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Influence of Assessment Process on Students Higher Order Learning in Science Subjects in Bangladesh

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Abstract: *The study is an attempt to find out the influence of assessment process on students higher order learning in science subjects in Bangladesh. The main objectives of the study are: (i) to identify the nature of the question items of science subjects, (ii) to examine what kind of learning is influenced by the question items, and (iii) to identify the role of science exams on students higher order learning. Findings of the study showed that, majority of the science question items are mostly knowledge based. The nature of the items mainly demanded the memorizing ability of the learners and it can be said that simple learning or straightforward learning skills like memorizing is influenced heavily by the question items. It is also found unlikely but truly that; the question items do not play any significant role on students higher order learning. The foregoing discussions suggest that the nature of the assessment process used at the examinations make a bad or negative impact on students learning. Therefore, the nature of the question items of the science examination should be changed for influencing the students higher order learning and it should cover all the sub-domain of the cognitive domain of learning. The items should be designed in such a way that it encourages the students for self-thinking.*

Keywords: *Assessment, Assessment and learning, higher order learning, Influence of assessment on learning, Relation of Assessment and Learning.*

I. Introduction

The main objective of an educational system is to judge the learning of the students that is related directly to the teaching-learning process, curriculum development and other related areas. The curriculum includes assessment techniques so that students learning progressions can be measured. There is a strong relation between assessment and students learning. Assessment helps to reshape and direct contents, process and quality of learning. It works as a driven force for education. Assessment indicates students' competence for further education. The assessment and students learning has a strong connection which is established by various research works. Assessment process determines what the students are going to learn. In Bangladesh the relation of assessment and students learning has not been given the most priority. Students of our country are still nervous about the traditional assessment system. Moreover, teachers and parents of the students want their child to get good marks in the examinations as it appears as a symbol of brilliance of the students. As a result students are more focused to get good score in the examination rather than learning the content appropriately. It involves the students in such kind of learning process which will take less time to prepare for the exam and give them security of getting good marks.

Researcher shown that students who want to make sure about getting good marks in the exams are often engaged in memorizing the content of the text or note supplied by some sources like teacher, coaching center and guide book. In fact, the nature of the assessment system helps the students to do this kind of poor quality learning that is just memorizing the content. However, it is understood very easily that how the students learning is influenced by the assessment. Therefore, it should be the first work to reassess the assessment system for improving students learning and include some issues related with assessment and learning such as; in what kind of learning the students are involved by the current assessment system, what kind of learning is encouraged by the assessment, what type of assessment techniques should be introduced to promote higher order learning.

1.1 Learning

In simple, by the word learning we understand the process in which students are involved for fulfilling the need of knowledge and skills. However, according to Bloom learning does not mean simply knowing something. Learning involves acquiring knowledge and skills as well as the ability to apply the knowledge properly. In the fields of neuropsychology, personal development and education; learning is one of the most important mental function of humans, animals and artificial cognitive systems. It relies on the acquisition of different types of knowledge supported by perceived information. It leads to the development of new capacities, skills, values, understanding, and preferences. Its goal is the increasing of individual and group experience.

Learning functions can be performed by different brain learning processes, which depend on the mental capacities, the type of knowledge which has to be acquitted, as well as on socio-cognitive and environmental circumstances. Learning ranges from simple forms of learning such as habituation and classical conditioning

seen in many animal species, to more complex activities such as play, seen only in relatively intelligent animals and humans. Therefore, in general, learning can be conscious and not conscious.

1.2 Higher order learning

Benjamin Bloom led a group of educational psychologists in classifying levels of intellectual behavior within learning environments. Known as Bloom's Taxonomy, this hierarchy identifies six levels within the cognitive domain. The lowest level is simple recall or recognition of facts. The categories represent increasing complexity and abstraction, with the highest level being evaluation.

Begum, et al (2007) refers that, higher order learning engages students in the process of transformation of the information and ideas into synthesizing, explaining, generalizing or making decision. Learning which need critical and creative thinking called higher order learning skills.

1.3 Assessment

In general, judging the learning outcomes of the students is known as assessment. Assessment is the process of documenting, usually in measurable terms, knowledge, skills, attitudes and beliefs. According to R. J. Dietel (cited in Ahmed, 2002; p.5) assessment may be defined as "any method used to better understand the current knowledge that a student possesses." Assessment may affect decisions about grades, advancement, placement, instructional needs and curriculum.

