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THE ANALYSIS OF RELEVANCY OF SECONDARY SCHOOL (SSC) CURRICULUM WITH BLOOM'S TAXONOMY IN KPK

Marium Hussain[1], Uzma Munawar[2] & Husna Nazeer[3]

[1]PhD Scholar, Department of Education, The Women University Multan, Punjab, Pakistan
[2]Assistant Professor, Department of Education, Women University Multan, Pakistan
[3]PhD Scholar, Department of Education, The Women University Multan, Pakistan

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ABSTRACT

The study aimed to examine the impact of analysis of relevancy of secondary school curriculum with Bloom's Taxonomy in KPK. The study investigated This study investigates the relevance of the Secondary School curriculum in KP with Bloom's Taxonomy, a widely recognized framework for categorizing educational objectives across cognitive domains. Through inclusive review of curriculum content and teaching methodologies, study identifies significant gaps in the integration of higher-order cognitive skills within the curriculum in APS PMA Kakul and Burn hall school of Abbottabad. The population of the study includes all the teachers of APS PMA Kakul and Burn hall school of Abbottabad. The mean academic achievement score of teacher was calculated and compared with the teachers interaction score after making a data matrix. The data was analysed and study found that collaborative approach with the relevance of SSC science curriculum in KPK to Bloom's Taxonomy is a critical factor in shaping future of science education in the region. Addressing these gaps over curriculum reform and teacher training, as vital to ensure students' critical thinking and problem-solving skills necessary for success in higher education and beyond.

Corresponding Author: Marium Hussain: marium005@yahoo.com

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INTRODUCTION

A curriculum is a well-defined and prescribed course of study that provides information on learning objectives and outcomes, instructional materials, activities, and assessment techniques and processes used to provide program curriculum (Akhtar, Andleeb & Akhtar, 2024). Higher education institutions must have a framework for developing, analysing, and evaluating their

educational programs on a regular basis in order to identify the curricula's quality, relevance, and efficacy (Ali, 2018). Benjamin Bloom and his colleagues published Bloom's Taxonomy is a well-supervised learning paradigm that has long been utilised by elementary and secondary school teachers, university and college students, and academics. It offers cohesive framework and a uniform terminology for educators and academics to use. Bloom's Taxonomy can help to identify student's performance in class. The taxonomy was developed in response to need to stimulate growth of critical thinking abilities, to assure student knowledge of their degrees of performance in classes, and to raise student accountability in courses (Anderson & Krathwohl, 2001).

The resources for education are essential to the implementation of written curricula. However, the Punjabi secondary schools lack, misallocate, and underuse the resources that are available (Dahar & Faize, 2011). The Bloom taxonomy for educational objectives is used to assist teachers and curriculum creators in creating learning experiences for the students and in creating the assessment instruments to gauge their progress. They recommended that in order to guarantee a student's total growth, learning experiences should be divided into three primary categories: cognitive, affective, as well as psychomotor (Ali, Khan, Ali & Ali, 2021). The cognitive domain, which deals with information recall and recognition as well as growth of intellectual capacities and skills, has been accorded the highest emphasis by Bloom (Nasir & Iqbal, 2017). The fact that education is a very successful way to improve a society's individual and collective ethics serves as a gauge for its significance. The greatest thinkers, such as Plato and Aristotle, have glorified education and referred to it as the essential foundation of a well-balanced society. It could not be incorrect to say that curriculum is its materialized shape and that it is an abstract concept.

The curriculum serves as the foremost guiding principle for the education curriculum is not a unidirectional set of instructions; rather it is a meaningful process involving the sender and the receiver through a number of mediums. One such and verily most important medium is the textbook (Shahzad, Saleem & Mahmood, 2021). The importance of textbooks can be realized from the fact that they hold the central position in education, especially in the underdeveloped countries (Kelly, 2004). Curriculum is a meaningful process that involves both the sender and the recipient over a variety of media; it is not a one-way collection of instructions. The textbook is one such and unquestionably most significant medium. The fact that textbooks are essential to education, particularly in the developing nations, allows one to appreciate their significance (Memon, Ali & Ahmed, 2020). When teaching English to students as a foreign language, the textbook could be their only source of information. As a matter of fact, textbooks are first and weighty material that students worldwide, including those in Pakistan, have access to. The textbook serves as main teaching, learning and reference resource for language instruction in Pakistan.

