ANALYSIS OF ACTIVITIES IN JUNIOR SECONDARY SCIENCE CURRICULUM OF BANGLADESH

-A FOCUS ON SCIENCE PROCESS SKILLS-

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Abstract

This study aims to explore process skills in junior secondary science curriculum in Bangladesh. Data was collected through document analysis. An interpretive research methodology was adopted to extract meaning from the data. Activities of three science textbooks from grade six, seven and eight were analyzed. All the activities were selected from physical science part of the textbooks. 68 activities from 35 chapters were analyzed. The study has revealed that junior secondary curricular activities emphasized on basic process skills mainly observing, inferring and to some extent measuring. Other basic skills like classifying, predicting, communicating and time space relationship are less emphasized. Except identifying variable skill, other integrated skills were not found at all. The study also reveals the inconsistency of process skills reflected in the curriculum across grade levels. As promoting process skills is one the main goals of science curriculum, this study strongly suggests to re-organizing the contents and activities of the curriculum so that every process skill is communicated.

Key words: Junior Secondary Science Curriculum, Process skills, basic skills, integrated skills, Bangladesh

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Background of the study

Process skills are the ways of thinking about and interacting with materials and phenomena that can lead to an understanding of new scientific ideas and concepts. By using these skills, students can gather information, test their ideas, and construct scientific explanations of the world. Process skills are especially important in inquiry-based learning; they are tools that students use to carry out scientific investigations and build an understanding of scientific concepts from the results of those investigations (Exploratorium, 2006).

In Bangladesh, the main objective of science is to understand nature (MoE, 2010). Science has been unraveling the mystery of nature through experiment, observation and mathematical logic. The goal of newly introduced secondary science curriculum is to utilize process skills for developing knowledge and ideas about nature through inquiry. The goal is stated as follows:

"To enable learners to gain knowledge by exploring nature through ***inquiry*** *and enable them to use this knowledge in real life*" (NCTB, 1996).

Inquiry is a multifaceted activity that involves the process of science, for example, making observations; posing questions; examining books and other sources of information to see what is already known; planning investigations; reviewing what is already known in light of experimental evidences; using tools to gather, analyze, and interpret data; proposing answers, explanations and prediction; and communicating the results. Inquiry requires identification assumptions, use of critical and logical thinking, and consideration of alternative explanations (National Research Council [NRC], 1996). As newly introduced curriculum (1996) intends to promote process skills, therefore, a rigorous study on the curriculum regarding process skills is needed to figure out the effectiveness of the curriculum.

The purpose of this study was to analyze three junior secondary science textbooks' activities to determine the emphasis given to process skills categories: a) basic process skills b. integrated skills across grade levels. The specific research question that guided this research is: what process skills are emphasized across the junior secondary grade levels?

Although much research regarding process skills have been carried out in western countries, research regarding science process skills is still scarce in South-Asian countries. This study is an initial effort regarding process skills especially in Bangladesh. The result of this study is expected to provide information especially teacher educators, teachers and curriculum

developer and other stakeholders about the process skills at junior secondary levels in Bangladesh.

Secondary Education System: A brief Introduction

Secondary education system in Bangladesh consists of 7 years duration with 3 sub-levels; Junior Secondary Education (Grade VI-VIII), Secondary Education (IX-X) and Higher Secondary Education. After finishing grade X, students have to sit for a public examination and earn` a Secondary School Certificate (SSC) degree and after finishing grade XII, they earn` a Higher Secondary Certificate (HSC) degree. At junior secondary level student must study science known as general science as a compulsory subject. At this stage there is no stream like science, arts or business studies. Stream wise segregation starts from grade nine.

Concept of process skills

Science educators have identified three main aspects of Science: a body of knowledge, a set of process (a way of investigating), and a way of knowing (Bell, 2009; Rezba, et al., 2007). The process skills (PS) are just one aspect (a set of process) of science. The aspect of process of science variously termed as the scientific method, scientific thinking, critical thinking, inquiry, and problem-solving (Padilla, 1990; Welch, 1975). Today the term "science process skills" is commonly used. Popularized by the curriculum project, Science - A Process Approach (SAPA), these skills are defined as a set of broadly transferable abilities, appropriate to many science disciplines and reflective of the behavior of scientists (Padilla, 1990). Rezba, et al., (2007) define Process skills as ways of thinking in science.

