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Antecedents of Employees' Goal Orientation and the Effects of Goal Orientation on E-Learning Outcomes: The Roles of Intra-Organizational Environment

Der-Chiang Li ¹ and Ching-Yeh Tsai ^{2,*}

¹ Department of Industrial and Information Management, National Cheng Kung University, Tainan 701, Taiwan; lidc@mail.ncku.edu.tw

² Institute of Information Management, National Cheng Kung University, Tainan 701, Taiwan

* Correspondence: r78001025@gs.ncku.edu.tw; Tel.: +886-627-57-575

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Abstract: Organizational learning is beneficial for the maintenance and development of an organization's long-term competitive advantages. However, organizational learning can be achieved only through the learning carried out by individual members. Therefore, employees' learning plays a critical role in companies that pursue sustainable management. E-learning allows employees to learn without any time or space constraints, which strengthens and improves organizational learning capacity. The participants of this study were employees in small and medium-sized enterprises. This study explored and identified the ways in which these employees' perceived intra-organizational environment (including the organization's commitment to learning and a competitive psychological climate) affects their learning outcomes through their goal orientations and computer anxiety (CA). A questionnaire was administered to the employees who have used an Enterprise Resource Planning (ERP) e-learning platform. The results indicated that an organization's commitment to learning and its competitive psychological climate affect e-learning outcomes, with employees' goal orientations and CA acting as mediator variables. Furthermore, in contrast to past studies, this study found that the organization's competitive psychological climate could strengthen employees' learning motivation (i.e., learning goal orientation) and their desire to perform well (i.e., proving goal orientation), thus improving their e-learning outcomes. Finally, the empirical results were used to develop recommendations for high-ranking executives, department managers, and human resource departments.

Keywords: intra-organizational environment; computer self-efficacy; computer anxiety; goal orientations; learning outcomes; e-learning

1. Introduction

According to Drucker [1], in addition to being a source of competitive advantage, knowledge is the only important resource in the new economic era. Relatedly, talent and knowledge competition is the biggest challenge facing modern companies. Employees are important assets of a company. Therefore, effective organizational learning contributes to the development and maintenance of long-term competitive advantage. However, organizational learning can be achieved only through the learning of individual members [2]. As such, organization members' learning and knowledge accumulation are important sources of an organization's competitive advantage. Therefore, employees' learning plays a critical role in the sustainable management of companies. E-learning allows employees to learn without any time or space constraints.

Past studies have shown that computer anxiety (CA) tends to be lower in computer users who are more confident about their skills (e.g., those with high self-efficacy) [3–7]. The process of e-learning

requires the use of information technologies (IT), computers, and the Internet. Therefore, this study attempted to introduce the employees' computer self-efficacy (computer SE) as a control factor that influences employees' e-learning.

Many studies have examined the influence of e-learning platforms on users' learning behaviors [8–11] and the results of e-learning incorporation in organizations [12–15] from the perspective of IT. However, there has been little research on the effects of organizational environment on employees' learning motivations and e-learning outcomes.

Researchers keep asking the same question: why do employees differ in their learning outcomes during e-learning? The theory of goal orientation originating from educational psychology provides a theoretical framework that explains the differences in employees' behaviors and performance [16]. The theory of goal orientation advocates that learners' learning motivations affect their learning behaviors in the achievement situation, which results in different learning results [17]. Empirical studies have shown that learners' goal orientations influence their learning outcomes [18–21]. An organizational environment is an important factor that influences employees' goal orientations, but there is a lack of research on this topic. Employees' learning takes place in a company's environment, and therefore, the effect of the latter on employees must be considered. Accordingly, this study viewed organizational environment as an important factor influencing employees' e-learning.

Employees' learning is an important aspect of organizational learning. The improvement of employees' learning outcome has thus become a focus of attention in business and academic circles. Therefore, this study examined and identified the ways in which employees' perception of the organizational environment influences their e-learning outcomes, with goal orientations and CA set as mediator variables. Employees who used e-learning were recruited to participate in a questionnaire survey. It is hoped that this study can help improve the learning outcomes of employees' educational training, as well as the effectiveness of human resource management.

2. Literature Review and Research Hypotheses

This section explains the constructs and content of the research variables and infers the relevance of each variable.

