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Development of Educational Managers' Readiness Scale for Using Chat-GPT

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Abstract
The purpose of the study was to develop educational managers' readiness scale for ChatGPT adoption. The scale was based on the technology readiness index 2.0 model, covering the aspects i.e., optimism, innovativeness, discomfort, and insecurities. A total of 57 items were initially created to reflect the four core constructs of technology readiness. A 6-point semantic differential scale was used. The range of the scale was set as from low to high. The scale was content validated by the experts. It achieved an excellent S-CVI value of 0.94. It was reduced to the final 23-item readiness scale after the content validity process. These items of the scale were administered to a sample of 21 deans and 89 heads of social sciences faculty from both private and public sector institutions. It was found to have high internal consistency. The Cronbach α value was found to be 0.790. The final instrument consisted of 23 items after the piloting processes.

Keywords: Technology Readiness Index 2.0, ChatGPT, Educational Managers' Readiness, Artificial Intelligence (AI).

Introduction
The rapid evolution of technology has transformed educational practices, introducing innovative tools like ChatGPT that promise to redefine teaching, learning, and administration. ChatGPT, an AI-driven language model, offers immense potential in streamlining academic workflows, providing personalized student support, and fostering interactive learning environments. However, successful integration of such tools in educational settings hinges on the readiness of educational managers to adopt and implement these technologies effectively. The concept of technology readiness defined as an individual's propensity to embrace and use new technologies plays a pivotal role in understanding how stakeholders interact with technological advancements (Parasuraman & Colby, 2015). The Technology Readiness Index (TRI) model has emerged as a robust framework to evaluate readiness through four dimensions: optimism, innovativeness, discomfort, and insecurities. Optimism reflects trust in technology's benefits, while innovativeness captures openness to new solutions. In contrast, discomfort and insecurities highlight concerns about reliability, usability, and ethical implications (Abdullah et al., 2024). Despite its utility, existing models like TRI were primarily designed for general contexts and may not fully address the unique dynamics of educational management. Factors such as institutional culture, policy

frameworks, and the multifaceted responsibilities of educational managers introduce complexities that require tailored assessment tools (Tang et al., 2024). Moreover, the integration of AI tools like ChatGPT brings ethical, operational, and pedagogical challenges that current readiness frameworks inadequately capture, underscoring the need for a specialized approach (Shi et al., 2020). Given these gaps, this study emphasizes the development of a novel readiness scale specifically for educational managers. This tool is designed to assess their preparedness to adopt AI technologies like ChatGPT while addressing organizational and contextual variables. The scale aims to provide actionable insights for policymakers and stakeholders, ensuring a smoother transition toward AI integration in education. The focus on educational managers is critical, as their leadership significantly influences the acceptance and success of new technologies within academic institutions. By building on existing models and addressing their limitations, this study seeks to bridge the gap between theoretical frameworks and practical application, contributing to both the academic literature and the operational readiness of educational institutions.

Research Objectives

The objectives of this study are to:

1. Design a readiness scale grounded in theoretical and empirical frameworks.
2. Validate the scale using expert reviews and psychometric analyses.
3. Assess the reliability and applicability of the scale among educational managers.

Methodology

Design of Scale

The ChatGPT Readiness Measurement Scale was developed based on the Technology Readiness Index (TRI) model, which includes the core constructs of optimism, innovativeness, discomfort, and insecurities**.** The scale aimed to assess educational managers' readiness to adopt and integrate AI technologies like ChatGPT in educational settings, providing a comprehensive evaluation of their attitudes, perceptions, and concerns toward its use. The item development process involved an extensive review of existing literature on technology readiness in educational contexts, alongside consultations with experts in the fields of technology adoption and educational management. This ensured that the scale was relevant, contextually appropriate, and aligned with the challenges and opportunities faced by educational managers. A total of 57 items were initially created to reflect the four core constructs of technology readiness. These items were developed to capture various dimensions of readiness regarding ChatGPT adoption, including the perceived benefits, openness to innovation, discomfort with new technology, and concerns about security and reliability. Each construct was represented by 15-16 items, ensuring that all aspects of readiness were comprehensively covered. The items were designed to be clear, concise, and applicable to the professional context of educational managers, reflecting their everyday experiences and challenges.

