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Effect of think-pair-share and choral response assessment methods on academic achievement of prospective science teachers

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ABSTRACT

A number of assessment methods are used to improve teaching which accelerates students' achievement. This study investigates the effect of two assessment methods (Think – Pair – Share and Choral Response) on academic achievement of prospective science teachers in a public sector university in Lahore, Pakistan. It employed a quasi-experimental pretest-posttest control group design which was conducted on two already existing intact groups i.e. control group (n=51) and experimental group (n=36). The pre-test was administered to both the groups, and then the participants were exposed to the treatment after which the post-test was administered. The two tests, which had been devised based on Bloom's Taxonomy of Educational Objectives, were the same for both groups. The validity of the tests was ensured by five relevant experts; the reliability was established as 0.832 through a pilot study on 200 prospective teachers. Those items in the test were selected that had difficulty ratings of 0.2 – 0.8 and discrimination ratings of 0.2 – 0.6. The collected data were analysed using independent sample *t-test*. Results revealed that the students who were assessed through chosen methods of assessment showed better performance than those who were assessed traditionally. It was also found that students showed better performance while applying Think – Pair – Share than Choral Response. Hence, the study recommended to use these methods of assessment during teaching in order to improve students' achievement.

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Introduction

In the new millennium, the education system of Pakistan experienced a major shift and affecting the quality of education owing to the aims of policy makers to bring about reforms (Ahmad et al., 2014). In a global education context, assessment of learners, teachers and the system has become a major means to identify the flaws in an education system in order to improve its quality at both systemic and individual levels (Braun, & Singer, 2019). Towards this end, exploration, implementation and innovation are required at system level to improve the quality of teaching-learning. Major questions that arise are when to assess how to assess, and what kind of assessment is effective (Huber,

& Helm 2020). Assessment might be used to measure the quality of education and to ensure that standards are matched with what tertiary learners are learning i.e. learning outcomes (Kile, 2020; Redfield, 2001).

Recently, a paradigm shift has occurred from traditional assessment to standard based assessment system to improve the quality of education. Standards-referenced assessment refers to the achievement of pupils in relation to a particular set of standards. It provides a criterion on the basis of which one can decide whether progress has been taking place or not. It provides the opportunity to the pupils to improve their learning and plays a key role in mobilising educational reforms through assessment (Rind & Malik, 2019). Assessment aids teachers in selecting the content matter, teaching methodology, designing curriculum and evaluating pupil performance in order to achieve the targeted objectives/ outcomes as well as what kind of assessment method is suitable to assess the particular learning outcome. Assessment and learning outcomes both examine the alignment between components of effective teaching i.e. objectives, teaching material/content, effectiveness of methods used for teaching, and level of achievement attained on specific learning objectives. It also diagnoses the involvement of pupils in the classroom. Teachers can assist pupils in achieving their goals not only through instruction but also by using proper assessment methods (Kulasegaram & Rangachari, 2018). The improvement of learning does not only depend on the assessment method used but also how well it is aligned to the specific learning targets and the content that is to be used in achieving that targets. This is basically the umbrella under which standards/outcomes based education lies (Sharma, 2015).

Standards-based education is commonly followed in many countries where they focus on learning outcomes and choose the assessment that best suits that standard. At global level, government authorities set standards for achievement and clearly set standards and criteria for learners to attain particular knowledge or skill at different levels of education. The alignment of standards and curricula is the critical element of the assessment system (U.S. Department of Education, 2018, p. 9). The importance of standards-based education lies in matching of objectives to particular standards. If, in any case, the standards are not aligned or matched to the assessment then results have less value in diagnosing the learning needs of learners as well as determining how well a pupil is performing at some grade level. Researchers need to focus in exploring the strategies and tools to measure the standard based performance.