2.1. E-Learning

The definition of e-learning varies across disciplines. According to the definition established in 2001 by the American Society for Training and Development (ASTD), e-learning can be categorized into computer-based learning (CBL), web-based learning (WBL), e-learning, and long-distance learning. Sun, Tsai, Finger, Chen, and Yeh [22] defined e-learning as an educational or training tool that involves the use of Internet technologies. E-learning allows employees to use Internet resources to gain knowledge without time or space constraints, which reduces the organization's learning costs [23].

2.2. Computer Anxiety (CA)

Heinssen, Glass, and Knight [24] suggested that CA is not a negative attitude because it is a reaction to fear or antipathy, whereas a negative attitude involves an individual's perception of the ways in which computers influence society and quality of life. Heinssen, Glass, and Knight [25] defined CA as users' fears generated by a computer. The researchers found that CA varies depending on the user's experience of computer use. Moreover, CA has negative physiological or psychological effects related to computerSE.

People with CA worry that they may lose important data or make other mistakes when using IT tools. In the study by Marakas, Johnson, and Palmer [26], CA was described as a dynamic mental state that can change under the influence of the environment and external stimuli. Both theoretical and empirical studies support that higher CA is associated with lower computerSE [6].

People with CA are afraid of talking about computers, view computers as a menace, and may even develop such emotions as hostility, disgust, fear, tension, and resistance with regard to computers,

which, in turn, causes physical and mental discomfort and affects their computer-related attitudes and learning outcomes [6,27,28].

2.3. Relationship between Goal Orientations and Computer Anxiety (CA)

2.3.1. Goal Orientations

The theory of goal orientation originating from educational psychology provides a theoretical framework that explains the differences in employees' behaviors and performance. Some scholars [29–31] suggested applying the theory of goal orientation to issues related to industrial and organizational psychology and organizational management. Dweck and Leggett [17] indicated that, in an achievement situation, achievement motivation is determined by the learning goal for some people and the performance goal for other people. Empirical studies showed that people with learning goal orientation focus on the enhancement of skills, seek opportunities to learn and gain new knowledge, and enjoy the process of self-growth; people with proving goal orientation want to surpass others in terms of skills and performance and pay a high degree of attention to competing and comparing themselves with others [17,32–34].

It should be noted that a learning goal leads to positive processes and results, whereas the performance goal results in lower motivation and autonomy. Empirical studies in which students were the participants suggested that although the learning goal leads to positive processes and results, the performance goal does not necessarily lead to negative processes and results [21,32–34]. Educational psychologists Elliot [35] and Elliot and Harackiewicz [36] maintained that a possible reason for the inconsistency of results for performance goal orientation in past studies could be the failure to distinguish between approach and avoidance motivations in the concept of performance goal orientation. Therefore, drawing from the achievement motivation theory (approach motivation versus avoidance motivation), performance goal orientation was divided into performance-approach goals and performance-avoidance goals. Relatedly, VandeWalle [37] conducted a study in which the participants were organizational members and divided performance goal orientation into the proving dimension and the avoiding dimension; furthermore, personal goal orientation was divided into three domains, namely, learning goal orientation, proving goal orientation, and avoiding goal orientation. People with learning goal orientation strive to develop themselves by acquiring new skills, becoming familiar with new settings, and improving their personal competence; those with proving goal orientation strive to prove their competence and receive helpful feedback; those with avoiding goal orientation tend to avoid criticism and negative feedback from others regarding their competence. Many studies have been using the aforementioned three-dimension viewpoint to examine the goal orientation of organizational members [38–41]. In this study, the three dimensions proposed by VandeWalle [37] were also applied.

2.3.2. Influence of Employees' Goal Orientations on Their Computer Anxiety

According to the goal orientation theory in educational psychology: (1) Learning goal orientation originates from an individual's inner interest in her or his work [21,42]. Therefore, employees with learning goal orientation seek challenging environments, believing that this will improve their computer competency and enable them to overcome the fear of dealing with computers. (2) People with learning goal orientation do not feel distressed about mistakes occurring during the learning process and demonstrate adaptive patterns [17]. As such, learning goal orientation can reduce employees' CA. (3) People with learning goal orientation consider hard work to be the key to success and improve their competence [17,43]. Thus, learning goal orientation can encourage employees to continue making attempts when faced with difficulties, invest more efforts, and stay the course. This study proposed the following hypotheses based on the aforesaid analyses.