SAPA grouped process skills into two types:-basic and integrated. Other researchers acknowledge this grouping of PS. But the components of process skills vary from one source to another. Different researchers list different numbers of components of PS within *basic* and *integrated* categories. For example, SAPA II (1975, cited in Riris, 2004) compiled a list of 13 process skills including basic and integrated, Oustland(1998) and Gable(1993) list 15 PS; Tolman(2002) lists 10 PS; the most recently Martin , et al,.(2004) list 16 PS.

This research has considered 13 process skills compiled by SAPA II (1975) as they are the basics and most common skills in junior grade levels (Riris, 2004). The definitions and examples given below are based on current sources of process skills that represent commonly accepted uses of the process skill terms: Padilla (1990); Rezba, et al., (2007); Exploratorium (2006); Oustland (1998); Gabel (1993); Riris (2004); and AAAS(1965).

Basic Process Skills

1. *Observing*- using the senses (seeing, hearing, touching, tasting, smelling) to gather information about an object or event. Technology can sometimes extend our senses. Magnifying lenses, for example, can extend the sense of sight. Example: Listing the similarities and differences of a cube of ice and a ball of ice.

2. *Classifying*- grouping or ordering objects or events into categories based on properties or criteria. Children can classify when grouping objects by their observed properties and /or arranging objects or events in a particular order. Example: Placing all rocks having certain grain size or hardness into one group.

3. Measuring - using both standard and nonstandard measures or estimates to describe the dimensions of an object or event. Measurements of the properties of objects and substances and events help to communicate information about such things as their length, volume, temperature, mass, weight, force, time, and so on. Example: Using a meter stick to measure the length of a table in centimeters.

4. *Predicting* - stating the outcome of a future event based on a pattern of evidence. In fact, a prediction is based on knowledge about what has happened before, a pattern of evidence, or a hypothesis. It is a response to the question, "what will happen in this particular instance if…?"

Example: Predicting the height of a plant in two weeks time based on a graph of its growth during the previous four weeks.

5. *Inferring*- is a statement that attempts to interpret or explain a set of observations. The logical conclusion we draw from a set of observations is inference. It is a response to the question, "what do your findings tell you?" Example: The cabbages that were growing in my garden are gone and there are droppings on the ground. That is evidence that rabbits have been there.

6. *Communicating*- is to express thoughts in ways that others can understand. Effective communication is clear, precise, and unambiguous. Communication tools help children to be able to make good decisions about how to communicate observation and ideas. Some communicating tools that are common in science classrooms are: data table, charts, graphs, concept maps, models, oral description, drawings, body language, written language, and so on. Example: Describing the change in height of a plant over time in writing or through a graph.

7. *Using Space-Time Relationship*- is identifying relative position and motion of object, as well as changes over time. All events occur at certain times and in certain places. For example, if a

child is studying the flotation of objects using a bowl of water and an object to test, location and timing are unimportant. But if the task is to check the outdoor temperature in the shade of the building each hour throughout the day, both timing and location are crucial in comparisons that are to be made. ***Integrated Process Skills***

1. *Controlling variables*- being able to identify variables that can affect an experimental outcome, keeping most constant while manipulating only the independent variable. Example: Realizing through past experiences that amount of light and water need to be controlled when testing to see how the addition of organic matter affects the growth of beans.

2. *Interpreting data* - organizing data and drawing conclusions from it. Example: Recording data from the experiment on bean growth in a data table and forming a conclusion which, relates trends in the data to variables.

3. *Formulating Hypothesis* is to make educated guesses on the basis of current information, prior to investigating or experimenting. Formulating hypothesis is similar to prediction but more controlled and formal. Example: The greater the amount of organic matter added to the soil, the greater the bean growth.