Education was idealized and seen as the cornerstone of a well-balanced society during the eras of Plato and Aristotle. The education is the outcome of meticulous planning rather than being delivered randomly (Richards, 2005). One such instance of planning is curriculum. Curriculum

refers to diverse kinds of teaching and learning programs. The education experts, community members, parents, teachers, and students' confidence in kind of knowledge, values, skills, and attitudes that should be imparted to kids is reflected. The learner, the instructor, instructional tactics, learning approaches, experiences, and the learning outcomes make up an all-inclusive entity of educational institution (Hamza, 2004). Pakistan education system is semi-centralized. The boards of intermediate and secondary education, which are independent organisations, administer external exams. The Federal Government created the curriculum, which is being implemented by provincial or local governments, provincial textbook boards create textbooks. Resources for education are essential to implementation of written curricula (Shah & Rehman, 2019).

Bloom's taxonomy was created to give educators a common language to talk about and share teaching and evaluation strategies. The taxonomy is normally used to evaluate learning across a range of cognitive abilities, while it can be used to achieve specific learning objectives. Each cognitive level, from higher-order to lower-order thinking. According to taxonomy, academic learning be divided into three categories: cognitive, affective, and psychomotor. The cognitive domain is responsible for the mental production of knowledge, the affective domain for the continuous emotional development of mentality, and the psychomotor domain for the physical skills. This shift provides a new perspective on each of the six cognitive abilities. The graphic indicates that the higher levels call for more intricate brain functions. Since using lesser levels is necessary to attain higher levels.English language textbooks for senior secondary schools in Iran use Bloom's taxonomy of learning objects. In comparison to higher-level cognitive talents, lower-order cognitive abilities were more common across all academic areas (Sori & Mustapha, 2025).

Research Objectives

1. To analyze the relevancy of secondary school curriculum (science subject) with bloom taxonomy in the KP context.
2. To investigate impact of aligning the school curriculum in KP with Bloom's Taxonomy on students' learning outcomes.
3. To examine the perception of teachers about the curriculum development according to bloom taxonomy in KP.

LITERATURE REVIEW

One of the main areas of pedagogical research is the curriculum's applicability, particularly in secondary school, when foundational knowledge and cognitive skills are developed. Benjamin Bloom created Bloom's Taxonomy in 1956. It is the hierarchical taxonomy of cognitive abilities that includes higher-order thinking abilities like analysing, evaluating, and generating as well as lower-order thinking abilities like remembering and understanding. In order to make sure that academic objectives and desired learning outcomes align, taxonomy has been extensively utilised as framework for curriculum development and assessment. In order to foster students' critical thinking, problem-solving abilities, secondary school certificate curriculum in Pakistan,

particularly in province of Khyber Pakhtunkhwa (KP), needs to be in accordance with Bloom's Taxonomy. Given how quickly science and technology are advancing, SSC science curriculum is essential for preparing students for both postsecondary education and the global workforce (Khoy, 2025). Thus, one of the best-known learning theories in education is the Taxonomy of Educational Objectives, also called Bloom's Taxonomy (Bloom, Engelhart, Furst, & Krathwohl, 1956).