Standards-based assessments serve an important role in educational system because educators have to teach the content based on the learning standards and then conduct assessment accordingly. Alignment of assessment with standards is not a new concept in education system (Bloom, Maidus, Hastings, 1981; Impara, 2001; Tyler, 1949; Webb, 1999). It has been important tool to measure education outcomes and the validity of assessment methods. The present study has its roots in Webb's (1997, 2002) method of alignment to determine the match between the educational objectives and assessment methods used (Blank, 2002). The alignment model presented by Norman Webb (1997a; 1997b; 1999) has been one of the influential models in education (Ananda, 2003; Impara, 2001; La Marca et al., 2000). With the passage of time, people became more research and outcome oriented. They used the results of assessment in the evaluation of education systems and to take decisions based on that (Azeem & Gondal, 2011). Assessment methods are very much interrelated with that of learning standards as well as course contents. One cannot proceed in the process of effective assessment without considering the content and standards. However, in this study, the effect of two methods of assessment viz. Choral Response and Think – Pair – Share were ascertained on academic achievement of prospective science teachers to get an insight of the methods best suitable to improve their achievement.

Choral Response

Choral response is a recent data based procedure that is no longer being used. In choral response the teacher gives a flag or signal to the learner who have to respond in a unified way (Wolery et al., 1992). Using this quick paced strategy can get pupils' attention resulting in increased

response and commitment. In direct instruction, choral response is additionally used as an informal method (Carnine et al., 2004). Pupils who need correction and the ones who gave correct answers might be distinguished by this procedure Teachers can correct the students immediately after getting the responses. This process relies on three criteria: learners must have the ability to give a concise answer; 1-3 word answers; and just a single perfect response. With these criteria, a teacher can easily monitor how the pupils react and then provide them a constructive feedback accordingly (Heward, 1994). In order to support all considered things and guarantee mindfulness, the exercise should be carried out at a lively pace (Kamps et al., 1994). Small groups improve the reliability of choral response. Using clear signal of when to respond, giving sufficient feedback, giving pupils a little break to think and calling individual pupils occasionally are some of the other aspects by which choral responding can be enhanced. With this method, teacher can easily assess whether pupils can understand the concepts and educational content being taught, or not (Blackwell & McLaughlin, 2005).

Think – Pair – Share

Another method to carry out assessment is Think – Pair – Share; it is a simple method of assessment in which teacher asks students to think in pair and then respond by either writing the vocabulary or concepts after instruction, reading out aloud the answers asked by the teaching, summarize main ideas of the concept, discussing muddy point from the lecture, choral responding and answering the questions asked while doing self/peer assessment. Frank Lyman was the first educationist who proposed this model in 1981. The fundamental component of this model is to improve achievement by means of discussion with fellows. The process is more effective with more discussion and learning outcomes are also improved (Kaddoura, 2013). This method is one of the active learning methods which prompts learners to work out solutions to problem (Nasr, 2003). Pupils are required to think about the answers and write them on a paper sheet in the given time. Then, they are required to pair up with their class fellows and share their views. After discussing their answers in pair, they are asked to share their answers with the whole class. The teacher may circulate throughout the class during this time, and provide guidance where appropriate. This method places pupils at the centre of learning (Dyer, 2012). If it is done properly, it gives a true reflection of knowledge sharing among individuals and groups resulting in a healthy classroom environment. Teachers can intervene to avoid useless classroom discussions that may not achieve the set objectives. This method asserts that students' in-class participation is an important precursor of their academic achievements. The short time between teachers' questions and calling on the first pupil, hand raising as the gateway to in-class participation which requires students to elaborate and formulate their ideas in a short time. TPS can be assumed to provide students with the opportunity to elaborate their ideas and gain more confidence from peer support by reducing anxiety and boost their confidence (Mundelsee, & Jurkowski, 2021).

Many researchers including Boston (2002), Deubel (2006), Kile (2020), and Stiggins (2018) have addressed the different dimensions of effective assessment particularly at higher education level. They found that students can get involved in learning and perform better while using multiple assessment methods such as think-pair-share, oral questioning, think aloud activities, exit ticket, self-responding, peer-responding, Muddiest Point. The study focuses on two of these assessment methods (Think – Pair – Share and Choral Response) and explored how these methods of assessment improve the achievement of trainee teachers in classroom.

