ISSN E: 2709-8273
ISSN P:2709-8265
JOURNAL OF APPLIED LINGUISTICS AND TESOL
JALT

JOURNAL OF APPLIED LINGUISTICS AND TESOL

Vol.7. No.4.2024

PERCEPTION OF SECONDARY SCHOOL TEACHERS FOR IMPLEMENTATION OF CLASSROOM ASSESSMENT TECHNIQUES

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Abstract

Assessment is an essential pillar of education. Classroom learning requires feedback for decision-making about the effectiveness of the teaching-learning process. Classroom Assessment Techniques (CATs) is a formative assessment approach that helps to understand learners' needs to facilitate learning. The current descriptive study used a survey design to explore the perception of secondary school teachers regarding the implementation of CATs at the classroom level. Classroom Assessment Techniques Questionnaire for Teachers (CATQTs) was developed to collect data from 300 teachers through a simple random sampling technique. CATQTs consisted of seven sub-dimensions; minute-paper, muddiest-point, analytic memos, concept maps, one-sentence summary, application cards, and class-modeling of twenty-nine statements. The content validity was ensured by experts and the reliability of the CATQTs was calculated employing Cronbach's Alpha score of .846. The collected data were analyzed by applying mean, standard, and independent samples t-tests, to find out differences among gender, locality, and science and arts stream of teachers. The study's results showed that teachers were implementing CATs at secondary schools. The results revealed significant differences among male and female, science and arts teachers in CATs implementation. The male and the science teachers were more focused on the implementation of CATs than the female and the art teachers CAT implementation. The results exhibited no significant difference between urban and rural teachers' CATs implementation but urban teachers were making use of CATs implementation as compared to rural teachers' CATs implementation. Based on the results, it was recommended that policymakers, curriculum developers, teachers training institutions, and head teachers play their role in the effective implementation of CATs at the classroom level.

Keywords: *Classroom Assessment Techniques, Implementation, Perceptions, Secondary School Teachers*

INTRODUCTION

Transmission of knowledge requires self-awareness, metacognition, retrieval of information, and preparation for adaptive learning in the contemporary transformative era. Teaching without learning is a waste of resources, and there is less learning without assessment. The 21st-century learning involves active learners, individualization, inquiry, collaboration, support, and emotional experience. Focusing on how students learn means, focusing on students' learning styles, deep learning, feedback, and concentrating on assessment strategies (Barkley & Major, 2016; Katz, & Henry, 1993; Richart, 2000).

Assessment is a process for collecting, reviewing, and using information for decision-making about the teaching-learning process. The assessment provides a framework for mapping students learning progress (Bartley, 2005). Classroom assessment techniques (CATs) are non-graded assessment techniques to monitor students' learning and teachers' instructional process. CATs are low-stakes assessment strategies to gauge students' learning needs. CATs improve metacognitive awareness through monitoring and feedback strategies among learners (Angelo & Cross, 1993; Flint, 2004: Stiggins, 2010). Teachers are a primary part of learning and have various perceptions about CATs implementation.

ISSN E: 2709-8273
ISSN P:2709-8265
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Perception is a way of seeing things through a set of lenses that influence individual opinion, understanding, action, and ways of responding to the situation. People have different perceptions about the same object, situation, or phenomenon (Munhall, 2008). Teachers have vague perception about CATs, and their ways of implementation (Brown, 2013; Stiggins, 2010). Teachers have weak and fuzzy perceptions about CATs practices (Danielson et al., 2008; Nenty et al., 2007). Teachers reported a favorable perception regarding assessment but faced barriers to effective use in the classroom (Ndalichako, 2015). The perception of teachers about assessment is critical evidence of how teachers teach and what students learn during the teaching-learning process. CATs may play a bridging role in students learning and teacher instructional process but the less focused area is classroom assessment in the teaching-learning process. There is a dire need to explore the perception of secondary school teachers about CATs implementation and to find ways of CATs enactment in the classroom.