Bloom's Taxonomy is frequently used by educators to develop learning objectives that focus on both subject matter and level of understanding they hope students will acquire. Assessments are subsequently developed to precisely document students' progress towards these objectives (Anderson & Krathwohl, 2001). The cognitive domain of Bloom's Taxonomy experienced the significant change in 2001 when co-editor Lorin Anderson, David Krathwohl, one of Bloom's original collaborators, published the revision to the 1956 hierarchy. With input from cognitive psychologists, curriculum theorists, instructional researchers, and testing as well as assessment specialists, language used was changed from nouns to verbs, which redirected the focus from acquisition to active performance of types of learning involved in each stage of the hierarchy with balanced the instructional design is in terms of knowledge depth (Lord & Baviskar, 2007). Additionally, the synthesis was dropped, and create was enthused to the highest level of the domain.Bloom's Taxonomy has been extensively utilized as guiding framework for curriculum development.

The taxonomy's six cognitive domains to remember, understand, apply, analyze, evaluate, and create serve as a scaffold for educators to design learning activities that cater to a range of cognitive processes. The studies have shown that curricula aligned with Bloom's taxonomy not only enhance student engagement but also promote deep learning and the ability to transfer knowledge to innovative contexts (Anderson & Krathwohl, 2001). The relevance of educational curricula is the central focus of pedagogical research, particularly in the context of secondary education, where foundational knowledge and cognitive skills are developed. Thus, Bloom's Taxonomy, introduced by the Benjamin Bloom in 1956, provides a hierarchical classification of cognitive skills, ranging from lower-order thinking skills like remembering and understanding to higher-order thinking skills such as analyzing, evaluating, and creating. The taxonomy has been widely adopted as a framework for curriculum design and assessment, ensuring that the educational objectives are aligned with the desired learning outcomes (Anderson & Krathwohl, 2021).

The secondary school curriculum in Pakistan, especially in the Khyber Pakhtunkhwa province, must be in line with Bloom's Taxonomy to develop students' critical thinking, problem-solving skills. The relevance of the SSC science curriculum in preparing students for postsecondary education and the global workforce is crucial given the speed at which science and technology are developing. Al-Saraireh (2011). Higher-order thinking abilities like application, analysis, and critical thinking are frequently overlooked in favour of lower-order thinking abilities like data memorization, fundamental idea comprehension, especially in disciplines like physics, according to research on the KPK SSC science curriculum. The students are taught scientific

definitions and formulas, they are rarely given chance to apply concepts to real-world issues, analyse experimental data, or assess scientific claims all of which are critical abilities required for both further education and scientific jobs (Lestari & Pratolo, 2025). This disparity hinders pupils' capacity to acquire analytical and problem-solving abilities, that are critical in modern world.

Additional practical experiments, open-ended enquiries and project-based learning that help deeper engagement with scientific topics should be incorporated into the curriculum to close this gap (Ali, 2018). The Bloom's Taxonomy should also be emphasised in teacher preparation programs so that teachers can create classes that encourage not only memory also creativity and critical thinking. The KPK educational system can better equip students to confidently face problems in the classroom and in the workplace by implementing these reforms (Ahmed & Khan, 2020). Teachers can improve their lesson plans and monitor students' progress with the aid of Bloom's Taxonomy. Teachers can observe how pupils develop cognitively over time by segmenting learning into many levels, ranging from basic memorisation to the sophisticated critical thinking. With so many educational standards to adhere to, Bloom's Taxonomy offers a clear framework for establishing learning objectives and determining whether or not students have a thorough understanding of subject matter. Teachers might change their teaching plans or go over the subject again if pupils are having trouble at the higher levels (Rehman & Khan, 2020).

RESEARCH METHODOLOGY

This study uses the simple, numerical-based methodology to assess how well the secondary school curriculum in the Khyber Pakhtunkhwa conforms to Bloom's Taxonomy. The finding participants is the first phase in research process, which is followed by information gathering via questionnaires or curriculum papers, statistical analysis of the data, and interpretation of the findings. This methodical approach helps guarantee that the results are accurate and the trustworthy, offering unambiguous proof of which curriculum components successfully foster students' critical thinking abilities and which require development. Thus, this study's research design is the descriptive in the nature and use quantitative research procedurethat combines quantitative techniques to offer a thorough examination of the Secondary School Curriculum's applicability to Bloom's Taxonomy in KP. In this drive, this method enables a comprehensive knowledge of how well the curriculum fosters the different cognitive talents listed in Bloom's Taxonomy.