Rationale of the Study

Researchers (Grisay, 1991; Harlan & Malcolm, 1996; Pinger, Rakoczy, Busser, & Klieme, 2018; Tomlinson & McTighe, 2006) found the overall effectiveness of assessment methods on students' achievement at different levels. At university level, no significant research has been found by the

researcher to find the effect of TMAs on students' academic achievement. Teacher's assessing methodologies act as a bridge between his or her teaching and his/her students' academic achievement. It minimizes the learning gap and improves the quality of the teaching-learning process by increasing the learning proficiency of students (Bitchener & Knoch, 2008). In Pakistani education system, traditional assessment methods just measure the limited performance of the students instead of guiding them during the process of learning (Adegoke, 2010; Aftab, Qureshi, & William, 2014; Ahmad, Rehman, Ali, Khan, & Khan, 2014; Aworanti, 2011; Peterson, 2007; Rehmani, 2003). They lay more focus on the students' learning capacity rather than on their abilities to think systematically and how they comprehend and analyze the things. In view of this approach, the current study was designed to determine the effectiveness of assessment methods such as Choral Response and Think – Pair – Share on students' achievement.

Research Objectives

Following research objectives were formulated for this study.
1. To find out the effect of Think – Pair – Share and Choral Response as methods of assessment on prospective science teachers' academic achievement.
2. Identify the best method of assessment among Think – Pair – Share and Choral Response in regard to promoting prospective science teachers' academic achievement.

Methods

This study was experimental in nature using pretest and posttest with a control group to compare the effect of assessment methods Think – Pair – Share and Choral Response on the academic achievement of prospective science teachers. There were 238 prospective science teachers in the programme. For this purpose, those students were selected who were specialising in Science Education. Two intact groups were chosen for the study with a total of 87 prospective science teachers who were later named as experimental and control group. In this way, the number of participants in control group was 51 whereas in experimental group it was 36.

Instrumentation

Lesson plans, worksheets and an achievement test were used as instruments for collecting data for this research. The instruments were developed in accordance with the student learning outcomes and methods of assessment. The lesson plans were formulated by considering the learning objectives on four domains presented by Chappuis, Stiggins and Arter, (2012): knowledge, reasoning, process and product (Appendix-B). A brief description of each of these is given in the figure.

The achievement test (pre-test and post-test) was developed with reference to Bloom's Taxonomy of Educational Objectives 1956. For this, a two-way specification table was formed covering all levels of Bloom's Taxonomy. The final test consisted of 30 MCQs, one essay type question and two short open-ended questions (Appendix-A).

The instruments of the study were validated by five experts in the field of education and curriculum and finalised by implementing their suggestions. Two hundred students in their 5th semester were chosen for piloting of the achievement test. Some items were then revised following item analysis. The reliability of the final test was 0.832 and the items exhibited difficulty and discrimination ranges of 0.2 - 0.8 and 0.2 - 0.6 respectively. The final test after piloting was administered to the students before conducting the experiment. The post-test was conducted 16 weeks later.

Intervention Procedure

The intervention was carried out for 16 weeks. Both the groups were assessed and taught by the principal researcher to keep both groups on the same pace and to minimise the external threat of validity and researcher biasness during the study. Traditional method of assessment such as paper and pencil test at the end of the instruction was used to assess the control group while the experimental group was assessed through Think – Pair – Share and Choral Response on daily basis. For this purpose, worksheets and tests were used and the results were recorded daily.

Both these groups were assessed side by side on daily basis. Beside this, groups were pre-tested before the experiment to check their baseline performance. After pre-test, both groups were randomly assigned to treatment groups. Both the groups were taught by the same person and the content taught to the prospective teachers were the same as well. After intervention, both the groups were post-tested to get the cumulative achievement score on the basis of which groups are to be compared. The lessons were planned in such a way that every individual got an opportunity to participate in the study and assessed by both assessment methods. Same content was taught to both the treatment group and the comparison group. The study lasted for the whole semester (16 weeks). Separate portfolio of every student was organized in which their record was maintained. Students received the feedback promptly to excel. The experimental group was tested after applying every assessment method to measure the significant effect of that assessment method on students' achievement. After applying the treatment both the groups were tested (post-tested). The researcher compared the achievement of the both groups. The scores of pre-test and post-test of each group were also compared to check the effectiveness of the assessment methods.

