

Effectiveness of instructional design process on employee performance in the technology development industry

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Received: 28 May 2025

Available Online: 25 June 2025

Revised: 20 June 2025

DOI: 10.5861/ijrsm.2025.25073

Accepted: 23 June 2025

ISSN: 2243-7770

Online ISSN: 2243-7789

OPEN ACCESS



Abstract

The study aimed to examine the effectiveness of instructional design process on employee performance in Technology Development Industry. Specifically, it assessed the effectiveness of the instructional design process in terms of Analysis, Development, and Implementation; determined employee performance in terms of task performance, contextual performance, and adaptive performance; tested the significant relationship between the instructional design process and employee performance; proposed a plan of action to improve the instructional design process and employee performance. This study used descriptive quantitative research using 250 participants from well-known companies in technology industry. Findings indicate that employees generally agree that instructional design process across analysis, design, development, and implementation is moderately effective. The employee's performance is at a moderate level in terms of task performance, contextual performance, and adaptive performance. A highly significant relationship between instructional design process and employee performance shows that effectively designing training and learning programs directly and substantially improves employee capabilities and overall work output. A proposed action plan was developed to improve the instructional design process and employee performance in the technology development industry.

Keywords: instructional design process, employee performance, technology development industry

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1. Introduction

The software technology industry in China is known for its rapid innovation, dynamic growth, and intense global competition. To thrive in this environment, companies must not only acquire top talent but also invest in retaining and developing their workforce. One of the most strategic approaches to enhancing employee performance is the implementation of a structured instructional design (ID) process that ensures training programs are relevant, effective, and aligned with business goals. The instructional design process—encompassing Analysis, Design, Development, Implementation, and Evaluation (ADDIE)—serves as a systematic model for creating training solutions that meet organizational and learner needs.

Training and development are vital in equipping employees with the competencies needed to adapt to emerging technologies and evolving business trends. In China's high-tech software firms, employees are often engaged in continuous learning through e-learning platforms, technical workshops, and mentorship programs. These initiatives reflect not only a commitment to skill advancement but also a recognition of the role that well-structured instructional design plays in aligning training with job performance. Programs built around behavior-based and learner-centered instructional design principles can lead to improved knowledge retention, engagement, and application of skills in real-world tasks (Johnson et. al.,2024). Effective instructional design begins with a thorough analysis of performance gaps and learning needs, which forms the foundation for crafting targeted interventions. This is especially crucial in the fast-paced software sector, where skill demands shift rapidly. The design and development phases ensure that instructional content is logically sequenced, aligned with learning objectives, and supported by appropriate multimedia and technology tools (Clark et. al.,2021). The implementation of these programs must consider contextual challenges such as organizational culture, learning preferences, and hybrid work models (Tsai et. al.,2024). Finally, evaluation of training effectiveness helps measure impact on job performance and guides future instructional strategies. In addition to content delivery, the broader goal of instructional design in the software industry is to foster a performance-driven culture. Performance management practices such as SMART goals (Locke et. al.,1990), data-driven feedback systems, and 360-degree evaluations are often integrated into learning systems to ensure alignment between training and employee output (Li et. al.,2021). However, challenges persist, such as the difficulty in evaluating knowledge-based roles, frequent changes in required competencies, and the decentralization of training resources (Chen et al., 2021).

By understanding how instructional design contributes to training quality and performance outcomes, technology companies can refine their learning and development strategies to promote innovation, attract and retain talent, and sustain competitive advantage in the digital economy.

Objectives of the Study - The study aims to examine the effectiveness of instructional design process on employee performance in Technology Development Industry. Specifically, it assessed the effectiveness of the instructional design process in terms of Analysis, Design, Development, and Implementation; determine employee performance in terms of task performance, contextual performance, and adaptive performance; tested the significant relationship between the instructional design process and employee performance; proposed a plan of action to improve the instructional design process and employee performance.

2. Methods

Research Design - Descriptive research design was used in this study for an adequate and precise interpretation of the findings. The descriptive research design in this paper analyzes the correlation between the

three dimensions of information system, knowledge sharing and competitive strategy and the innovation performance of management consulting firms through questionnaire survey. Descriptive research aims to comprehensively depict a group of individuals, events, or phenomena. It is appropriate for identifying characteristics, frequencies, trends, and classifications. It proves valuable when dealing with lesser-known subjects or issues.

