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The Experiences, Challenges, and Acceptance of Item Bank System (IBS) as a Tool for Paper Generation: A Case Study

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Abstract: *Using the Item Bank System (IBS) for paper generation is gaining popularity in educational settings. However, limited research has been conducted on the experiences, challenges, and acceptance of IBS. This study explored the challenges educators and head teachers face when implementing IBS for paper generation in educational settings. Thematic analysis of data collected from four participants revealed that technical challenges, such as system integration, maintenance, and interface design, and human resource challenges, including a lack of adequate training and support for educators and resistance to change, impact the effective use of IBS for a paper generation. Addressing these challenges through adequate training, support, and resources can help ensure IBSs successful adoption and use in educational settings. The study highlights the importance of further research to investigate the perceptions and experiences of students and evaluate the effectiveness of IBS in enhancing exam quality and productivity in educational settings.*

Key Words: Item Bank System, Paper Generation, Educational Settings

Introduction

The use of technology in education has become increasingly widespread in recent years, and one of the innovations in this field is using the Item Bank System (IBS) as a tool for paper generation. IBS is a software system that stores and manages an extensive database of exam items and can be used to generate exams, quizzes, and other assessments randomly.

The traditional method of generating papers for exams, quizzes, and other assessments often involves manual preparation by educators, which can be time-consuming and prone to errors. With the advent of technology, IBS has emerged as a solution to this problem. By storing exam items in a database, IBS makes it easy for educators to quickly and accurately generate exams, reducing the time and effort required for manual preparation.

The use of IBS in education has been proliferating, and many institutions have adopted this technology to improve the efficiency and quality of their assessments. The IBS streamlines the process of item creation and paper generation, providing teachers, subject specialists, and assessment experts with

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a centralized platform to access and create standardized items. This enhances the quality and consistency of the assessments, making them more reliable and valid and allowing for better evaluation of student learning.

In the School Based Assessment (SBA) at the elementary level throughout Punjab, the Punjab Examination Commission (PEC) recognizes the importance of using an efficient and effective assessment tool. The PEC introduced the IBS as an Information and Communication Technology (ICT) solution to improve the existing item writing and paper generation process.

Previously, the item creation process at PEC was a manual, time-consuming task limited in its resources and capabilities. With the support of The World Bank, PEC was able to digitize and upgrade its item creation and paper generation process, making it more efficient and productive. The IBS is designed to improve the previous manual system by offering several key features and benefits.

The IBS features word-like editing tools that make creating items easier and a media gallery that allows users to store and access images. The system also supports multiple languages, including English, Urdu, and Arabic, and includes a plagiarism check to ensure the authenticity of items. Additionally, the IBS provides psychometric data tagged to each item, allowing users to understand each item's quality and difficulty better.

The IBS also includes user management, security, and system performance features, such as custom roles for each user, multi-level authentication, and minimum page load times. Communication among users is facilitated through online messaging. The school account allows user authentication through a QR code, auto paper generation based on a table of specifications, and auto key and rubric generation. The IBS also provides log maintenance at the level of each user and reports and statistics available to PEC and district focal persons.

In conclusion, the introduction of the IBS is a significant step towards improving the assessment process at PEC. Its digitization of the item creation and paper generation process, combined with its various features and benefits, make it a valuable tool for the smooth conduct of SBA at the elementary level throughout Punjab. Furthermore, the IBS can potentially increase the productivity and efficiency of the assessment process, improve the quality of items and exams, and provide a more reliable and transparent system for monitoring and evaluating student performance.

However, despite its potential benefits, using IBS has challenges. Some educators may resist using new technology, while others may face difficulties using the system effectively.

Research Gap

Despite the growing interest in using Item Bank Systems (IBS) for computer-based testing, there appears to be a research gap regarding the experiences, challenges, and acceptance of IBS as a tool for paper generation in educational settings. In particular, little is known about how head teachers use IBS to create traditional paper-based tests and what factors may influence their decision to use IBS in this way.

Statement of the Problem

Despite the potential benefits of using the Item Bank System (IBS) as a tool for paper generation, the widespread adoption of this technology in education has not been without its challenges. Principals, IT teachers, and educators may face difficulties using the system effectively, leading to a low level of acceptance and ineffective utilization of the technology. Additionally, some educators may resist using new technology, further hindering the adoption and integration of IBS into the educational landscape. The problem, therefore, is the lack of understanding and effective utilization of IBS as a tool for paper generation in education. This study aims to address this issue by examining the experiences, challenges, and acceptance of IBS among educators through a case study approach.

