to analyze social and scientific issues simultaneously. In addition, Able (2008) added that in science education SSI can be organized to be taught for citizens in class to provide education that they need to think critically about in relation to science, technology and society. Furthermore, Christenson et al. (2011) stated that in school education it is vital to guide students to find the opportunity to transfer their school knowledge to daily live and SSI is a good way to do this.
Using SSI as a context help students to become more interested to learn science and prepared to use it in their real life after school for making decision. When considering the above explanations on how teaching SSI could be an important aspect of teaching that provides the chance for students to transfer their knowledge to real life, think critically, improve students ability in science, argumentation, and enable them to analyze scientific and social issues simultaneously it is easy to perceive the usefulness of SSI in science education. So, if we want to have an effective education system, teaching SSI is a very important aspect of that education system.

**Method of Teaching SSI**

According to Chang Rundgren and Rundgren (2010) as well as Nichols and Zeidler (2009), discussion, dialogue, debate, and argumentation are included when teaching SSI in schools. As mentioned earlier, Chang Rundgren and Rundgren (2010) stated that teaching SSI in school could include methods like presenting models of argumentation, using dialogue, discussion and role play. Through this approach students also find chances to present their ideas clearly and improve their ability in science. In addition, Nichols and Zeidler (2009) stated “Socio scientific issues (SSI) involve the deliberate use of scientific topics that requires students to engage dialogue, discussion, and debate” (p.49). Considering their importance for teaching SSI each method will be described in detail below.

According Grace (2005), education scholars’ constantly emphasize the significance of discussion in science lesson which promotes the teaching process and encourages students to state their ideas and cope with difficulties. This is considered the heart of teaching controversial issue (ibid). In addition Nichols & Zeidler (2009) wrote that practicing debate and argumentation in the class room is not always possible especially for newly trained teachers. First teachers could consider discussion next think about debate. Practicing decision before debate leads teachers and students during teaching controversial socio-scientific issues to have a controlled manner, behave well, and make productive argumentation. Furthermore, Albe (2008) stated that group discussion is helpful for students to exchanges their ideas and be aware of different aspects of the issue.

Debate is one approach which enables students to pay close attention to the significant parts of the argumentation and express their opinions and also encourage them to present their arguments clearly (Levinson, 2001). According to Albe (2008) debate is used in class to provide citizens with the education they need to think critically about the relations between science, technology and society and also to train to make informed decision according to the raised question. On the other hand, Grace, (2005), does not agree that practicing debate is such a good idea. He states that during debates students repeatedly wanted to articulate their opinion of the issue and vote accordingly without contemplation. Hence, it can be problematic if the students don’t listen and develop their arguments. It is not a useful approach to ask students make quick decision about something which requires more time for adults to take decision.

Duschl and Osborne, (2002) stated that, if teachers do not use dialogue during teaching in the classroom argumentation won’t occur. It is not possible to teach science without dialogue and argumentation because learning science is a process of enquiry which requires such language activities. Also, it is stated that “the quality of dialogue and discourse is central for learning citizenship education” (Deakin Crick et al., 2004; cited in Harris & Ratcliffe, 2005, p. 442).In addition Harris & Ratcliffe (2005) argued that children who are as young as eight can by practicing role-play and dialogue improve their critical thinking, tolerances and understands how to respect others.
According to Duschland Osborne, (2002), argumentation is considered an important feature for learning science. Understanding science requires planned and structured activities to engage students in using and practicing discourse. Such activities support social construction of knowledge and students thinking and enable their teachers to critically evaluate them sufficiently (ibid). In addition, Newton et al. (1999) stated “we believe that argumentative practices are central both to education and science”, and, in addition, “pedagogy which promotes arguments lies at the heart of an effective education in science” (p. 554). Moreover, Lee (2007) stated that most researchers emphasize on using argumentation as teaching strategy to promote understanding of SSI and to empower critical thinking to guide for making better decisions.

Christenson et al. (2011) and Sadler (2004) stated that formal argumentation or reasoning is fixed and depends on unchanging premises which contains a conclusion. On the other hand informal reasoning makes it possible for students to provide information from their own experience, believes and understandings. In addition, Christenson et al. (2011) stated that informal reasoning works as the core of informal argumentation and informal argumentation is highly related to the quality of decision making about SSI.

To analyze the supporting reason and argumentation of students the SEE-SEP model was developed and serves as analytical framework for the content of arguments in a study of (Chang Rundgren & Rundgren 2010). The name of the SEE-SEP model was taken from the six subject areas of SSI. Sociology (S), Environment (E), Economy (E), Science (S), Ethics (E) and Policy (P), which are connected to three aspects of value, personal experience and knowledge. These three aspects are related with the six subjects’ areas people could use to support their reasons (Christenson et al.2011; Chang Rundgren & Rundgren 2010).

According to (Black et al., 2003), peer work has been very important and vital for learning, especially for assessing students learning achievements. Black et al.(2003) stated that peer assessment is vital for learning. It is a very important and difficult job to get students to think about their works and goals. In this aspect students are taking ownership of their own learning and they have to think about what they know and take responsibility for their learning. It has been considered important for several reasons; first reason is that this motivates students to work carefully. The second reason is that students accept critics of their work. Third reason is this it improves communication between teacher and students during the learning process.

According to above explanations, when a teacher wants to teach SSI and science it is vital to use dialogue, discussion, debate, argumentation and peer work. These issues are considered very important and vital for teaching SSI. For proper implementation of these issues in the class, the pedagogical knowledge of the teachers is very important beside the subject knowledge to put in practice and effectively use each method. Shulman (1986) stated that even though pedagogical knowledge is apart from subject knowledge, it is considered to be a very important and vital aspect for teaching.