4. *Defining operationally* - stating how to measure a variable in an experiment. Example: Stating that bean growth will be measured in centimeters per week.

5. *Experimenting*- is investigating through controlled manipulation of variables, using all applicable and appropriate process skills. Example: The entire process of conducting the experiment on the affect of organic matter on the growth of bean plants.

6. Formulating models - creating a mental or physical model of a process or event. Examples: The model of how the processes of evaporation and condensation interrelate in the water cycle.

The definition of 13 process skills has been used as reference for identifying and classifying the process skills that involve in activities (experiments).

Research design: This study was conducted based on interpretative research framework (Strauss & Corbin, 1990). Identifying the themes or patterns is the main stance of interpretative research by looking at the meaning of the text. A text or document does not have a single 'objective' meaning, it has multiple meanings; the key activity in document research is interpretation rather than trying to discover "some kind of Holy Grail" (Wellington, 2000, p. 116). Finding interpretive understanding is the main focus in document research. It involves a deeper understanding and interpretation of documents; it is the exploration and decoding of the

underlying, hidden meaning of a text. Curriculum documents are valuable sources in educational research; they are treated as social products, therefore the object of the analysis (Wellington, 2000, p 110). In this research the textbooks considered as intended curriculum because they are published by curriculum authority and in fact, are de-facto curricula. Since this research attempts to identify process skills themes to extract meaning from the curriculum documents so the adopted research framework is suitable to identify themes focusing the meaning of the text.

Data source: Data for this research has been collected from the science textbooks below:

a. Shamsudduha, A.K.M., Golam R. M., Abdul, W., & Khan, Z.I. (1997). *General Science: for class VI [in English]* Dhaka: National Curriculum and Textbook Board.

b. Shamsudduha, A.K.M., Golam R. M., Abdul, W., Khan, Z.I., Chowdhury, M.H. K (1997). *General Science: for class VII [in English]* Dhaka: National Curriculum and Textbook Board.

c. Shamsudduha, A.K.M., Golam R. M., Abdul, W., Khan, Z.I., Morshed, A.K.M. (1997). *General Science: for class VIII [in English]* Dhaka: National Curriculum and Textbook Board.

The selected textbooks are published by curriculum authority know as National Curriculum and Textbook Board (NCTB) and year of publication is 1997. NCTB is the only institute of the country in charge of developing, publishing and distributing the curricula, the syllabi and the textbooks. So, the selected textbooks are compulsory for using in junior secondary grads across the country.

Science activities that require the use of various science process skills. Therefore, this research has chosen the activities of the textbooks selected from the physical science part. The reason for this is that the physical science part of the books contains most of the activities (experiment) and comprises more than 60% of the chapter of the entire books. Grade and chapter wise number of activities of physical science are shown in the table 1.

Grade	Chapter contents	Number of Activity(s)
6th	Measurements	3
	Matter	5
	Air	5
	Metal and Non metal	0
	Water	1

	Force, Pressure and Motion	0
	Work, power and Energy	0
	Electric Energy	4
	Megnetic Enrergy	1
Subtotal	**9**	**19**
	Heat	4
	Pressure of liquid	5
	Atmosphere	4
	Oxygen	6
	Hydrogen	1
7th	Carbon dioxide	1
	Solution	1
	Light	1
	Magnetism	3
	Electricity	0
	Common laboratory process	5
	Product of essential good from Discarded Raw material	0
Subtotal	**12**	**31**
	Structure of Matter, Atom and Molecule	2
	Symbol, Formula and Valency	0
	Chemical Reaction and Chemical Equation	0
	Acid, Bases and Salts	7
	Hardness of Water	3
8th	Common Laboratory Process	1
	Measurement	0
	Gravitation and Gravity	0
	Simple Machines	0
	Heat	3
	Sound	1
	Refraction of Light	1
	Electricity	0
	Science and Technology in Everyday Life	0
Subtotal	**14**	**18**
Grand	**35**	**68**

Table 1: Physical science chapter contents and activities according to Grade.