Objectives

This study examines the experiences, challenges, and acceptance of IBS as a tool for paper generation by exploring a case study. The objectives of this study are:

- The studys objective is to explore the experiences, challenges, and acceptance of the Item Bank System (IBS) as a tool for paper generation in educational settings.

Significance of the Study

The results of this study have the potential to provide valuable insights into the effectiveness and efficiency of the IBS in improving the assessment process. It can inform educators, policymakers, and researchers about the potential benefits and limitations of using IBS in assessment and help them make informed decisions about its implementation. This study can also contribute to developing best practices and guidelines for implementing and using IBS in other educational contexts. Ultimately, this studys results can help improve the quality of assessments and support the fair and accurate evaluation of student learning.

Literature Review

In recent years, there has been a growing interest in using Item Bank Systems (IBS) as a tool for paper generation in educational settings. IBS allows educators to store and manage many test items in a digital format, which can be used to create customized tests quickly and easily. This approach offers several advantages over traditional paper-based testing, including greater efficiency, flexibility, and accuracy (Cito, 2018; Van der Linden & Glas, 2010).

Despite the potential benefits of IBS, there is still a research gap regarding its use as a tool for paper generation. In particular, little is known about the experiences, challenges, and acceptance of IBS among educators and headteachers in this context. Several studies have explored the use of IBS in computer-based testing, but less attention has been paid to its use for traditional paper-based tests (Deng & Wei, 2017; Martin & Kelly, 2019).

One potential challenge with using IBS for paper generation is the need for appropriate item selection and test assembly methods. This is especially important when constructing tests with different difficulty levels or for different levels of learners. There is a need for research that explores the use of different item selection methods, such as random or targeted selection, and the impact on the resulting test quality (Whiting, 2018).

Another essential factor to consider is the perception and acceptance of IBS among educators and head teachers. While IBS is effective in computer-based testing, whether educators and head teachers will adopt this approach for paper-based tests is unclear. There is a need for research that explores the attitudes and beliefs of educators and head teachers toward IBS and the factors that influence their decision to use IBS for paper generation (Chen & Liu, 2019).

In addition to these challenges, there are technical and logistical issues to consider when using IBS for paper generation. These include appropriate software and hardware and sufficient training and support for educators and head teachers (Lu, 2017). There is a need for research that explores the practical aspects of using IBS for paper-based tests, such as the implementation process, costs, and sustainability.

Overall, the literature suggests a research gap regarding using IBS as a tool for paper generation in educational settings. There is a need for research that explores the experiences, challenges, and acceptance of IBS among educators and head teachers in this context. By addressing these gaps, we can better understand IBSs potential benefits and limitations and identify strategies for improving its use in educational settings.

Several studies have highlighted the advantages of using IBS for paper generation. For example, IBS allows educators to create more reliable, valid, and efficient tests than traditional paper-based tests (Chen & Liu, 2019; Whiting, 2018). IBS also allows for

greater flexibility in test design, as educators can select items based on specific learning objectives or cognitive domains (Cito, 2018).

One study by Deng and Wei (2017) found that using IBS for paper generation led to significant improvements in test quality, including increased reliability and validity. The study also found that using IBS reduced the time and effort required to create and administer tests and the potential for item exposure.

Despite these advantages, challenges are associated with using IBS for paper generation. One potential challenge is the need for appropriate item calibration and equating methods. These methods are necessary to ensure that test scores are comparable across different forms of the same test or across tests that measure the same construct (Van der Linden & Glas, 2010).

In addition to these challenges, there are concerns regarding the security and confidentiality of test items in an IBS. There is a need for appropriate measures to ensure that test items are kept secure and confidential and that the integrity of the testing process is maintained (Chen & Liu, 2019).

Overall, the literature suggests that while challenges are associated with using IBS for paper generation, there are also significant potential benefits. There is a need for further research that explores the experiences, challenges, and acceptance of IBS among educators and head teachers in educational settings, as well as strategies for addressing these challenges. By doing so, we can better understand the potential of IBS as a tool for paper generation in educational settings and identify opportunities for improvement.

