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"Alignment of National Curriculum with Textbooks of Mathematics for Grade V and General Science of Grade VIII in Baluchistan

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Abstract

Textbooks are the main source of transferring knowledge to secondary school students in Pakistan. These textbooks are reflection of educational policy and national curriculum. Main objective of the current study is to observe the curriculum alignment with the textbooks of Grade V and Grade VIII. Qualitative research approach was adopted by using document analysis .Curriculum-Textbook Alignment Rubric and Qualitative Analysis of C-T Alignment were used as tools for data collection. National curriculum and textbooks of General Science for grade VIII and Mathematics for grade V were analyzed. The results of the study reveal that content and Student Learning Outcomes (SLOs) of the textbooks are truly aligned with National Curriculum.

Key words: textbooks, curriculum alignment, Baluchistan, national curriculum, General Science and Mathematics

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1.1. Introduction

Around the world every country sets its educational and national goals. In the light of these goals and objective curriculum is developed .For the attainment of these goals textbooks are developed in such a way which satisfy the national and education standards of the country. Textbooks are developed according to the national policy and curriculum Shah, Rafique, Shabir& Zahid (cited in Mehmood,2009).When the content of textbooks are not in alignment with national curriculum, then the attainment of national goals are not possible. Textbooks are the only easily accessible resource in teaching and learning process especially in developing countries including Pakistan. Mehmood (2011) stated that textbooks play significant role in teaching and learning process especially in developing countries. In Pakistan, textbook is distinctive teaching resource among all others resources. Textbook is long-lasting, convenient and there is no need of electricity and any other electronic device while using it (Sunday, 2014). In the context of Pakistan, the leg mate source of knowledge for instructor and learners are textbooks identified by Bano (2005). Majority of teachers use textbooks due to the following reasons (i): As it is time consuming and difficult process to develop their own content for class,(ii):Teachers don't have that much time to prepare and develop their lessons for class,(iii): due to some restrictions made by administrator and examination system ,teachers are not allowed to make their own content (Sheldon,1988). Newly inducted, inexperienced instructors and those teachers who do not have time for lecture preparation actually teaches from the textbooks word by word (Tyson, 1997). Tomlinson (2010) affirmed that textbooks help pupils for examination preparation, it saves the teachers' time for lecture preparation of class, regulate their instructions, and help the head of educational administrator to run teaching and learning process everywhere at a particular grade of language. Therefore; it is the need of time to examine whether textbooks are in accordance to National context and to evaluate that these textbooks are effective and useful. These are the main reasons that textbooks should be aligned with National Curriculum. The textbook evaluation is crucial to identify the merits and demerits of textbooks. While developing the textbooks, many things should be kept in mind.

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Firstly, does it help to attain the national goals? Do the material and content of textbooks are interesting? Does it help to promote the skills regarding to all level of Bloom's taxonomy? By continuous process of evaluation of textbooks, we can identify the shortcomings and can improve the standards of textbooks in all aspects. Mehmood (2011) stated that textbooks must be developed according to the National Curriculum. Glatthorn (2000) found out that if textbooks are not aligned with curriculum. It shows that curriculum and textbooks developers the teachers are not in contact with each other and they all are working in isolation asserted by Mahmood (2010). To improve the quality of textbooks, its alignment with curriculum is mandatory. When textbooks are aligned with curriculum, its quality improves (Mahmood , 2010).

It is the foremost research study which focuses curriculum and the availability of "Student Learning Outcomes"(SLOs) and content mentioned in textbooks published by Balochistan Textbook Board (BTB), Quetta. The textbooks play a very pivotal and crucial role in learning and teaching process. In developing countries, the role of textbook is broadened as it is utilized by teachers and students when it is needed and demanded (Mahmood, 2011). Shah, Rafique, Shakir, and Zahid asserted that in the developed countries the process of designing textbooks is quite different. In the first step, textbooks add the material which is present in national curriculum of the country and that too is done by professional publishers and curriculum designers (2015). In the second step, the government passes the newly designed textbooks through evaluation process to reassure its quality.

In Pakistan, textbooks play an important role in instruction as it is the most used and easily available source of gaining knowledge in the country. Due to the above mentioned reasons, textbooks are considered as the backbone of education system in Pakistan. As already discussed that textbooks are the main source of gaining knowledge and learning in the country, therefore; it becomes mandatory to check that whether textbooks are aligned to the national curriculum. Alignment and evaluation process are important as they highlight students' needs and learning objectives. There are multiple reasons to align a textbook with national curriculum. Firstly, it helps in pinpointing the advantages and disadvantages of the content present in

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textbooks. Secondly, it identifies that whether textbook fulfils purposes and objectives mentioned in the national curriculum. Thirdly, alignment aids in identifying potency and usefulness of textbook and helps to determine that whether bloom's taxonomy applies to the textbooks or not. All around the world, quality of textbooks is considered more important than other aspects discussed above.