Participants of the Study - The participants for this study are the 250 employees of top five technology companies in Shanghai City in terms of employee population particularly Lenovo group, Huawei Technologies Co., Ltd., Shanghai Wicresoft Co., Ltd., Tencent and Alibaba Group Holding Limited. Each company have 50 respondents using quota and convenience sampling.

Instrument of the Study - This study used a self-made survey questionnaire as the main data input instrument because it is effective and practical in quantitative data collection from many people in an orderly manner. Developing self-made questionnaire can be made to meet all the requirements of the specific study. This also applies to structure, types and phrases of the questions, etc. In addition, self-made questionnaires are less costly whether it is distributed physically or electronically, data can always be collected by the researcher with minimal spending of resources. In addition, survey questionnaires can be distributed over the internet or can be printed in hard copies which means respondents can fill them out at their convenience and time. This technique also has an advantage in that it facilitates uniformity in the data collection process since all the participants respond to the same questions. The questionnaire is composed of two parts. Part 1 is about the effectiveness of the instructional design process in terms of Analysis, Design, Development, and Implementation. Part 2 described employee performance in terms of task performance, contextual performance, and adaptive performance. Validation of the questionnaire through the help of experts was made and pilot testing. Results of reliability is shown below.

Table 1

Reliability Test Result using Cronbach Alpha and its Interpretation

Cronbach Alpha	Number of Items	Interpretation
Instructional Design		
Analysis	0.747	Acceptable
Design	0.813	Good
Development	0.848	Good
Implementation	0.806	Good
Employee Performance		
Task Performance	0.826	Good
Contextual Performance	0.714	Acceptable
Adaptive Performance	0.730	Acceptable

Legend: ≥ 0.9 excellent; ≥ 0.8 good; ≥ 0.7 acceptable; ≥ 0.6 questionable; ≥ 0.5 poor; $0.5 >$ unacceptable;

Table 1 indicates generally acceptable to good internal consistency across the measured constructs. Specifically, the "Design," "Development," "Implementation," and "Task Performance" dimensions demonstrate good reliability with alpha coefficients ranging from 0.806 to 0.848, suggesting that the items within these scales consistently measure the same underlying concept. The "Analysis," "Contextual Performance," and "Adaptive Performance" dimensions show acceptable reliability, with alpha values between 0.714 and 0.747, implying a reasonable level of internal consistency, although potentially with room for improvement in item homogeneity compared to the "good" rated dimensions. Overall, the instrument appears to provide reasonably reliable measures for the intended constructs, with the majority exhibiting good internal consistency.

Data Gathering Procedure - The research process followed various stages, such as planning, collection of data, analysis, and interpretation. Most importantly, once the questionnaire is ready, content validation is carried out to confirm the intended purpose and how relevant the contents are without ambiguity. This involves getting an evaluation of the questionnaire items from Human Resource, training, and development experts. In addition, the questionnaire is first tried out on a limited population to assist in spotting problems or lack of clarity in the

questionnaire. Next, the researcher secured permission from the HR head of the five companies to request for the approval of data gathering from their employees. In this case a request letter will be prepared specifying the reasons for the research, the methods to be used in carrying out the research and the possible outcomes. Next is the questionnaire administration which involves distributing the questionnaire to a representative sample of employees. The method of administration of questionnaires may vary including the use of online survey and use of paper-based questionnaires, or a combination of both. Once completed, questionnaires will be retrieved, and data cleaning and preparation will begin. This involves inputting data into statistical software, checking for errors, and ensuring data accuracy. Finally, the data obtained were analyzed using the relevant statistical methods. Some descriptive statistics are obtained to present the data. In analyzing the results, it is important to understand the statistical results relative to the research objectives.

Data Analysis - Weighted mean and rank were used to determine effectiveness of instructional design processes and to describe employee performance. The result of Shapiro-Wilk Test showed that p-values of all variables were less than 0.05 which means that the data set was not normally distributed. Spearman rho was used as part of the non-parametric tests to determine the significant relationship. All analyses were performed using SPSS version 28.

Ethical Consideration - The researcher adhered to ethical standards while carrying out the respective tasks. As such, all data obtained will be anonymized to protect the privacy and confidentiality of participants. There will be no collection or dissemination of any information that directly attributes participants' comments or actions to them. All potential participants will be able to sign a consent form detailing the main objectives of the research, risks associated with the study, as well as benefits that may benefit from the study. To enhance the ethical standards, set in this research study, the research proposal will be sent to the Ethics committee for approval before the commencement of the study. In this case, the committee will evaluate the potential risks and benefits of the study as well as the ethicality of the study itself. This is important because their approval means that the research will be carried out within the limits of ethics and regulations set out regarding the conduct of various types of research.