There are different techniques of assessment through which the learning of the students can be measured. In Bangladesh, examination is the most using technique and taken in the form of written, practical and viva. There are two main public examinations in Bangladesh through, which the learning of the students are measured after a certain period. These two exams are (i) the secondary school certificate examination (SSC) and (ii) the higher secondary certificate examination (HSC). For assessing students learning achievement, these exams play a significant role.

1.4 Connection between assessment and learning

Assessment is a much more comprehensive and inclusive term than measurement or testing. The term measurement is limited to quantitative descriptions of students; that is the results of measurement are always expressed in numbers. It does not include qualitative description. Assessment on the other hand may include both quantitative and qualitative descriptions of students. In addition, assessment always includes value judgments concerning the desirability of the results (Linn & Gronlund, 2005; p.49).

Researcher engaged in studies of students learning have observed that assessment influence students learning most rather than the teaching. Students engaged in learning is largely motivated by the assessment system they are involved (Begum, et al, 2007). Different research shows that, there is a strong connection of learning and assessment. According to Gipps, subject matters presented in teaching is determined by assessment system. That is why students learning are also heavily dependent on assessment system and it plays an important role in students learning. (Begum, et al, 2007)

Holt and Willard-Holt (2000) emphasize the concept of dynamic assessment, which is a way of assessing the true potential of learners that differs significantly from conventional tests. Here the essentially interactive nature of learning is extended to the process of assessment. Rather than viewing assessment as a process carried out by one person, such as an instructor, it is seen as a two-way process involving interaction between both instructor and learner. The role of the assessor becomes one of entering into dialogue with the persons being assessed to find out their current level of performance on any task and sharing with them possible ways in which that performance might be improved on a subsequent occasion. Thus, assessment and learning are seen as inextricably linked and not separate processes.

According to this viewpoint, instructors should see assessment as a continuous and interactive process that measures the achievement of the learner and the quality of the learning experience. The feedback created by the assessment process serves as a direct foundation for further development. The assessing process influences the students strongly to which kind of learning should be given priority. Therefore, if the nature of the assessing process is explored it can be detected very easily that which kind of learning is influenced.

1.5 Objectives of the Study

The main objective of the study is to find out the influences of assessment process on students higher order learning in science subjects.

The following are the key questions of the study:

i. What is the nature of science question items?
ii. What kind of learning is influenced by the question items?
iii. How much effective the exams are in achieving the defined learning outcomes?
iv. What kind of role is played by the science exams on students higher order learning?

II. Methodology

The methodology of the study is described through: (a) study nature, (b) study areas, (c) the sampling design, (d) respondents, (e) tools of data collection and (f) data analysis. These are spelled out in the following sections.

2.1 Study nature

The study is descriptive in nature based on both qualitative and quantitative approach of research. Data and evidence have been gathered from a range of sources using a combination of different data generating instruments and strategies. Both primary and secondary sources have been chosen for collecting necessary data.

2.2 Study area

The study has been confined to the capital only. It has included the secondary schools and colleges. The respondents of the study were: (i) students of grade XI-XII, (ii) students of grade X, (iii) teachers, (iv) education experts.

2.3 The sampling design

In order to select the sample of schools and colleges, a list of schools and colleges were collected. Within the schools and colleges, teachers and students have been selected following simple random sampling. Education specialists have been selected following purposive sampling. Samples of 5 secondary schools and 5 colleges have been chosen purposefully from capital city. The numbers of schools and colleges have been chosen based on the result criterion and availability of time and financial support.

2.4 Respondents

2.4.1. Teachers: Teachers view about curriculums reflection on SSC question items, nature of the SSC question items, what kind of learning is achieved by the students, how much learning outcome is achieved, how much effective the content of the exam is, the role of the content in students higher order learning and so many related things are very much necessary. Therefore, teachers are important source of information for the study. Total number of 15 teachers, 3 from each school has been selected randomly for collecting information.

2.4.2. Students: From each school 10 students of grade X have been selected by following simple random sampling to collect their views about the examination system and its effectiveness on their learning. Similarly, from the selected colleges a total number of 50 students of grade XI-XII have been chosen. The college students have been chosen because they have already taken part in the exam and they can give a clear view of the effect of the examination and assessment system they faced and the influence of the exam on their further learning. The students have represented both boys and girls. In total, a sample of 100 students has been selected.