Objectives of the Study

Objectives of the current study were:

1. Measure the perception of Secondary school teachers for the Implementation of Classroom Assessment Techniques.
2. Find out the difference of opinion between male and female secondary school teachers about the implementation of CATs
3. Measure the difference of opinion between urban and rural secondary school teachers about the implementation of CATs
4. Determine the difference of opinion between science and arts secondary school teachers about the implementation of CATs

LITERATURE REVIEW

The current study literature review deals with feedback, deep learning, cognitive learning theory, assessment, and perception of teachers about CATs. To meet the educational challenges of students in the 21st century, it is necessary to redesign student learning and teacher capacity building through feedback (Joyce, Weil, & Calhoun, 2000). *Feedback* is the information about the student's achievement and performance related to desired set standards. The function of feedback is to develop self-regulation practices in students (Nicol & Macfarlane-Dick, 2006). Feedback is a dynamic, interactive way of information for immediate correction to improve outcomes and motivation of learning partners. Participation is feedback on the nature of learning taking place in the classroom for deep learning (Cohen, 2008). *Deep learning* has gained momentum in formative assessment as it provides feedback to make information meaningful through a retrievable process. Deep learning techniques help to analyze students' responses, monitor their learning progress, and identify areas of improvement. This allows teachers to adjust teaching strategies and provide timely assistance to individual students. Deep learning contributes to formative assessment through feedback, mastery assessments, and personalized learning (Karpicke & Grimaldi, 2012). An interactive classroom is essential to avoid surface learning and promote deep learning. Deep learning and Cognitive Learning Theory (CLT) facilitate how learners learn. CLT focuses on what is in the mind of the learner instead of learning through stimulus-response connection. Learning occurs as a result of constructing relationships among learners' prior knowledge, experience, and new skills being learned as an active learner in the learning process (Cowan, 2006). Learning results in the assimilation of prior skills into new information through long-term memory structure connections. There are three key processes in the building of connections during learning; attention for learning, deep learning, and metacognition, through

ISSN E: 2709-8273
ISSN P:2709-8265
JOURNAL OF APPLIED LINGUISTICS AND TESOL
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which learners control monitoring their learning, selecting learning strategy, and resource management (Angelo & Cross, 1993; Cross & Palese, 2015; Steadman & Svinicki, 1998). Cognitive Learning Theory (CLT) claims that learning involves active mental processes by which learners acquire, process, and organize information. Schema theory, metacognition, and scaffolding support CLT during the assessment process. CLT uses formative assessment techniques of self-explanation elaboration and retrieval practice. Using CLT principles in classroom assessment helps students develop self-regulation skills, and improve retention and understanding through structured feedback and retrieval practice (Anderson, & Krathwohl, 2001; Bruning et al., 2004; Zimmerman & Schunk, 2001).

Teachers' Perception of the Implementation of Classroom Assessment Techniques

Perception is a process of having different opinions about the same phenomenon based on sensory information. Teachers have vague perceptions about assessment implementation (Brown, 2013). Etymologically the term assessment is derived from the Latin word assidere which means "to sit beside" (Stefanakis, 2002). The assessment is a process through which information is collected to some known standard. Assessment is a vital element of the teaching-learning process. Through the use of assessment, both teachers and students have the opportunity to reflect on teaching learning outcomes (Bowden, & Marton, 2003). When students know their results, they know what to do to fill in their learning gaps. The CATs are non-graded in-class activities designed to provide teachers and students feedback on teaching learning process (Walker, 2012). CATs enhance higher-order thinking skills among learners. Angelo and Cross (1993) reported that CATs promote the teaching-learning process in particular subjects and situations, in finding out how well, how much, and what is being learned by learners. The CAT helps to determine the intensity of learning happening in the classroom and provides a feedback loop between students and teachers (Cohen, 2008; Divoll, Browning & Vesey, 2012; Simpson-Beck, 2011). The CATs contribute to improving the performance of students in tests and the level of participation in discussions (Cross & Palese, 2015). The CATs provide feedback about student learning and instruction. It provides an opportunity for students to take responsibility for their learning. It improves learning; CATs promote interaction and build relationships among teachers and students (Hanson & Florestano, 2020).