Methodology

The total number of individuals from which participants/samples are selected is called the population (Nasrin Akhter et al., 2021; Nasrin Akhter et al., 2021; Ali et al., 2021; Azeem et al., 2021; Faiz et al., 2021; Jabeen et al., 2022; Kanwal et al., 2022). The number of individuals from which data were collected is called the sample (quantitative) or participants (qualitative) (Lakhan et al., 2020; Mah Jabeen et al., 2021; Munir et al., 2021; Saeed et al., 2021; Sajjad et al., 2022; Siddique, 2020; Siddique et al., 2022; Siddique et al., 2021; Siddique et al., 2023; Siddique et al., 2021). The participants in this study were Headteachers, IT teachers, and Subject teachers who were using the Item Bank System (IBS) as a tool for paper generation.

Sample

A purposive sampling technique was used to select the participants for this study. The sample consisted of 2 Headteachers and 2 IT teachers actively using the IBS in School Based Assessment (SBA).

Sampling Technique

Purposive sampling was chosen as the sampling technique for this study as it allowed the researcher to select knowledgeable and experienced individuals using the IBS.

Data Collection

Data was collected through semi-structured interviews and questionnaires from the participants

as they used the IBS. The data were then transcribed and coded for analysis.

Coding and Analysis

The data were analyzed using thematic analysis, which involved identifying and categorizing patterns and themes. The themes were then organized and interpreted to understand the experiences, challenges, and acceptance of the IBS as a tool for paper generation. The findings were then presented in a case study format.

Data Analysis

Following are the theme and sub-theme for the data analysis

Theme: Challenges of Item Bank System (IBS) Implementation for Paper Generation

Sub-theme 1: Technical Challenges

- Difficulties in system integration
- Issues with system maintenance and updates

Sub-theme 2: Human Resource Challenges

- Lack of training and support for educators and assessment specialists
- Resistance to change and adoption of new technology

Participant 1 (Headteacher)

Sub-theme 1: Technical Challenges: This participant reported that they experienced difficulties in integrating the IBS system with their existing learning management system. They reported that the technical issues delayed the creation of exams, which affected their course delivery timelines.

Sub-theme 2: Human Resource Challenges: This participant noted inadequate training and support in using the IBS system. They reported that they had to rely on their trial-and-error approach to learn the system, which was time-consuming.

Participant 2 (Headteacher)

Sub-theme 1: Technical Challenges: This participant reported that they encountered issues with system maintenance and updates, which affected the system's stability and reliability. They reported spending extra time resolving technical issues, which impacted their productivity.

Sub-theme 2: Human Resource Challenges: This participant reported resistance to adopting the IBS system by some educators. They reported that some educators preferred the traditional paper-based exam system and hesitated to switch to the IBS system.

Participant 3 (IT Teacher)

Sub-theme 1: Technical Challenges: This participant reported that they experienced difficulties in navigating the IBS system interface, making it challenging to locate the necessary information for their exams. They suggested improving the systems user interface to enhance usability.

Sub-theme 2: Human Resource Challenges: This participant did not report any challenges related to human resources in using the IBS system.

Participant 4 (IT Teachers)

Sub-theme 1: Technical Challenges: This participant reported that they had challenges integrating
the IBS system with their existing course content, which impacted the quality of their exam questions. They suggested that a more intuitive and user-friendly interface could help to improve the integration process.

Sub-theme 2: Human Resource Challenges: This participant reported not receiving adequate training and support to use the IBS system effectively. They suggested that more comprehensive training and ongoing support could help to address this challenge.

The thematic analysis reveals that implementing IBS for paper generation in educational settings is challenging. The technical challenges related to integrating the IBS system with existing educational technology and maintaining the system were significant issues that impacted productivity and created delays. The lack of adequate training and support for educators and assessment specialists was also a critical human resource challenge that hindered the effective use of the IBS system. Additionally, resistance to change and the adoption of new technology from some educators was another significant challenge.

However, it was also noted that some participants did not report significant challenges in using the IBS system. The challenges encountered may depend on individual factors such as technical aptitude, prior experience with similar systems, and motivation to learn and adopt new technology.

The thematic analysis underscores the importance of considering technical and human resource challenges in implementing

IBS for paper generation in educational settings. Addressing these challenges through adequate training, support, and resources can help ensure IBS's successful adoption and use in educational settings.

Discussion

The discussion of the theme and sub-themes highlights the challenges faced in implementing the Item Bank System (IBS) as a tool for paper generation in educational settings. The technical challenges highlighted by participants included difficulties in integrating the IBS system with existing learning management systems, system maintenance and update issues, and challenges with system interface design. These challenges impacted productivity and delayed the creation of exams, which can impact course delivery timelines.