2.4.3. Education experts: Education experts view about curriculums reflection on SSC question items, nature of the SSC question items, what kind of learning is achieved by the students, how much learning outcome is achieved, how much effective the content of exam is, the role of the content in students higher order learning are very important and relevant for this particular study. Therefore, they are important source of information for the study. A total number of 4 education experts have been selected purposively for collecting necessary information.

2.5 Data collection techniques

In order to maintain the validity of data, triangulation techniques have been employed for collecting evidence and information. For the study, two types of data generating instruments have been used. The purpose and development procedures of the tools are described below:

2.5.1 Interview schedule: A semi structured interview schedule (with open and close ended questions) for class teachers and education experts has been developed to know their perception and view about the nature and content validity of science exams and the effect of the exams on students higher order learning. A draft interview schedule has been administered on a small group of respondents. After reviewing the trialed questionnaire, the final version has been prepared for administering on the selected samples.

2.5.2 Questionnaire: A semi structured questionnaire (with open and close ended questions) has been developed for the students. The purpose is to gain insights and feelings of the respondents about the exams and their learning. The daft questionnaire has been tried out on a group of respondents before collecting data.

2.6 Data Analysis

Data from questionnaire and interview schedule have been presented in both quantitative and narrative form. The quantitative data have been shown in terms of percentages of total response. In analyzing the qualitative data and evidence obtained from interview and questionnaire a descriptive approach has been used.

Different themes emerged from the data related to students learning, higher order learning, the nature of items used in the SSC science examination and their role on students learning have been identified and data have been analyzed under each theme.

III. Finding of the Study

By and large it is found that the science exams are mostly dominated by knowledge based and lower order learning based questions. It refers that; students can answer the maximum number of question by memorizing which does not fulfill the objectives of learning. Even for subjects like science; students memorize different formulas, concepts and skills where they ought to understand the concepts of complex things and realize the relationship of the facts and draw conclusion from experiment and like so many. In learning science, students need higher order or complex cognitive abilities. As the assessment process of science demand straightforward learning from the students so the students are not encourage to develop their higher order learning skills.

For higher order learning students have to understand the matter and apply it properly where needed. The items must have the ability to judge students higher order cognitive ability like: understanding, application, analysis, synthesis and evaluation along with psychomotor ability. There are few items in the test materials which encourage the students to get them involved in synthesizing and evaluating or creating activities. Some test items have appeared as fully or partially related to the learning skills like understanding and analyzing. But the fact is that, the prescribed textbook or guide book for these subjects already contains the answers. As a result, the students can memorize the answers from the text before the exams.

A total number of 96; SSC candidates (50) and SSC passed (46) students were answering the questionnaire. The required evidence and information about learning, higher order learning, the nature of the SSC science questions, the kind of learning influenced by the questions, the effect of SSC science questions in higher order learning and so on were collected through the questionnaire. The following section shows students view on different issues.

3.1 Students conception about learning

Majority of the students (57.29%) (N55) concept about learning is that learning means application of the knowledge they have learned. Some of them (16.66%) (N16) said learning is, understanding the text and some (15.62%) (N15) think understanding their teacher is learning. To a few number of them (12.50%) (N12), learning is change in their behavior and few (7.29%) (N7) thinks memorization means learning. But the students who think memorization is learning answer the other options also.

3.2 Students conception about higher order learning

Half numbers (50%) (N48) of students think that application ability of the achieved knowledge and skill to solve a problem is higher order learning and almost half (46.87%) (N45) answer that higher order learning means analyzes new problems with the help of previous knowledge. Some students (23.95%) (N23) said higher order learning means understanding a topic by reading and then write in own word. [Fig: 1]