Hypothesis 1a: *Employees' learning goal orientation has a significant negative effect on CA.*

By contrast, in a performance comparison environment, employees with proving goal orientation worry about whether they will surpass others in their abilities because they seek praise and profit [42]. Furthermore, employees with proving goal orientation care about winning in competition and comparison with others and, in the case of failure, they experience a strong feeling of threat and exhibit negative behaviors [44,45]. Therefore, this study assumed that employees with strong proving goal orientation have higher CA due to increased psychological pressure and anxiety in a competitive and comparison-based environment. Hence, the following hypothesis was proposed.

Hypothesis 1b: *Employees' proving goal orientation has a significant positive effect on CA.*

Compared to those with learning goal orientation, employees with avoiding goal orientation surmise that competence is the key factor that affects their feedback and outcomes, and investing additional time and effort implies that they lack competence [17]. In addition, they might worry that making mistakes during their learning process will reflect their lack of competence, and any negative feedback directed toward them may trigger feelings of failure and anxiety, thereby promoting their motivation to develop avoiding goal orientation [37,45,46]. Studies with students as the participants have indicated that examinations and the anxiety of receiving negative feedback correlated significantly and positively with the avoiding goal orientation of learners [47,48]. Since learners with avoiding goal orientation need to invest more effort throughout their learning process, they are concerned about unsatisfactory learning outcomes and will maintain their self-esteem by avoiding being regarded as incompetent. Therefore, they will develop stronger anxiety-related behavior. Based on the aforementioned analyses, the following hypothesis was proposed.

Hypothesis 1c: *Employees' avoiding goal orientation has a significant positive effect on CA.*

2.4. Influence of Intra-Organizational Environment on Employees' Goal Orientations

Scholars have had varying views on goal orientation in early studies. In achievement contexts, a learner's goals are influenced by personal intrinsic factors such as intelligence belief, self-efficacy, personality traits, and beliefs about learning [17,49–52]. However, subsequent studies asserted that the goal orientations pursued by learners could also be influenced by extrinsic and environmental factors such as classroom goal structure, significant others, and the types of learning activities conducted [53–58]. Hence, the goal orientations pursued by an individual are concurrently influenced by intrinsic and extrinsic factors [29,30,53]. Empirical studies have shown that learning environments influence the goals pursued by an individual, and subsequently affect their learning performance [59–61]. Since this study aimed to enhance employees' learning efficacy, the emphasis was placed on the influence of environmental factors on personal goal orientations.

VandeWalle [62] claimed that an intra-organizational environment can hinder employees' learning, while Porter and Tansky [63] argued that outcome-based evaluations of employees reduce their learning orientation and promote their performance orientation. Brown, Cron, and Slocum [64] revealed that organizational members' behaviors and performance depend on the perceived competitiveness of the organizational environment. In addition, various scholars [65–69] emphasized the importance of organizational learning. An organization can enhance its overall performance by improving individual or group behaviors. At present, many studies focus on students, and experiments have been designed to verify the influence of the overall competition or learning climate shaped by the classroom goal structure (such as rewarding high achievers or emphasizing personal improvement) on students' goal orientation and learning effects [53,56–58,70]. Other studies [42,59,71,72] explored the influence of organizational and personal learning on employees' work performance and ability to innovate. To date, merely a handful of studies have explored the influence of supervisors' leadership behavior on organizational members [73,74], and only a few studies have discussed the effects of organizational climate (organizational learning and competition). In this study, intra-organizational environment factors that could affect employees' goal orientations included organizational commitment to learning and competitive psychological climate. The potential effects of organizational commitment to learning

and competitive psychological climate on employees' goal orientations are described in the sections that follow.

2.4.1. Effects of Organizational Commitment to Learning

Past studies viewed organizational learning as an inevitable process but hardly ever discussed the settings and motivations that would promote learning. The core values and key resources needed for the creation of competitive advantage have been gradually transforming in the modern knowledge-based economy. Organizational learning and other knowledge management subjects have become an important factor for winning a competition. Organizational learning refers to using individual learning, group learning, and organizational learning to solve the issues facing the organization, improve organizational activities, and enhance the organization's ability to adapt [2,68,75,76]. Sinkula, Baker, and Noordewier [77] used the perspective of market information processing and developed three constructs to measure organizational learning, which included commitment to learning, shared vision, and open-mindedness. Organizational commitment to learning is the organizational psychological climate perceived by employees. It has two important functions: (1) Information function. Organizational commitment to learning communicates the following information to employees: learning is important, the organization supports the improvement of employees' competence via learning, mistakes made in the learning process can be tolerated, etc. (2) Motivating function. Organizational commitment to learning lets employees understand that learning is a bridge to success. Organizational commitment to learning promotes employees' learning goal orientation through its information and motivating functions [74].