Content validity

Content validity was evaluated through expert judgment. Three subject-matter experts in the fields of educational leadership, psychology, and technology were consulted to assess the relevance and representativeness of the items in the scale. Experts rated each item for relevance using 3-points i.e., relevant, irrelevant, relevant but modifications required. The Content Validity Index (CVI) was calculated for each item and for the overall scale. An item was considered relevant if it received a rating of all 3 experts. The validation process provided strong evidence for the scale's content validity, as well as its reliability.

The Content Validity Index (CVI) analysis for the scale demonstrated strong validity. The S-CVI for the entire scale was calculated to be 0.94**,** indicating a high level of content relevance and

agreement among the experts. This suggests that the scale has excellent content validity and is highly suitable for assessing the educational managers' readiness for using ChatGPT. The CVI for individual items also reflects strong consensus on the importance of each construct, with most items meeting the threshold for acceptable validity. Thus, the scale is well-constructed and appropriate for the intended research context.

Pilot Testing and Reliability

The ChatGPT readiness measurement scale was administered to a sample of 21 deans and 89 heads of social sciences faculty from both private and public sector institutions in Lahore, Pakistan. This sample was selected through random sampling to ensure equal opportunity for all participants. The sample was reflective of the broader population of educational managers in higher education institutions, including a diverse range of professional backgrounds, gender, age, and years of experience in leadership roles and university type. This pilot testing provided valuable insights into the scale's applicability and relevance for educational managers in higher education, ensuring its suitability for further refinement and use in the study.

Reliability of the scale was assessed using the internal consistency method, with Cronbach's alpha being calculated for the entire scale as well as for each sub-construct.

Table Reliability Statistics

Constructs	No of Items	Cronbach's Alpha
Readiness	23	0.790
OP	7	0.797
IN	6	0.782
DIS	5	0.759
INS	5	0.819

The reliability analysis shows that the scale exhibits good internal consistency i.e., 0.790. The optimism construct, with a cronbach's alpha of 0.797, demonstrates adequate reliability. Innovativeness (0.782) and discomfort (0.759) also show acceptable internal consistency, indicating that the items are reliably measuring their respective concepts. The Insecurities construct has the highest cronbach's alpha of 0.819, suggesting strong internal consistency. Overall, cronbach's Alpha values for each construct are above the acceptable threshold of 0.7, confirming that the scale is reliable for measuring educational managers' readiness for using ChatGPT.

Final Scale

After experts' validation, the initial scale was reduced from 57 to 23 items because of the repetitive nature of some items. The final version of the readiness scale consists of 23 items divided into four sub-constructs:

1. Optimism: 7 items measuring the extent to which educational managers have a positive attitude and trust in the potential benefits of using ChatGPT in higher education.
2. Innovativeness: 6 items measuring the managers' openness to incorporating ChatGPT into their teaching practices and their willingness to explore new approaches using the tool.
3. Discomfort: 5 items measuring the managers' feelings of unease and uncertainty regarding the integration of ChatGPT, including concerns about its impact on teaching and student engagement.

4. Insecurity 5 items measuring the managers' concerns about the technical reliability of ChatGPT, potential changes to their teaching style, and risks related to ethical and privacy issues.