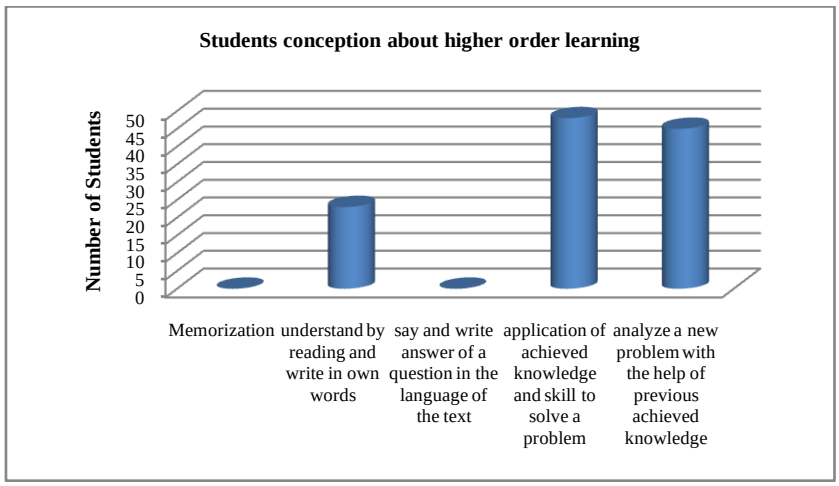

Fig-1: Students conception about higher order learning

3.3 Students conception about when their higher order learning happens

Majority of the students (60.41%) (N58) answer that if they are able to solve a problem with the help of previous knowledge then their higher order learning happens, some (44.79%) (N43) thinks if they are able to

analyze problems then their higher order learning is complete. A very few of them (19.79%) (N19) thinks their higher order learning happens if they are able to answer in own words by reading the text.

3.4 Purpose of passing the examination

According to the students, a huge number of the students (92.70%) (N89) purpose of passing the examination is to get admission in a good institution in future. A large number (81.25%) (N78) of them replied their purpose is to get good grades. A good number of students (36.45%) (N35) wants to pass the exams for their self-satisfaction. Some students also wanted to satisfy their parents (23.95%) (N23) and teachers (13.54%) (N13).

3.5 Reasons behind the learning according to the students

From the answer of the students it has been found that students have some common reason behind their learning. The students answered through the questionnaire informed that the reasons behind their learning are: (i) getting good grade or marks in the examination, (ii) students want to admit in a good institution and to admit themselves they need to show the institute good results, (iii) students want to do some good jobs in the future and for good jobs they need good results, (iv) students want to earn social honor for their parents and also for themselves. To ensure the social prestige of their parents and themselves they want good result in the examination and that enforce them to the learning.

Without these common reasons the students also mentioned some reasons behind their learning which are (i) students do have competition with their classmates and they want to overcome one another in the examination. That act as a strong force for them for learning. (ii) Some students want to increase their knowledge so that they can cope with the modern world and the society. This also encourages the students learning.

3.6 Types of learning encourage by the science content according to the students

Most (51.04%) (N49) of the student answered that science content encourages them to memorization. Some of them (29.16%) (N28) said understanding ability of learning is encouraged and some (26.04%) (N25) think application ability is encouraged. A very few students (17.70%) (N17) answered that the science content encourages their analytical ability.

3.7 How the students learn the science content

Most of the students replied that they learn the science content by memorizing from the text (47.91%) (N46), from the teachers note (39.58%) (N38), from the guide book (25%) (N24) and from the note supplied by the coaching center (32.29%) (N31). Some students also learn the science by acquiring the skills to solve problem (27.08%) (N26) and to analyze and explain a matter (21.87%) (N21). Few of them (28.12%) (N27) answered they learn the science by understanding the theme from the content of the text.

3.8 Types of learning influenced by the question paper

Above half number (61.45%) (N59) of the student thinks the question paper influences them for total memorization or recalling. A good number of them (36.45%) (N35) said understanding and application ability is influencing and a number of them (21.87%) (N21) replied solving new problem on the basis of the achieved knowledge is influencing. [Fig: 2]

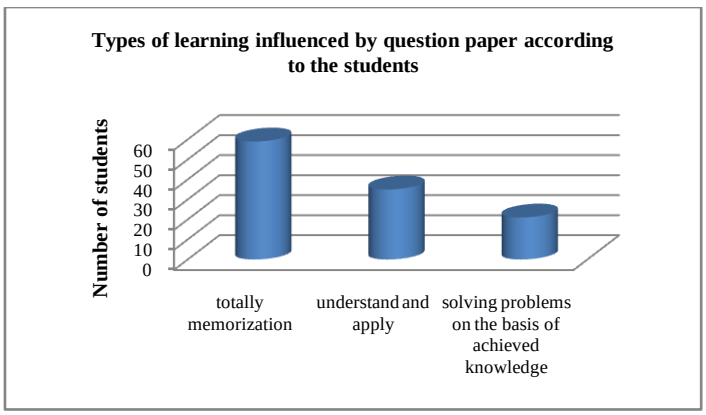

Fig-2: Types of learning influenced by the question paper

3.9 How students take preparation for the science examination

Most of the students (75%) (N72) take preparation for the science examination by memorizing from the text, some (35.41%) (N34) memorize teachers note and some students (14.58%) (N14) takes preparation from the text. A few of them (17.70%) (N17) takes preparation by using the existing knowledge to analyze and solve new problem.