Data collection & analysis: Textbooks analysis

There are a variety of conceptual frameworks for conducting textbook analysis, each designed to examine printed material from a particular perspective. Some frameworks address the inclusion of subject matter content, some the difficulty of the content or the readability, and others the epistemological orientation or in-depth meaning of the text (Koulaidis & Tsatsaroni,

1996). This research, therefore, has focused the in-depth meaning of the text to identify the process skills through activities analysis to meet the research objective.

For identification of PS from an activity, this study has focused the meaning of the *direction* of the activity. This method of PS identification from activities has been followed by many other researchers (e.g. Exploratorium, 2006; Rezba, et al., 2007). Table 2 shows an example of process skills identification. To accomplish the task of identification, the following steps have been considered:

a. *Direction of the activity* needs to identify through carefully reading and underlined the text.
b. Find out the in-depth meaning of *the underlined direction* what it conveys about the component of PS.
c. The conveyed component of the PS has been marked as "×" sign in appropriate column of the PS and
d. Checked with the concept of PS (mainly the definition) to make sure that the *direction of the activity* really means so.
e. To assure the reliability, again the PS component was checked by two other inter raters who are experienced, knowledgeable, and researching on PS.
f. Take record of the identified skills according to grade and components.
g. Total number of skills according to grades and components.

Before analyzing, the study sets some criteria previously used by Riris (2004) as follows:

1. Textbooks analysis includes all activities (experiments) in grade 6 to grade 8 physical science contents.
2. The definition of 13 process skill provides theoretical frame work to identify components of PS.
3. Basic skills (BS) are considerably discrete skills which include *observing* (O), *classifying*(C), *measuring* (M), *communicating* (Co), *predicting* (P), *inferring* (I), and *using space-time relationship* (STR).
4. Integrated skills(IS) are considerably collective skills which include (a) formulating hypothesis, (b) controlling variable, (c) experimenting, and (d) interpreting data

.Table 2: process skills identification

Sample activities	Identified and underlined the direction/s	Component of PS								Check with the concept of Process Skills	Inter rater	
		BS							IS		1	2
		O	C	M	P	I	STR	Co				
a. Take some lime stone ($CaCO_3$) in a test tube and add few drops of hydrochloric acid in it. What have you seen? What happens if you hold an ignited stick at the mouth of the test tube? Can you explain what has just happened?	What have you seen?	×	-	-	-	-	-	-	-	Observing is using sense (seeing) to gather information about an object or event	√	√
	What happens if you hold an ignited stick at the mouth of the test tube?	-	-	-	×	-	-	-	-	Prediction is a response to the question, "what will happen in this particular instance if…?"	√	√
	Can you explain what has just happened?	-	-	-	-	×	-	-	-	Inferring is a statement that attempts to interpret or explain a set of observations	√	√
b. Take some iron filings and some sulphur dust on a piece of paper and mix them well, spread them over the paper. You can observe through a magnifying	What do you see?	×	-	-	-	-	-	-	-	Observing is using sense (seeing) to gather information about an object or event. Magnifying glass increase the sense	√	√

glass. What do you see? Can you now separate the iron filings and sulphur dust from this mixture?	Can you now separate the iron filings and sulphur dust from this mixture?	-	×	-	-	-	-	-	-	Classifying- is grouping or ordering objects or events into categories based on properties or criteria.	√	√
	Total PS	2	1		1	1						

***Note**. All the activities are analyzed with the same process mentioned above. Finally, grade wise findings were discussed. The results show the chapter wise number of the activity and page numbers of the book because some activities on some pages do not contain any process skills.*

Accordingly, to identify integrated skills in the textbook activities, the study assumed if an activity include one of the four integrated skills, for instance (a), then the other three skills of (b), (c) and (d) were considerably included altogether.

Result and discussion

Grade and chapter wise activity analysis results regarding process skills (Basic and integrated) are given in the table 3, 4, and 5. The sign "×" in a particular column of PS, indicates that the analyzed activity contains PS component and the sign "-" indicates that the analyzed activity does not contain PS components.