The teachers are central factors in the enactment of appropriate assessment techniques through their values and beliefs for better outcomes for learners. Teachers may implement creative assessment strategies to gauge students' learning (Linn & Miller, 2005). Participation in classroom discussion is essential for students successful in assessment. Teachers support students to produce hope through active participation. Collaborative discussion has a positive impact on developing critical thinking and long-term retention (Nagel et al., 2009). Teachers can integrate CATs in any course to facilitate learning. Angelo and Cross (1993) reported three steps of using CATs; planning, implementation, and responding. A variety of CATs are available in literature, and teachers select related knowledge, skill creativity, or problem-solving CATs. Practitioners of various disciplines have described a minute paper as having outstanding benefits and pedagogical innovation that ample opportunity to the learner for active learning (Chizmar, & Ostrosky, 1998; Magnan, 1991). The implementation of assessment techniques involves integrating various assessment methods into teaching practices to effectively monitor, support, and improve student learning. This process requires thoughtful planning, consistent application, and reflective adaptation to meet the diverse needs of learners. Key steps involved in the effective implementation of assessment techniques included setting clear learning goals, selecting appropriate assessment techniques, providing clear instructions, offering feedback, and engaging students. Implementing

ISSN E: 2709-8273
ISSN P:2709-8265
JOURNAL OF APPLIED LINGUISTICS AND TESOL
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assessment techniques successfully requires a balanced, flexible approach that adapts to student needs and classroom dynamics (Manuel, 2023).

Classroom Assessment Techniques (CATS) for Measuring Various Learning Domains

Various CATS are discussed for different measuring learning domains.

Minute paper and muddiest point techniques are used for assessing prior knowledge, recall, and understanding. The *minute paper* is a widely used classroom assessment technique that allows teachers to gauge students' understanding of the material presented. It involves asking students to spend one to two minutes answering a question. This technique provides teachers with quick feedback on students' comprehension, enabling them to adjust instruction in real time to reinforce key concepts. A teacher uses minute paper at the end of the lesson to measure how students learn and understand the content (DeJesús, 2024). Implementation; at the end of the lesson students take out a piece of paper and give them 3 to 5 minutes to respond. Possible questions include; what is an important thing that was learnt and what students want further clarification. Two important questions; what is an important thing that students learned during this class and what questions remained unanswered (Cohen, 2008). CATs of Minute paper are used for obtaining feedback about learning from students (Angelo & Cross, 1993). Minute paper of CAT is less helpful for mechanical-type questions or questions that appear off-subject (Cohen, 2008). Teachers are more persistent and inspired in applying CATs that help them learn (Pascarella & Terenzini, 2005). The process of using minute paper is that the teacher stops for 3 to 5 minutes between talks, or the end of a talk and asks students to write important points of the topic of today's discussion on a sheet. The teacher collects the sheets and clarifies the answers to the questions raised by individuals (Angelo & Cross, 1993; Olmsted, 1999). A minute paper benefits teachers in determining an in-depth understanding of the concepts, identifying the gray area of the topic and students' responses about the topic, and closing the communication gap that hampers the effective teaching-learning process (Vonderwell, 2004). From the teacher's point of view, it gives feedback on what the learner has learned, and up to what extent, the SLOs of the topic have achieved. A minute paper can easily be employed for dynamic participation during the teaching-learning process. *Muddiest point* CATs are used to assess recall, knowledge, and understanding. The muddiest point technique provides information on what students find clear or confusing about a topic. The teacher provides a reading passage, topic, or any learning activity, and students are required to respond to two or three questions with answers and one muddiest point (Angelo & Cross, 1993). For example, after a lesson on fractions, a teacher asks, what was the most confusing part of today's lesson? Responses from students help the teacher to understand which aspects of fractions need further clarification. This assessment technique encourages active reflection, making students more aware of their learning process and challenges. Teachers receive valuable feedback that can inform future instruction, lesson pacing, and differentiation efforts. This provides an opportunity to learn from each other. Teachers review the answers of each student. Teachers summarize the discussion and make the muddy point clear (Manuel, 2023).

1. **Analytic Memos are used for Assessing Skills in Analysis and Critical Thinking.**

For assessing skills in analysis and critical thinking teachers use CATs to help students focus on the main idea through the breakdown of information for better comprehension of what, why, and how of the topic. Implementation; at the end of class, ask students to reflect on the main theme of what, why, and how was discussed. To assess skills in analysis and critical thinking, classroom assessment provides opportunities to gauge students' comprehension and help teachers refine instruction in a school setting. Classroom assessment focuses on open-ended tasks, reflective exercises, real-world problems, analytic

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ISSN P:2709-8265
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memos debates, and active discussions that encourage students to process, evaluate, and construct arguments or solutions (Black & Wiliam, 1998; Brookhart, 2010; Fisher, 2003). Teachers use *analytic memos* to help students in analyzing concepts by supporting the main idea with supplementary content. This allows students to reflect on gaps in their thinking mastery of materials. Implementation; at the end of class, the teacher asks students to write 1-2 pages on the main ideas of class, summarizing, organizing, and analyzing the key concepts (Messick, 2013).