3.10 Students opinion about how they get more marks in the science exams

Most of the students think that if they answer the science questions according to the text they get good marks in the examination. In the examination the students have to answer a lot of question which are taken from the text and to ensure good marks the students have to answer the entire question in limited time. In the time of assessment the teachers also feel bored to check the whole answer script through reading. Then the teacher tries to find that whether the student follow answer of the text book or not, and gives marks to them. So the students who want to secure good marks anyhow try to follow the answer given in the text. Some students also think oppositely that if they follow something different from the text it helps them to get good marks in the science exams. The students think that if they answer differently from the answer given in the text it will impress their teacher and then they will get more marks than the others.

3.11 Role of the science question items on students learning

The students have some common feelings and thoughts about the role of the science question items on their learning. The students expressed their feelings in two steps about the science question items: (i) the current role of the science question items on students learning that means what kind of learning is encourage by the question items and (ii) the role of the science question items on students' further learning or higher order learning.

Most of the students answered that the current role of the question items on their learning is that, the question items are making them more courageous for memorizing the answer from the text and deliver it in the time of the examination. The students mentioned that the items of the science examination are repeated in every year and most of the items are taken directly from the text or exercise given in the text. So it is easier for them to find out the answers of these questions easily from the text and then memorize the answers. The students also said that they want to get good marks in the exams in easiest way which is one of the main reasons of their learning. In the science exams the students get the chance to predict the question and as a result they memorize the answer of those questions which gives them security of the marks but not developing any kind of learning skills.

Some students answered that the role of the science exams question items are very much helpful for their learning and it is making their learning meaningful. These students give some reasons for this which is: the question items are including the understanding and application ability along with knowledge based and analytical ability. According to those students it helps them to shape their complete learning which will help them in future. But the numbers of these students are very low compare to the total student number.

The students who thinks that the items of the science question is influencing them towards memorization also thinks that the items are not helpful for students higher order learning as the items does not include any higher order learning skills. The answers of these items can be given easily by memorizing. For higher order learning skills students need to understand a context, analyze the content and apply proper solution to any problem. But to answer the question items students need not to achieve either of these skills except memorizing. The question items do include some items demanding some understanding, application and analytical ability from the students but the students need not to apply the higher order skills as they can find the answer in the text and memorize the answer.

The analysis of the teachers thought about students learning, higher order learning, nature of the science questions used at SSC and the effect of these questions on students learning are presented below.

3.12 Teachers conception about students learning

Majority of the teachers (60%) (N9) conception about student learning is the application ability of the students what they have learned. Other teachers (40%) (N6) think students learning are the ability of analyzing the content. A good number of teachers (46.66%) (N7) belief that students learning means change in their behavior due to some reason. Some (26.66%) (N4) teachers also thinks that students learning also include the understanding ability and explain the topic in own words and some teacher (20%) (N3) thinks students learning is the memorization ability.

3.13 Teachers concept about students higher order learning

Almost all of the teachers (86.66%) (N13) think that application ability of the students based on their knowledge can be considered as higher order learning. Some of them (40%) (N6) said higher order learning

understands a matter and then explain it. None of the teacher said that student's higher order learning means just knowing the content.

3.14 Teachers opinion about how the students learn

Most of the teacher (60%) (N9) replied that students learn something by memorization and a good number of them (53.33%) (N8) think students can learn by discussing any matter with their class mates. Some teachers think students learn by reading the text (20%) (N3) and by thinking themselves (20%) (N3). A few of the teacher (13.33%) (N2) thinks students learn by getting help from the coaching center and house tutor.

3.15 Teachers opinion about the process which makes students learning effective

Majority of the teacher (73.33%) (N11) thinks that if the students are able to solve a problem with the help of achieved knowledge and skills it makes their learning effective. Some (40%) (N6) teachers think that, students learning are effective when they are able to explain anything with logic and few (26.66%) (N4) thinks if the students are able to understand something and then able to answer in own words. Only 2 of the teacher (13.33%) thinks if the students can remember the content it will make effective learning, but they also mentioned the ability of solving a problem with the help of knowledge and skills.