Results

The results for the present study are given below;

Table 1

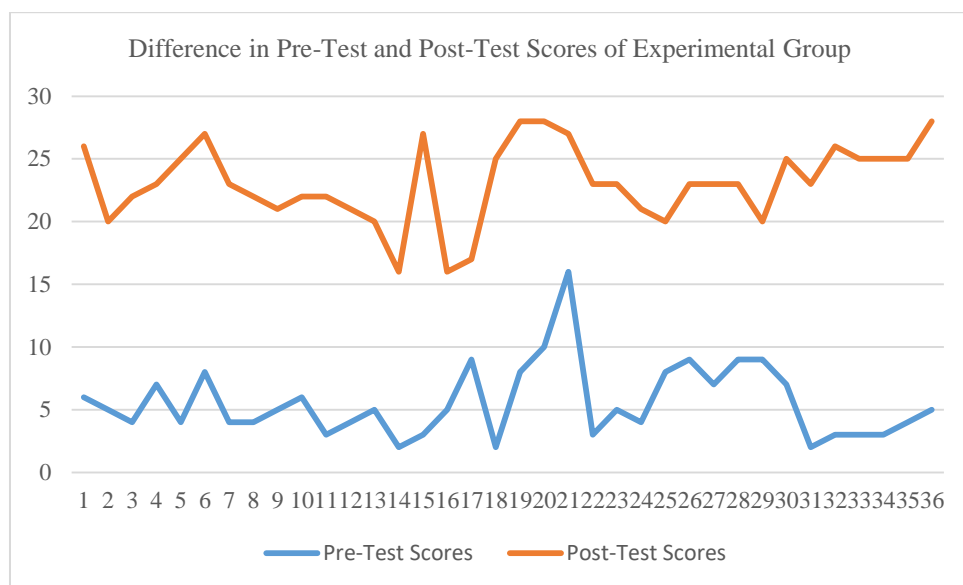*Independent sample t-test on pretest and posttest scores of control and experimental group*

Test	Groups	N	Mean	SD	df	t-value	Sig. (2-tailed)
Pretest	Control	51	6.12	2.215	85	1.191	0.237
	Experimental	36	5.53	2.360			
Posttest	Control	51	14.25	2.869	85	16.82	.000
	Experimental	36	23.97	2.311			

Table 1 describes the difference in pre and post achievement scores of the control and experimental groups. Independent sample *t*-test was applied (Control M = 6.12, SD= 2.215; Experimental M = 5.53, SD= 2.360) at 0.05 level of significance, in order to compare the mean achievement scores of the prospective teachers in pretest. The t value was 1.191 with df (85) which is lower than the table value of t (1.290). In the same way, the p-value is 0.237 that is higher than 0.05 which reflected that the prospective teachers in both groups are not significantly different from one another.

The achievement scores of prospective teachers in posttest were (Control M= 14.25, SD= 2.869; Experimental M = 23.97, SD= 2.311) at 0.05 level of significance. The t value was 16.82 with df (85) which is higher than the table value of t (1.290) and the p-value is 0.000 that is less than 0.05 which reflected that prospective teachers in experimental group scored better in posttest when they were separately assessed by Think – Pair – Share and Choral Response than the prospective teachers of control group.

Figure 1

Graphical representation of pre-test & post-test score of the experimental group

The above figure shows the difference in pretest and posttest scores of prospective teachers from the treatment group. It can be clearly seen in the graph that the pretest scores of the experimental group are well below than the posttest scores of the group which shows the improvement in group during sixteen weeks of experiment. The lines of the graph clearly show that the assessment methods i.e. Choral Response and Think – Pair – Share played a clear role in improving the academic achievement of the students.

Table 2

Independent sample t-test of control and experimental group after using choral response

Groups	N	Mean	SD	df	t-value	Sig. (2-tailed)
Control	51	2.101	.534	85	25.220	.000
Experimental	36	5.026	.304			

The table describes the difference in achievement scores of control and experimental group. Independent sample t-test was applied (Control M= 2.101, SD= .534; Experimental M= 5.026, SD= .304) at 0.05 level of significance in order to compare the mean achievement scores of the students in both groups. The t-value was 25.220 with df (85), which is higher than the value of table t (1.290). In the same way, the p-value is 0.000 that is less than 0.05 which reflected that experimental group students scored better when they were assessed by Choral Response than the control group.

