CHAPTER I

INTRODUCTION

1.1. Background of Study

Globalization has changed the system and habits of communities in this century, including the education sector. Nowadays, education must be able to fullfil and prepare for the demand of science based society and the growth of labor market liberalization (KKNI, 2015). Innovation of various method and model in teaching and learning have to be advanced to satisfy this globalization's effect. The mobility of student and labor accros countries also provide the challenges for the education's world to do quality comparison between countries (KKNI, 2015). Indonesia must prepare some education program to make the Indonesia human resource can be accepted to work abroad.

Indonesia has implemented National Curriculum 1994 and Core and Institutional Curriculum 2000/2002 before 2012. The National Curriculum 1994 is also called Kurikulum Berbasis Isi (KBI) or Content Based Curriulum. It is prioritized mastery skill in science and technology. Meanwhile, Core and Institutional Curriculum 2000/2002 is named Kurikulum Berbasis Kompetensi (KBK) or Competency Based Curriculum which is oriented in Global Competence and there is no limitation in mastering the knowledge. Both of this curriulum did not oriented towards quality equality (Kurikulum, 2014).

Therefore, Indonesia has some internal problems such as the inequality of learning outcomes in same study program and the discrepancy of graduated scholar's quality (Kurikulum, 2014). The graduated scholars do not have equal qualifications one with others, even they are graduated from same study program, but studied in different university. In addition, it cannot also be distinguished between scholars who are graduated from institution based on academic, vocational or professional. Disorganized qualification makes the academic accountability of higher educational institutions beomes getting down (Kurikulum, 2014).

Meanwhile, Indonesia has signed the global education convention called the Recognition of Studies, Diplomas and Degrees in Higher Education in Asia and the Pacific on December 16th, 1983. Then this convention has been renewed on January 30th, 2008 to anticipate the globalization's effect in education (KKNI, 2015). Economic sector has tight relationship to education. Education provides and trains the human resources as the subject to do economic sector. Therefore, Indonesia has also approved various international economic conventions such as World Trade Organization (WTO), General Agreement on Trade in Services (GATS), Asia-Pacific Economic Cooperation (APEC) and ASEAN Free Trade Area (AFTA) to provide higher employment oppurtunity. This conventions show the need for the same understanding of international community in terms of employment qualifications clearly. Therefore, a system of employment qualifications that can be recognized together, called a qualification framework must be designed by every convention members. This qualification framework will provides more job opportunities, creating recognition of international equality

in diplomas or academic certificate which is given by educational or training institutions, and will facilitate student and expert exchange program between universities across countries (KKNI, 2015).

For this reason, Indonesian government has formulated an educational reference framework which is called as Kerangka Kualifikasi Nasional Indonesia (KKNI) or Indonesian Qualification Framework (IQF) as a guidance to higher level of formal educational institutions in 2012. The IQF is regulated in Peraturan Presiden No. 8 Year 2012. It is a competency qualification level framework that can combine, equalize, and integrate the education field with the work training field and work experience in the context of providing work competency recognition in accordance with the work structure in various sectors (Direktorat, 2010).

The IQF provides nine qualification levels, starting from level 1 as lowest qualification and level 9 as the highest qualification. The qualification level is the learning achievement level that has been agreed on nationally. It is arranged based on the measurement result of education and / or training which is obtained through formal, non-formal, informal education or work experience. The levels determination is carried out through a comprehensive mapping of labor conditions in Indonesia in terms of labor producers (supply push) and users (demand pull). It also regulated by considering Indonesia's condition such as the development of science, technology and art, development of sectors that support the economy and people's welfare such as industry, agriculture, health, law, and others. The IQF has been implemented in some Indonesia's university since 2012 such as UGM (Universitas Gajah Mada), Universitas Muhammadiyah Malang, Universitas

Pendidikan Indonesia (UPI), Universitas Negeri Jakarta (UNJ), Universitas Negeri Jember (UNEJ), Universitas Yogyakarta (UNY) and Universitas Negeri Medan (Unimed).

