Aligning Assessment and Learning Outcomes: A Case Study of Khyber Pakhtunkhwa 6th Grade Textbook of Science

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Abstract: This study aimed to align assessment with outcomes. A case study of grade 6 textbook of science with objectives to find out the students learning outcomes of grade 6 textbook of general science at Elementary and Secondary Education in Khyber Pakhtunkhwa, to find out the assessment techniques assigned with SLOs to grade 6 of science at Elementary and Secondary level in Khyber Pakhtunkhwa, to align the SLOs with assessment techniques of 6th grade science textbook to find coincidences or otherwise. The research questions were, what are the students' learning outcomes of grade 6th textbook of the science subject at Elementary level in Khyber Pakhtunkhwa? What are the assessment techniques assigned to those SLOs of grade 6th textbook at Elementary level in Khyber Pakhtunkhwa? What are the coincidences of the SLOs and assessment techniques of grade 6th science at elementary level in Khyber Pakhtunkhwa?

Key Words: Alignment, Curriculum, General Science, Learning Outcomes, Science Textbook

Introduction

An important concept of education is the idea of learning outcomes. By the conclusion of a learning session, course, or module, learners possess the abilities, and knowledge listed in these outcomes. According to Jenkins and Unwin (2001), learning outcomes clarify whatever is anticipated of students at the conclusion of a particular academic assignment. Similar to this, Adam (2004) identified learning outcomes as clear, and verbal assertions of the competencies, knowledge, and abilities a student should have after finishing a particular course of study.

Roberts (2010) goes on to say that learning outcomes are what the pupil needs to comprehend, know, and be able to carry out after completing a training course. In arguing for this point of view, Fitzmaurice and Donnelly (2005) noted out that learning outcomes, which focus on the measurable aspects of what students should do, offer an actual basis for instructional design and learner assessment.

As an additional process, assessment is the careful gathering and review of data that indicates the growth and accomplishment of students. As defined by Tontus (2020), it is the process of collecting and analyzing data gathered from a range of sources and activities that helps to develop a complete picture of student learning. Price and Nelson (2007) added that assessments are tools educators use to keep an eye on pupils' prior knowledge and learning development in the context of classroom practices. As defined by Walvoord (2010), assessment involves methodical methods of collecting and using student data for use in decision-making and instructional changes.

Further, with the goal to strengthen educational alignment and teaching success, Lines and Lambert (2000) described assessment as the process of collecting, examining, and utilizing facts related students' performance.

Despite its importance, whether testing methods truly reflect the instructional goals is an ongoing topic in curriculum and instruction. There are often differences between what is taught, what is measured, and what students are required

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to learn as an outcome of textbook-based practices or evaluation instruments that do not totally match with the stated Student Learning Outcomes (SLOs) (Kennedy, 2006).

Current curriculum frameworks in Pakistan make this issue especially important. Defining instruction and material across provinces is the aim of the Single National Curriculum (SNC). The amount to which the assessment homework in textbooks truly reflect the probable SLOs continue to be up for discussion (Ashraf, 2021).

This study compares whether the SLOs and end-of-chapter examinations match up in Khyber Pakhtunkhwa's Grade 6 General Science textbook. The research tries to find out whether the assessments satisfactorily support the curriculum's learning objectives and provide an important boost to pupil development by looking at this alignment. This was actually gap in research whether SLOs aligned with activity given in the exercises for the purpose of assessment or not.

Objective

- To determine the methods of assessment used with SLOs and the alignment of the science textbooks for grade 6 in Khyber Pakhtunkhwa's elementary and secondary schools.

Literature Review

For students to receive high-quality education, curriculum alignment—more especially, between learning objectives, instructional resources, and assessment procedures—is vital. Efforts to implement uniform syllabus in Pakistan, and specifically in Khyber Pakhtunkhwa (KPK), has brought to light continuing issues with linking pupil learning outcomes (SLOs) with textbook events and classroom assessments (Mahajan & Singh, 2017; Choong, 2013).

To check the unity of the written, taught, and assessed curricula in secondary schools in Punjab, Bhatti (2015) performed a curriculum audit. By focus on biology for grades IX–X, this study showed significant distinctions at the coarse and fine grain levels, particularly amongst teacher groups. Concerns within whether or not textbooks and assessments reflect academic objectives were highlighted by the misalignment of SLOs and exam questions. This study indicates a greater national challenge that also relates to middle-grade medical guidance, given the fact that it was done in Punjab and at the secondary level.