The target population for study consists of individuals who are directly involved in teaching, development, and oversight of SSC in KP. Teachers from various subjects who are currently teaching at the secondary level (Grades 9 and 10) in KPK schools. Individuals with expertise in specific subjects who can provide insights into how well the curriculum aligns with Bloom's Taxonomy. The sampling randomly technique was used to select data respondents. Secondary school Teachers: 15 teachers were randomly selected with demographic backgrounds APS Abbottabad School of District (KPK).Subject specialist: Subject specialist at least 15 teachers of Burn Hall School Abbottabad, District (KP).The collected data analyzed with help of IBM SPSS

Software. The researcher feed all collected data in SPSS sheet to perform the different statistics techniques for data analysis in quantitative analysis like mean, frequency, SD, T-Test, ANOVA in Analysis.

DATA ANALYSIS

The demographic presents the gender-wise distribution of teachers participating in the study of secondary school curriculum with bloom's taxonomy. The majority of teachers were female 57.0% and 43.0% were male participants in the study. This indicates a higher representation of female teachers in the study compared to male teachers. In this drive, the table presents the institution-wise distribution of teachers from the same study onsecondary school curriculum with the bloom's taxonomy. The 63.7% of teachers belongs to APS Abbottabad, and 36.3% of teachers were from Burn hall school Abbottabad, shows greater proportion of faculty in APS Abbottabad.

Table 1

Subject wise Analysis

Subjects	N	Frequency	Percentage	Mean
Physics	7	7	30.5	1.57
Chemistry	12	12	40.5	1.42
Biology	11	11	32.0	1.91
Total	30	30	100.0	1.63

The table show that Physics has a mean of 1.57, suggesting that, on average, responses, scores are closer to the midpoint of scale used, with some variability Chemistry has a slightly lower mean of 1.42, indicating responses are generally a bit lower compared to Physics, but with similar variability Biologyhas the highest mean of 1.91, suggesting that responses are generally higher for Biology, with less variability compared to the other subjects. Table 4.4 depicted the subject-wise distribution of teachers from study on secondary school curriculum with bloom's taxonomy. The data showed that 23.0% of Physics teachers have curriculum relevancy with bloom's taxonomy, 40.0%, Chemistry teachers have curriculum relevancy and 32.0% of Biology teachers have curriculum alignment. The overall mean across all the subjects is 1.63, with the moderate indicating that responses are generally above midpoint but vary somewhat across subjects.

Table 2

ANOVA Test Analysis

	Sum of squares	Df	Maen square	F	Sig.
Betweengroups	1.427	2	.713	3.476	.045
Within groups	5.540	27	.205		
Total	6.967	29			

This table value the F-value of 3.476 with the p-value (Sig.) of 0.045 indicates that there is a statistically significant difference between the group means at the 0.05 significance level.Since

the p-value is less than 0.05, which suggests that not all group means are equal, and there is likely a significant effect of the independent variable on the dependent variable.The result of ANOVA displays that SSC Science curriculum in KPK is sufficiently aligned with Bloom's Taxonomy or if significant improvements are needed. Summarize the importance of alignment for enhancing the quality of the education and preparing students for higher education and the workforce.

Table 3

T-Test Analysis

Gender	Mean	Std.Deviation	T- value
Male	2.00	.707	.818
Female	2.24	.831	.837

The table value show that T-values correspond to the non-significant p-value (e.g., > 0.05), it would mean that there is no significant difference in the scores between male and the female participants, and any observed difference could be due to random variation rather than a true difference in gender performance or outcomes. The T-values (0.818 for males and 0.837 for females) suggest that a t-test was performed to compare mean scores between male and female participants.