Medan State University or Universitas Negeri Medan (Unimed) has implemented the curriulum based on IQF since odd semester of the 2016/2017 academic year in all study program (Unimed, 2017). The implementation of curriculum based on IQF was reaffirmed by Surat Keputusan Rektor number 0149/33 UN/LL/2016. Then, Unimed developed a spesific program called "six course assigment" to train students to reach the learning outcomes in IQF. It consists of six tasks such as routine task, critical book report, critical journal report, idea engineering, mini research and project and must be finished by all students in each courses . It is a strategy carried out in learning to achieve outcomes, stimulating students to become strong, creative, independent learners as well as being able to collaborate with others. These kind of six tasks is a new pattern and unique in the lecturing process.

The IQF curriculum implementation based on six tasks has been revised after it has been implemented for two year. The Revised IQF curriculum has been implemented since academic year of 2018/2019 until now. The revision makes some differences in division of subjects which is aimed to prepare graduates to enter the 4.0 industrial revolution era. There are new courses, new content of courses added. Conversely, there are also old courses or old course content removed.

Bilingual Educational Study Program (BESP) and Regular Educational Study Program (RESP) in Faculty of Mathematics and Natural Science have

applied the curriculum based on IQF. It was conducted since the odd semester of the 2016/2017 academic year too. BESP students are the next educators who trained to be able to take part in international events and be teacher who can teach in Indonesian and English. The Unimed Bilingual Program is a progam to answer the challenge of globalization in education sector. Meanwhile, RESP students are teached by using just Indonesia language.

All Unimed students must do six type of tasks for each subject in one semester. The objective of giving this six task is to fulfill the level 6 learning outcome (Bachelor level) in IQF. The routine task is carried out in each meeting by the lecturer. While, the critical book report is reviewing books based on theories which is learned in the class to broaden student's understanding. Critical journal report is analysing all components of a research journal critically. The idea engineering is a process to remake or find a new idea about the topic in a subject matter. Mini research is done by a group of students based on one topic. It must cover a minimum of hypothetical questions, theories, instruments, data collection, data analysis, and conclusions. The last is project, students must be able to create models or products that have aesthetic, aesthetic, social, cultural and economic values. It requires students to be able to apply the knowledge for problem solving and then communicate the results (Unimed, 2017).

The six tasks can act as homework as Cooper's said in his book in 1989, because it is finished by students when they don't have class meeting. Cooper (1989) has said homework as tasks assigned by the school teacher to students and execute during non-school hours. But, the meaning of homework becomes more complex recently because the various types of homework are given by teacher in

different difficult level, skill, subject area, completion deadline (long or short term), degree of individualization, social context (finished independently or with other students), mandatory or voluntary, or it will be submitted for grading or not (Cooper, 2007; Coutts, 2004). This is in accordance with the six tasks which are submitted in different time, have various difficulty level, and are resolved individually or in a group.

Cooper (1989) said that homework has both positive and negative impact. The positive impact such as students get better retention of factual knowledge; better critical thinking, concept formation, information processing, study habits and skill; greater self-disciplined; more independent problem solving and greater parental appreciation. But students can loss of interest in academic material; have physical dan emotional fatigue; denial of acces to leisure time and community activities; have parental interference; and increase cheating one with others. This is the negative impact of giving homework.

Many education researcher have done the study to know the effect of homework. Some of them stated that the groups of students who were given homework had a higher level of academic achievement than the students were not given homework (Copper, 1989; Copper & Valentine, 2001; Trautwein et al., 2007). It was noticed that homework gave different effects on each grade level of students. Homework affected greatly on students achievement in higher school. The effect was half as much for students in middle school and there was no effect or slightly on students achievement in elementary school (Copper 1989; Copper & Valentine, 2001). There is a positive correlation between student's spending time

on finishing the homework (at least one hour per week) and the student's achievement in higher level students (Copper & Valentine, 2001).

Songsirisak & Jitpranee (2018) did investigation about the impacts of homework on students' learning for 140 undergraduate students from a Thai university. It revealed the students preception toward homework. The study showed that 74.1% of students knew the importance of homework and its necessary on their learning, 72.8% of students understood the function of homework, 87.1% of students realized that homework is a part of their grade scores and 84.3% of students did not agree homework is not helpful for them. They also agreed (77.1%) that homework helped students learn and increased their academic achievements. However, most of them (87.9%) did not like to have overloading homework.