Table 3

Independent sample t-test of control and experimental group after using think-pair-share

Groups	N	Mean	SD	df	t-value	Sig. (2-tailed)
Control	51	2.849	.713	85	23.990	.000
Experimental	36	7.720	.540			

The table describes the difference in achievement scores of control and experimental group. Independent sample t-test was applied (Control M= 2.849, SD= .713; Experimental M= 7.720, SD= .540) at 0.05 level of significance in order to compare the mean achievement scores of the students in both groups. The t-value was 23.990 with df (85), which is higher than the value of table t (1.290). In the same way, the p-value is 0.000 that is less than 0.05 which reflected that experimental group students scored better when they were assessed by Think-Pair-Share than control group.

Table 4

Independent sample t-test to compare group after applying think – pair – share and choral response

Groups	N	Mean	SD	df	t-value	Sig. (2-tailed)
Think – Pair – Share	36	7.720	.540	34	19.731	.000
Choral Response	36	5.026	.304			

The table describes the difference in achievement scores of groups assessed through Think – Pair – Share and Choral Response. Independent sample t-test was applied (Think – Pair – Share M= 7.720, SD= .540; Choral Response M= 5.026, SD= .304) at 0.05 level of significance in order to compare the mean achievement scores of the students in both groups. The t-value was 19.731 with df (34), which is higher than the value of table t (1.290). In the same way, the p-value is 0.000 that is less than 0.05 which reflected that the students scored better when they were assessed by Think – Pair – Share as compared to Choral Response.

Discussion

The results of the study are evident that treatment group exhibited better performance as compared to control group which means that assessment methods (Think – Pair – Share and Choral Response) put a positive effect on the academic achievement of the students and they showed interest in the methods of assessment used. Abejehu (2016) conducted a study in which he explored the effect of assessment methods on students' academic achievement and the results supports the finding of this study that assessment methods increase the performance of the students. Likewise, another study revealed that assessment methods were supportive to promote the students' performance and achievement (James & Folorunso, 2012). The results of the current study also aligned with the research studies conducted by (Gibbs & Simpson, 2004, 2005; Louden, 2005; Matters, 2006; Nicol & MacFarlane 2004) which revealed the positive effect of assessment methods on students' achievement.

Some other studies discovered that pupils responded more to teacher questions when they were required to chorally respond in the classroom instead of using traditional questioning like raising their hand and volunteering to respond individually (Godfrey, Grisham-Brown, Schuster, & Hemmeter, 2003; Haydon et al., 2013; Kamps, Dugan, Leonard, & Daoust, 1994). Results also showed that during choral responding individuals' learning improves and they were motivated to learn (Haydon et al., 2013). Another study reported that the pupil respond actively during choral responding and their achievement increased as compared to individual response mode (Hughes & Coplan, 2010; Umbreit et al., 2007). Akhtar & Saeed (2020) also confirms that choral responding improves the students' academic achievement and have significant effect on students and can be used in the classrooms at higher education.

Another method of assessment used in this study is Think – Pair – Share that was also very helpful for teachers and students to improve the learning. Yusuf, Owede, and Bello, (2018) conducted an experimental study following quasi experimental design to investigate the effect of think – pair – share on students' academic achievement in Bayelsa State compared to the traditional (lecture)

method of teaching frequently used by classroom teachers. This present finding also confirms the findings of Bataineh (2015) and Bamiro (2015) reported in their separate studies that students who were taught with the use of Think-Pair-Share strategy obtained higher scores compared to those taught with traditional method. This finding corresponds with the findings of Jumanta (2014), Sejani (2016) and Shadrina (2013) that had worked on the effect of the use of think-pair-share on students' academic performance in mathematics and found it to be effective at improving students' academic performance. The result of the study revealed that both male and female students benefited from the use of think-pair-share as a teaching strategy. Cooper and Robinson (2000) were also of the view that Think – Pair – Share may be used as a valuable form of assessment that may be helpful in increasing the performance of the students. The results correspondingly explored that this method improve the understanding and performance of the students. Heward (1994) results also justify the findings of the present research study in a way that Think – Pair – Share not only improved the understanding and performance of the students but it also creates a sense of cooperative and sharing among students that ultimately leads them towards constructive learning and they perform better. They explored that this method is also helpful for the students to understand the content matter inn a better way. Vineeta Persaud and Rita Persaud (2019) also explored in their study that Think – Pair – Share increased the students' achievement as well as students' interaction in the large classes even. Pradana, Sujadi, and Pramudya (2017) were also of the view that if Think – Pair – Share was used as formative assessment method it can improve students' learning and they pose the reason against this learning increase that this method made students active and they take more interest that may helpful to them in increasing their learning.

