PAPER

A Study of the Use of Multimedia in AI Industry in Terms of its Impact on In-Service Education and Work Attitude as Well as Work Performance

Kuan-Hung Chen,
Guangzeng Tian(✉)

College of Tourism and
Geography, Shaoguan
University, Shaoguan, China

1173931709@qq.com

ABSTRACT

To meet the increasing demand for talent with the expansion of domestic artificial intelligence industries in foreign markets, many artificial intelligence industries are training high quality employees. In this respect, the present study aims to investigate the effectiveness of using multimedia in the artificial intelligence industry in-service education programs. The participants of the study were composed of artificial intelligence industry supervisors and employees in China. The study focused on a sample comprised of AI industry supervisors and employees in China. Data were collected over a period spanning from the 1st of January 2022 to the 1st of June 2022. A total of 500 questionnaires were distributed, and 423 valid copies were retrieved, yielding a retrieval rate of 85%. According to the results of the study, it can be stated that artificial intelligence industries can benefit the research results through in-service education and learning and development. Moreover, the results of the current study can help promote work performance of employees to produce the necessary soft power that determines success in the future, and to improve business dilemma and enhance competitiveness of artificial intelligence industries. The results of the study revealed that the use of multimedia in artificial intelligence industry increase the self-confidence of employees, they feel respected, noticed, and supported by superiors, and have a good and pleasant interactive relationship with colleagues. As a result, their work attitudes are positively influenced.

KEYWORDS

artificial intelligence industry, in-service education, work attitude, work performance, absorption

1 INTRODUCTION

A company, conceptualized as a microcosm of social organization, consists of a diverse workforce characterized by variations in gender, age, expertise, and personality traits. The strategic alignment of employee characteristics with job

requirements and organizational culture can catalyze both job satisfaction and overall performance. Targeted in-service education or training courses, by enhancing work skills and attitudes, not only promote individual work performance but also exert a positive impact on the collective performance of the organization. In this context, increased employee satisfaction through continual in-service education contributes to greater efficiency and overall performance. In response to the burgeoning demand for talent precipitated by the expansion of domestic artificial intelligence (AI) industries into foreign markets, many organizations are investing in the cultivation of high-quality employees. This strategy aims to propel the AI sector into new markets, fostering development and the distribution of innovative projects. The competitive landscape necessitates the fortification of human capital within the AI industry where training and skill development stand as essential channels for human capital investment. This approach parallels traditional enterprise efforts to enhance employees' professional expertise and technological knowledge, thereby augmenting their competitiveness and motivation, ultimately fueling company growth. Consequently, training and development emerge as potent mechanisms for creating added value in human capital.

The advent of information technology and its subsequent proliferation has engendered a profound impact on modern society, reflecting a global trend characterized by rapid change. This influence extends to the realm of education, traditionally viewed as resistant to transformation, yet now evolving towards an information-technology-centered paradigm. Information education represents a pivotal development point for the future of education. Since its inception, the ecology of teaching and learning has undergone significant metamorphosis. The Internet era has ushered in an educational environment marked by innovative changes. The judicious application of multimedia teaching tools provides educators with the means to alleviate uncertainty in material selection, to gain insights from the teaching methodologies of peers, and to identify reference sources or discussion forums for students' academic pursuits. Employee work attitudes, influential in shaping behavioral performance, job satisfaction, work performance, turnover intention, and organizational identification, have been extensively explored in previous studies [1]. Prior research has indicated that trust-based social relationships, emerging from interactions between supervisors and colleagues, foster positive effects on knowledge sharing and helping behaviors [2]. However, the specific impact of in-service education across the entire organizational landscape has remained largely unexplored. According to the findings of the present study, AI industries stand to derive substantial benefits from in-service education, learning, and development initiatives. These results contribute valuable insights, promoting employee work performance and cultivating the soft power necessary for future success. Additionally, the outcomes offer strategies to mitigate business challenges and augment the competitiveness of the AI industry.

2   LITERATURE REVIEW

Pan et al. [3] underscored the significance of in-service performance for corporate success, delineating its multifaceted impacts that include promoting employees' quality, augmenting performance, enhancing organizational cohesion, and ameliorating the working atmosphere within the organization. Additionally, in-service performance serves to elevate employees' adaptability, professional technological knowledge, and work attitudes. In a complementary vein, Said and Chiang [4]

contended that effective in-service education has the potential to bolster organizational production efficiency. When coupled with judicious human resource strategies, in-service education can facilitate employees' integration within the organization, engendering a more positive work attitude and mitigating human resource attrition. However, it must be recognized that in-service education that is misaligned with individual interests may precipitate suboptimal utilization of human resources.