Bembenutty & White (2012) have studied the association between homework practices of college students, motivation and self-regulation of learning, and final course grades. They gave assessment of help-seeking, self-efficacy, intrinsic motivation, and homework logs suggested to one hundred thirty-three college students and found that the relationship between students' beliefs and homework practices are associated with their academic performance, reported use of adaptive help-seeking, and motivational beliefs. Furthermore, Ileri (2013) has conducted a research about the effect of homework on academic success for 286 students at at TOBB University of Technology and Economics (TOBB ETU). Academic success is the student grade from students' quiz and mid-term grades. His study showed that students who complete their homework have higher academic success.

Ramesh & Rao have (2015) have investigated the impact of class assignment on higher order thinking skills (HOTS) for ninety seven students from undergraduate computer engineering class. They found that there was a significant difference in HOTS of students who got Home Assigment (HA) compared with students who received In-Class Assigment (CA). Moreover, the knowledge survey recorded that students who completed CA have higher confidence in answering questions with HOTS. Also, their confidence level enlarging as the cognitive level of the questions go up the Bloom's hierarchy. Beside it, Siregar (2020) said that Project and Problem Based Learning which is integrated in six tasks or homework has a significant effect on student's High Order Think Skill and science attitude in Microbiolgy Subjects. Moreover, Liu et al. (2006) found that students who obtain positive attitudes toward science are more likely to keep up science achievement levels, although when they experienced less than being able to do it than their peers without a positive attitude.

Contrastly, Galloway et al. (2013) stated that too many homework can reduce the effectiveness of doing homework. Their study proved that students who spent more than 3 hours of homework per night experienced more academic stress, physical health problems, lack of balance in their lives, and even alienation from community. It is indicated that homework acts as a stressor in students' lives. Doing homework more than two hours per night causes counterproductive. The Metlife Survey of the American Teacher 2007 has done survey for 2,101 students in grade 3-12 and found that 89 percents of students declared they experienced stress when doing homework (MetLife, 2007). This survey also reported almost 30 percent of 500 parents approved overload homework was a

dominant source of stress and conflict in their family. Homework also can increase cheating (Kralovec & Buell, 2000). They have done a survey to high school students and identified 80 percent of high scored students confessed do cheating by rewrite their friend homework, copy and paste directly from internet or make their parents finish it. It concludes that homework can give a significant, less meaningful or none effect on students outcome, but too many homework can decrease the homework's function.

Newell et al. (2015) said that great academic outcome are necessity to get successfull in pursuing a bachelor's degree and a science-related career. Academic outcomes can be grade point, high order thinking skill, science process ability, mid-semester or semester quizz grade, etc. Bergmann & Sams (2014) wrote that to find out the teaching and learning's outcome, teachers are often use instructional framework called Bloom's taxonomy. Alsowat (2016) noted the revised Bloom's taxonomy contains six levels of cognitive aspect (from the lower to highest level) such as remembering, understating, applying, analyzing, evaluating and creating. Meanwhile, the skill such as analyzing, evaluating, and creating recognized as higher order thinking skills (HOTS). Moreover, Brookhart (2010) defines HOTS as three terms such as transfer, critical thinking, and problem solving . Casner & Barrington (2006) said that to get success in the workplace, employers must have two fundamental qualification such as creativity and critical thinking (HOTS). Furthermore, the other skill such as master in information and technology and has collaborative and innovative thinking skills concidered as crucial factor too (Magsino, 2014). In Indonesia, Critical thinking must be owned by graduates from Undergraduate Program. This is stated in the

Regulation of the Education and Culture Minister of the Indonesia Republic, Number 49 year 2014 abouts National Higher Education Standards Clause 6 which declare that graduates of the Bachelor Program must have general skills, namely being able to apply logical, critical, systematic, and innovative thinking in the context of development or implementation science and technology that notice to and applies humanities values in accordance with their field of expertise (Kemendikbud, 2014).

Study has displayed that science-related career aspirations are particularly relevant with students' attitudes toward science and their perceived utility of science (Regan & DeWitt, 2015; Bøe & Henriksen, 2015). Moreover, the relevance of interest and utility to students' prospective aspirations towards studying and working in science, together with further factors as well as the science's personal value to their identities, their current confidence, their confidence in their future attainment, and their parents's affect has been reestablished by some researcher in England such as DeWitt & Archer (2015), Mujtaba & Reiss (2014) and Sheldrake (2016). The conclution is the successful of working in science related-career is influenced by the student's HOTS and their attitude towards science.