Conclusion

From results of the study it can be concluded that methods of assessment (Think – Pair - Share) improve the academic achievement of prospective science teachers. These methods have significant effect on students and can be used in the classrooms at higher education. Although when it comes to the comparison of these methods, the students produce significantly high mean scores across Think – Pair - Share than Choral Responding. It reflects that Think – Pair - Share is the more effective methods of assessment, but these two methods are significantly good in regard to promoting pupil's achievement. It is practicable in the classroom easily at a time and even separately. These methods of assessment may be used with different teaching strategies or other assessment methods in order to get better results. The teachers at other levels may also use these methods to explore them at other levels in intentions to improve students' learning.

Recommendations

In the light of the aforementioned findings and conclusions of the study, the following recommendations have been put forward for consideration:
The university teachers may be recommended to use different assessment methods to assess their students in different subjects. By using TMAs of assessing the students who showed relatively greater interest in class as compared to the students who were assessed by using traditional methods of assessment. In this way, the assessment methods used might leave long-lasting effect on students and consequently, their performance may improve in the relevant subject. This study may be replicated by using other TMAs with specific duration of time to assess the students' learning that may add the body of literature on the actual efficacy of assessment methods, especially of those that are flaunted as especially effective methods of assessment.

Implications for Future Research

The present study was conducted to find out the effect of TMAs on academic achievement of students in university classrooms. The results of the study suggested that TMAs has positive effect on students' achievement. While considering the research findings, following implications are drawn from the study for future researchers. Some other TMAs may be used at same level like Agree/Disagree Circles, Exit Ticket, Frayer Model, Muddiest Point, etc. to find out the effectiveness of those methods. These methods may be used while altering the combination of TMAs used to see if still they are this much effective or not. The future researchers may use more than two groups to check out the effectiveness of TMA separately in spite of doing it on single group. The researchers may adopt any other research design e.g. True Experimental design or Solomon four group design instead of quasi experimental design to find out the effectiveness of TMAs on students' achievement. The policy makers or curriculum developers might conduct this kind of research at large scale level as some project in more than one university before indulging it in curriculum or making it the part of university curriculum. They should promote such assessment systems that measure progress of students and the education system over time.

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Appendix

Test

Student Number: _____   Student Name _____   Time: 1- hour

Course: Curriculum Development   Program BSEd. (Hons.)   Marks: 40

Part I – MCQs

Read each statement and all of the alternatives carefully. Encircle the alternative that best answers the question or completes the statement. Overwriting and cutting leads to deduction of marks.

1. Who defines curriculum as the written document that systematically describes goals planned, objectives, content, learning activities, evaluation procedure and so forth?   (KNOWLEDGE)
   a. Pratt
   b. Cronbleth
   c. Tyler
   d. Tanner

2. The creative principle of curriculum deals with the objective of education which means:
   (COMPREHENSION)
   a. Create new things while considering students' needs
   b. Discover and develop special interests, tastes and aptitudes of students
   c. Develop curricular activities to promote teaching
   d. Investigate different learning gaps and create interest of students.

3. The outline of the content to be studied by a student at a specific level of education is called:
   (COMPREHENSION)
   a. Course
   b. Subject
   c. Syllabus
   d. Content

4. Principle of maturity deals with the type of curriculum at different stages. According to this principle the best sequence for the activities to be included in the curriculum is:
   (ANALYSIS)
   a. Activity related to wonder, practical curriculum, generalization
   b. Practical Activities, generalization, theory development
   c. Activities related to interest, generalization, theory development
   d. Activity related to wonder, practical activities, generalization,

5. In your computer subject, you allow your class to chat as a part of your motivation before discussing them the roles of computer as a tool. Chat is used in this context as a/an:
   (APPLICATION)
   a. Informative
   b. Communicative
   c. Application
   d. Situating

6. When students learn lessons such as the importance of winning, the pain of losing, or how competition can turn friends into enemies, they are most likely learning the: (APPLICATION)
   a. Null curriculum
   b. Hidden curriculum
   c. Curriculum-in-use
   d. Rhetorical curriculum