Labrague et al. [5] posited that the foundational objective of an enterprise implementing in-service education lies in fostering organizational performance. As an ancillary benefit, in-service education serves to elevate employee work attitudes—a factor that stands to considerably aid future development. The cultivation of work attitudes through in-service education not only contributes to improved work performance but also provides tangible metrics for evaluation, as evidenced by customer satisfaction and feedback. Participation in education programs can act as a catalyst, enhancing employee productivity, skills, knowledge, and attitudes. An enterprise committed to providing in-service education programs demonstrates an investment in the ongoing development of professional skills and knowledge. Such an approach fosters a sense of organizational identity and cohesion, furthering the enterprise's unifying mission. Synthesizing the insights gleaned from the aforementioned studies, the following research hypothesis was derived:

H1: In-service education presents significantly positive correlations with work attitude.

Kim and Choi [6] found work attitude as steady and persistent, generated under vigor and enthusiasm. They also stated that positive work attitude created positive effects that resulted in positive outcomes in terms of the corporate performance. Employees with long-lasting work attitude can form a high-performance culture atmosphere in the company. A corporation's existence is possible with employees. Therefore, meeting employees' demands to have them show dedication and devotion to work are the key success factors of a corporation. Yamaguchi et al. [7] discussed whether employees' affective satisfaction and happiness can result in a deeper absorption towards work. Additionally, the employees' satisfaction ensures their happy involvement in the work. The results of the study revealed that work attitude might be the principal variable between job satisfaction and work performance. In other words, satisfaction from work can promote work performance through high work attitude. In a study delineating the role of work attitude in performance enhancement, Rizqillah and Suna [8] discerned a somewhat counterintuitive dynamic, where high satisfaction levels did not necessarily contribute to business development. Conversely, employees manifesting a robust work attitude could potentially drive higher performance levels within the company. This body of research underscores the interconnectedness between work attitude and work performance, illustrating how job involvement and work attitude can exert a tangible impact on overall organizational success.

Based on the synthesis of the studies aforementioned, the following research hypothesis can be formulated for the present study:

H2: Work attitude shows significant positive correlations with work performance.

Oh et al. [9] discussed the correlations among learning motivation, in-service education, and work performance of employees in high-tech industries and found out that an employee with in-service education can perform higher in work. They

also started that the positive behavior in in-service education contributes to the effectiveness in work. Harris et al. [10] discussed the correlations among learning attitude, in-service education, and work performance of employees in an independent power production firm. They aimed to understand the significance of in-service education on employees' work performance. Significant effects of in-service programs on work performance were discovered. It was found that the adjustment of the power producer's training policy can enhance the employees' work skills and the work performance. Levoy et al. [11] investigated this issue in the two branches of a large credit card company. They discovered that the implementation of internal marketing concept can result in higher job effort and better work performance, when the internal marketing concept includes employee training. Based on the above research results, this study proposed the following hypothesis.

H3: In-service education shows significantly positive correlations with work performance.

3 METHODOLOGY

3.1 Operational definition and measurement of research variable

In-service education. The learning outcome was classified into cognitive outcomes as skill-based outcomes, and affective outcomes according to An et al.'s [12] detailed structure of learning levels.

1. Cognitive outcomes: These outcomes include measuring trainees' knowledge, skills, attitude, and other dimensions acquired through training.
2. Skill-based outcomes: These outcomes include measuring trainees' changes in applying knowledge and skills acquired from the training to the work. Through these outcomes mainly the transfer of trainees' attitude, knowledge, ability, and behavior due to training to promote work performance are evaluated.
3. Affective outcomes: These outcomes include measuring trainees' satisfaction with and response to training courses, including course content, material preparation, lecturer's instruction method, and environment and equipment.

Work attitude. According to Lam et al. [13], work attitude in this study refers to vigor, dedication, and absorption.