SSI Teaching Examples
As explained earlier teachers use several methods for teaching SSI, but two of them will be further elaborated as examples of how to teach SSI. These methods are concrete and I chose to elaborate them further since I see them as most possible to implement in Afghan schools when teaching SSI. Hence it is important to inform Afghan readers about their existence. The first teaching method has been propagated by Chang Rundgren (2011) and the other was proposed by Lee (2007).
Chang Rundgren (2011) explained a way for teaching SSI which she called the “Post it” approach. When using a “Post it” approach teachers are expected to follow the subsequent steps when teaching SSI:

First the teacher presents a SSI topic and poses a question about SSI to which the students can agree or disagree to, in this step the teacher encourages students to discuss about the topic. Second, the teacher divide students in two groups of YES and NO. During the third step the students select subject areas from SEE-SEP model to support the response (YES or NO). The teacher then reminds the students to consider multi-dimensions of SSI when presenting their reasons and let the students choose the subject area/areas they prefer. Each student should present at least one of the dimensions from which he/she can offer supporting reasons. Next, the teacher let students think and search information, discuss and find reasons to support their idea and also let students discuss with other group members to develop their argumentation. Fourth, the teacher instructs the students to explicitly express their argumentation by writing it on a sticky note (“post it”) or any other piece of paper. The teacher then draws a circle on the board in the classroom and divides it into YES and NO areas. Students then by turn post their reasons on the board on the circle within YES and NO parts. Then students orally explain their argumentation thoroughly, and next the teacher groups the reasons considering SEE-SEP model and its categories of six different subject areas. Fifth, the teacher elaborates on the skill of informal argumentation. The teacher draws a separate circle and chooses one subject area and let students discuss and defend their conflicting opinions. If the exercise needs more time and inquiry it can be given as an assignment for the students. Then students present the result, their arguments, in a group discussion. Finally the teacher provides feedback to students’ ideas and argumentation and concludes the SSI topic together with the students.

Lee (2007), in an alternative suggestion, reported on a series of lessons using explicit instruction about SSI. To present his method he used smoking in restaurants as an example. The issue in focus is about the harmful effects of passive smoking and first the issue was presented together with necessary conceptual understanding for the topic. This was followed by presentation of scientific data and evidence about the issue (harmful effect of smoking) to students for them to analyze and discuss. After that the students were encouraged to speak of their ideas and make their arguments for their decision making about smoking in restaurants.

When looking at these two examples of teaching SSI they had different methods and steps and they explained their methods by different words, but they both emphasize discussion, argumentation, analyzes and active engagement of students and involving them in the lessons when teaching SSI. So discussion, argumentation and involving students for making decision are considered important factors when teaching SSI and teachers are expected to include those issues when teaching SSI.

**Barriers of Teaching SSI**

In this section the barriers of teaching SSI will be delineated. According Grace (2005) SSI is linked to science subject which is mostly part of science program in the curriculum. Science teachers are consequently involved when teaching SSI. The teachers who teach SSI revealed the following difficulties and barriers for teaching SSI (ibid):

First barrier is lack of time for discussing social and ethical issues because teaching science content knowledge is top priority in curriculum and after teaching that the remaining time is used for discussing SSI which is often not enough. Also, SSI have no specific answer; it needs arguments to make a decision. Accordingly, lack of teaching skill and strategy to deal with
controversial issues is also one of the barriers. Furthermore, not using suitable teaching materials and activities considered to be another problem for teaching SSI (Grace, 2005).

As stated earlier, argumentation is closely connected to teaching SSI. According to Newton et al. (1999) teachers also complain from lack of time and lack of professional knowledge to manage argumentation and discussion. Newton et al. (1999) stated that in many cases teachers complained about not having enough time for discussion and argumentation. Organizing discussion effectively is considered a difficult pedagogical task for teachers, especially for less experienced teachers. Many teachers have not enough pedagogical knowledge of practicing discussion in the class.

To conclude, both Newton et al. (1999) as well as Grace (2005) emphasize lack of time and professional knowledge as major barriers for including SSI when teaching science in school.

**Related Subjects and Global and Local SSI**

SSI has been one main aspects of education in the field of science in recent decades and many researchers emphasized its significance and argue for its inclusion in school curricula. It is possible to connected SSI to different subjects and disciplines such as biology (e.g. cloning and genetics), environmental science (e.g. global warming), chemistry (e.g. DDT and dioxin) and physics (e.g. nuclear power) (Chang Rundgren & Rundgren, 2010).

Also in Afghanistan different school subjects contains some topics about SSI. For example environmental science points to air pollution and global warming, biology points to genetic engineering, using medicine for curing diseases and its side effects and impact of using alcohol and drugs for health, chemistry points to DDT and dioxin and physic points nuclear power. According to Chang Rundgren and Rundgren (2010) there are both local and global SSIs. Global issues are those issues which exist without any geographical boundaries. Different countries in the world confront the same issues like global warming and nuclear power. In addition, there are some local issues in specific countries like using DDT to eradicate mosquitoes which suffer from malaria. By using DDT to eradicate mosquitoes a decrease in number of death caused by malaria is achieved, though in the same time it may destroy the environment.

Using DDT because of eradicating mosquitoes is one of the most useful SSIs in poor countries, and it is also relevant in Afghanistan, but there are also some other relevant issues like dramatic increase of vehicles especially in Kabul (capital city of Afghanistan) which has caused air pollution and more traffic. Cutting forest trees illegally and not paying attention to greenness of environment are also other important factors which cause air pollution. Using drug and alcohol is yet another relevant SSI in an Afghan context.
RESEARCH METHOD
This study aims to find out what methods teachers use for teaching SSI in Afghan upper secondary schools, and which teaching methods teachers perceive as appropriate when teaching SSI. This study relies mainly on quantitative methods and uses questionnaires with optional answers together with a few open-ended questions, which slightly hands on qualitative aspect of the study. Quantitative method is ideal for studies conducted in limited time, with limited resources and with broader and diverse coverage. Quantitative methods mostly deal with numbers, figures, and statistical measurements and can be economical both for collecting and for analyzing the data. Another reason is that quantitative methods mitigate the risk of misinterpretation of data and are appropriate for collecting facts and opinions (Denscombe, 2010).

Data Collection
In sampling it is important to have a representative sample from all sorts of teachers regarding influential factors such as gender and area. Cohen et al. (2010) describes the importance of representativeness of sampling and stated that the researchers’ needs to take into consideration that sampling should be clear, valid and representative for all sorts of sub-populations. In this study data collection was made in the Takhar province out of convenience. Data was collect from upper secondary schools of Takhar province. The data was collected in September 2013. Totally 20 of Takhar province upper secondary schools were selected as sample both from urban and rural areas. It was collect from 10 boys and 10 girls’ schools, five in each category (urban and rural areas). Thereby I consider my sample as representative. Considering the research demands and time, 100 questionnaires were distributed for science teachers’ five teachers from each selected upper secondary school. When filling the questionnaire names of schools were not mentioned in the questionnaire and also teachers’ names were optional. So these actions ensured that teachers’ anonymity was secured.