Table 4

Curriculum Alignment with Bloom Taxonomy

Statement	Mean	StdDev
The concepts in the biology curriculum clear and easy for students to remember.	4	.77
The students can explain biological processes in their own words after the study curriculum	4	.788
In curriculum of biology include activities that require students to apply their knowledge to solve problems	4.3	.794
Biology curriculum encourage critical thinking and analysis of biological data or experiments?	4.3	.466
In biology curriculum effectively aligns with the cognitive domains of Bloom's Taxonomy	3.77	1.135
Students successfully recall physics formulas, laws, and definitions taught in the curriculum.	3.93	.45
physics curriculum provides sufficient opportunities for students to memorize essential concepts and facts.	3.5	1.137
Curriculum includes practical tasks or experiments that require students to apply their knowledge of physics.	3.43	.898
In physics curriculum promotes analytical thinking and problem-solving by encouraging students to analyze data and situation.	4.13	.507
The current physics curriculum effectively aligns with the cognitive domains of Bloom's Taxonomy?	4.37	49
Students taught to assess accuracy and validity of experimental data in chemistry.	3.5	1.009
Chemistry curriculum encourage students to analyze data and results from chemical experiments critically.	4	.83

This table show that curriculum clearly supports comprehension and understanding that are in line with Bloom's Taxonomy's lower-order cognitive domains, as seen by the mean scores of 4.00 for the statements pertaining to the clarity of concepts and students' capacity to explain biological processes. Still, the curriculum successfully promotes higher-order thinking skills including application and analysis, as seen by the high mean scores of 4.30 for statements on critical thinking and problem-solving exercises. Though many people think the curriculum aligns well, some may think it may be improved, as indicated by the slightly lower mean score of 3.77 for alignment with Bloom's Taxonomy and the comparatively high standard deviation (1.135). The high mean score of 4.13 indicates that physics curriculum is producing inspiring outcomes, especially in developing analytical thinking and problem-solving abilities. The domain of remembering is supported by the mean score of 3.93, which indicates that students are successful in recalling basic concepts like formulas and laws. Standard deviations show a range of responses, suggesting potential gaps in application of information through practical activities.

In contrast, mean scores for comments about memorisation opportunities (3.50) and practical tasks (3.43), are lower. Strong consensus and consistency among responders that the program satisfies cognitive domain expectations are shown in the reported mean of 4.37 for alignment with Bloom's Taxonomy (assuming the standard deviation is 0.49, not 49).The outcomes for the chemistry curriculum are less clear. With a comparatively large standard deviation (1.009) and a moderate mean score of 3.50, students' ability to evaluate the validity and accuracy of experimental data revealed a range of opinions. On other hand, the curriculum's promotion of data analysis and critical thinking in the experiments received the higher mean score (4.0), suggesting that it supports Bloom's Taxonomy's analysis level. Overall, there is variation in the consistency and depth of this alignment especially in the areas of memorisation, practical application, and evaluation even still all three science curricula exhibit components that are consistent with Bloom cognitive domains, mainly in inspiring comprehension and analytical skills.