1. **Concept Maps and One-sentence summary are used for Assessing Skills in synthesis and Creative Thinking**

Assessing synthesis and creative thinking during classroom assessment is essential for fostering higher-order cognitive skills in students at the school level. Synthesis and creative thinking involve encouraging students to integrate different ideas, create original solutions, and apply knowledge in new contexts. The use of concept mapping, self-assessment, and peer assessment strategies provides students with opportunities to practice synthesis and creative thinking platforms (Novak & Cañas, 2008; Falchikov, & Goldfinch, 2000). Teachers use CATs to ask students to develop material for evaluating understanding. *Concept Maps* help students to organize content and develop connections between learning material. Implementation; at the end of class, the teacher asks students to create a visual representation of the topic discussed in the class. A concept map focuses on the relationship among different concepts (Angelo & Cross, 1993; Messick, 2013). Concept maps encourage synthesis by requiring students to visually organize and connect ideas. On the other hand, mind maps, foster creative thinking by allowing for free association and brainstorming (Novak & Cañas, 2008). *The one-sentence summary* focused on a specific answer to those students' answers. One-sentence summary judges correct information. Students' responses to this type of CAT are quickly sorted into three piles: correct, complete, and incomplete responses. Then the number of responses in each pile can be counted, and the approximate percentage of the total class represented can be calculated. Teachers also look at thoughtful responses among them from the target group (Angelo & Cross, 1993).

1. **Application Cards and Class Modeling are used for Assessing Skills in Applications and Performance**.

Assessing skills in performance and applications real-time helps teachers to gather feedback on understanding, and abilities of students to improve learning. Important strategies in assessing skills through applications and performance included observation and feedback, performance-based assessments, self-assessment, peer assessment, portfolios, application cards, class modeling, and digital assessments (Andrade & Heritage, 2017; Black, & Wiliam, 1998; Wiliam, 2011). *Applications Cards* assess learners' skills by eliciting possible applications of lessons learned in class to real life or other specific areas. Application cards encourage students to apply learned concepts to real-world scenarios. Application cards help students connect theoretical knowledge to practical applications by requiring them to describe how they would use a particular concept in a real-life situation. For example, after learning about fractions, students might fill out an application card explaining how they would use fractions to double a recipe. This form of assessment is flexible and can be tailored to different subjects. In science, for instance, students might explain how Newton's laws are relevant in sports, while in history, they might relate historical events to current issues (Angelo & Cross, 1993; Black & Wiliam, 1998; Marzano, 2007). In a school-level biology class, a teacher might give students an application card asking them to describe how cellular respiration is relevant to athletes' endurance. This activity not only checks understanding but also sparks interest by linking learning to students' interests.

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Class modeling technique assesses performance by engaging students in physically acting out their applications of knowledge (Angelo & Cross, 1993). These techniques involve students taking on roles to represent real-world scenarios, allowing teachers to assess their understanding more dynamically and practically. The key idea is to have students visually and tangibly represent their understanding, which allows teachers to see how well students grasp the material. Science Students might create models of the solar system, demonstrating their understanding of planetary orbits and sizes. In geometry and mathematics, students might model geometric shapes and their properties, allowing the teacher to gauge their comprehension of spatial concepts and relationships. The benefits of role-play involve active learning, real-world application, and social and communication skills, visual representation encourages deep thinking and immediate feedback. These techniques not only help assess knowledge but also promote deeper learning and provide teachers with insights into how students are engaging with the content Angelo & Cross, 1993; Black & Wiliam, 1998; Marzano, 2007).