3.16 The reasons working as a factor for students learning

According to the teachers there are some common reasons working as a factor for students learning. The reasons which encourage the students for their learning are: (i) making secure for getting good marks in the examination, (ii) the need and expectations of their parents and teachers which work as a force on them to make them bound for their learning, (iii) students want to get themselves admitted in a supreme educational institution in the future and for admission in a good institution they need good marks or grade which is another common reason behind their learning, and (iv) students want to get rid from the social pressure created for them if they are not been able to succeed in the exams. So they want to pass the exam in the easiest way and want to secure their position in the society. Students also want to get a good job after completion of their study. They think without good marks or good result it would not be possible for them to get a good job. That also works as a factor for their learning mentioned by the interviewed teachers.

3.17 Teachers thought about assessing a student

Majority of the teacher (80%) (N12) thinks that the purpose of assessing a student is to promote into the next class or stage and to judge a student's achievement. A good number of them (73.33%) (N11) think that the purpose is to identify the number of pass or fail, some teachers (53.33%) (N8) answers that they want to compare the students with each other and some (46.66%) (N7) thinks that the purpose of assessing students is to help their learning. A few (26.66%) (N4) mentioned about giving feedback to the students.

3.18 How do the assessment techniques influence students learning?

The teachers that had been interviewed think that assessment has a great influence on students learning. They think assessment is the most important part of teaching learning activities. According to the teachers the assessment techniques and assessment process gives a guideline to the students to shape their learning. The students can know their learning status through the assessment and then they can take decisions on how to improve their learning and do better. By the assessment students are informed about their present condition of learning and on which point they need to improve and give preference. If the assessment process include the techniques to judge the students various learning skills like thinking ability, application ability, analytical ability and others higher order learning ability then the students are interested to achieved these skills and that helps them to format their learning.

Again if the assessment technique only includes some routine ability likes memorization ability or recalling ability then the students will be interested to achieve only that kind of learning skill. Because the main target of a student is to get good marks in the examination and for ensuring the good marks students want to make preparation according to the assessment style and techniques used in the examination. So ultimately students are influenced by the assessment to select the type of learning.

3.19 How the students take preparation for the examinations

According to the teachers 86.66% (N13) of them think students take preparation for the examination by memorizing the text. A number of them (73.33%) (N11) think students memorize the guide or note for taking preparation for the exam. Very few of the teachers (20%) (N3) think students understand the content and few (13.33%) (N2) thinks students take preparation by acquiring knowledge and skills.

3.20 Teachers concept about how the students learn the science content

Almost all the teacher (93.33%) (N14) answered that students learn the science content by memorization. Some also thinks students learn the science content by understanding (20%) (N3), by acquiring the knowledge and skills to solve new problem (13.33%) (N2) and by acquiring analyzing skills (13.33%) (N2).

3.21 Type of question influential for students higher order learning

Most of the teacher (66.67%) (N10) commented that if students can answer the question by applying their knowledge and skill it can be influential for their higher order learning. Some teacher (33.33%) (N5) think, the question which makes students thinking is the one that influences higher order learning. Some (20%) (N3) said answer of those questions which can be written from students' practical life is influential for higher order learning. [Fig: 3]

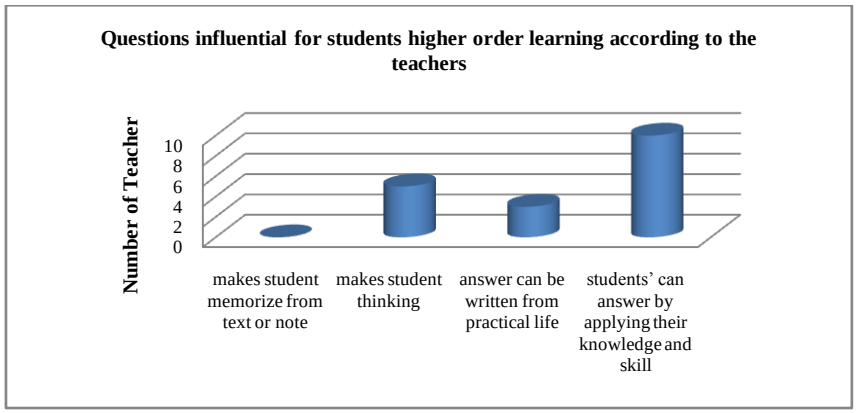

Fig-3: Types of questions influential for students higher order learning

3.22 Types of learning encourage to the students by the science question paper:

A very large number of the teachers (80%) (N12) think the students are encouraged for memorizing the text by the science question papers. Some teachers (66.67%) (N10) feel students are encouraged to memorize the guide and note. Few of the teachers (20%) (N3) said the question paper encourage the students to understand and write the answer in their own word. [Fig: 4]