Research Instrument
A questionnaire instrument has been developed and used for this study because it suited the research questions. Moreover the use of a questionnaire is a very cost-efficient method to collect a vast amount of data in short time that do not need much material and money. This is in the line with Denscombe (2010) who stated that questionnaires are economical considering time and material and easier to arrange rather than other tools. In addition, Cohen et al. (2010) stated that questionnaires are a widely used tool for collecting information and it can be administered without the presence of a researcher and also in comparison to other tools it is simple to analyze.

The questionnaire contains 15 questions about how teachers teach, what methods they use for teaching SSI and what methods they perceive as most appropriate method for teaching SSI. The questionnaire included different kinds of questions aiming at capturing the respondents’ views about methods of teaching SSI. Some of the questions included multiple choices that had to be made by the respondents, others were simple yes/no questions and several questions were followed by an open question where the respondents were encouraged to provide their opinions. In some questions the respondents could select more than one option. Most questions have multiple answers options with one blank answer where teachers could write their view if it was not included in the options. The questionnaire was translated into Dari because the respondents (teachers) first language was Dari. The English as well as the Dari versions of the questionnaire are attached as appendix to this thesis (see annex I and II).
The first step was to develop a questionnaire allowing for data collection to answer the research questions. After developing the questionnaire out from the research questions it was sent to the supervisor for peer-review. Then the supervisor suggested some changes based on the highlighting of the problems about “leading questions”. After revision the supervisor approved the questionnaire. No pilot-test was done due to time constraints.

Data Analysis
After all data was collected it was transferred into an excel file to give an overview of the data and allow for comparison of the respondents answers. In order to illustrate the respondents’ views about teaching methods of SSI, the importance of teaching SSI, relating SSI to students’ real life and possible barriers of SSI in Afghanistan upper secondary schools, much the data was converted into graphs.

Validity and Limitations
When considering validity of this study, there were enough questions in the questionnaire to extract teachers’ views about methods of teaching SSI, importance of teaching SSI, relating SSI to students’ real life and possible barriers of teaching SSI. The questionnaire has been distributed to respondents (teachers) with various backgrounds considering: education level, gender (male and female) and geographical areas within the province (rural and urban). When filling in the questionnaire they were guided of how to do and they were able to ask questions when facing problems. Also when filling in the questionnaire they were ensured what each question meant. So these procedures could enrich and insure the validity of this study.

First limitation was that when going to each school it should be explained to each school principle the purpose of the questionnaire and secondly also to the teachers. Sometimes they were worried because they were thinking that teachers teaching methods will be evaluated by those questionnaires and that they would not be anonymous. After about half an hour talking and ensuring them that information of respondents remain anonymous they could catch the aim. The official letter from MoE also helped and it was important to prove the aim. Even after explaining the aim some of the teachers did not agree to fill in the questionnaire, but fortunately most them did. The teachers’ mistrust of the aim of the questionnaire could influence their sincerity when filling in the questionnaire.

The second limitation was that despite guiding the teachers on filling the questionnaire, most of the teachers were not able to correctly fill in some questions. This problem forced me to monitor the whole process preventing me from gathering data from a larger sample.

In addition understanding the concept of SSI was difficult for the respondents (teachers). Therefore I also had to put a considerable amount of time explaining the questions to the respondents, which also might have influenced their answers.
FINDINGS

Respondents (teachers) Profiles
A total of 100 questionnaires were distributed to 100 science teachers who taught in upper secondary schools. The respondents aged from 18 to 60 years old with average age of about 30 years. Moreover, 50% of the respondents were female teachers and 50% were male teachers. 50% of the respondents (teachers) lived in rural areas and 50% of them lived in urban areas. In terms of educational background 23% of the respondents’ were university graduates, 52% were Teacher Training College (TTC) graduates and 25% were secondary school graduates. Most of the secondary school graduate teachers were studying in-service TTCs at the time of the data collection. A majority of the secondary school graduate teachers lived in rural areas. The level of teachers experience ranged from 1 to 40 years with average experience of 8.7 years. All were science teachers, but they taught different subjects; 44% taught biology, 29% taught chemistry and 27% taught physics. The reason why science teachers were selected is that SSI is mostly included in science subjects and science teachers are more involved in teaching SSI rather than other teachers.

Major Findings
To extract teachers’ views about methods of teaching SSI, and relating it to students’ real life questionnaires were used and below is a presentation of the findings.

Methods Which Teachers Use for Teaching SSI

![Figure 1](image-url)

**Figure 1.** The figure illustrates teachers’ views what methods they use when teaching SSI.

As illustrated in figure 1 a majority of teachers used lecture-based methods. However, their second priority was group work. The third used method was discussion. Dialogue, peer work and debates were least used methods when teaching SSI. About 4% of teachers had other views.
Figure 2. The figure illustrates how the teachers learned their preferred teaching methods

As illustrated in figure 2 most of the respondents (teachers) learned their used teaching method during their education. Self-study and imitation from the teachers were least influential factors for choosing teachers teaching methods. About 10% of the teachers had different ideas. 5% of them said “all mentioned issues influenced to choose and learn this teaching method” and other 5% said “I learned this teaching method during my teaching experience”.

Figure 3. The figure shows how teachers teach SSI related to subject.

As illustrated in figure 3 most of the respondents (teachers) used other methods (different from their normal teaching) for teaching SSI, but in contrast some of them responded that they taught as science subjects. A few of them responded that they teach as social science and mathematics.
Figure 4. The figure illustrates teachers’ views about using discussion and argumentation when teaching SSI.

As illustrated in figure 4 most of the respondents (teachers) were teaching by using the book and also let students to discuss and argue. Only few of them were teaching just by using the book.

In response to the question about involving students’ when teaching SSI, all of respondents (teachers) responded positively. Figure 5 illustrates the reasons on why they involve students in the teaching process.

Figure 5. The Figure shows the teachers reasons to why they involve students in the learning process.

As illustrated in figure 5 the first and most selected reason for involving students in the learning process was that students can learn more if they are involved in learning process. Catching student’s interest for learning and enabling them to use their learned knowledge out of school had less significance for teachers involving students.

Relating SSI to Students Daily Live

In response to the question about importance of relating SSI to students daily lives, all of the respondents (teachers) responded positively and selected yes and also all of the respondents said that they relate SSI to students daily live. In response to question about how they relate SSI to
students’ daily live, a majority (77%) of respondents (teachers) said that they encourage students to use the knowledge that they learned in school outside school in their daily life. Some (23%) of them responded that they relate the issues which they study in schools with the issues that exists in the society.