Various Studies were structured regarding CATs globally, some of them are reported below. A study was framed by Warsi and Shah (2019) to explore the perception of university teachers about CATs in Pakistan. The study was descriptive in nature and survey technique was used to collect. A random sampling technique was used to collect data from 54 teachers from six universities. Descriptive and inferential statistics were used to analyze data. Findings reported that students are interested in assessments that contribute to their grades instead of deep learning and higher-order thinking skills. A study was structured by Ashakiran and Deepthi (2013) to explore the effectiveness of CATs in a one-minute paper in the one-hour lecture of post-graduate students. The lecture was divided into five components. The delivery time of each part of the lecture was 8 to 12 minutes. At the end of each part, 2 minutes were given to students to respond to two questions. The results reported that the use of a one-minute paper is thinking-centered during learning and provides autonomy for active learning. Li and Van Lieu (2018) structured a study to compare traditional and online usage of CATs at the university level. The study was mixed-methods based on survey design to explore the phenomenon. The study sample consisted of 117 university faculty members. Mean percentage and ANOVA were used to analyze the collected data. No significant difference existed between traditional and online teaching strategies. Jawad, Majeed, and Alrikabi (2021) designed a study to determine the effect of CATs on mathematical and logical thinking among fourth-grade students in Iraq. The experimental study was based on a quasi-experimental research design. The sample of the study consisted of 44 students. The finding of the study explored a significant difference between the control group and the experimental group. Nawaz and Akbar (2022) reported that only 40% of formative assessment techniques are being used by teachers at secondary, furthermore, urban teachers were using better formative assessment techniques as compared to rural teachers in Punjab. Harwood (1999) framed a study to explore students' perceptions regarding classroom assessment techniques. The sample of the study was 157 students. The data were analyzed through percentage and frequency. The findings of the study reported that 64% of students have perceptions that CATs; and minute papers encourage participation during teaching learning process when feedback is provided.

RESEARCH METHODOLOGY

The present study used a descriptive method and survey design. All public sector secondary schools of Punjab constitute the population. The sample of the current study consisted of 300 teachers selected through a simple random sampling technique from the

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ISSN P:2709-8265
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district Hafizabad Punjab, Pakistan for the study. The researchers developed CATQTs on a 5-point Likert-type scale to measure teachers' perceptions regarding classroom assessment techniques. The CATQTs include minute papers, muddiest points, analytic memos, concept maps, one-sentence summaries, application cards, and class modeling of 29 items to gauge students learning. The content validity of the self-developed questionnaire was validated by five educational experts. The reliability of the CATQT was calculated employing Cronbach's Alpha score .846. The factor-wise reliability scores of the questionnaire were more than .758. Ethical considerations were ensuring to collect of the data. The researchers personally visited the selected school to collect data. The researcher guided the teachers in providing accurate data. The researcher shared the purpose and context of the study and briefed them before starting to fill in the questionnaire.

ANALYSIS AND INTERPRETATION

The collected data were analyzed through mean, standard, and independent samples t-test was employed to find out the significant difference between gender and locality, and science and arts stream of teachers.

Objectives 1

Measure the perception of Secondary School Teachers for the Implementation of Classroom Assessment Techniques?

Table 1. *Analysis of Classroom Assessment Techniques*

S.r #	***Dimensions of CATs***	***M***	***SD***
1	*Minute-paper*	3.46	1.20
2	*Muddiest-points*	3.24	1.20
3	*Analytic-memos*	3.36	1.22
4	*Concept maps*	3.36	1.29
5	*One-sentence summary*	3.56	1.28
6	*Application cards*	3.55	1.25
7	*Class-modeling*	3.45	1.22
	Overall	**3.43**	**1.23**

Table 1 showed that teachers were using minute paper, muddiest points, analytic memos, concept maps, one-sentence summary, application cards, and class-modeling classroom assessment techniques. The statistical values showed that the mean of the statements were between 3.24 to 3.56 and overall M = 3.43, SD = 1.23. Therefore, it was recommended that respondents agree with all CATs implementations.

Objectives 2

Find out the difference of opinion between male and female secondary schools teachers about the implementation of CATs

Table 2. *Independent Sample T-Test on the Dimensions of CATS by Gender*

Statement	**Group**	**N**	**M**	**SD**	**t**	**df**	**Sig**
Minute-paper	Male	150	3.72	.88	3.96	128	.00*
	Female	150	3.16	.81			
Muddiest-point	Male	150	3.56	.76	1.83	128	.05*
	Female	150	3.11	.75			
Analytical memos	Male	150	3.50	.96	1.73	128	.08
	Female	150	3.21	.88			

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Concept map	Male	150	3.53	1.01	2.15	128	.03*
	Female	150	3.16	.94			
One-sentence summary	Male	150	3.83	.97	3.59	128	.00*
	Female	150	3.26	.81			
Application cards	Male	150	3.75	1.01	2.52	128	.01*
	Female	150	3.32	.89			
Class-modeling	Male	150	3.67	1.0	2.80	128	.00*
	Female	150	3.20	.85			
Overall	**Male**	**150**	**3.65**	**.92**	**2.65**	**128**	**.02***
	Female	**150**	**3.20**	**.84**			