Table 3 shows overall status of process skills at grade six. 2 observing, 1 classifying, 3 measuring, 2 predicting, and 2 inferring basic process skills are found through activity analysis across the chapter. In the textbook activities prescribed for grade six, there was no reflection for two other basic skills such as time-space relationship and communicating. Similar state was observed in the case of integrated skills. A trend of emphasizing basic process skills is shown in the activities.

Table 3: Process skills in grade six according to chapter wise activities.

Grade	Chapter	Activity (experiment)	Page	Process skills							
				BS							IS
				O	C	M	P	I	STR	Co	
6th	1	1	11	-	-	×	-	-	-	-	-
		2	12	-	-	×	-	-	-	-	-
		3	13	-	-	×	-	-	-	-	-
	2	2.1	26	-	×	-	-	-	-	-	-
		2.2	27	-	-	-	-	-	-	-	-
		2.3	28	-	-	-	-	-	-	-	-
		2.4	31	-	-	-	-	-	-	-	-

		2.5	33	-	-	-	×	-	-	-	-
	3	3.1	42	-	-	-	-	-	-	-	-
		3.2	44	-	-	-	-	-	-	-	-
		3.3	45	-	-	-	-	-	-	-	-
		3.4	45	-	-	-	-	-	-	-	-
		3.5	46	-	-	-	×	-	-	-	-
	4	-	-	-	-	-	-	-	-	-	-
	5	1	71		×	-	-	-	-	-	-
	10	-	-	-	-	-	-	-	-	-	-
	11	-	-	-	-	-	-	-	-	-	-
	12	1	171	-	-	-	-	-	-	-	-
		2	172	-	-	-	-	×	-	-	-
		3	174	-	-	-	-	×	-	-	-
		4	175	×	-	-	-	-	-	-	-
	13	1	187	×	-	-	-	-	-	-	-
	Total			2	1	3	2	2			

Here, "×" = activity has PS component; "-"activity does not have PS component

Table 4 shows overall status of process skills at grade seven. Chapter wise activity analysis has revealed 8 observing, 4 measuring, 1 predicting, 6 inferring, and 2 communicating basic skills. There is no reflection for classifying and time-space relationship skills in the activities across the chapter. A similar state was found in the case of integrated skill.

Grade	Chapter	Activity (experiment)	Page	Process skills							
				BS							IS
				O	C	M	P	I	STR	Co	
	1	1	6	×	-	-	-	×	-	-	-
		2	13	-	-	-	-	-	-	-	-
		3	16	-	-	×	-	-	-	-	-
		4	16	×	-	-	-	-	-	-	-
	2	1	21	-	-	-	-	×	-	-	-
		2	22	×	-	×	-	-	-	-	-
		3	24	-	-	-	-	-	-	-	-
		4	26	-	-	-	-	×	-	-	-
7th		5	27	-	-	×	-	-	-	-	-
	3	1	38	-	-	-	×	-	-	-	-
		2	38	-	-			×	-	-	-
		3	39	-	-	-	-	-	-	-	-
		4	39	-	-	-	-	-	-	-	-
	4	1	52	-	-	-	-	-	-	-	-
		2	54	-	-	-	-	-	-	-	-

		3	58	×	-	-	-	-	-	-	-
		4	59	×	-	-	-	-	-	-	-
		5	60	×	-	-	-	-	-	-	-
		6	62	-	-	-	-	×	-	-	-
	5	1	69	-	-	-	-	-	-	-	-
	6	1	79	-	-	-	-	-	-	-	-
	7	7.1	97	×	-	×	-	-	-	-	-
	13	1	193	-	-	-	-	-	-	×	-
	14	1	198	×	-	-	-	-	-	-	-
		2	200	-	-	-	-	×	-	-	-
		3	203	-	-	-	-	-	-	×	-
	15	-	-	-	-	-	-	-	-	-	-
	19	19.1	251	-	-	-	-	-	-	-	-
		19.2		-	-	-	-	-	-	-	-
		19.3	255	-	-	-	-	-	-	-	-
		19.4	256	-	-	-	-	-	-	-	-
		19.5	257	-	-	-	-	-	-	-	-
	20	-	-	-	-	-	-	-	-	-	-
	Total			8		4	1	6		2	

Table 4: Process skills in grade seven according to chapter wise activities.