The Federal Ministry of Education in Pakistan is accountable for sustaining the quality and standards of education, therefore; it is the criteria for textbooks to be approved by the Ministry of Education prior to be used in the schools (Mahmood, 2011). Curriculum Wing (CW) administers textbook development and curriculum and is responsible for upholding and managing standards of curriculum primary level to secondary levels in schools. Each province in Pakistan has its own functional Provincial Textbook Boards (PTBB). There are four textbook boards in the country which prepare, publish and are accountable for providing marketing to the textbooks which are the part of schools' curriculum (UNESCO, 1998). In order to ameliorate the quality of textbooks, the Provincial textbook boards pursue the instructions and directions mentioned in the national curriculum. In the next step of improving the worth of textbooks, they are forwarded to curriculum wing so that they can be reviewed and approved. The process of reviewing books is done by National Curriculum Review Committee (NCRC) which works under curriculum wing. Karamouzian, Narcy-Combas and Ahmad (n.d) asserted that it is an unfortunate fact that Ministry of Education is incapable of ensuring quality of textbooks. Ministry of Education is incompetent to set the quality standards for the textbooks which are used in schools.

1.2. Research Objective

The following are the main objectives of the study

1. To explore the alignment between the textbooks and national curriculum of grade VIII General Science.
2. To explore the alignment between the textbooks and national curriculum of grade V Mathematics.

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1.3. Research Questions

1. Do the content and material of textbook of General Science in grade VIII is in accordance with National Curriculum?
2. Do the content and material of textbook of Mathematics in grade V textbook is in accordance with National Curriculum?

1.4. Delimitations of the study

Due to the shortage of time and resources, this study is delimited to the textbooks of Science for grade 8th and Mathematics for grade 5th.

2.1. Research Method

Qualitative method of research was adopted to observe the alignment between the National Curriculum of Science for grade VIII and Mathematics for grade V with the textbooks of the said subjects published by Balochistan Textbook Board (BTB). The current study was conducted with the help of document analysis. Documents include the National curriculum for Science and Mathematics of grade VIII and V respectively. Along with this textbooks of General Science for Grade VIII and Mathematics of grade V were analyzed to observe its alignment with National Curriculum. .

Curriculum-Textbook Alignment Rubric and Qualitative Analysis of C-T Alignment developed by Saeed (2014) were used to analyzed the alignment between the National Curriculum and textbooks of Science and Mathematics of grade VIII and V respectively. Prior to use the instrument, the consent of the researcher was taken. The instrument of the study modified according to the needs of the study.

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2.2. Data Analysis and Interpretation

This section describes the data analysis and results of this study. Textbook of General Science for grade VIII and textbook of Mathematics for grade V were examined. Both General Science textbook and textbook of Mathematic are published by Balochistan Textbook Board, Quetta. The writers of these books are highly qualified and expert. This book is reviewed by internal and provincial committees. General Science textbook contains 12 chapters and textbook of Mathematics comprised of 9 units. Students Learning Outcomes are written in the start of each chapter. A total of 99 SLOs are there in the textbook of General Science for grade VIII. Textbook of Mathematics for grade V contains 84 SLOs.

2.3. Analysis of unit#8: Measurement of physical quantities

Table No.1 Analysis between Students Learning Outcomes given at the start of unit with the Students Learning Outcomes described in National Curriculum

S.No.	Students Learning Outcomes in Curriculum	Students Learning Outcomes in Textbooks	Alignment Degree		
			Aligned	Partially aligned	Not Aligned
1	Define a physical quantity with examples	Define physical quantity with examples	Yes		
2	Apply the prefixes milli-,kilo-, centi-, and interpret the units	Apply the prefexes milli-, kilo-,centi-, and interpret the units	Yes		
3	Interconvert smaller units and bigger units	Interconvert smaller units and bigger units	Yes		
4	Select and use measuring	Select and use	Yes		

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	instruments	measuring instruments	
5	Interpret SI units in daily life	Interpret SI units in daily life	Yes
6	Investigate why it is desirable for scientists to use the SI units in their work	Investigate why it is desirable for scientists to use SI units in their work	Yes
7	Measure the volume of liquid by reading correct meniscus	Measure the volume of liquid by reading correct meniscus	Yes

The above table explains the alignment degree of SLOs prescribed in national curriculum and eight class science textbook student learning outcomes .It is clear from the above table that science textbook SLOs are fully aligned with the national curriculum SLOs.