Table 2 demonstrates the difference of opinion of male and female teachers regarding CATs. There existed a significant difference in Minute-Paper of CATs, the mean score of male teachers was greater (M = 3.72; SD = .88) than females (M = 3.16; SD = .81), about Muddiest-Point. The mean of male participants was greater (M=3.56; SD=.76) than females (M=3.11; SD=.75), about Analytical Memos, the mean of male participants was greater (M=3.50; SD=.96) than females (M=3.21; SD=.88), about Muddiest-Point regarding male and female, the mean of male participants was greater (M=3.56; SD=.76) than females (M=3.11; SD=.75), about Analytical Memos regarding male and female, the mean of male participants was greater (M=3.50; SD=.96) than females (M=3.21; SD=.88), about Concept Map, the mean of male participants was greater (M = 3.53; SD = 1.01) than females (M = 3.16; SD = .94), about one-Sentence summary, the mean of male participants was greater (M = 3.83; SD = .97) than females (M = 3.26; SD = .81), about application cards, the mean of male participants was greater (M = 3.75; SD = 1.01) than females (M = 3.32; SD = .89), and about class-modeling, the mean of male participants was greater (M = 3.67; SD = 1.00) than females (M = 3.20; SD = .85). Overall, there existed a significant difference among male and female teachers, mean score of male was greater (M = 3.65, SD = .92) than female (M = 3.20, SD = .84).

Objectives 3

Measure the difference of opinion between urban and rural secondary school teachers about the implementation of CATs

Table 3. *Independent Sample T-Test on Dimensions of CATS of Urban and Rural*

Statement	Group	N	M	SD	t	df	Sig
Minute-paper	Urban	150	3.72	.78	1.295	128	.198
	Rural	150	3.16	.81			
Muddiest-point	Urban	150	3.36	.76	.185	128	.853
	Rural	150	3.11	.75			
Analytical memos	Urban	150	3.50	.96	.318	128	.751
	Rural	150	3.21	.88			
Concept maps	Urban	150	3.53	1.01	.303	128	.762
	Rural	150	3.16	.94			
One-sentence summary	Urban	150	3.83	.97	.396	128	.692
	Rural	150	3.26	.81			
Application cards	Urban	150	3.75	1.01	.431	128	.667
	Rural	150	3.32	.89			
Class-modeling	Urban	150	3.67	1.0	1.190	48.39	.600
	Rural	150	3.20	.85			

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ISSN P:2709-8265
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Overall	Urban	**150**	**3.62**	**.92**	**.588**	**116.62**	**.646**
	Rural	**150**	**3.20**	**.84**			

Table 3 presents the difference of opinion of respondents regarding the Minute-Paper of CATs. There existed no significant difference about Minute-Paper, the mean of male participants was greater (M = 3.72; SD = .78) than females (M = 3.16; SD = .81), about Muddiest-Point regarding urban and rural, the mean of urban teachers was greater (M = 3.36; SD = .76) than rural (M = 3.11; SD = .75), about Analytical Memos the mean of urban teachers was greater (M=3.50; SD=.96) than rural (M=3.21; SD=.88), about Concept Map, the mean of urban teachers was greater (M = 3.53; SD = 1.01) than rural (M = 3.16; SD = .94), about one-Sentence summary, the mean of urban teachers was greater (M = 3.83; SD = .97) than rural (M = 3.26; SD = .81), and about class-modeling, the mean of urban teachers was greater (M = 3.67; SD = 1.00) than females (M = 3.20; SD = .85). Overall, there existed no significant difference among urban and rural teachers, mean score of urban was greater (M = 3.62, SD = .92) than rural (M = 3.20, SD = .84).