Ahmad (2019) carried out a more directly relevant inspection where he tested the value of teacher training programs that were provided by Khyber Pakhtunkhwa's Provincial Institute for Teacher Education (PITE). Based to his research, middle school teachers, including those in Grade 6, showed more capacity to carry out SLO-based teaching and assessment methods. However, concerns such as insufficient follow-up, irregular training delivery, and limited access to educational resources remained and ultimately had a bearing on classroom implementation.

Bibi (2021) studied Bloom's taxonomy to examine the alignment of secondary science curricula in KPK. While focusing on higher secondary schools, her research indicated that although textbooks addressed cognitive domains but mainly neglected the personal and psychomotor factors. In addition, the study identified gender-based inequalities and the underutilization of inquiry-based learning, two topics of which are particularly important to science education because this field involves concrete and critical thinking skills beginning in the early grades.

Few studies have taken up Grade 6 science textbooks in KPK with the focus on the alignment between SLOs and end-of-chapter exercises, considering the reality that these studies offer helpful details on educational and assessment issues at the provincial level. There is a glaring research null and void here. In science education, middle school is a significant transitional period as pupils go from basic understanding to more formal research in science. Students could miss key skills essential to future educational success if textbook performs fail to coincide with the stated outcomes.

SNC (Single National Curriculum)

The Single National Curriculum, according to the Ministry of Federal Education and Professional Training, helps students meet global standards, equips them with 21st-century abilities, and builds on topic development in the early grades to get them ready for conceptual learning in later grades.

Significance

Ashraf (2013) claims that in an attempt to provide their children with a contemporary education and facilitate their social integration, Prime Minister Imran Khan implemented the first phase of the Single National Curriculum (SNC) for classes I through V. Seminaries, public and private schools, and other educational establishments will all teach the SNC. Students in grades 6 through 8 are anticipated to begin utilizing the SNC the following year, and classes 9 through 12 are anticipated to begin using it in 2023. The cabinet authorized its implementation on February 25, 2020, after it was part of the PTI manifesto. Commercial publishers would also be allowed to print the curriculum's sample textbooks, which were purportedly authored by the government.

Methodology

Qualitative approach

Reporting with sincerity while evaluating weaknesses and the consequences of intentional bias. Because this study was qualitative in nature, a written analysis approach was used. In the opinion of Ary (2010), the term "documentation" covers a wide range of written down, material, and visual things, including what other writers may refer to as artefacts. To find out further about the subject, the researcher studied texts and other objects.

The proposed investigation included an examination of the following documents.

1. Khyber Pakhtunkhwa textbook board for the sixth grade science textbook
2. Science in Grade 6, Single National Curriculum,
3. SNC's curriculum development guidelines
4. DCTE's (Directorate of Curriculum and Teacher Education, Abbottabad) guidelines

A few scheduled interviews with key informants were conducted in addition to document analysis, including:

1. Director SNC
2. Director DCTE
3. Director PITE

The data was examined utilising the content analysis method, which includes creating and classifying codes, topics, and concepts. The content analysis technique's comparison analysis paradigm was used to reach conclusions.

Data Analysis

The general scientific curriculum for grades VI–VIII is based on the idea that scientific education increases kids' ability to research and answer questions concerning the nature of the events going place within the environment. Therefore, it meets with world standards. STEAM (Science, Technology, Engineering, Arts, and Mathematics) is a combined strategy used in the General Science Curriculum. The goal of the STEAM approach is to improve skill development. These skills prepare students for the 21st-century workforce. The learning way for each grade level reveals the way the needs for education and learning are laid out in a sequential way. Enhancing higher order thinking skills is the intent of the student-centered curriculum. Also, efforts have been made to improve the links between all scientific fields.

- Include children in scientific activities like creating hypotheses and predictions while promoting additional abilities like judgement and critical thinking.
- Increase imagination, teamwork, and communication in along with the use of lab equipment and the internet
- Students needed to be worthy to put together their own possible scientific findings.

We feel that our curriculum boosts students to take ownership of their own education by promoting scientific methodology and experimentation greater. As an outcome, they grow interest and finally begin finding ways that improve their potential for thinking on their feet.

As a result, students learn scientific knowledge, attitudes, and a sense of the value of scientific research. This is done through mental and physical exercises. It suggests that students shift their focus from "what" is going on in a specific situation to "why."

This technique takes students into line with a scientific approach and increases their awareness of the issue at hand. Children constantly look for answers since one of the most vital components of the curriculum is the development of scientific thinking. Rather than observing others' results, they are pushed to turn out their own.