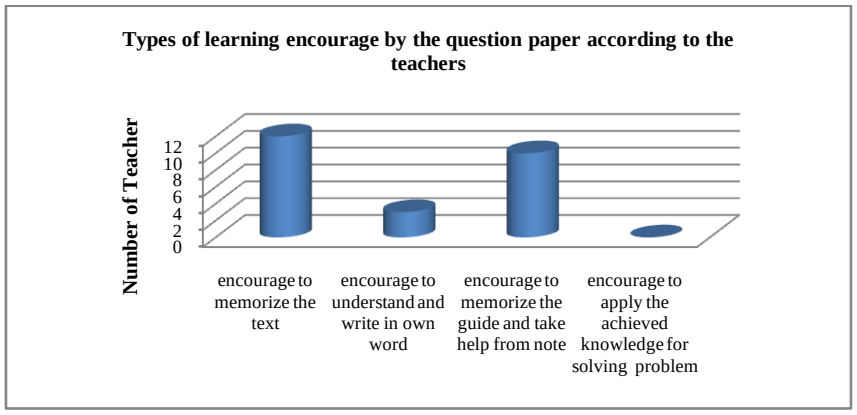

Fig-4: Types of learning encourage to the students by the science question paper

3.23 Teachers view about the science examination and students higher order learning

Teachers thought that for learning science students need to develop their understanding ability, analytical ability and application ability properly. Because the main objective of the science learning is to develop the students higher order learning skills or critical thinking ability, and complex learning. Through the examinations students are being tested whether they achieved these skills or not. So the examination specially the question items and assessment process plays an important role for the students to achieve higher order learning skills. In our country the examination of science subjects are totally knowledge based. It only asks the students to memorize the answers from the text or other sources and deliver it at the time of the examination. It basically encourages the students for straightforward and temporary learning. Most students of our country want to do well in the examination without taking proper preparation. So they search for those types of questions which can be memorized easily as memorization is the easiest way of preparation for the exam. Also there are a

good number of items in the question paper of the examination which demand the same (recalling) from the students. So if a student wants to get good grades or marks, he or she can just achieved this easiest learning skill and do well in the exams.

In the question papers lots of items are taken directly either from the exercise of the text or from the content of the text. As a result of that students have the chance to get familiar with the question items which also leads their learning to memorization. The items of the question papers also repeated from the previous year which makes it easy for the students to guess the items and prepare the answers by memorizing. The teachers also mentioned that the question papers do have some items which demand some higher order learning skills but those items are very low number compare to the total number of items. And without answering these items students can still secure good marks in the examinations.

According to the teachers the question papers should include more of the higher order learning skill related items which will test the students real learning rather than recalling or memorizing. The teachers think that if the items are new and critical thinking related which demand the understanding, analyzing and application, evaluating ability; it will help the students higher order learning.

3.24 Experts concept about Students learning

Students learning is not just recalling or memorizing or some particular skills like understanding ability or analytical ability or presenting ability. Rather it is an integral combination of all the skills. For learning students need memorizing ability though it is the base of all higher order learning like understanding, application, analysis, synthesis and evaluation. Therefore, students learning mean acquiring all the higher order learning skills including memorizing skills.

3.25 How students learning become effective

The experts think that students learning can be effective if they learn something and then able to analyze it with logic, if the students are able to understand the topic and explain the topic with their own words and if the students are able to solve new problem relating their old knowledge and learning experience. The experts also think that if teachers encourage the students for their learning it could also make the students learning effective.

3.26 Effect of the assessment on students learning according to the experts

According to the experts the assessment influences the students learning by introducing the learners or the students to the assessment system. If the assessment system is knowledge based the students are encouraged for recalling or memorizing. The assessment determines in which way the students learning should advance and how. By the assessment tools and techniques the students get idea and direction which learning skill is wanted from them and which one will give them the maximum benefit for the examination that is the marks.