**Methods Teachers Perceive as Appropriate Teaching Method for Teaching SSI**

As illustrated in figure 6 giving lecture was most appropriate teaching method according to the respondents (teachers), the second most appropriate teaching method was group work, from teachers’ points of view. The third most appropriate teaching method was discussion between students. Debate, dialogue and peer work was ranked as the least appropriate teaching methods according to the teachers.

![Figure 6](image-url)

**Figure 6.** The Figure illustrates teachers’ view what methods teachers perceive as appropriate teaching method for teaching SSI.

![Figure 7](image-url)

**Figure 7.** The figure illustrates the reasons why teachers use those methods and perceive them as appropriate method for teaching SSI.
Figure 7 illustrates teachers’ reasons why they chose their preferred teaching method. The first and most important reason was promoting students’ learning achievement. The second reason was to improve students’ learning interests.

**Importance of Teaching SSI**

In response to the question about importance of teaching SSI, all respondents had positive answers and all of them responded that teaching SSI is important, but they had different reasons about the importance of teaching SSI which is illustrated in figure 8.

![Bar Chart](image-url)

**Figure 8.** The figure illustrates teachers’ reasons for viewing teaching SSI as important.

As illustrated in figure 8 respondents (teachers) had different reasons about the importance of teaching SSI in secondary schools. Most selected reason was improving students’ argumentation. The second most selected reason was improving students’ scientific literacy and the third most selected reasons was enabling students to make sufficient decision. Least selected reasons were improving students’ critical thinking and enabling them to act as an active citizen.
Barriers of Teaching SSI

![Diagram showing the distribution of barriers for teaching SSI](image)

**Figure 9.** The figure illustrates teachers’ experiences of barriers for teaching SSI in Afghan schools

As illustrated in figure 9 the first and most important barrier was a lack proper teaching materials for teaching SSI in Afghan upper secondary schools. A majority of respondents (88%) selected this option. Also lack of professional teachers and time were important barriers for teaching SSI rather than policy and curriculum. In addition 4% of respondents had different ideas; they mentioned teachers’ low salary and proper teaching as barriers.

**Summary of Findings**

According to the teachers, the most used and most appropriate teaching methods were lectures, group work and discussion respectively. Dialogue, debate and peer work were not considered important methods for teaching SSI. A majority of the respondents said that they learned their teaching methods during their own education. In addition, most of them said that they use separate method for teaching SSI compared to other subjects. Moreover, they all claimed that they involve students in the learning process when teaching SSI, but they had different reasons about why involving the students; the most selected reason was to improve students’ learning achievements.

About the importance of relating SSI to students real live all of the respondents had positive ideas and also they all claimed that they relate SSI to students daily live. A majority (77%) of respondents said that they encourage students to use the knowledge that they learned in school outside school in their daily life outside school, and the rest of the teachers said that they relate the issues which they study in schools with the issues which exists in the society.
About the importance of teaching SSI, all respondents had positive answers and all of them agreed about the importance of teaching SSI, but they had different reasons about the reason for the importance of teaching SSI. The most selected reason was improving students’ argumentation. The second most chosen reason was improving students’ scientific literacy and the third reason was enabling students to make sufficient decisions.

About barriers of teaching SSI the majority of respondents said that the most important barrier is lack of proper teaching materials for teaching SSI in Afghan schools. Respectively lack of professional teachers and time were also recognized as important barriers for teaching SSI.
DISCUSSION
The findings of this study are to a large extent consistent with other studies on the use of methods while teaching SSI, but to some extent it contradicts. Focus of this study is methods of teaching SSI in Afghan upper secondary schools, which methods do teachers use and what methods do they perceive as the appropriate were investigated. This study also focuses on how teachers relate SSI to students’ real life and if they consider teaching SSI as relevant and what possible barriers teachers have for teaching SSI.

Methods That Teachers Use for Teaching SSI and Perceive as Appropriate Teaching Method When Teaching SSI
The findings from teachers’ views show that the most used, and perceived appropriate, teaching methods are: lecture, group work and discussion respectively. Dialogue, debate and peer work are not perceived as important for teaching SSI. However, when considering other researchers findings, all above mentioned methods are useful for teaching SSI. According to Chang Rundgren and Rundgren (2010) and Nichols and Zeidler (2009), discussion, dialogue, debate and argumentation are included when teaching SSI in schools. As mentioned earlier, Chang Rundgren and Rundgren (2010) states that teaching SSI in school could include methods like presenting models of argumentation, using dialogue, discussion and role play. There were no options about presenting model and role play in questionnaire, but Chang Rundgren and Rundgren (2010) points to its importance when teaching SSI. Chang Rundgren and Rundgren (2010) add that through these approaches students also get a chance to practice to present their ideas clearly and improve their ability in science subjects. In addition, Nichols and Zeidler (2009) states that “Socio scientific issues (SSI) involve the deliberate use of scientific topics that requires students to engage dialogue, discussion, and debate” (p.49). According to Levinson (2001), debate is a teaching method which enables students to pay close attention to the significant parts of the argumentation and express their opinions and also encourage them to present their arguments clearly. According Harris and Ratcliffe (2005) it is not possible to teach science without dialogue and argumentation because learning science is a process of enquiry which requires such language activities.

Furthermore when considering the teaching examples from Chang Rundgren (2011) and Lee (2007), they only use a form of lecture method when presenting the topic to introduce the topic, and then they use other methods. They emphasize discussion, argumentation, analyzes, group work, peer work and active participation of students and involving them in lesson when teaching SSI. Accordingly, discussion, argumentation, group work, peer work, and involving students for making decision are important factors when teaching SSI. Teaching SSI by using lecture is not proposed by the researchers (except for when introducing the topics), but according to Afghan secondary teachers lecture based method is the most important teaching method rather than other methods. It shows that there are differences between Afghan teachers’ teaching methods and other scholars view about how to best teach SSI. Considering this result Afghan teachers need more pedagogical knowledge beside subject knowledge to be able to put in practice different methods when teaching SSI.

The findings also illustrates that teachers have reasons why they select those methods as their teaching method. The first and most important reason is promoting students learning achievements. The second reason is improving students’ learning interests. However when considering other researchers ideas it seems impossible to promote students learning
achievements and improve students’ learning interest if lecture is dominating method for teaching. For achieving these goals teachers probably need to use different methods.