The human resource challenges highlighted by participants included a lack of adequate training and support for educators and assessment specialists, resistance to change, and some educators' adoption of new technology. Lack of training and support led to educators and assessment specialists relying on their trial-and-error approach to learning the IBS system, which can be time-consuming and less effective. Resistance to change and adoption of new technology by some educators could lead to a lack of buy-in and motivation to use the IBS system effectively, which can also hinder effective implementation.

To address these challenges, adequate training, support, and resources should be provided to educators and assessment specialists to ensure they can use the IBS system effectively. The training should be comprehensive and ongoing to ensure that educators and assessment specialists are updated with the system's updates and functionalities. Technical support should also be readily available to address any system issues.

To overcome resistance to change and the adoption of new technology by some educators, it is essential to communicate effectively the benefits of the IBS system. Highlighting the advantages of using the IBS system, such as the ability to generate exams more quickly and easily and improve the quality of exam questions, can motivate educators to adopt the system.

In conclusion, the discussion highlights the importance of addressing technical and human resource challenges in implementing IBS for paper generation in educational settings. By doing so, the successful adoption and use of IBS can be achieved, leading to improved exam quality and productivity for educators and assessment specialists.

Findings

Based on the data's thematic analysis, the study's findings reveal that implementing the Item Bank System (IBS) for paper generation in educational settings is challenging. Technical challenges related to system integration, maintenance, and interface design were significant issues that impacted productivity and created delays. Human resource challenges, including a lack of adequate training and support for educators and assessment specialists and resistance to change and adoption of new technology by some educators, also hindered the effective use of the IBS system.

However, it was also found that some participants did not report significant challenges in using the IBS system. This suggests that challenges depend on technical aptitude, prior experience with similar systems, and motivation to learn and adopt new technology.

The findings of this study have important implications for educational institutions and policymakers. Addressing the technical and human resource challenges highlighted in this study through adequate training, support, and resources can help to ensure the successful adoption and use of IBS in educational settings. The benefits of using IBS for paper generation, such as improved exam quality and productivity, can be realized if these challenges are addressed.

Conclusion

In conclusion, the study aimed to explore the experiences, challenges, and acceptance of the Item Bank System (IBS) as a tool for paper generation in educational settings. The study found that technical and human resource challenges hindered the effective use of IBS. Technical challenges included difficulties in system integration, maintenance, and interface design. In contrast, human resource challenges included inadequate training and support for educators and assessment specialists, resistance to change, and some educators' adoption of new technology.

The study highlights the importance of addressing these challenges through adequate training, support, and resources to ensure IBSs successful adoption and use in educational settings. The benefits of using IBS for paper generation, such as improved exam quality and productivity, can be realized if these challenges are addressed.

Overall, the findings of this study have important implications for educational institutions and policymakers. The study provides insight into the challenges educators and assessment specialists may face when implementing IBS for paper generation. It emphasizes addressing these challenges to ensure IBSs successful adoption and use. By doing so, educational institutions can improve exam quality, increase productivity, and ultimately enhance the learning experience for students.

Future Research Directions

1. **Long-term Effects of IBS Adoption:** Future research can investigate the long-term effects of adoption for paper generation in higher education. This can include a longitudinal study to track the impact of IBS on student learning outcomes and assess the systems sustainability.
2. **Comparative Analysis of IBS with Traditional Paper Generation:** A comparative analysis of IBS with traditional paper generation methods can be conducted to examine the advantages and disadvantages of each approach. This can inform decision-making around the adoption and implementation of IBS.
3. **Evaluation of IBS Implementation Strategies:** Future research can evaluate the effectiveness of different implementation strategies for IBS adoption, including staff training and support, institutional policies, and stakeholder engagement.
4. **Exploration of Student Perceptions of IBS:** While the proposed study will explore student experiences with IBS, future research can further investigate student perceptions of the system and its impact on their learning experience.
5. **Development of IBS as an Adaptive Learning Tool:** Future research can explore the potential for IBS to be developed as an Adaptive learning tool, which can provide personalized learning experiences for students based on their assessment performance.

Overall, these future research directions can help advance our understanding of using IBS as a tool for paper generation in educational settings and inform best practices for adopting and implementing the system.

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