3. Results and discussion

Table 2

Summary Table on Effectiveness of Instructional Design Process

Indicators	Weighted Mean	Verbal Interpretation	Rank
Analysis	2.95	Agree	3
Design	2.88	Agree	4
Development	2.97	Agree	1
Implementation	2.96	Agree	2
Composite Mean	2.94	Agree	

Legend: 1.00 – 1.49 Strongly Disagree; 1.50 – 2.49 Disagree; 2.50 – 3.49 Agree; 3.50 – 4.00 Strongly Agree

Table 2 presents the assessment of the respondents on the Effectiveness of the Instructional Design Process across on its four areas: Analysis, Design, Development, and Implementation. The composite mean of 2.94 indicates that the respondents Agree in general. This implies that the instructional design process was considered effective by the participants, with each phase contributing positively to the overall training experience. The result reflects a consistent and structured approach to instructional planning and delivery, suggesting that the organization applies standard instructional models such as ADDIE (Analysis, Design, Development, Implementation, Evaluation). This outcome could be influenced by the institution's implementation of employee development programs that follow formal training procedures. The organization might have invested in capacity-building workshops or learning management systems, improving the consistency of instructional design and there may be an internal team or department responsible for quality assurance in training programs, ensuring each phase is planned and executed properly. This result is consistent with the findings of Molenda (2015), who affirmed that when all phases of the instructional design process are properly integrated, the quality and impact

of training increase significantly. Morrison et. al.,(2019) emphasized that comprehensive instructional design leads to greater alignment between learning objectives, content, and outcomes.

Among the items cited, Development ranked first with a mean score of 2.97 and a verbal interpretation of Agree. This implies that the respondents appreciated the quality, accuracy, and clarity of the developed instructional materials. This may be due to the use of up-to-date content, user-friendly formats, or multimedia enhancements that are aligned with the learners' work environment. This could also reflect the organization's effort to standardize materials using templates and updated references, or training developers might have collaborated with subject matter experts to ensure technical accuracy and relevance. This aligns with the findings of Allen et. al.,(2012), who argued that effective development of learning materials enhances learner engagement and knowledge retention. Similarly, Branch (2022) stressed the importance of content quality and usability in instructional development.

Implementation, ranked second with a mean of 2.96, followed by Analysis with 2.95, and Design with 2.88. All the items received a verbal interpretation of Agree, showing a uniformly favorable perception of the instructional design process across all dimensions. Meanwhile, Design ranked fourth with a mean score of 2.88 and a verbal interpretation of Agree. This implies that although the design phase was still positively viewed, it may not have met the same level of excellence as the other phases. Possible reasons for this include limitations in customizing the learning experience, or perhaps insufficient consideration of various learning styles. There may have been time constraints in preparing diverse instructional methods, or design templates might have been reused from previous trainings, limiting innovation. Supporting this, Bates (2019) pointed out that designing learning experiences requires adaptability and learner-centered strategies, which are sometimes constrained by institutional resources or timeline. Dick et. al.,(2014) emphasized that high-quality design requires iterative testing and feedback to maximize effectiveness.

Table 3

Summary Table on Employee Performance

Indicators	Weighted Mean	Verbal Interpretation	Rank
Task Performance	2.97	Agree	2
Contextual Performance	2.99	Agree	1
Adaptive Performance	2.90	Agree	3
Composite Mean	2.95	Agree	

Legend: 1.00 – 1.49 Strongly Disagree; 1.50 – 2.49 Disagree; 2.50 – 3.49 Agree; 3.50 – 4.00 Strongly Agree

Table 3 presents the assessment of the respondents on employee performance in terms of task performance, contextual performance, and adaptive performance. The composite mean of 2.95 indicates that the respondents generally agree with the effectiveness of these aspects of performance. This implies that employees are perceived as performing adequately in terms of their tasks, contributions to their work environment, and adaptability to changes. The consistent "Agree" response across the performance indicators shows that employees demonstrate satisfactory performance in various areas. According to Rahman et al. (2025), contextual and adaptive performance are critical in fostering overall organizational productivity, which is supported by the fact that these areas received relatively high ratings in this study. Furthermore, Yulianto et al. (2024) highlights the importance of developing learning models that consider both technical and contextual aspects to enhance employee performance.