Here, the sign "×" = activity has PS component & the sign "-"=activity does not have PS component

Table 5 shows overall status of process skills at grade eight. 8 observing, 1 classifying, 2 predicting, 5 inferring, 1 communicating and 1 integrated skill are identified through activity analysis. Like previous grades, no reflection is found regarding space-time relationship in grade eight as well. A similar pattern is shown in the case of measuring skill.

Table 5: Process skills in grade eight according to chapter wise activities.

Grade	Chapter	Activity (experiment)	Page	Process skills (BS)							IS
				O	C	M	P	I	STR	Co	
	1	1	7	×	-	-	-	-	-	-	-
		1	9	×	-	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-
	4	4.1	43	×	-	-	-	-	-	-	-
8th		4.2	44	×	-	-	-	-	-	-	-
		4.3	45	×	-	-	-	-	-	-	-
		4.4	47	-	×	-	-	-	-	-	-
		4.5	51	×	-	-	-	-	-	-	-

	4.6	51	-	-	-	-	×	-	-	-
	4.7	52	-	-	-	×	-	-	-	-
5	5.1	61	-	-	-	-	×	-	-	-
	5.2	62	-	-	-	-	×	-	-	-
	5.3	65	-	-	-	×		-	-	-
6	1	79	-	-	-	-	-	-	-	-
7	-	-	-	-	-	-	-	-	-	-
8	-	-	-	-	-	-	-	-	-	-
9	-	-	-	-	-	-	-	-	-	-
10	1	118	-	-	-	-	×	-	-	×
	2	123	-	-	-	-	×	-	-	-
	3	124	×	-	-	-	-	-	-	-
11	1	132	×	-	-	-	-	-	-	-
12	1	142	-	-	-	-	-	-	×	
13	-	-	-	-	-	-	-	-	-	-
14	-	-	-	-	-	-	-	-	-	-
Total			8	1		2	5		1	1

Here, "×" = activity has PS component; "-"activity does not have PS component

Table 6 provides information regarding the frequency of process skills (*basic* and *integrated*) in different grade levels. There are 10 basic skills in grade six, 21 in grade seven and 18 in grade eight. Grade six and seven do not contain any integrated skills. Only one integrated skills namely identifying variables is shown in grade 8. According to the data, process skills, in basic process skills category, were mostly involved in the 7th grade as well as in the 8th grade and were least involved in the 6th grade. Meanwhile, process skills in integrated category, were almost not involved in any studied activities. Observing skill was found more prominent (18) in basic skills category where other skills, like classifying (2), predicting (5), and communicating (3) were less prominent. Time-Space relationship skill was absolutely absent in all grades, in a similar fashion with the integrated skills such as defining operationally, formulating hypothesis, experimenting and interpreting data.

Table 6: Grade wise number of Process skills.

Process skills	Type of skill	Grades		
		Grade 6	Grade 7	Grade 8
Basic Skills	1.Observing	2	8	8
	2.Classifying	1	-	1
	3. Measuring	3	4	-
	4.Predicting	2	1	2
	5.Inferring	2	6	5
	6.Communicating	-	2	1
	7.Time-Space relationship	-	-	-
Integrated skills	8.Defining operationally	-	-	-
	9.Formulating hypothesis	-	-	-
	10.Experimenting	-	-	-
	11.Identifying variables	-	-	1
	12.Interpreting data	-	-	-
	13.Formulating model	-	-	-
Total		**10**	**21**	**18**

Figure1 shows overall distribution of process skills across grade levels. Observing skill is highly emphasized in grade 7 and grade 8 but not emphasized in grade 6 in a similar manner. Similar pattern is also seen in the case of inferring skill. Among the grades very little emphasis is given in the case of classifying skill where there is no reflection of it in grade 7. A moderate emphasis is given in measuring skill in grade 6 and 7 while grade 8 does not make any room for it. More or less, a similar fashion of emphasis is given in the case of predicting skill at all grade levels. Communicating skill makes very little space at grade 7 and grade 8 while in grade 8, there is no room for it. Among the 13 process skills, time-space relationship, formulating hypothesis, experimenting, interpreting data and formulating model do not communicated through activities in all three grades. Identifying variables skill is communicated only in grade 8.