1. Vigor: This concept can be explained as presenting perseverance at work, willingness to make efforts for work, presenting high tolerance to difficulties, and not easily withdrawing.
2. Dedication: This concept can be explained as presenting high commitment to work, affirming and being proud of the work, facing challenges, and showing strong work enthusiasm.
3. Absorption: This concept can be explained as being able to fully involve in and be happy at work, without noticing the passing of time and not wanting to pull out from the work.

Work performance. According to the research of Huang et al. [14], work performance contains two dimensions in this study.

1. Task performance: This dimension refers to performance of workers who contribute to the technological core of the organization's work activity.
2. Contextual performance: This dimension refers to performance of workers who, in addition to their work activity, perform other activities that contribute to the effectiveness of the organization.

3.2 Research sample

The sample for the present study comprised supervisors and employees from the artificial intelligence industry in China. A total of 500 questionnaires were distributed, of which 423 were deemed valid, resulting in a retrieval rate of 85%. The distribution spanned from the 1st of January 2022 to the 1st of June 2022. The respondents consisted of 286 males and 137 females, with age distribution as follows: 21–30 years (n = 88), 31–40 years (n = 152), 41–50 years (n = 163), and above 50 years (n = 20). Regarding educational background, the sample included 58 participants with elementary school education, 196 with high school diplomas, 124 with undergraduate degrees, and over 50 with graduate-level qualifications.

3.3 Reliability and validity

The construction of the questionnaire for this study was grounded in an extensive review of existing theories within the relevant literature and was tailored to the specific context of the research subject. This approach was adopted to ensure a faithful representation of the underlying essence of the constructs, thereby validating the content. The construct validity of the items was further assessed through factor analysis, yielding commonality estimates that ranged between 0.7 and 0.9. These results attest to the robustness of the questionnaire's validity.

In terms of reliability, the accepted benchmark for high reliability in basic research is a coefficient above 0.8, whereas a coefficient around 0.7 is considered satisfactory for exploratory research. In this study, the measured Cronbach's α value ranged between 0.80 and 0.95. This lies within the theoretically accepted range of 0.70 to 0.98, confirming the reliability of the scale utilized in this investigation.

4 RESULT ANALYSIS

4.1 Factor analysis

Factor analysis results of this study are shown in Table 1. After factor analysis ran on the in-service education scale, three factors were extracted as "cognitive outcomes" (eigenvalue = 3.571, α = 0.86), "skill-based outcomes" (eigenvalue = 2.836, α = 0.84), and "affective outcomes" (eigenvalue = 2.317, α = 0.87). The cumulative covariance explained was found as 74.183%. The factor structure of work attitude scale, after factor analysis, was found composing of three factors as "vigor" (eigenvalue = 2.581, α = 0.83), "dedication" (eigenvalue = 1.944, α = 0.82), and "absorption" (eigenvalue = 2.163, α = 0.81). The cumulative covariance explained was found as 77.651%. Two factors were extracted after the factor analysis of the work performance scale which are "task performance" (eigenvalue = 4.621, α = 0.90), and "contextual performance" (eigenvalue = 3.855, α = 0.93). The cumulative covariance explained was found as 84.924%.

Table 1. Factor analysis

Variable	Factor	Eigenvalue	α	Cumulative Variance Explained
In-service education	Cognitive outcomes	3.571	0.86	74.183
	Skill-based outcomes	2.836	0.84	
	Affective outcomes	2.317	0.87	
Work attitude	Vigor	2.581	0.83	77.651
	Dedication	1.944	0.82	
	Absorption	2.163	0.81	
Work Performance	Task performance	4.621	0.90	84.924
	Contextual performance	3.855	0.93	

4.2 Correlation analysis

Table 2 shows statistically significant correlations among in-service effectiveness, work attitude, and work performance. The result revealed the possibility of multicollinearity among the dimensions; the significant correlations among research dimensions reveal the correspondence with research hypotheses.

Table 2. Pearson correlation analysis

Dimension	α	In-Service Education	Work Attitude	Work Performance
In-service education	0.85			
Work attitude	0.82	0.25**		
Work performance	0.91	0.31**	0.36**	

Note: ** for $p < 0.01$.