Figure 1

Overall Percentage

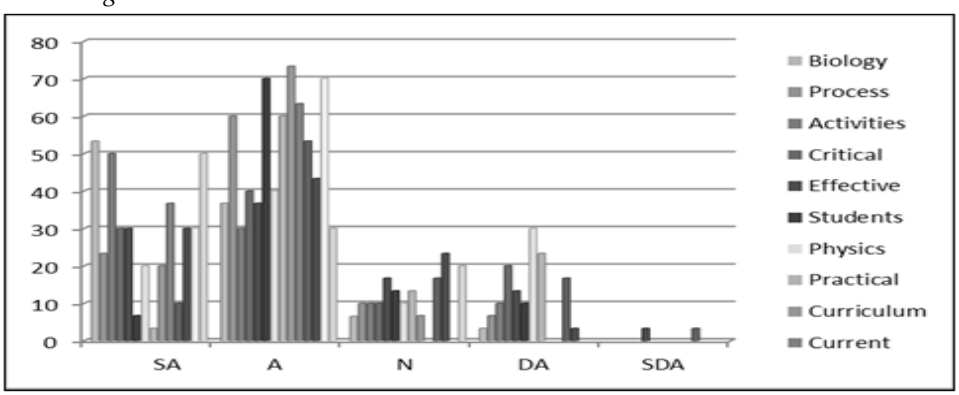


Table 5

Teachers Perception/Training

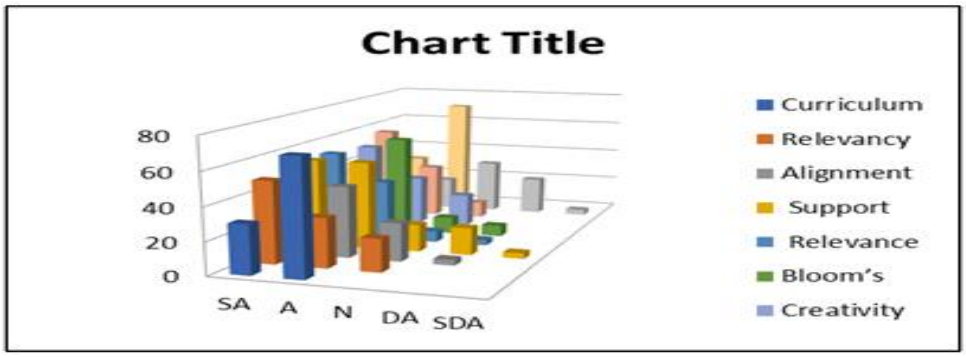
Statements	Mean	St.dev
Curriculum aligns with bloom s taxonomy to equip students skills needed for success.	4.6	.486
You know about relevancy of curriculum with bloom taxonomy in teaching practice.	3.8	.61
Curriculum alignment with bloom taxonomy across subjects and grade level promoting cohesive learning experience.	4	.788
curriculum support the development of critical thinking and problem-solving skills in students.	4.3	.799
Curriculum relevance to promote deeper learning and better academic achievements of students.	4.4	.77
Curriculum with Bloom's Taxonomy relevancy enhances the students learning outcomes.	4	.788
Alignment of curriculum with bloom taxonomy to develop critical thinking and creativity in students.	4.3	.794
The curriculum with relevancy of bloom taxonomy should be updated to reflect changing societal needs of students.	4.47	.681
You receive adequate support to effectively deliver the curriculum according bloom taxonomy.	3.3	1.149
The curriculum relevancy with bloom taxonomy objectives relevant to the students' future careers and personal live.	4.3	.43

This table shows that opinions about the curriculum's alignment with Bloom's Taxonomy and its significance for the students' growth and future achievement are largely favourable. The respondents' strong agreement that the curriculum successfully aligns with Bloom's Taxonomy to give children the abilities they need for success is indicated by the highest mean score of 4.6 and low standard deviation (0.486). Strong agreement that curriculum fosters critical thinking, creativity, problem-solving, deeper learning, and academic accomplishment is also indicated by high mean scores, which range from 4.3 to 4.47. These answers demonstrate that teachers think curriculum based on the Bloom's Taxonomy improves students' cognitive capacities and equips them for problems they may face in the real world. A lower mean score of 3.8 was given to statement about awareness of Bloom's Taxonomy in teaching practice, indicating that while many educators are aware of its importance, more knowledge or training in this area is still needed.

Bloom's Taxonomy had the lowest mean score of 3.3 and biggest standard deviation of 1.149, making the adequacy of support for teachers in delivering the curriculum a noteworthy area of concern. This reveals a wide range of experiences and implies that many teachers believe they are not receiving enough assistance to successfully apply this framework. Although efforts to promote cohesive learning are acknowledged, there may be some areas where full integration is absent, as indicated by the moderate agreement (mean = 4.0) on the curriculum's consistent alignment across subjects and grade levels. All things considered, results show a strong belief

in usefulness and applicability of Bloom's Taxonomy in curriculum design, but they highlight necessity of more professional development and support for teachers in order to fully reap its benefits.