Thus, my findings reveals that considering the spent resources and time allocated by the Government of Afghanistan and international donors for developing the education system of Afghanistan there is not visible changes up to now regarding the aspect of SSI within science education because lecture still is the dominant teaching method and teachers are not familiar about alternative and more appropriate methods. By using the lecture as method students are not active participants in learning. Teachers talk and students listen. Teachers play a central role and shape the aspects of the curriculum. It shows that if it is left to the teachers of Afghanistan they will use a behavioristic influenced pedagogical approach which is considered to be a traditional teaching method. As Yalmiz (2011) states, behaviorism is a learning theory where focus is on the teacher who plays a central role and shape every aspect of curriculum and instruction. In addition, Wang (2007) states that behaviorism emphasizes on directed guidance and instruction in which teachers deliver knowledge to students in an organized way. According to this theory the teacher is the authority in the class and students do as teachers direct them to.

There are several possible reasons to why the participating teachers of this study are not aware some of the alternative methods and do not use those methods. The first reason is lack of proper teaching materials for teaching. Other reasons that the teachers states for not using alternative teaching methods are lack of professional knowledge and time. The reason why the lecture method is the dominate method for teaching SSI might be that practicing this method is relatively easy and does not require much teaching materials and professional knowledge. In order to implement alternative methods more professional knowledge is needed. As Newton et al. (1999) states, organizing discussions effectively is a difficult pedagogical task for teachers, especially for less experienced teachers. Many teachers have not enough pedagogical knowledge of practicing discussion in the classroom. So if Afghanistan governments want to have qualitative and developed education more time is needed, more attention and more resources to be allocated on teachers’ education to be able to use different methods for teaching and improve their pedagogical knowledge. The resources and time which spent the last decade does not seem to be enough.

The finding also shows that most of the teachers’ use different methods adopted from other subjects’ while teaching SSI, which is similar to Grace (2005) findings. According to Grace (2005), SSI requires separate time and teaching method in order to be taught sufficiently. As Grace (2005) states, teaching science content knowledge is top priority in the curriculum and after teaching that the remaining time is used for discussing SSI which is often not enough. Also, SSI have no specific answer, it needs to be practiced by argumentation and decision making. Hence, SSI requires more time and alternative use of methods in comparison to other subjects. Some of the respondents in this study say that SSI should be taught as science. They might think that SSI is mostly included in science subjects and science teachers mostly involved in teaching it, it should be taught as science.

All the participating teachers claim that they involve students in the learning process when teaching SSI, but that they had different reasons for involving them; the most important reason was to improve students’ learning achievements. In contrast, Able (2008), Boghossian (2006), Chang Rundgren and Rundgren (2010), and Schunk (2011) all emphasize the importance of students’ argumentation and active participation in the learning process, not the learning achievement as such. According Able (2008), teaching SSI provides opportunities to improve student’s ability to make arguments. This is considered very important in order to motivate
students and increase their interests for science education by teaching SSI in the class. In addition, Chang Rundgren and Rundgren (2010) explained that teaching about SSI promotes students informal reasoning and argumentation which are closely connected to SSI instruction since by using SSI instruction students could learn how to make good argumentation. This was also confirmed by Boghossian, (2006) and Schunk, (2011). Boghossian (2006) states that learning is an active process of creating knowledge, if students are active participants in the learning process and try to find meaning for their experiences then they would be able to use their leaned knowledge what they do in their individual live. For this to happen, the leaner should be the center of the knowledge construction processes, not the teacher. The teacher should just support the learners to construct and learn knowledge. In addition, Schunk, (2011) stated that involving students in learning process enable students to thinking and to create and learn new knowledge.

Relating SSI to Students Daily Life
The findings demonstrates that all of the respondents respond positive about the importance of relating SSI to students’ real life, and they all also claim that they do relate SSI to their students’ daily lives. A majority (77%) of the respondents say they encourage students to use the knowledge that they learned in school outside school in their daily life. This reveals that the teachers relate SSI to students’ real life and believe that school is a good context to do that. During school education it is vital to guide students to find the opportunity to transfer their school knowledge to students’ daily lives and that SSI is a good way to do this (Chang & Chiu, 2008).

Even though all teachers say that they relate SSI to students’ real life it seems difficult for teachers to do this due to their limited knowledge about what students do out of school in their individual life. Therefore it needs more effort and time to enable teachers to relate SSI to students’ real life considering barriers of teaching SSI in Afghanistan upper secondary schools.

Importance of Teaching SSI
All respondents agree that it is important to teach SSI, but they have different reasons about why it is important. The most pronounced reason is to improve students’ argumentation. The second ranked reason is to improve students’ scientific literacy and the third reason is enabling students to make sufficient decisions. The fourth most selected reasons are improving students’ ability to handle science and transferring their knowledge to daily life, which mirrors the reasons Sadler (2004) and other researcher put forward as reasons for teaching SSI. Sadler (2004) states that including SSI and practice argumentation on SSI in school classrooms has many advantages i.e. improve student’s scientific literacy provide a context for argumentation and informal reasoning and so on. In addition, Chang Rundgren and Rundgren (2010), states that SSI could help students to transfer scientific knowledge to real life. Through this, students can understand the importance and impact of scientific and technological development in the society. Furthermore Chang & Chiu (2008) explains that over the past decades teaching controversial issues (SSI) has become one important aspect of science education to understand how people make decision and act to improve individual thinking. My results indicate that Afghan teachers are aware of these reasons.

Barriers of Teaching SSI
About barriers of teaching SSI a majority of the respondents say that the most important barrier is the lack of proper teaching materials (e.g. textbooks) for teaching SSI in Afghan schools. In addition, lack of professional teachers and time are also important barriers for teaching SSI. It is
line with the findings of Grace (2005) and Newton et al. (1999). They also say that lack of time and professional teachers are important barriers, but according to their views lack of time is the most important barrier, but according this study teaching material is the most important barrier, for example there are not enough textbooks for students, but the lack teaching materials such as textbooks does not seem to be a barrier for teaching SSI in Britain where Grace (2005) did his research. As Grace (2005) claims, the major barrier for teaching SSI is lack of time for discussing the social and ethical aspects included in SSI because teaching science content knowledge is top priority in curriculum and after teaching that the remaining time is used for discussing SSI and this is often not enough.

Also organizing discussions effectively is considered to be a difficult pedagogical task for teachers, especially for less experienced teachers, and if teachers don’t have any professional knowledge and teaching experiences it is difficult to put discussion in practice (Newton et al., 1999). Furthermore, since SSI has no specific answer one needs to make arguments to make a decision. Accordingly, lack of teaching skills and strategy to deal with controversial issues is probably also one of the barriers for Afghan upper secondary teachers. Considering my results from this study there are several barriers for teaching SSI in Afghan schools, and much time, resource and effort is needed to overcome these barriers to improve the education system in Afghanistan, i.e. to provide suitable material for teaching and improving teachers’ pedagogical knowledge to enable them to teach sufficiently.