The youth raise questions, arranges a search, obtains facts, and begins looking for the reply. One of the special features of the curriculum is the distinct sections allocated to "technology". We do not question that this will give the students a technical awareness of a number of issues that they may apply as a tool for solving issues facing the real world. People obtain trust when applying to specific fields and it improves their ability for dealing with troubles that come up during everyday life as the outcome of a range of probable situations.

Students split into two groups and get tutoring in person on odd or even days as a part of the curriculum's mixed structure. On the days when there is no in-person instruction, students will learn via the internet. One approach would be to rotate private lessons among various child groups once a week, or perhaps every day.

The Single National Curriculum (SNC) aims to remake education. Through a common strategy for advancing high-quality education, it pulls between the public and private sectors. This unification, textbook creation, a similar teaching method, cooperative teacher training, a successful evaluation system, and suitable monitoring and supervision can all help express the National Vision.

Table 1

Slos Chapter Balanced Diet	evaluating methods assigned with SLOS	Alignment of Both
Describe and diagnose illnesses driven on by nutritional deficiencies.	Multiple Choice Question (2,7,10) brief inquiry(3)	Indeed.
Find out the chemical arrangement, necessary nutrients, and dietary sources.	Multiple Choice Question (6,9) long question(1) brief inquiry(2,7) structure response question (1,3)	There is no partially aligned issue pertaining to chemical makeup.
Fitness and diet go hand in hand.	Long question(3) Multiple Choice Question (1) brief inquiry(6,7) project work	Indeed.

Table 2

SLOS Chapter Human Digestive System	Evaluating Methods Assigned with SLOS	Alignment of Both
Discuss one or two usual digestive sickness in brief.	There is no question-related stomach disorder.	Not in queue
Allow a quick overview of the purpose of enzymes in digestion.	brief inquiry(4) structure response question(1) Multiple Choice Question (5,10)	Indeed.
Highlight the significance of digestion to the human body and go over its physical and chemical parts.	Multiple Choice Question (1,3) brief inquiry(1) long question(1) structure response question(2)	Indeed.

Table 3

SLOS Chapter Mixtures	Evaluating Methods Assigned with SLOS	Alignment of Both
Outline the variations between elements, compounds, and combination.	Multiple Choice Question (1)	Aligned in part
Clarify why air is treated as a gas mixture.	brief inquiry(5) Multiple Choice Question (4,8)	Indeed.
A series of metals and other components are termed as alloys.	Multiple Choice Question (3)	Indeed.

Table 4

Slos Chapter Energy	Evaluating Methods Assigned with SLOS	Alignment of Both
Prepare and display how you can power a small fan with a solar panel.	There is no SLO linked to the question.	Not in queue
Invent a design for a solar water heater.	There is no SLO linked to the question.	Not in queue
Accept that energy has a physical appearance.	Multiple Choice Question (1,3)	Indeed.

Table 5

SLOS Chapter Cellular Organization	Evaluating Methods Assigned with SLOS	Alignment of Both
Appreciate that the initial parts of life are cells, which split into tissues, organs, systems, and organisms.	Multiple Choice Question (1,2), True False (1,3) brief inquiry(1,2,3)	Indeed.
As you paint each animal or plant cell, indicate the main organelles.	Long question (2), project work	Indeed.
Produce slides using cheek cells and onion peels to illustrate and contrast plant and animal cells.	Question with a structured response (1)	Indeed.

Findings

1. Unit 1's cellular arrangement and assessment methodology were judged to be consistent with SLO. The SLO for the multiple-choice, true-false, and short questions is "Realize that the initial parts of life are cells, which split into tissues, organs, systems, and species."
2. The MCQs short question, long question, and matching column were used to assess plant reproduction in a way that was determined to be consistent with the SLO in the unit under the SLO, " Name the various means that plants can multiply."
3. The assessment technique for balanced diet in Unit 3 showed that the question about chemical composition was only partially in line with SLO. The questions that address "Name the necessary parts, dietary sources, and the chemical makeup" include multiple-choice, short, long, and structured answer questions.
4. The SLO to "Summarise one or two frequent digestive sickness in brief." was not relevant to the question about digestive disorders, according to Unit 4's evaluation technique for the human digestive system.
5. The evaluation technique employed in unit 6, elements and compounds, was deemed to be somewhat compliant with SLO. The project task's SLO is "Using a word equation "Clarify the steps of creating a compound.
6. The Mixtures assessment technique used in Unit 7 was found to be partially compliant with SLO. "Outline the variations between elements, compounds, and blends." is the SLO for the multiple-choice questions.
7. The energy evaluation method used in Unit 8 was deemed to be inconsistent with the SLO question. "Make together a tiny fan and illustrate how to make a solar panel to power it."
8. It was found that the assessment technique in unit 8, Energy, did not correspond with the SLO "Develop and put up a water heater that works on solar electricity."
9. Technology in Everyday Life, the evaluation method used in Unit 11, was found to be partially compliant with SLO. The SLO for the multiple-choice and structure-answer questions is "Create a circuit that will show how it works of an electric bell."
10. Unit 12's Solar System evaluation approach was judged to be consistent with SLO. For the long question, the SLO is "Think about how man-made satellites have boosted our awareness of space and how space research applies them."