Figure 2
Overall Percentage



DISCUSSION

The Bloom Taxonomy is a hierarchy of thinking skills that ranges from simple skills, such as knowledge, to complex thinking, such as evaluation since conception of Bloom's Taxonomy, his colleagues have carried on his work and developed a two-dimensional taxonomy for the learning, teaching, and assessing the student learning outcomes. The Knowledge Dimension identifies four types of the knowledge: factual, conceptual, procedural, and metacognitive. The second aspect of Bloom's Taxonomy, the Cognitive Process Dimension, outlines six ways of the thinking (remember, understand, apply, analyze, evaluate, and create) and their many sub processes. In "Analysis Based On Bloom's Taxonomy: Pakistan's Federal English Curriculum And Examination Content For Matric," Hassan (2023) examines how the goals of the English curriculum in Matric and the content of country's annual exams, or board exams, fit. In order to contribute to a better, more valid, and dependable English language assessment, the researcher concentrated on discussing the significance of English language assessment within the Matric system and evaluating the disparity between the test content as well as the English assessment objectives.

The study argued that all relevant stakeholders, including test developers, users, educational researchers in Pakistan, should concentrate on implementing higher levels of Bloom taxonomy. A student might, for instance, begin by learning facts by heart and then progressively develop the ability to evaluate and apply them in novel ways. Thus, by ensuring that students grasp fundamental ideas before progressing to more complicated ones, this framework also assists teachers in effectively planning their classes. The taxonomy also serves as a checklist, assisting educators in matching appropriate thinking skills to assessments and tasks. Moreover, these are among the core processes or skills that are the basis of any discussion of critical thinking (Hui, 2025). Bloom's Taxonomy is still a crucial component of modern education, and its digital

version gives teachers flexible way to balance academic objectives with emerging the diverse technologies.

Teachers may foster advanced skills like analytical reasoning, creative problem-solving, and moral decision-making by carefully combining digital resources such interactive platforms and collaborative tools with the taxonomy's cognitive tiers. In addition to preparing the students to handle obstacles in the real world, this alignment reimagines classrooms as testing grounds for flexible skill development. (Acharya & Nepal, 2024). The result of the displays that SSC Science curriculum in KP is sufficiently aligned with Bloom's Taxonomy or if significant improvements are needed. The SSC science curriculum's alignment with Bloom's Taxonomy in KPK has been found to present a number of difficulties. Therefore, the conventional teaching approaches that predominate in the area's classrooms are one of the main obstacles. The higher-order thinking skills have been difficult to incorporate into the curriculum due to the widespread use of the lecture-based instruction and an assessment system that emphasises rote memorisation (Khan, 2020).

CONCLUSIONS

The KPK SSC science curriculum covers fundamental information and comprehension in part in accordance with Bloom's Taxonomy, but it falls short in terms of fostering the development of more advanced abilities like analysis, assessment, and creativity. This disparity hinders students' critical thinking and problem-solving abilities, which are essential for college and the workplace. The curriculum urgently needs to be updated to incorporate practical experiments, problem-solving activities, and projects that foster sophisticated thinking in order to enhance science education. To properly teach abilities, teachers also need training. In order to find best practices, future studies should compare KP's scientific curriculum with that of other areas and monitor effects of curriculum alterations on student performance over time. KPKmay change its scientific curriculum and genuinely prepare students for challenges of future by filling in these gaps.

Recommendations

1. To incorporate the higher-order thinking into teaching the education department should provide the explicit guidelines.
2. The regular inspections of schools are necessary to make sure they are adhering to these modifications, analytical and application-based exam questions.
3. Students' capacity to develop critical and creative thinking is limited by current KP SSC curriculum, that emphasis on lower-order thinking skills.
4. Create supplemental materials and textbooks that encourage the critical thinking for the students of the secondary school.
5. To provide effective training the teachers how to use HOTS in their lesson delivery hold seminars and workshops for the teachers.
6. Promote student-centered and inquiry-based teaching strategies.Redesign the learning objectives to use Bloom's Taxonomy at all levels.

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