To sum up, findings of this study reveals that traditional methods (lecture method) are the dominant teaching method in Afghanistan schools when SSI topics are being taught, but to some extend teachers also use informal argumentation by implementing group work and discussion beside the lecture method. It indicates that some changes are occurring. Before (when I was a student) teachers were only using lecture method, e.g. I do not remember practicing discussion and group work in my class. It shows that the education system is improving, but it does not fully respond for today’s needs. Besides visible developments in the education system challenges are still ahead Afghanistan government and international organizations should work hard and spend more time and resources to develop the education sector. Afghanistan government and international organizations have to pay attention to improve teachers’ pedagogical knowledge and provide suitable teaching material for making teachers able to implement other methods in the classroom to improve students’ learning achievements and interests.
CONCLUSION

The overall aim of this study was to find out what methods secondary teachers in Afghanistan use for teaching SSI. The particular aim of the study was to explore what methods of teaching SSI teachers use and what methods they perceive as appropriate when teaching. This study also investigate how teachers relate SSI to students’ real life and if they consider teaching SSI is of importance and what possible barriers teachers have for teaching SSI. The findings of this study to a large extent correlate to the existing findings of knowledge and are also similar to the reviewed literature, but to some extent it contradicts.

The findings of this study is a novel contribution and is useful in Afghanistan where no research is found about methods of teaching SSI, but this study may not correspond to other developed countries because the educational system of countries may differ according the economic and social situation that they have. Developed countries might not have the barriers which exist for teaching SSI in Afghanistan upper secondary schools. This study revealed that teaching material has been important barrier for teaching SSI in Afghan schools, but according Grace (2005) this is not a barrier in Great Britain, which is a developed country.

To some extent results of teachers’ views could be debatable since they believed that they can improve students’ learning achievements and interests by using a lecture based method, group work and discussion when teaching SSI without using other methods such as debate, dialogue and peer work. Also teachers’ perceived the lecture-based method most important and appropriate method for teaching SSI in contrast with other studies. As Nichols and Ziedler (2009) states “Socio scientific issues (SSI) involve the deliberate use of scientific topics that requires students to engage dialogue, discussion, and debate” (p.49). So, considering this view using dialogue and debate is important when teaching SSI, but considering Afghan teachers’ view they only seldom use these methods.

One important issue that might influence the results in a positive way (i.e. implying a more inclusive way of teaching SSI) was the fact that biology teachers were more eager to fill in the questionnaire during data collection rather than physic and chemistry teachers. After data collection it has been found out that there are more SSI topics presented in biology textbooks in contrast to physics and chemistry textbooks (Ghairat, 2013). Therefore it is likely that biology teachers are more involved in teaching SSI in comparison to other science teachers. So due to the reason that biology teachers filled in more questionnaires in comparison to physic and chemistry teachers, i.e. making up a un-proportional large part of the sample (44%), could have influenced the results of this study.

This study covers only teachers’ views on methods of teaching SSI. In this study considering the time it was not possible to observe the teachers teaching in the class when teaching SSI. It is possible that teachers teach differently then they claim they are doing, especially considering their reluctance to participate it might be that the teachers try to please what they think I is the best way of teaching. Another interesting approach would be assess students’ views about SSI and to test to what extent different teaching methods are useful for improving students learning achievements and interests. Further studies should be conducted which should include students views and observe the classes during teaching of SSI to see to what extent do the teachers practice the methods which they mentioned in questionnaire. As Cohen et al. (2010) states that the distinctive aspect of observation as a research method is that it provides opportunity for researchers to gather live data from naturally occurring social reality. In this way the researcher can look directly at what is happening rather than relying on second hand information. What people do and say may differ, but observation provides a real check. Also, to
have students’ views and see to what extent they are satisfied with the methods teachers’ use for teaching SSI is of interest. In addition, to assess students learning achievements and investigate to what extent methods are useful to improve students’ learning achievements is also of great importance.
REFERENCES


Annex I

Questionnaire for Teachers

Name: ___________________________________________(optional)

Age: __________________________ years

Gender: □ Male     □ Female

Education Level: (Please select one option based on your highest level of education) □ Less than Grade 12 □ Grade 12 □ Teacher Training College □ University □ Other, please specify: __________________________________________________

Teaching Experience______________________________________ years

Teaching Subject:
□ Biology   □ Chemistry   □ Physics

Teaching Class: □ Boys        □ Girls

Teaching Level/Grade: □ Grade-10 □ Grade-11 □ Grade-12

School location: □ Rural area □ Urban area

Dear teacher, I want to investigate how teachers teach and what methods that are perceived as the most appropriate methods for teaching the following issues that are called socio-scientific issues (SSI). SSI are dilemmas which contain both social and scientific issues. The following topics (SSI) are listed from secondary school text books.

1. Genetic engineering (e.g. screening gender from embryos)
2. What to eat and how to eat to be healthy
3. Driving car and air pollution
4. Global warming
5. Using medicine for curing diseases and its side effects
6. Impact of computer in daily life and its side effects
7. Cutting trees
8. Nuclear power energy production
9. Impact of using alcohol for health
10. Impact of using drugs (e.g. opium, tobacco) for health

Dear respected teacher, there are a short instruction for each question in questionnaire. Please read the instruction and answer correctly after thinking. There are some options for every question please tick √ your options, but in case none of them suits your view, please write your views in the (other- please specify) option.

Thank you for your help!

Questions

1. What methods do you use when teaching above issues (SSI)? (You can select more than one option.)
   A. ☐ Giving lecture
   B. ☐ Discussion between students
   C. ☐ Debate among students
   D. ☐ Students dialogue with each other
   E. ☐ Par work
   F. ☐ Group work
   G. ☐ Others, please specify______________________________________________________________
2. How did you learn this teaching method?
   A. ☐ Copied from my teachers
   B. ☐ During my education
   C. ☐ By studying
   D. ☐ Others, please specify________________________________________________________

3. Do you teach above issues (SSI) like other subjects or use a separate method?
   A. ☐ Like science
   B. ☐ Like social science
   C. ☐ Like mathematic
   D. ☐ Use separate method

4. Do you believe that it is important to relate above issues (SSI) to students’ life outside school?
   ☐ Yes ☐ No

5. If yes, do you relate SSI to students’ daily life when teaching?
   ☐ Yes ☐ No

6. If yes how do you relate?
   A. ☐ I relate the issues which they study in school with the issues that exist in the society.
   B. ☐ I encourage them to use the knowledge that they learned in school outside school in their daily life.
   C. ☐ Other please specify____________________________________________________________

7. Do you only teach SSI by using the book or let students to discuss and argue?
   A. ☐ I only teach by using the book.
   B. ☐ I introduce the topic and let students to discuss and argue.
   C. ☐ I teach by using the book and also let students to discuss and argue.
8. Do you let students be involved in the process of teaching SSI?