Contextual Performance, ranked first with a mean score of 2.99 and a verbal interpretation of "Agree." This implies that respondents believe their colleagues contribute positively to the work environment and are generally supportive. Smith-Downing et. al.,(2021) argue that effective contextual performance is essential for maintaining a harmonious work environment, which is evident in the ranking of this indicator. In the local setting, employees in the workplace often rely on each other for collaborative efforts, especially when facing project challenges. Wintersberg et. al.,(2025) point out that fostering a collaborative work culture significantly impacts overall job satisfaction and performance.

Task Performance, ranked second with a mean score of 2.97, followed by Adaptive Performance, with a mean score of 2.90. Both aspects received a verbal interpretation of "Agree," indicating that employees are meeting the required standards for their technical tasks and adapting well to changes. The emphasis on task performance aligns with the findings of Rahman et al. (2025), who highlight that technical proficiency and meeting specific job expectations are crucial in evaluating employee performance.

Adaptive Performance, ranked third with a mean score of 2.90, suggests that while employees are generally adaptable to new technologies and project demands, there is still a gap in their ability to fully embrace all changes. This can be attributed to the ongoing evolution of technology, which requires continuous learning and adjustment. Yulianto et al. (2024) emphasize that adaptability is critical in fast-changing work environments, and while employees may agree with their adaptability, the practical application may take time to develop.

Table 4

Relationship Between the Effectiveness of the Instructional Design Process and Employee Performance

Analysis	r-value	p-value	Interpretation
Task Performance	0.705**	<0.001	Highly Significant
Contextual Performance	0.694**	<0.001	Highly Significant
Adaptive Performance	0.770**	<0.001	Highly Significant
Design			
Task Performance	0.703**	<0.001	Highly Significant
Contextual Performance	0.705**	<0.001	Highly Significant
Adaptive Performance	0.756**	<0.001	Highly Significant
Development			
Task Performance	0.711**	<0.001	Highly Significant
Contextual Performance	0.755**	<0.001	Highly Significant
Adaptive Performance	0.787**	<0.001	Highly Significant
Implementation			
Task Performance	0.674**	<0.001	Highly Significant
Contextual Performance	0.686**	<0.001	Highly Significant
Adaptive Performance	0.745**	<0.001	Highly Significant

Legend: Significant at p-value < 0.01

Table 4 shows the association between the effectiveness of the instructional design process and employee performance. The computed R-values indicate a high direct correlation, and the resulting p-values were less than the alpha level. This means that a significant relationship exists and implies that an effective instructional design process would improve employee performance and vice-versa. The two variables are dependent on one another. This implies that the two variables instructional design processes and employee performance are directly related and mutually influential. In other words, when instructional design is implemented effectively, it tends to enhance employee performance, particularly in the areas of task execution, workplace behavior, and adaptability to change. This finding aligns with the study of Chai et al. (2024), who emphasized that well-structured instructional systems promote knowledge retention, skill development, and work engagement, all of which contribute to improved performance outcomes. Similarly, Johnson et. al., (2024) observed that behavior-based instructional design processes ensure relevance and alignment with job demands, thereby boosting task performance and employee confidence. The interdependence of these variables reinforces the idea that investing in quality instructional design is not merely a training initiative but a strategic driver of employee productivity and organizational growth.

Table 5

Proposed Action Plan to Improve the Instructional Design Process and Employee Performance

Key Result Area	Strategies	Person/s Responsible	Success Indicator
Design (Enhanced Relevance of Training Materials to	Needs Assessment with Stakeholders: Conduct thorough needs assessments involving technology developers to identify specific skill gaps and relevant topics for training materials. Contextualized Examples and Case Studies:	HR Department	Increased application of learned concepts in practical technology development scenarios, as observed through project outcomes or feedback.

Technology Development Processes)	Incorporate real-world examples and case studies directly related to the technology development processes the learners are involved in. Regular Curriculum Review and Updates: Establish a system for regularly reviewing and updating training materials to reflect the evolving technologies and development processes within the organization.		
Adaptive Performance (Enhanced Adaptability in Dynamic Technological Environments)	Regular Training and Workshops: Conduct regular training sessions and workshops focusing on emerging technologies relevant to the workplace. Cross-Functional Projects: Implement cross-functional projects that expose employees to different technologies and working styles within the organization. Knowledge Sharing Platforms: Establish platforms (e.g., internal wikis, forums) for employees to share knowledge, best practices, and insights on new technologies.	HR Department, IT Department Heads	Increased employee engagement with emerging technologies and cross-functional collaboration, demonstrated by consistent participation in relevant training and workshops, active contribution to knowledge-sharing platforms, and successful involvement in cross-functional projects utilizing diverse technologies.