7. When confronted with a learning situation, the learner: analyzes the problem, discriminates between essential and nonessential data, and perceives relationships: (APPLICATION)
   a. Gestalt theory
   b. Psychosocial theory
   c. Piaget theory
   d. Theory of curriculum development

8. Determining the value orientation of the curriculum involves consideration of the following components EXCEPT: (ANALYSIS)
   a. Availability of facilities and equipment
   b. The students for whom the curriculum is being developed
   c. The subject matter to be learned
   d. The society that has established the schools

9. Which is an example of spiral curriculum? (ANALYSIS)
   a. Teachers work together to integrate several subject areas into their lessons to give students a more holistic learning experience
   b. A student is required to use skills he acquired in math the previous grade to understand new information about a math topic in his current class
   c. A teacher organizes her class around several key questions that students will work to answer throughout the year
   d. None of above

10. During her first year as a teacher, Sara was visited on several occasions by colleagues and administrators who observed her teaching. Following each observation, she met with those who observed her so that they could help her identify her strengths and areas for improvement. These observers were engaged in: (ANALYSIS)
    a. Collaborative action research
    b. Evaluative reviews
    c. Diagnostic reviews
    d. Learning reviews

11. In demonstration method, teacher acts as a: (COMPREHENSION)
    a. Facilitator
    b. Helper
    c. Showman
    d. Leader

12. Special needs of the child should be considered while developing the curriculum follows the principle of: (COMPREHENSION)
    a. Integrity
    b. Individual differences
    c. Learning
    d. Flexibility

13. Curriculum trends according to progressivism are: (COMPREHENSION)
    a. Humanistic approach, societal education, cultural experiences
    b. Cultural experiences, school development, ideological principles
    c. Schools reforms, cultural reforms, societal reforms
    d. School reforms, relevant and contextualized curriculum, humanistic education

14. The trend which is catching the attention of policy makers is: (KNOWLEDGE)
    a. CAI
    b. ICT
    c. IRT
    d. CTT

15. Professor Ali is thinking of an online learning approach by which content provides links to information at other locations and serves as a focal point for a distance education experience. Which of the following should he use? (APPLICATION)
    a. Computer-aided Instruction
    b. Web-based Instruction
    c. Self-paced Program
    d. Teleconferencing

16. Which is NOT a basic consideration in selecting and evaluating the content of an educational technology tool? (ANALYSIS)
    a. Will it motivate and maintain interest?
    b. Is there evidence of its effectiveness?
    c. Can it be easily dismantled?
    d. Does it match the content?

17. Technology, computers, and the Internet have been used for many classroom and educational purposes. Which of the following is NOT a reason offered for computer use? (ANALYSIS)
    a. Drill and practice on specific skills, often the same skills required in state assessment tests
    b. Promote higher order thinking through simulations and collaborative action research
    c. Reduce disruptive behavior by refocusing students on individual computer tasks and assignments rather than on each other
    d. Modernize the school culture by reshaping American education for the twenty-first century

18. The process in which philosophy provides the starting point and will be used for the succeeding decisions is known as: (APPLICATION)
    a. Problem solving
    b. Decision making
    c. Inductive approach
    d. Deductive approach

19. When a teacher comes in a class and say, "Today we shall try to know about the proportion of oxygen and nitrogen in the air". He/she follows which step of lesson plan: (APPLICATION)
    a. Introduction
    b. Students' learning outcome
    c. Announcement of aim
    d. Generalization

20. The curriculum that is perceived and experienced by the students referred to as: (COMPREHENSION)
    a. Experiential
    b. Instructional
    c. Institutional
    d. Societal

21. Kainat and Maliha want to answer this question, but they have just answered two questions. "Let's give Sidra a chance to answer and then you both can tell the class whether you agree with her or not". What method of teaching is being used by the teacher? (APPLICATION)
    a. Discussion
    b. Lecture
    c. Project
    d. Problem solving

22. A student has difficulty staying focused and on task. Which one of the following teacher responses would be a consequence, rather than a punishment? (ANALYSIS)
    a. Calling the parents to notify them of the student's behavior
    b. Deducting points from the student's final grade
    c. Having the student move closer to the teacher's desk
    d. Having the student stay in detention to make up the work missed due to being off task