4.3 Model fit test

The present study utilized the "maximum likelihood" (ML) estimation method. An analysis of the structural equation model revealed convergence in the findings. The overall model fit indices, indicative of the external quality, were determined as follows: (1) the χ^2 ratio, with $\chi^2 = 1.375$, was found to be smaller than 3, (2) the Goodness of Fit Index (GFI) was 0.95, greater than 0.9, and the Adjusted Goodness of Fit Index (AGFI) was 0.89, exceeding 0.8, (3) the Root Mean Square Residual (RMR) was 0.026, less than 0.05, and (4) the Incremental Fit Index (IFI) was 0.92, surpassing 0.9. With a sample size of 423, well above the basic requirement, the overall model fit indices satisfied the testing criteria, thus fully demonstrating the external quality of the structural equation model.

For the internal quality, the Squared Multiple Correlations (SMC) of the manifest variables were greater than 0.5, signifying robust measurement indices for the latent variables. Additionally, the latent variables related to in-service education, work attitude, and work performance exhibited composite reliability greater than 0.6.

The average variance extracted from these dimensions exceeded 0.5, meeting the stipulations for the internal quality of the model.

4.4 Path relationship test

In evaluating the path relationships, dimensions such as cognitive outcomes, vigor, and task performance were selected as reference indicators, fixed at 1. Subsequent analyses produced the causal path (refer to Table 3) and relation diagram (see Figure 1), elucidating significant estimates between the various dimensions and variables. The analyses revealed a lower explanatory power for skill-based outcomes (0.97) in comparison to cognitive outcomes, and a higher explanatory strength for dedication (1.02) in contrast to vigor. These results contribute to a nuanced understanding of the underlying relationships within the model, offering valuable insights for further exploration and application.

Table 3. Overall linear structural model analysis result

| Factor/Evaluation Standard		Estimate
In-Service education	cognitive outcomes (α1)	1.00
	skill-based outcomes (α2)	0.97
	affective outcomes (α3)	1.04
Work attitude	Vigor (β1)	1.00
	Dedication (β2)	1.02
	Absorption (β3)	1.07
Work Performance	task performance (σ1)	1.00
	contextual performance (σ2)	1.03
In-service education→work attitude		0.258
work attitude→work performance		0.342
In-service education→work performance		0.311
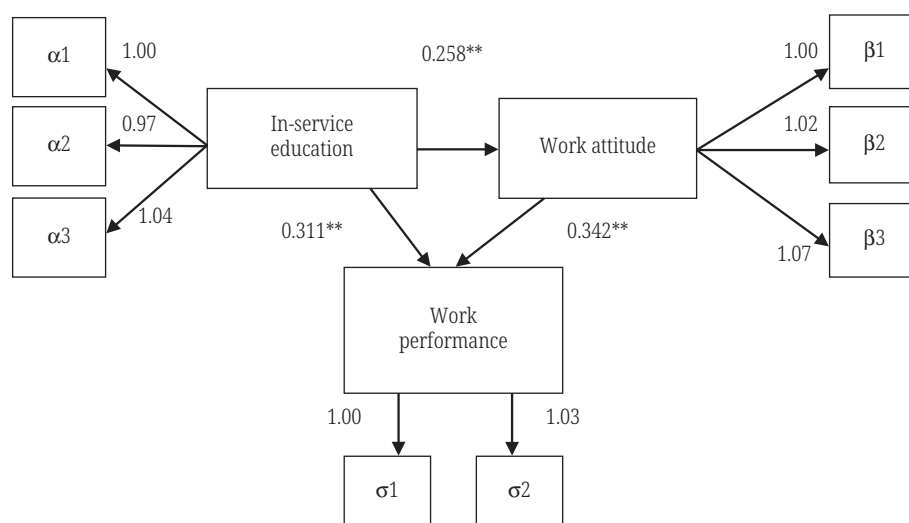
Fig. 1. Relation diagram