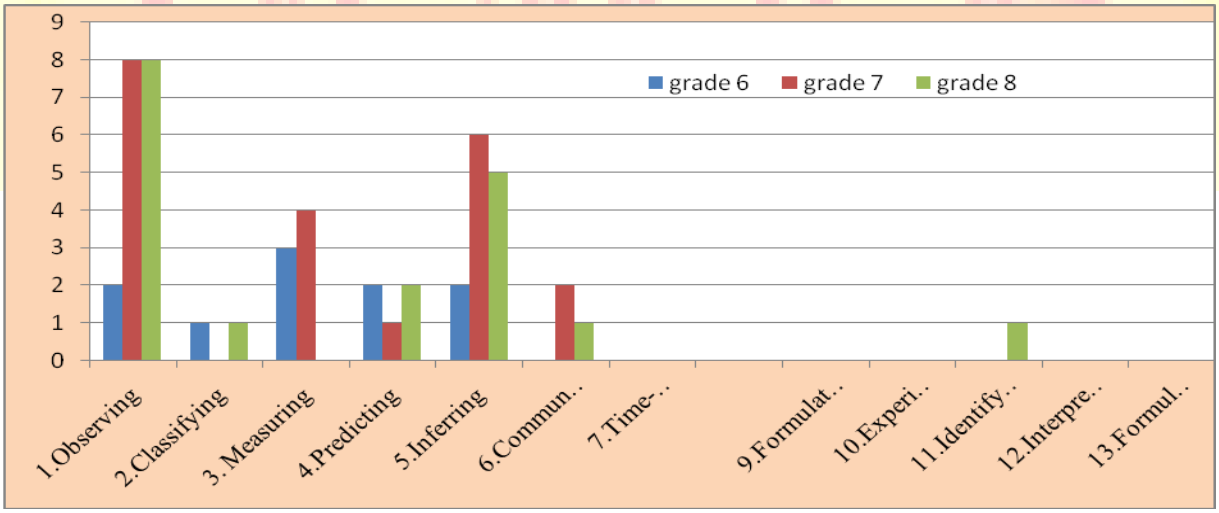

Fig.1. Science process skills across the grades

The concept of learning hierarchies and processes of science by Gagné (1965) provide a theoretical framework for process skills. Learning hierarchy refers to the progressive development within each process skill. At the earliest stage, process skills are basic and discrete. They become increasingly interrelated as science courses progress. For instance, inferring skill is interrelated with observing skill. The students develop competency in the basic processes and after they have acquired these skills, they continue to use these skills in the more complex form of the integrated processes of scientific activity.

The Idea of learning processes of science, suggests that basic process skill is communicated in early grade and intergraded skills are communicated in higher grade. This notion of science processes do not reflected properly in the textbooks studied. For example, Observing skill, one of the very basic skills, is emphasized highly in grade seven and eight but not in grade six. Similar patterns are also seen in the case of inferring skill. The study also reveals the inconsistency of process skills across the grade.

The newly introduced curriculum (1996) call for a paradigm shift to encourages the application of understanding and skills to real-world contexts through inquiry rather than rote memorization of presented facts. But this study has revealed that junior secondary science textbooks activities of Bangladesh fail to promote process skills, especially integrated skills, primarily because of two reasons: textbook activities did not hierarchically promote process skills and did not significantly address inquiry.

On the basis of the findings, it can be suggested that junior secondary science curricula's contents and activities should be re-organized so that it can communicate all the process skills through inquiry.

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