According to the norm of reciprocity described in the psychological contract theory [78], people help and do not hurt those who have helped them before [79]. This study suggested that organizational commitment to learning manifests itself in the organization's investment in employees' learning and its tolerance toward mistakes made in the learning process. Such specific acts of organizational commitment to learning contribute to the development of employees' competence [74]. According to the psychology of reciprocity, employees try to reciprocate to the organization through improved performance [79]. In addition, organizational learning environments encourage employees to evaluate their success (or failure) through their individual standards [80]. This reduces the employees' fear of being regarded as incompetent when they make mistakes during their learning process, thereby decreasing their propensity to develop avoiding goal orientation. In other words, when organization members disagree with the organization's values, motivations, or goals, their commitment will lead to negative influences [81]. Based on the analyses above, the following hypotheses were proposed:

Hypothesis 2a: *Organizational commitment to learning has a significant positive effect on employees' learning goal orientation.*

Hypothesis 2b: *Organizational commitment to learning has a significant positive effect on employees' proving goal orientation.*

Hypothesis 2c: *Organizational commitment to learning has a significant negative effect on employees' avoiding goal orientation.*

2.4.2. Effects of Competitive Organizational Psychological Climate

Psychological climate refers to the organizational environment perceived by employees. Employees use personal values to explain and evaluate their benefit from the organization's actions [82]. Competitive organizational psychological climate refers to employees' belief that the organization gives rewards to employees based on their comparison with each other [64]. It should be noted that although both psychological climate and organizational climate are related to the organizational environment, the former involves individual-level perceptions and understanding, whereas the latter involves shared organizational-level perceptions [83]. Many studies have considered competitive psychological climate as an individual-level variable [82–85]. In view of the differences in individual

perceptions of intra-organizational competition, this study treated competitive psychological climate as an individual-level variable.

How does competitive environment affect learners' goal orientations? Educational psychologists Ames and Ames [80] suggested that, under the pressure of a competitive environment, learners might shift their focus to proving their competence and comparing their performance with that of others. Thus, a competitive environment promotes performance goal orientation. An empirical study conducted by Church, Elliot, and Gable [86], with university students as research participants, demonstrated that evaluation focus—a classroom environment factor—significantly and positively affected students' performance goal orientation. Empirical studies in which the participants were employees showed that competitive psychological climate helps to improve employees' goal establishment [56], as well as their behaviors and performance [85].

According to the goal theory and control theory, the setting of a clear goal helps employees to focus on the task and encourages them to search for information and strategies that would help to achieve the goal [87]. Therefore, the pressure created by a competitive environment can also be positive pressure that encourages the pursuit of information and strategies [88]. Furthermore, although competition does not directly provide learning-related information, the result-related information that it provides can encourage employees to uncover the causes of good and poor performance. It also expands employees' understanding of the comparison between them and colleagues and helps them determine the learning value of others' skills and knowledge and learn from others' mistakes and success [64]. For these reasons, a competitive psychological climate does not suppress employees' learning but, on the contrary, promotes it.

Furthermore, VandeWalle [62] advocated that competition hinders employee learning. Studies with students as the participants have revealed that competitive environments can suppress the learners' learning motivations, therefore developing their avoiding goal orientation [89,90]. The researchers determined that when learners face the stress of competition, they will shift their focus to proving their competence and comparing their performance with others [64,80,85]. This mindset may trigger an individual's anxiety of failure and the potential negative feedback from others on their competence, thus developing their avoiding goal orientation [91]. Based on the above, the following hypotheses were proposed in this study.

Hypothesis 3a: *Competitive psychological climate in an organization has a significant positive effect on employees' learning goal orientation.*

Hypothesis 3b: *Competitive psychological climate in an organization has a significant positive effect on employees' proving goal orientation.*

Hypothesis 3c: *Competitive psychological climate in an organization has a significant negative effect on employees' avoiding goal orientation.*

2.5. Influence of Goal Orientations and Computer Anxiety (CA) on Learning Outcomes

2.5.1. Learning Outcomes

Learning outcomes are an indicator of learners' learning results. The target of performance evaluation is for learners to understand their learning progress and for teachers and learners to have a basis for learning improvement [92]. Learning outcomes evaluate learners' performance in a certain indicator or changes in a certain behavior after their participation in learning activities [92,93].