Discussion

Keeping in view the importance of higher education is especially vital in the economic development of the country. Educational managers at higher education need to adopt modern trends of technologies like AI (Iqbal, Arif, & Abbas, 2011). The development and validation of the Educational Managers' Readiness for ChatGPT scale represent a significant contribution to the field of educational technology, in Pakistan, increasingly adopt artificial intelligence (AI) tools. This scale provides a structured approach to measuring the readiness of educational managers, particularly educational managers, to incorporate and effectively use ChatGPT in their educational practices at higher education. Their attitudes, beliefs, discernments, and readiness toward technology play a significant role in their adoption of technology (Rukh, Iqbal, & Shams, 2021). Moreover, the teachers and administrators are needed to use recent mobile based technologies to equip their students with the latest and easily accessible knowledge (Shams, Butt, & Iqbal, 2014). By focusing on four key dimensions, Optimism, Innovativeness, Discomfort, and Insecurity, the tool captures the psychological and organizational factors that influence educational managers' willingness to embrace AI technologies. The findings from the scale validation, including the Content Validity Index (CVI) and reliability measures, offer strong support for the robustness and applicability of this tool in educational settings. The scale underwent rigorous content validation through expert reviews, resulting in an overall S-CVI of 0.94, indicating a high level of content validity. This suggests that the scale is highly relevant and representative of the constructs it seeks to measure, providing a solid foundation for assessing the readiness of educational managers. The CVI calculation process demonstrated that most items in the scale were deemed relevant by at least two out of three experts, with only a few items requiring revision or removal due to repetitive or unclear wording. This highlights the importance of expert consultation in the tool's development, ensuring that the final scale is contextually appropriate and adequately covers the various facets of educational managers' readiness for technology adoption. The reliability of the final version of the scale was assessed through Cronbach's Alpha coefficients, with values ranging from 0.759 to 0.819 across the four sub constructs, indicating acceptable to good internal consistency. Specifically, optimism (0.797), innovativeness (0.782), discomfort (0.759), and insecurity (0.819) all displayed satisfactory reliability, with insecurity showing the highest reliability. This suggests that the items within each sub construct consistently measure the intended dimensions, supporting the scale's overall reliability for use in future research. These values also suggest that the tool is robust enough to be applied across different educational contexts and populations, with potential for cross-validation in other regions or countries.

The initial version of the scale included 57 items, which was later reduced to 23 items following expert review and validation. Hence this reduction was primarily due to the repetitive nature of some items. However the final scale now includes four distinct sub constructs, each representing a different aspect of educational managers' readiness for ChatGPT. The reduction in items not only makes the scale more concise but also enhances its practicality for use in educational settings, where time and resources for data collection may be limited. The final version of the scale reflects the four key sub constructs of readiness: optimism, innovativeness, discomfort, and insecurities. These sub constructs are essential for understanding the multifaceted nature of educational managers' attitudes toward technology adoption. Optimism reflects the degree to which managers believe in the positive potential of ChatGPT for enhancing educational outcomes. Innovativeness captures the willingness to explore new technologies and adapt to changing educational environments. Discomfort assesses the challenges and uncertainties that arise with the integration

of new technologies, while Insecurities measure concerns related to the technical reliability and ethical implications of AI tools. Together, these sub constructs provide a comprehensive picture of the factors that influence educational managers' readiness for technology adoption. The Educational Managers' Readiness for using ChatGPT scale has significant implications for both theory and practice in educational management and technology integration. Firstly, the scale can serve as a diagnostic tool for educational institutions to assess their leadership's preparedness to integrate AI tools like ChatGPT into the learning environment. By identifying areas of strength and weakness across the four dimensions of readiness, institutions can develop targeted interventions to improve educational managers' attitudes, knowledge, and skills regarding AI tools. Moreover, the findings from the scale can inform professional development programs for educational managers, focusing on addressing concerns related to discomfort and insecurities while enhancing optimism and innovativeness. For example, targeted training and workshops could be developed to build confidence in using ChatGPT, alleviate concerns about its ethical implications, and foster a mindset of innovation that embraces technology for improving educational outcomes. While the Educational Managers' Readiness for ChatGPT scale represents a valuable tool for understanding the readiness of educational managers, there are some limitations that should be addressed in future research. The pilot testing of the scale was conducted in Lahore, Pakistan, and included a limited sample size of 110 educational managers. Future studies should expand the geographical scope by testing the scale in other regions of Pakistan or internationally. This would help determine whether the scale is universally applicable across different cultural and educational contexts. The pilot study primarily focused on deans and heads of social sciences faculty, which may limit the generalizability of the findings to other educational leaders or managers. Future research should consider a more diverse sample that includes a wider range of educational leaders, such as principals, vice-principals, and department heads from various disciplines and levels of education. Future studies could employ a longitudinal approach to track changes in educational managers' readiness over time. This would be particularly useful in understanding how readiness evolves as educational managers gain more experience with AI tools like ChatGPT and as the technology itself evolves. While the current scale focuses on the readiness of educational managers, further research could explore the specific barriers that hinder the adoption of ChatGPT and other AI tools. This could include examining organizational factors such as institutional culture, resource availability, and policy frameworks that either facilitate or impede the adoption of technology in education.