3.27 How the question items should be?

In the opinion of the experts the question paper of the science subject should include all the sub-domain of cognitive domain of learning that is knowledge, understanding, application, analysis, synthesis and evaluation. For science subject the items should be taken from the knowledge (30%), understanding (20%), application (20%) and the higher order learning skills: analysis, synthesis and evaluation or creation (30%). [Fig: 5]

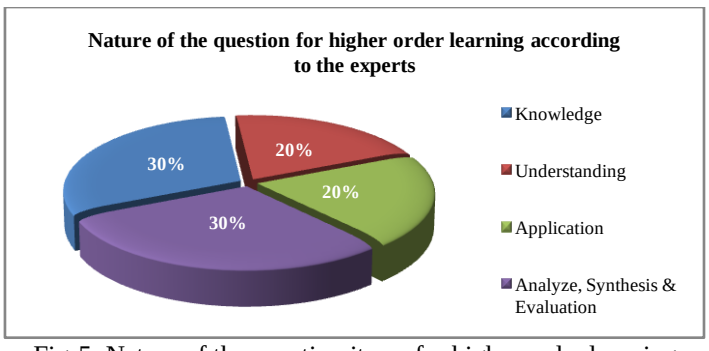

Fig-5: Nature of the question items for higher order learning

3.28 What kind of learning is influenced by the current question items?

The experts think that the current science questions using in the examinations do play role only for students' lower level learning or root level learning as it is not covering all the sub-domain of cognitive domain. As a result of that students are only guided to the direction of straight forwarding learning that is recalling the

answer because the majority of the items are from the knowledge sub-domain. According to the experts the current items of the science question paper do not encourage the students higher order learning. The cause is that the majority of the items are knowledge based and the answers can be memorized earlier. Students can memorize the answers and answer very easily without achieving the other skills. Even the mathematical items are taken directly from the text and students memorize the answer. Besides the number of items which supposed to judge the higher order learning skill of the students are very low.

IV. Conclusion

Examination is one of the important forms of assessment in students learning process. Students try to do a good result through the exam. But the main focus of the exam is not having a good or excellent result by the student. The objective of the process is to measure learning outcome of the students. Measure of learning outcomes means not only the learning achieved through memorizing but also the learning which is called higher order learning. According to Blooms domains of learning; analysis, synthesis and evaluation sub domains of cognitive domain, affective and psychomotor domain are well known as higher order learning. Science subjects are the most important subjects through which the higher order learning ability of students can be measured. The objective of science subjects is to judge the understanding, application, analysis, synthesis and evaluation ability of the students along with the knowledge so that it can have effect on students higher order learning.

In general, the items of the examination question paper ask from the students the answer of 'what' rather than 'why' or 'how' (Ahmed, 2002). According to the Criteria the language of some question items demanded some higher skills like understanding, application and analysis. So it may be assumed that these items involve the students in critical thinking ability and application and analytical ability. But it has been found that the students are actually encouraged and involved in memorizing the answers as the answers are given in the text.

The nature of the question items is such type that it encourages the students to memorize the answer of some previous selected and constructed items. Though there are some question demands some higher ability than simple recalling but in reality the students do not get the chance to practice these abilities as they find it easier to find and memorize the answer. From teachers, students and experts response it has been cleared that science question items influence the students mainly for memorizing or recalling which represents the lowest level of cognitive domain. The question papers are developed in such a way that students only practice their knowledge ability for good result. It is also come out from the study that the science examination does not play any role for significant higher order learning. The content or item of the exam is knowledge demanded and it does not make the students to understand, apply and analyze or achieve other higher skills according to Bloom's cognitive higher order learning.

From the study, it has been found that the current assessment process and the nature of the question items do not influence the students learning to the direction of higher order. The items of the science examinations are designed in such a way the students do not feel the need to achieve the higher order learning skills. From the study it has also given a clear idea that the examination system only gives preference for good marks rather than acquiring the higher order learning skills like analysis, synthesis and evaluation. By the current assessment system students are more influenced to get good marks in the examination, which in fact might not has any role on their learning except the lower order learning like memorizing. The test items need to be like that in which the learners are not engaged in finding the answers from some source and memorized it. The items should be designed in such a way that it encourages the students for self-thinking.

The study is an effort to make people understand the relationship between the examination and students learning. Attempts have been taken to examine the assessing process of the science exams that are being used in the examination. The study has also investigated the concept of teachers and students about the learning influenced by the science exams and the role of these particular exams on students higher order learning. The findings will give the relevant educators, teachers, parents, students and concerned authority a clear idea and knowledge about what kind of learning is encourage by the exams and does it help the students higher order learning. It would make them thinking alternatively about the exams nature, which might be helpful for students higher order learning.

As this is a small-scale study and because time was limited, the researcher has selected only the capital area to select samples of students and teachers from some selected schools and colleges. Students and teachers of science group of secondary education have been selected for the study. Therefore, the Result of the study would be restricted for the specific group rather than to a general group.

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