The student of BESP and RESP as the next educator who will sharpen the Indonesia's human resources. They studied general biology course in Unimed. General biology course is one of subject matter in Biology. It discusses about basic knowledge in biology such as pollution, bionutrition, regulation, bioindustri, biodiversity, etc. It is important to be mastered by BESP and RESP scholars because the topics in this course are applied in daily life and make people care

more about their environment. It is also one of the faculty's compulsory subjects because all students of Faculty of Mathematics And Natural Sciences in Education Program must master it. The Other similar subjects are basic physics, general chemistry, and calculus.

The output of the IQF curriculum implementation based on six tasks on students outcome such as HOTS and science attitude have not been recorded yet scientifically. Some reseacher from Unimed have been discussed about the strategy of IQF curriculum implememtation based on six tasks for students (Pasaribu et al., 2017; Sutopo, 2018; Siregar, 2018), lecture and student preception on IQF curriculum based on six tasks (Harahap, 2019; Putri, 2019), development of teaching material based on IQF curriculum (Dewi, 2017; Manurung et al., 2019; Natsir, 2019; Irfan et al., 2020).

The analysis research of student's HOTS and science attitude in general biology course for undergraduate students is still limited in Unimed. Eventhough, this study is important to know as an description of the Unimed student's quality. Beside it, this study can be use as source to know the quality of human resources in Indonesia. The study that has been carried out such as the effect of Projek and Problem Based Learning on college student's HOTS, scientific attitude and science ability on microbiolgy course (Siregar, 2020); the effect of Inquiry Contextual Worksheet on college student's HOTS, scientific attitude and science ability water on mirobiolgy subject matter (Kesumawati, 2020); Designing the High Order Thinking Ability Test Instruments In Microbiology Based On Contextual Education In Unimed Biology Educational (Hasruddin et al., 2018).

Based on the background, it is necessary to find the condition of student's HOTS and scientific attitude to reveal the output of the IQF's implementation in student's cognitive and .attitude. The writer done the research with the title " Analysis of Student's High Order Thinking Skill And Scientific Attitude on General Biology Course in Mathematics And Natural Science Faculty Of Medan State University".

1.2. Problem Identification

Based on the background above, it can deduced some problems such as :

a. The effect of giving homework is still debating. It can gives positive, useless or negative impact to student's academic aspect and non-academic aspects.

b. The output of IQF implementation based on six tasks on students outcome (HOTS and scientific attitude) in Unimed have not been recorded yet scientifically.

c. Analysis of college student's HOTS and scientific attitude on general biology course in Unimed is still limited.

1.3. Problem Limitation

In this research, the limitation of problem is :

a. The student's HOTS on general biology course based on bloom taxonomy hierarchy such as analyze (C4), evaluate (C5), and create (C6)

b. The student's scientific attitude on general biology course based on Harlen (1996) such as curiosity, respect for evidence, critical reflection, creativity

and inventiveness, open mindedness and cooperation with others, preseverance, sensitive to environment.

1.4. Problem Formulation

Based on the background and problem limitation, the study answered the question such as :

a. How is the profile of FMIPA student's high order thinking skill on general biology course generally?

b. How is the profile of FMIPA student's scientific attitude on general biology course generally?

c. How is the profile comparison of bilingual and regular student's high order thinking skill on general biology course?

d. How is the profile comparison of bilingual and regular student's scientific attitude on general biology course?

1.5. Research Objective

Based on the problem formulation, the goal of this research is to realize :

a. the profile of student's high order thinking skill in FMIPA Unimed,

b. the profile of student's scientific attitude condition in FMIPA Unimed,

c. the profile comparison of bilingual and regular student's high order thinking skill on general biology course,

d. the profile comparison of bilingual and regular student's scientific attitude on general biology course.

1.6. Research Significance

This research gives advantage such as:

a. students can know their ability in HOTS and scientific attitude in general biology course , so they will be more motivated to increase their achievement level in HOTS and science attitude,

b. enhancing the implementation quality of IQF curriculum integrated on six tasks in Unimed,

c. improving the standard of six tasks, so students just get the positive impacts and remove out the negative effects,

d. act as information resource for policymakers, teacher and curriculum developer as the guidance to make new a policy or rule in the learning process.