5   DISCUSSION

Corporate culture represents the foundational values that drive the progress of an organization. As inferred from the findings of this study, the deployment of multimedia in in-service education is an essential strategy for the artificial intelligence industry. The results reveal that certain outcomes, such as continuous reflection, participation, and integration, are instrumental in enhancing the efficacy of in-service education. Similarly, learning through multimedia curriculum design or specific practice behaviors reflect the culture and philosophy of the artificial intelligence industry and portray the behavior of a social citizen. These are all features that are key to the future success of individuals and the company. These findings of the study conform to the research results of Alessandri et al. [15] and Karatepe and Aga [16]. For this reason, when an artificial intelligence industry uses multimedia in in-service education, it might require hierarchy in the course content. From the aspect of functional category, different departments have different requirements in the culture of an artificial intelligence industry. For instance, the marketing department needs to understand artificial intelligence industry culture and brand building, marketing and promotion, and advertising and public relations. On the other hand, human resources department needs to understand the combination of artificial intelligence industry culture with recruitment, training, assessment, compensation, excitation, reward and punishment, and appointment and dismissal. Similarly, finance department might need to understand the use of artificial intelligence industry culture in investment decisions, budget management, and cost control. Accordingly, the use of multimedia in in-service education in other departments in the artificial intelligence industry should have different emphases. This point was highlighted in the studies conducted by Bakker et al. [17]. What is more, the use of multimedia in in-service education can create a vivid environment, integrate various approaches to education in multimedia in-service education. These approaches include lecture and discussion, case study, team participation, and game activity. Additionally, it can be adapted according to in-service education content and objects. The research results of Andrews et al. [18] and Schmitt et al. [19] reflect this point clearly as well. For example, lecture method might be appropriate for transferring knowledge from executives to new employees while game activity can be used for the new employees or retrained employees to create passion and develop identity. Similarly, the case study might be appropriate for employees who are deeply involved in certain problems in artificial intelligence industry to build consensus.

6   CONCLUSION AND RECOMMENDATIONS

The research results revealed that an artificial intelligence industry that uses multimedia in in-service education enables employees to show self-confidence at work and to be respected, mentored, and supported by the supervisors. Besides, a good and pleasant interactive relationship between colleagues has a particularly positive effect on work attitude. It refers to artificial intelligence industry team, harmony, happiness, and leading, excellent, and glorious corporate culture. Artificial intelligence industry employees put aside their self-centeredness and think in the collective dimension at work to contribute to the team and pursue their self-honor. In this case, the higher the self-efficacy and self-confidence, the more positive and responsible work attitude. This in turn results in working hard for the tasks allocated by the artificial intelligence industry and further creating a higher work attitude. Work

attitude is comparatively stable and consistent and is generated under vigor and enthusiasm. As a result, when using multimedia in in-service education, employees in an artificial intelligence industry can maintain their work attitude for a long period of time. The reason behind this is the fact that they receive care and support of their supervisors and affirmation and mutual help in the interactive cooperation with their colleagues which has a positive effect on their work performance. It is suggested that the senior artificial intelligence industry employees, who are more enthusiastic about work and integrating the culture of the company, guide the newer employees. In this way the generation gap is reduced. Additionally, they set good role models for artificial intelligence industry employees. Besides, artificial intelligence industry employees with less satisfactory performance can be transferred to branches with higher work attitude climate to positively affect their work attitude. It is obvious that artificial intelligence industry employees who perceive the support and care of their supervisors insist on the viewpoint of social exchange theory. When those employees have undergone the multimedia in-service education, they develop a high sense of responsibility for the artificial intelligence industry team. As a result, they develop an active and positive work attitude and behavior to their supervisors and the organization. This is consistent with "the law of magnetism" and "Canter's law" mentioned in management science. It is therefore suggested that both the management and human resources department can carry out the dynamic information control. In other words, they can check the interactive exchange among artificial intelligence industry employees every once in a while using techniques such as forums and questionnaire survey. In doing so, they aim to understand the problems of artificial intelligence industry employees encountered in the process of integrating into the organization as well as conduct directed assistance and education support. The two-factor theory proposed by Herzberg, who is a psychologist, emphasizes that motivators for artificial intelligence industry employees can enhance the passion and motivation to work hard for the company. As a result, the organizational team operation is also enhanced. The employees of an artificial intelligence industry who receive the unit supervisors' respect, support, care, and assistance, present high and positive motivation at work. This motivation leads to willingness and commitment to work, the employees show higher learning attitude and self-confidence in the work, and they overcome work difficulties and challenges with fearless resilience and perseverance.

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8 AUTHORS

Kuan-Hung Chen is an Associate Professor in the College of Tourism and Geography at Shaoguan University. His research interests focus on Marketing and Teaching Research (E-mail: guanhong0224@sgu.edu.cn).

Guangzeng Tian is a Professor in the College of Tourism and Geography at Shaoguan University. His research interests focus on Human Geography and Evaluation and Development of Tourism Resources (E-mail: 13794683856@sgu.edu.cn).