Objectives 4

Determine the difference of opinion between science and arts secondary school teachers about the implementation of CATs

Table 4. *Analysis of Science and Arts Teachers CATs Usage*

Statement	**Group**	**N**	**M**	**SD**	**t**	**df**	**Sig**
Minute-paper	Science	150	3.71	.76	2.98	128	.00*
	Arts	150	3.28	.75			
Muddiest-point	Science	150	3.53	.75	1.03	128	.06
	Arts	150	3.18	.77			
Analytical memos	Science	150	3.50	.97	1.40	128	.11
	Arts	150	3.27	.89			
Concept maps	Science	150	3.48	1.03	1.16	128	.13
	Arts	150	3.27	.96			
One-sentence summary	Science	150	3.80	.97	2.48	128	.01*
	Arts	150	3.39	.89			
Application cards	Science	150	3.70	1.01	1.43	128	.03*
	Arts	150	3.45	.95			
Class-modeling	Science	150	3.65	1.04	1.90	128	.05*
	Arts	150	3.32	.92			
Overall	**Science**	**150**	**3.59**	**0.93**	**1.76**	**128**	**.05***
	Arts	**150**	**3.30**	**0.87**			

Table 4 showed the difference of opinion of respondents regarding CATs. There was no significance difference about Muddiest-Point , the mean of science teachers was greater (M = 3.53; SD = .75) than arts teachers (M = 3.18; SD = .77), no significance difference about Analytical Memos, the mean of science teachers was greater (M = 3.50; SD = .97) than arts teachers (M = 3.27; SD = .89) and no significance difference about Concept Map, the mean of science and arts teachers was greater (M = 3.48; SD = .103) than science and arts teachers (M = 3.27; SD = .96). There was significance difference about Minute-Paper regarding science and arts teachers perception about CATs implantation, the mean of science teachers was greater (M = 3.71; SD = .76) than arts teachers (M = 3.28; SD = .75), significance difference about one-Sentence summary, the mean of science teachers was

ISSN E: 2709-8273
ISSN P:2709-8265
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greater (M = 3.80; SD = .97) than arts teachers (M = 3.39; SD = .89), significance difference about class-modeling, the mean of science teachers was greater (M=3.70; SD = .101) than arts teachers (M = 3.45; SD = .95), significance difference about Minute-Paper regarding male and female, the mean of male participants was greater (M = 3.65; SD = .104) than females (M = 3.32; SD = .92). Overall, there existed significant difference among science and arts teachers, mean score of science was greater (M = 3.59, SD = .93) than arts (M = 3.30, SD = .87).

Results

1. The results of the study measured that teachers were implementing CATs at secondary schools.
2. The results showed a significant difference between male and female teachers' CATs implementation, the mean score of males was greater (M = 3.65, SD = .92) than females (M = 3.20, SD = .84), male teachers were making use of CATs implementation as compared to female teachers CATs implementation.
3. The results revealed that there was no significant difference between urban and rural teachers' CATs implementation, the mean score of urban was greater (M = 3.62, SD = .92) than rural teachers (M= 3.20, SD = .84), but urban teachers were making use of CATs implementation as compared to rural teachers CATs implementation.
4. The results reported that there was a significant difference between science and art teachers' CATs implementation, the mean score of science was greater (M = 3.59, SD= .93) than arts (M = 3.30, SD = .87), science teachers were making more use of CATs implementation as compared to art teachers CATs implementation.

Conclusion

The results of the study measured that teachers were implementing CATs at classroom level. The results showed a significant difference between male and female teachers, and between science and arts teachers, but no significant difference between urban and rural teachers' CATs implementation at the classroom level.

Discussion

The current study was designed to explore the perception of secondary school teachers for the implementation of classroom assessment techniques. The results of the present study revealed that secondary school teachers were implementing CATs to enhance teaching and learning. The results showed a significant difference between male and female teachers' CATs implementation, male teachers were making use of CATs implementation as compared to female teachers' CATs implementation. The results revealed no significant difference between urban and rural teachers' CATs implementation, but urban teachers were making use of CATs implementation as compared to rural teachers CATs implementation. The results established a significant difference between science and art teachers' CATs implementation, science teachers were making more use of CATs implementation as compared to art teachers CATs implementation consistent with the results of the study by Harwood (1999) to determine students' perception regarding classroom assessment techniques, also consistent with results of o the study Warsi and Shah (2019) to explore the perception of teachers about CATs in Pakistan.

Recommendations

Based on the results, it was recommended that policymakers focus on the implementation of CATs at school level. The curriculum developers provided more content on CATs to improve the teaching-learning process. Teachers training institutions develop modules and train teachers on subject-based CATs to meet the needs of the contemporary

assessment paradigm. Headteachers bound teachers to the usage of subject-based CATs to enhance the academic achievement and performance of the students.

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