Conclusion

Science is a pragmatic field. Without laboratory validation, its theoretical form produces no results. In a similar vein, elementary school general science fundamentals require real-world applications to improve comprehension. Formative and summative assessment methods are necessary for the fundamental scientific concepts presented in textbooks. The alignment of objectives, context, and evaluation instruction was always the center of general science textbook authors' expertise. In this study, we examined the degree to which SLOs correspond with the assessment method used in the form of tasks at the conclusion of the lessons. Although it was discovered that most SLOs were in line with assessment methods, several of the activities lacked a connection to SLOs and were not centered on the real learning objectives. This is a problem with educational practices, especially when it comes to textbook construction, when all the caddied formalities of the textbook preparation structure are not taken into account.

Recommendation

1. The SLOs in the grade 6 general science KPK textbook were largely met by the assessment methods; nevertheless, some SLOs were disregarded and were not included in the assessment method.
2. It is advised that evaluation exercises at the conclusion of the class be in line with SLOs.
3. The process of creating textbooks needs to be varied and include M.E.D. as a required component.
4. To verify that SLOs and assessment methods are in line, more study will be done on different topics.
5. The curriculum process is a dynamic phenomenon that can be altered in response to the investigation of emerging technologies and trends in general science.

References

Adam, S. (2004, July). Using learning outcomes. In *Report for United Kingdom Bologna Seminar* (Vol. 1, No. 2).

Ahmad, S., & Khan, R. (2020). Exploring the Effectiveness of Science Training Program on the Performance of Science Teachers at Secondary School Level of Khyber Pakhtunkhwa. *Dialogue (Pakistan)*, *15*(2).

Bhatti, A. J. (2015). Curriculum Audit: An analysis of curriculum alignment at secondary level in Punjab. *Unpublished PhD Dissertation). International Islamic University, Islamabad*.

Bibi, F. (2021). *Analysis of Relevancy of Secondary School Science Curriculum with Bloom's Taxonomy in Khyber Pakhtunkhwa* (dissertation).

Choong, C. (2013). Definition of Assessment, Its Purpose in Classroom Assessment and Assessment Techniques. *Department of English at King Fahad University of Petroleum and Minerals (KFUPM)*.

Donnelly, R., & Fitzmaurice, M. (2005). Collaborative project-based learning and problem-based learning in higher education: A consideration of tutor and student role in learner-focused strategies. https://arrow.tudublin.ie/ltcbk/6/

Jenkins, A., & Unwin, D. (2001). *How to write learning outcomes*.

Kennedy, D. (2006). *Writing and using learning outcomes: a practical guide*. University College Cork. https://hdl.handle.net/10468/1613

Lambert, D., & Lines, D. (2000). *Understanding Assessment.* London: Routledge Falmer.

Mahajan, M., & Singh, M. K. S. (2017). Importance and benefits of learning outcomes. *IOSR Journal of Humanities and Social Science*, *22*(03), 65–67. https://doi.org/10.9790/0837-2203056567

Price, K. M., & Nelson, K. L. (2007). *Planning Effective Instruction: Diversity Responsive Methods and Management.* Thomson/Wadsworth.

Roberts, L. A. (2010). Assessing Ourselves: Confirming Assumptions and Improving Student Learning by Efficiently and Fearlessly Assessing Student Learning Outcomes. *Drexel L. Rev.*, *3*, 457. https://drexel.edu/law/lawreview/issues/Archives/v3-2/roberts/

Tontus, O. (2020). Concept of assessment and evaluation. *Glossary of Assessment & Evaluation in Higher Education*.

Walvoord, B. E. (2010). *Assessment clear and simple: A practical guide for institutions, departments, and general education*. John Wiley & Sons.