2.4. Analysis of unit #02: HCF and LCM

Table No.2Analysis between Students Learning Outcomes given at the start of unit with the Students learning outcomes described in National Curriculum

SR	Students Learning Outcomes in curriculum	Students Learning Outcomes in Textbooks	Alignment Degree		
			Aligned	Partially Aligned	Not Aligned
1	Find HCF of three numbers, up to 2 digits, using i) prime factorization method ii) division method	Find HCF of three numbers, up to 2 digits, using i) prime factorization method ii) division method	Yes		
2	Find LCM of four	Find LCM of four	Yes		

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	numbers ,up to 2 digits , using i) prime factorization method ii) division method	numbers, up to 2 digits , using i) prime factorization method ii) division method	
3	Solve real life problems involving HCF and LCM	Solve real life problems involving HCF and LCM	Yes

The SLOs mentioned in table No. 2 explains the match between the students learning outcomes stated in V grade Mathematics textbook of Balochistan Board, Quetta and SLOs mentioned in National Curriculum. It is clear from the above table that Curriculum SOLs and student learning outcomes mentioned in textbooks are in line with each other.

2.5 Alignment of National Curriculum of General Science of Grade VIII with Balochistan Textbook of General Science for Grade VIII

Table No. 3 Overall alignment of text of grade VIII General Science curriculum with Balochistan Textbook of General Science for Grade VIII

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	Unit Name in Curriculum	No of SLOs in Curriculum	Degree of Alignment		
			Fully Aligned	Partially Aligned	Not Alighted
	Human Organ system	9	Yes		
	Heredity in Organisms	5	Yes		
	Biotechnology	9	Yes		
	Pollutants and Their Effects on Environment	13	Yes		
	Chemical Reactions	9	Yes		
	Acids, Alkalis and Salts	6	Yes		
	Force and Pressure	8	Yes		
	Measurement of Physical Quantities	7	Yes		
	Sources and Effects of Heat Energy	9	Yes		
	Lenses	8	Yes		
	Electricity in Action	9	Yes		
	Exploring Space	7	Yes		
Total		99	Yes		

From above table No. 3, it is clear that overall text and content of curriculum are available in the textbook of General Science for grade VIII. It means that textbooks are truly

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aligned with the National Curriculum. All written SLOs in curriculum are present in the textbook. It also means that related pictures, diagrams and examples are illustrated in the textbook of General Science for grade VIII of Balochistan Textbook Board.

Table No. 4 Descriptive Analysis of C-T Alignment

Chapter/ Unit Wise Descriptive Analysis of C-T Alignment

Chapter/ Unit: Measurement of physical quantities **Number # 8**

Points of Concern	**Researcher's Comments**
1. Are there any sub-topics that do not match with the Student Learning Outcomes (SLOs) in Curriculum Document?	No
2. Is there any SLO that is not addressed in the Textbook? (If yes, mention please).	No
3. Are the illustration/pictures relevant to topic? (if no, mention)	Yes
4. Are the illustration/pictures helpful in the explanation of topic? (if no, mention)	Yes
5. Is there an exercise question for every SLO? (if no mention the topic/subtopic)	Yes
6. Is there an exercise question that does not belong to any SLO? (if yes mention the exercise question)	No

Qualitative Analysis of C-T Alignment (Saeed, 2014).

The above table No. 4 reflects the unit wise descriptive analysis of curriculum-Text Alignment of chapter No. 8, named Measurement of physical quantities. Descriptive analysis of

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C-T alignment informed us about the content available in the textbooks. Along with this, it also tells us about the structure of the book and related pictures or diagram available in the text which enhances the intellect of the pupils in schools. And, it let them understand clearly the concept they are learning. From the above table it is clear that relevant exercise is available in the content of textbooks along with pictures and graphs. It is also clear that related and relevant SLOs are available in textbooks. It means that the textbook of General Science of grade VIII of Balochistan textbook Board, Quetta is truly aligned with National Curriculum of General Science for grade VIII.

Table No. 5. Alignment of National Curriculum of Mathematics of Grade V with Balochistan Textbook of Mathematic for Grade V.