Future research should also include factor analysis to ensure the reliability of this readiness scale and also further investigate the impact of educational managers' readiness on actual outcomes in the classroom. For instance, studies could examine whether educational managers' optimism and innovativeness in adopting AI tools correlate with improved student engagement, learning outcomes, or teacher effectiveness. This would help to establish the broader implications of educational managers' readiness for the integration of AI tools in educational practices. As AI tools like ChatGPT become more prevalent in education, ethical concerns about privacy, data security, and the potential for bias will become more critical. Future studies should investigate how educational managers address these concerns and how they involve various stakeholders (teachers, students, parents) in discussions about the ethical use of AI tools. In conclusion, the Educational Managers' Readiness for ChatGPT scale offers a valuable tool for assessing the preparedness of educational managers to integrate AI technologies into their institutions. By identifying key factors such as optimism, innovativeness, discomfort, and insecurities, this scale provides insights into the psychological and organizational barriers to technology adoption. As educational institutions continue to navigate the complexities of digital transformation, this tool can guide the development of targeted interventions to support educational managers in effectively

utilizing AI tools like ChatGPT. Future research should build upon the current study by expanding the scope of testing, exploring additional barriers to adoption, and examining the broader impacts of AI integration on educational outcomes.

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Appendix

EDUCATIONAL MANAGERS' CHATGPT READINESS SCALE

1	I have a positive attitude towards ChatGPT in higher education	Low	1	2	3	4	5	6	High
2	ChatGPT in higher education is important to me	Low	1	2	3	4	5	6	High
3	I believe that learning to use ChatGPT would be easy for me	Low	1	2	3	4	5	6	High
4	I believe that ChatGPT can enhance the learning experience for my students	Low	1	2	3	4	5	6	High
5	I see the potential benefits of using ChatGPT as an educational tool	Low	1	2	3	4	5	6	High
6	ChatGPT has an impact on students engagement in the classroom	Low	1	2	3	4	5	6	High
7	I believe that using ChatGPT aligns with my teaching philosophy and overall learning experience for my students	Low	1	2	3	4	5	6	High
8	Educational managers are willing to incorporate ChatGPT into higher education	Low	1	2	3	4	5	6	High

9	I believe ChatGPT can generate, engaging and interactive content for lessons	Low	1	2	3	4	5	6	High
10	I see value in using ChatGPT as a supplementary tool for lesson planning	Low	1	2	3	4	5	6	High
11	Feedback from students indicates that ChatGPT enhances their learning experience	Low	1	2	3	4	5	6	High
12	The integration of ChatGPT promotes interactive learning in the classroom	Low	1	2	3	4	5	6	High
13	I would recommend ChatGPT to colleagues for educational purposes	Low	1	2	3	4	5	6	High
14	I am not confident that using ChatGPT improves student engagement in the classroom	Low	1	2	3	4	5	6	High
15	I feel anxious about how ChatGPT might affect the dynamics of teacher-student interactions	Low	1	2	3	4	5	6	High
16	I have reservations about the ethical implications of using ChatGPT in education	Low	1	2	3	4	5	6	High
17	I feel uncertain about how ChatGPT aligns with my current teaching style	Low	1	2	3	4	5	6	High
18	I am concerned about the privacy and security of student data when using ChatGPT	Low	1	2	3	4	5	6	High
19	I am worried about the technical reliability of ChatGPT and its potential impact on the learning experience	Low	1	2	3	4	5	6	High
20	I am concerned that using ChatGPT might require changing my teaching style	Low	1	2	3	4	5	6	High
21	I am worried that using ChatGPT in teaching might pose risks to student engagement	Low	1	2	3	4	5	6	High
22	The risk of unintentional bias in ChatGPT responses is significant for educational managers	Low	1	2	3	4	5	6	High
23	Teacher would like more guidance on incorporating ChatGPT into lesson plans without sacrificing educational goals	Low	1	2	3	4	5	6	High