☐ Yes  ☐ No

9. If yes, why do you do that?
A. ☐ To enable them to use their learned knowledge what they do outside school.
B. ☐ To get students interests during the learning process.
C. ☐ They can learn better if they are involved in teaching process.
D. ☐ Other please specify__________________________________________________________

10. What methods do you perceive as appropriate teaching methods for teaching SSI? Please rank the least appropriate as 1 and the most appropriate as 5.

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11. Why you use those methods and perceive as appropriate method for teaching SSI?
A. ☐ It promotes students learning achievements
B. ☐ It is my personal teaching method
C. ☐ It promotes students learning interests
D. ☐ Others please specify__________________________________________________________

12. What steps do you follow when teaching above issues (SSI)?
A. ☐ First I present the issue to students which are in the textbook. After that the students are encouraged to speak of their ideas and analyze the topic and discuss in groups to search or a solution to the SSI.
B. ☐ First I give a lecture and ask students to listen. And at the end of the period I give the students a chance to ask questions about the issue.

C. ☐ First I introduce the issue which is in textbook. Next I ask students to speak of their ideas about the issue. After that I let students think and search information, discuss and find reasons to support their ideas. At the end I provide feedback.

D. ☐ Other please specify

______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________

13. Do you think that teaching above issues (SSI) is important to improve students’ learning achievements?

Yes ☐ No ☐

14. If yes, select two of the most relevant and important reasons for teaching SSI according to you?

☐ Improve students’ critical thinking
☐ Improve students’ scientific literacy
☐ Enable student to act as active citizen
☐ Enable students to make sufficient decision
☐ Improve students’ ability to handle science
☐ Improve students’ argumentation
☐ Help students to transfer scientific knowledge to daily life
☐ Others, please specify
15. What do you think might be barriers for teaching SSI in Afghan schools? (You can select more than one option.)

a. □ Lack of time
b. □ Lack of proper teaching materials
c. □ Curriculum which did not include more SSI
d. □ Lack of professional teachers
e. □ Lack of specific policy for teaching SSI
f. □ Others, please
   specify_________________________________________________________
پرسشنامه برای معلمین

-name:_________________________________________________________

-sen:__________________________________________________________

-جنسیت: □ مرد □ زن

-سویه تحصیلی: (لطفا یکی از گزینه‌ها را انتخاب نمایید که بلند ترین درجه تحصیل شما باشد)

-□ کمتر از صنف 12 □ صنف 12 □ فارغ دارالمعلمين □ فارغ پوهشن □ دیگرها

-تجربه تدریس: ________________________________________________

-میلیون تدریس: □ کیمیا □ بیولوژی □ فیزیک

-صنف تدریس: □ اناث □ ذکر

-صنف تدریس: □ صنف 10 □ صنف 11 □ صنف 12

-موقعیت مکتب: □ شهر □ دهات

-استاد محترم بدنام که استادان مکتب ازکدام شیوه استفاده می‌نماید و کدام شیوه مناسب‌ترین شیوه برای تدریس موضوعات ذیل است که درزیر ذکر گردیده. موضوعات در زیر ذکر گردیده موضوعات علمی اجتماعی می‌باشند و این موضوعات بحث بیراه گریز اندکه سایس و اجتماع را شامل می‌شود.

1- چنگ انجینیرینگ (مثال: تشخیص جنسیت از نطفه)

2- چه نوع غذای خوریم و چگونه بخوریم تا صحتمند باشیم

3- استفاده از موتور و الگوی هوا

4- گرم شدن چه جهان

5- استفاده از ادویه برای تداوی امراض و عوارض جانبی آن

6- تاثیرات کمپیوتر در زندگی روزمره و تاثیرات آن در صحت

7- قطع درختان

8- استفاده از اتم برای تولید برق

9- تاثیرات استفاده از کول درصدت

10- تاثیرات استفاده مواد مخدر (تریاک و تنبک) درصدت
تشکر از همکاری تان

سوالات

1. شما در هنگام تدریس موضوعات ذکرشده (موضوعات علمی اجتماعی) ازکدام شیوه تدریس استفاده مینمایید؟ (شما میتوانید بسته از یک گزینه انتخاب را نامید)

<table>
<thead>
<tr>
<th>شیوه تدریس</th>
<th>گزینه‌های ممکن</th>
</tr>
</thead>
<tbody>
<tr>
<td>الف. ازتشریح (لکچر) استفاده می‌نمایم</td>
<td></td>
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<tr>
<td>ب. ازاساگره‌ها میخواهم بین هم موضوع درس را بحث نمایند</td>
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<tr>
<td>ت. شاگردان بین شان مباحثه کنند</td>
<td></td>
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<tr>
<td>ج. شاگردان باهم دیالوک می‌نمایند</td>
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<tr>
<td>ح. کارهای گروهی می‌کنند</td>
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<tr>
<td>خ. نظر دیگر داشته باشید لطفاً بنویسید</td>
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2. این شیوه تدریس را چکونه امکان‌پذیر می‌دانید؟

<table>
<thead>
<tr>
<th>شیوه تدریس</th>
<th>گزینه‌های ممکن</th>
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<tbody>
<tr>
<td>الف. از معلمین خود تقلید نمودم</td>
<td></td>
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<tr>
<td>ب. درجریان تحصیل آموخته‌ام</td>
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<tr>
<td>ت. از مطالعه آموخته‌ام</td>
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<tr>
<td>ث. نظر دیگر داشته باشید لطفاً بنویسید</td>
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3. آیا موضوعات ذکرشده (موضوعات علمی اجتماعی) را مانند مضامین دیگر درس میدهید یا از کدام شیوه جدا گانه استفاده می‌نمایید؟