Unit Name in Curriculum		No of SLOs in Curriculum	Degree of Alignment		
			Fully Aligned	Partially Aligned	Not Alighted
	1. Numbers and Arithmetic Operations	11	Yes		
	2. HCF and LCM	7	Yes		
	3. Fractions	13	Yes		
	4. Decimals and Percentages	19	Yes		
	5. Distance, Time and Temperature	9	Yes		

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	6. Unitary Method	6	Yes
	7. Geometry	13	Yes
	8. Perimeter and Area	6	Yes
	9. Information Handling	7	Yes
Total		99	

Table No. 5 shows the textbook alignment with the curriculum of Mathematics for grade V. The table illustrated that all SLOs mentioned in textbook of Mathematics are truly representing the SLOs mentioned in the curriculum for Mathematics.

Table No. 6. Descriptive Analysis of C-T Alignment

Chapter/ Unit Wise Descriptive Analysis of C-T Alignment

Chapter/ Unit: HCF and LCM **Number # 8**

Points of Concern	**Researcher's Comments**
1. Are there any sub-topics that do not match with the Student Learning Outcomes (SLOs) in Curriculum Document?	No
2. Is there any SLO that is not addressed in the Textbook? (If yes, mention please).	No
3. Are the illustration/pictures relevant to topic? (if no, mention)	Yes

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4. Are the illustration/pictures helpful in the explanation of topic? (if no, mention)	Yes
5. Is there an exercise question for every SLO? (if no mention the topic/subtopic)	Yes
6. Is there an exercise question that does not belong to any SLO? (if yes mention the exercise question)	No

Qualitative Analysis of C-T Alignment (Saeed,2014).

The above table Qualitative Analysis of C-T Alignment (Seed, 2014) describing the textbook content alignment of Unit No. 2 HCF and LCM of subject Mathematics. It is clear from the above table that relevant topics and subtopics are available in the content of textbooks related to the main concept. It is illustrated from above table that pictures and graphs are truly representing the content and integrating SLOs with content under discussion.

3.0. Discussion and Conclusion

In the textbook for the subject of Science VIII grade, there are 6 learning strands for grade VIII mentioned in National Curriculum (2006) which encompasses: Life Science, Physical Science, Earth and Space Science, Skills, Attitudes, Science, Technology, Society, and Environment. Benchmark of all these strands are given in the National Curriculum for the textbook developers that will help them to select a content which covers all these SLOs, Strands, and Benchmark.

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There are six strands, 99 SLOs in the National curriculum for the VIII grade General Science textbook. These SLOs are stated in the start of each unit in textbook and all these SLOs are fully aligned with National curriculum SLOs. The content of the textbook covers all the topics which are mentioned in the National Curriculum. The exercises given at the end of each unit asses the cognitive domain of Blooms Taxonomy and fully satisfied the SLOs of National Curriculum.

National curriculum for the subject of Mathematics of grade V encompasses 9 unites, Total no of SLOs in the textbook are 84 for the subject of Mathematics. These SLOs covering a variety of student's cognitive abilities which are mentioned in the National curriculum. The SLOs stated in the textbook of Mathematics are totally same as listed in National Curriculum 2006.The are five standards for the subject of Mathematics which is mentioned in curriculum. These standards comprises Numbers and Operation, Algebra, Measurement and Geometry, Information Handling, Reasoning and logical thinking,

The student learning outcomes, standards and Benchmarks which are narrated in the National Curriculum (2006) for grade V are fully aligned with the textbook of Mathematics which are published by Baluchistan Textbook Board, Quetta. The content of book covers all the SLOs and Standards of the National Curriculum.

One of the main objectives of the study was to observe the cubiculum alignment of textbooks of mathematics and general science of grade V and VIII respectively. From findings of the study it is clear that both textbooks are truly aligned with the curriculum. SLOs and content mentioned in the national curriculum of Mathematics and General Science are available in the textbooks for the said subjects

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published by Balochistan Textbook Board, Quetta. Moreover, pictures, diagrams, and examples quoted in textbooks are truly representing the concept of learning**.**

3.1. Recommendation

In the light of findings and conclusion of the study, it is clear that textbooks of Baluchistan Textbook Board, Quetta are truly aligned with National Curriculum against mentioned subjects. The study recommends that the researchers in future should look into the implementing stage of curriculum. As day by day the quality of our education system getting worst and learning of the pupils falling down as mentioned in ASER, 2018 annual report. The results of the report indicate that 73 % of grade V pupils don't read and understand a single paragraph from the textbook of English published for grade III.

From the findings of this study, it is understood that the problem of worst quality of education is not due to the textbooks, but the problem exists in the classrooms. The learning processes which are taking place during instructions and in school are imperative. It is suggested that the researchers in future should observe and explore the elements which are responsible for low quality learning process.

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