4. Conclusion and recommendation

The employees generally agree that instructional design process across analysis, design, development, and implementation is moderately effective. The employees generally agree that their performance is at a moderate level in terms of task performance, contextual performance, and adaptive performance. There is a highly significant relationship between instructional design process and employee performance. A proposed plan of action was developed to improve the instructional design process and employee performance in technology development industry.

The Human Resource Department may establish a formal mechanism for regular feedback from learners and instructors during the implementation phase, beyond post-training evaluations, to allow for real-time adjustments and ensure ongoing engagement and comprehension to improve the instructional design process. The department heads may implement a structured mentorship program that pairs high-performing employees with others to facilitate the transfer of best practices, organizational citizenship behaviors, and strategies for navigating change to improve the employee performance. The technology development industry may review and utilized the outlined action plan provided in the study for improving the instructional design process and employee performance. Future researchers can study the long-term impact of instructional design strategies on specific domains of employee performance across various types of technology companies, including startups and large enterprises.

5. References

- Allen, M. W., & Sites, R. (2012). Leaving ADDIE for SAM: An Agile Model for Developing the Best Learning Experiences. ASTD Press.
- Bates, A. W. (2019). Teaching in a Digital Age: Guidelines for Designing Teaching and Learning. BCcampus.
- Branch, R. M. (2022). Instructional Design: The ADDIE Approach. Springer.
- Chai, D. S., Kim, H. S., Kim, K. N., Ha, Y., et al. (2024). Generative Artificial Intelligence in Instructional System Design. Human Resource Development International. <https://journals.sagepub.com>
- Chen, X., Li, Y., & Liu, Y. (2021). The Impact of High-Performance Work Systems on Employee Innovative Behavior: The Mediating Role of Psychological Safety. Sustainability, 13(15), 8043.
- Clark, R. C., & Mayer, R. E. (2021). E-Learning and the Science of Instruction: Proven Guidelines for Consumers and Designers of Multimedia Learning (5th ed.). Wiley.
- Dick, W., Carey, L., & Carey, J. O. (2014). The Systematic Design of Instruction (8th ed.). Pearson.
- Johnson, D. A., Li, A., & McCalpin, A. L. (2024). The advancement of training within business using

- behavior-based instructional design. *Journal of Organizational Effectiveness*, [online ahead of print].
- Li, J., Wang, J., & Wang, Y. (2021). The Impact of Human Resource Management Practices on Employee Innovation: Evidence from Chinese High-Tech Firms. *Sustainability*, 13(24), 13725.
- Locke, E. A., & Latham, G. P. (1990). A theory of goal setting & task performance. Prentice Hall.
- Molenda, M. (2015). In search of the elusive ADDIE model. *Performance Improvement*, 42(5), 34–36.
- Morrison, G. R., Ross, S. M., & Kemp, J. E. (2019). *Designing Effective Instruction* (8th ed.). Wiley.
- Rahman, M., PK, P. K., & Iqbal, S. M. S. (2025). Employing metaverse technology to support the professional growth of corporate instructional designers. *Journal of Advancement in Parallel Computing*, 8(1), 41–54. <https://doi.org/10.5281/zenodo.14862848>
- Smith-Downing, P. J., Downing-Smith, P. J. (2021). *Instructional Systems Design and the Diffusion and Adoption of Technology*. Instructional Systems, digitalcommons.odu.edu.
- Tsai, C. Y., & Li, D. C. (2024). Enterprise implementation of educational technology: Exploring employee learning behavior in e-learning environments. *Sustainability*, 16(2), 459. <https://doi.org/10.3390/su16020459>
- Wintersberg, L., & Pittich, D. (2025). Digital Transformation of Corporate Technical Education and Training—A Case Study on Instructional Designers' Perceptions. *Vocations and Learning*, Springer.
- Yulianto, E., Sya'roni, D. A. W., & Hayati, N. (2024). Determinant Factors for Learning Model Development: Their Influence on Employee Performance. *Journal of Data and Information*, iuojs.intimal.edu.my.