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<thead>
<tr>
<th>شیوه تدریس</th>
<th>گزینه‌های ممکن</th>
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<tbody>
<tr>
<td>الف. مانند مضامین ساینس درس میدهم</td>
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<tr>
<td>ب. مانند علوم اجتماعی درس میدهم</td>
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<tr>
<td>ت. مانند ریاضی درس میدهم</td>
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<tr>
<td>ث. ازشیوه جداگانه استفاده می‌نمایم</td>
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4. آیا باورمند هستید که ارتباط دادن موضوعات ذکرشده (موضوعات علمی اجتماعی) برای زندگی بیرون از مکتب شاگردان مهم است؟

<table>
<thead>
<tr>
<th>ارتباط مهم است؟</th>
<th>گزینه‌های ممکن</th>
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<tbody>
<tr>
<td>بلی</td>
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<tr>
<td>نخیر</td>
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5. اگر بلی آیا شما موضوعات ذکرشده (موضوعات علمی اجتماعی) را به زندگی شاگردان ارتباط می‌دهید؟

<table>
<thead>
<tr>
<th>ارتباط مهم دارید؟</th>
<th>گزینه‌های ممکن</th>
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<tr>
<td>بلی</td>
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<tr>
<td>نخیر</td>
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</tbody>
</table>
6. اگر بله چگونه ارتباط می‌دهید؟
الف. موضوعات راکه در مکتب می‌خوانند با موضوعاتی که در اجتماع وجود دارد ارتباط می‌دهم.
ب. شاگردان را تشیق می‌نمایم و موضوعاتی که اجرا کرده‌اند راکه در مکتوب آمختند برپا نمایم.
ت. نظر دیگر داشته باشید لطفاً بنویسید.

7. ابای شما اینچه در کتاب است درس می‌دهید و بس یا شاگردان را اجازه خواهید داد درس در موضوع درس بحث و تبادل نظر نمایند؟
الف. شاگردان با استفاده از موضوعات درس می‌دریایم و بس.
ب. شاگردان در مورد موضوع درس شاگردان اجرا کرده‌اند در مکتوب موضوع درس بحث و تبادل نظر نمایند.
ج. از موضوعات کتاب استفاده می‌نمایم و همچنان به شاگردان اجازه دادم در مکتوب موضوعات درس بحث و تبادل نظر نمایند.

8. آیا شاگردان اجازه دارند مکتوب در درس به سهیم باشند?
بلی  □
نخیر □

9. اگر بله چرا شاگردان را سهیم می‌سازید؟
الف. شاگردان با موضوعات درس راکه در مکتب به روز کرده با موضوعاتی که در اجتماع وجود دارد ارتباط می‌دهند.
ب. شاگردان در موضوعاتی که در مکتب به روز کرده با موضوعاتی که در اجتماع وجود دارد ارتباط می‌دهند.
ت. شاگردان در موضوعاتی که در مکتب به روز کرده با موضوعاتی که در اجتماع وجود دارد ارتباط می‌دهند.
ث. نظر دیگر داشته باشید لطفاً بنویسید.

10. کدام شیوه فکری می‌کنید بهترین شیوه برای تدریس موضوعات ذکرشده (موضوعات علمی اجتماعی) می‌باشند. لطفاً درجه‌بندی نمایید.
نمایید بین نرده‌ای از 5 به 1 باشد.

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<td>الف.</td>
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11. چرا شما انتا به عنوان یک شیوه درسی انتخاب نمودید و چرا فکر می‌کنید این شیوه مناسب برای تدریس موضوعات علمی و اجتماعی می‌باشد؟

الف. سطح یادگیری شاگردان را بالا می‌برد.
ب. شیوه که از دید خودم درست است.
ت. علاقمندی شاگردان را به درس بیشتر می‌سازد.
ث. نظر دیگر داشته باشید لطفاً بنویسید.

12. کدام مراحل را در هنگام تدریس موضوعات ذکرشده (موضوعات علمی اجتماعی) درنظر می‌گیرید؟

الف. اول موضوعات که در کتاب است پیش کش می‌نمایم بعداً شاگردان را تشخیص می‌نمایم نظرشان را با گویند در گروه‌ها بحث نمایند تا راه حل برای موضوعات ذکرشده (موضوعات علمی اجتماعی) دریافت نمایند.
ب. اول درس را تشریح می‌نمایم از شاگردان می‌خواهم گوش دهند و در آخر ساعت درسی به شاگردان موقعیت میدهم در مورد موضوع درس سوال نمایند.
ت. اول موضوعات که در کتاب است پیش کش می‌نمایم. بعد شاگردان نظر خود را در مورد درس می‌گویند. بعد برای شاگردان وقت داده می‌شود در مورد دیدگاه‌های شان مباحثه نمایند و به نماهنگی بنیاد نی در مورد نظریت‌های شان دریافت نمایند. در آخر من بازدهی (فیدبک) ارائه می‌نمایم.
ث. نظر دیگر داشته باشید لطفاً بنویسید.

13. آیا فکر می‌کنید که تدریس موضوعات ذکرشده (موضوعات علمی اجتماعی) برای بالا بردن سطح دانش شاگردان مهم است؟

بلی □ نخیر □

14. اگر بلی دو دلیل که از دید شما زیاد مهم است انتخاب نمایید؟

الف. شاگردان قادر می‌شوند مثلتنهای بیشتری بگیرند.
ب. سوابق علمی شاگردان را افزایش می‌دهد.
ت. شاگردان قادر می‌شوند یک شهروند فعال در بین مردم کارکند.
ث. شاگردان قادر می‌شوند تا بیت تصمیم بگیرند.
ج. شواهدی های شاگردان را بالا می‌برد تا مضامین ساینسی را کمتر پیش برد.
ح. سطح انتقادی شاگردان را بالا می‌برد.
خ. قادر می‌سازد تا دانش علمی که شاگردان دارند به زندگی روزمره استفاده نمایند
د. نظر دیگر داشته باشید لطفا بنویسید

15. چه فکر می‌کنید موانع‌هایی که در مکاتب افغانستان برای تدریس موضوعات ذکر شده (موضوعات علمی و اجتماعی) وجود دارد کدام‌ها اند؟ (شما می‌توانید بیشتر از یک گزینه را انتخاب نمایید)
الف. کمبود وقت
ب. کمبود وسایل و درسی مناسب
ب. نقص را در مکاتب علمی اجتماعی را زیاد نه کنید
د. کمبود معلمان مسئول
ج. کمبود پالسی مشخص برای تدریس موضوعات ذکر شده (موضوعات علمی اجتماعی)
ح. نظر دیگر داشته باشید لطفا بنویسید