23. The non-verbal barrier to communication in the classroom may be: (COMPREHENSION)
    a. Informal dress style
    b. Walking too quickly up to someone
    c. Repeating the words again and again
    d. Speaking too loudly in the classroom

24. The kind of curriculum that is BEST to learn the social roles is: (KNOWLEDGE)
    a. Total
    b. Hidden
    c. Societal
    d. Managerial
25. Steps of Glover Plan are: (KNOWLEDGE)
    a. Questioning, Discussion, Investigation, Expression
    b. Introduction, Explanation, Discussion, Questioning
    c. Introduction, Expression, Questioning, Investigation
    d. Expression, Investigation, Questioning, Discussion
26. Heuristic is derived from the Greek word, which means to: (KNOWLEDGE)
    a. Discover
    b. Learn
    c. Demonstrate
    d. Act
27. A new element was introduced into curriculum process of cyclical models, called: (KNOWLEDGE)
    a. Content analysis
    b. Product analysis
    c. Situational analysis
    d. Curriculum analysis
28. The principal proponents of rational model are: (KNOWLEDGE)
    a. Ralph Tyler and Hilda Taba
    b. Skill beck and Hilda Taba
    c. Oliva and Tyler
    d. Tyler and Wheeler
29. Hilda Taba defined that the curriculum should be designed by the: (KNOWLEDGE)
    a. Curriculum wing
    b. High authority
    c. Teachers
    d. School
30. According to the needs and differences of the child; the curriculum should not be rigid and
    adopted follows the principle of: (COMPREHENSION)
    a. Integrated
    b. Individual differences
    c. Phantom
    d. Societal

Part II – Subjective Type

Attempt all Questions.
1. Consult the book of Biology-II and identify while developing this book which principles of curriculum development were considered.   (5)   (EVALUATION)
2. While considering the models of curriculum development create a model of your own choice. The model must possess all those characteristics which you think should be implemented in Pakistan.   (5)   (SYNTHESIS)
3. Develop a lesson plan that you consider is a best fit approach on any topic of your choice while considering different models and approaches of lesson plan.   (5)   (ANALYSIS)

Appendix-B

Model – Lesson Plan

Course Curriculum Development   **Topic**: Concept of Curriculum
Level   BSEd. (Hons.)   **Time**   90 minutes
Objectives
1. Comprehend the concept of curriculum by different practitioners.
2. Understand difference between curriculum, syllabus and textbook.
3. Know about the difference between different levels of curriculum and recognise the characteristics features of each.

Teaching Aids

      Multimedia, White Board, Board Marker, Worksheets, etc.

Recapitulation   10 minutes

Students' previous knowledge about the topic being taught is checked by asking various questions about it.

Different statements will be asked about syllabus, subject, course and curriculum from students. They will be required to give answer of the statement.

Explanation of the Content   30 minutes

After collecting the responses from the students discuss these statements with students to build up their concepts at the beginning. The terms curriculum, subject, course and syllabus will be discussed with the students by quoting different examples. The concepts of the students will be built on the basis of different definitions given by different practitioners.

Assessment Methods

 1. Think – Pair – Share   15 minutes

After explaining the terms, students will be asked to separate curriculum, content, syllabus, outline, and course from a book individually. After this, they will be required to discuss it with their pair and then in the class for discussion and clarification of concepts.

After this activity, different levels of curriculum will be explained to the students.

Explanation of the Content   20 minutes

      After collecting the responses(written) from the students, some definitions of curriculum from different practitioners will be discussed with them according to the context. The definition in different country context and the Latin and Greek meanings of the term "curriculum" will also be discussed with them. Students will be then required to think about their previous educational experiences and find a difference between curricular, extra-curricular and co-curricular activities by relating it with the concepts discussed.

Ending   10 minutes

   At the end of the lesson it will be asked from the students to tell on which point they feel difficulty during the lesson. An exit slip will be provided to all students and their responses will be collect on individual basis by asking them to paste the slip on the board while exiting.

Task Outcome   5 minutes

   Chose a definition of curriculum of your choice and discuss what you like about that definition that make it unique from all others. Also, write what is content and syllabus from a book of your choice.