There are many models that evaluate the effect of educational training. The most popular and widely recognized one is the four-level training evaluations model proposed by Kirkpatrick [94–97].

1. Reaction: Kirkpatrick suggested that the first level in the evaluation of training results is reaction, that is, trainees' satisfaction with the training course. At this level, trainees' feelings in relation to different aspects of the training course are evaluated.

2. Learning: Kirkpatrick suggested that the second level in the evaluation of training results is learning, that is, the acquisition of training course content (such as principles, facts, techniques, and attitudes) by trainees. At this level, the assimilation of principles, facts, techniques, and attitudes taught in a course is evaluated.

3. Behavior: Kirkpatrick suggested that the third level in the evaluation of training results is behavior, that is, the change in learners' work behavior resulting from the participation in training. At this level, an understanding of whether trainees can apply the learning results to their job is formed.

4. Results: Kirkpatrick suggested that the fourth level in the evaluation of training results is the level of results, that is, the final results obtained by the organization from training, which include increased sales, productivity, profit, reduced costs and employee turnover rate, and improved product quality. At this level, employees' direct positive contribution to organizational performance is determined.

Based on the arguments above, changes to behavior levels need to factor in the changes in personal performance that arise from applying on the job the new knowledge or skills acquired during training. Changes in performances cannot be generated within a short time, and previous studies mostly adopted self-assessment approaches [98], which increase the difficulty of making fair and objective measurements. According to Warr and Birdi [99], the results-level evaluations are difficult to perform because it is difficult to measure the change in organizational performance caused by a single training activity. Therefore, the reporting of training results is problematic in practice. This study took into account the difficulty of practicing the third- and fourth-level evaluation of learning outcomes in an objective manner due to the following reasons: (1) Data collection requires a lot of time; (2) Fair, impartial, and objective measurement criteria must be established; and (3) With regard to organization level measurements, industry and environment need to be taken into account, and a feasible and objective method must be established in order to measure organizational performance effectively. In addition, this study used Bushnell's [100] input-process-output (IPO) model as a reference to examine training results from a more comprehensive perspective. Furthermore, the reaction, learning, and behavior levels of Kirkpatrick's [96] four-level training evaluations model were integrated into the training output. Thus, this study used three levels, namely, reaction, learning, and behavior, to evaluate the employees' learning outcomes. The reaction level was evaluated as "learning satisfaction." The learning level was evaluated as "knowledge acquisition." The behavior level was evaluated as "skill enhancement."

2.5.2. Influence of Goal Orientations on Learning Outcomes

The theory of goal orientation assumes that learners with a learning goal are cognitively engaged in the learning process and focus on acquiring knowledge and skills [101]. Thus, people with learning goal orientation tend to apply more in-depth cognitive strategies during learning [17,55]. Learners with a proving goal focus on comparing themselves with others and do not spend much time and effort applying in-depth cognitive strategies [101], because harder work would imply a lack of competence [17,102]. Learners with avoiding goal orientation tend to attribute their failure to their lack of competence. Consequently, they are only willing to choose simpler jobs. Moreover, they are relatively less willing to invest more effort to overcome the failures they face, and have lower perseverance when they encounter difficult tasks, as they would avoid challenges for the sake of their self-esteem [17,85]. Based on the theory of goal orientation, both learning and proving goal orientations can effectively predict the learning outcomes.

With regard to empirical research, a study by VandeWalle [37] found that employees with learning goal orientation are happy to gain new knowledge and focus on the process of learning rather than on results. They do not mind the mistakes and failures made during the learning process and only care about a continuous progress in their knowledge and skills. Such employees apply new knowledge and skills in their work. Furthermore, they view insufficient competence or achievements as an opportunity for growth and invest more effort in enhancing their competence and learning in order to improve

performance [16,17,103,104]. The study by Janssen and Yperen [42] indicated that employees with proving goal orientation attach high importance to demonstrating their performance in a comparison environment. Such employees worry whether they surpass others in their abilities because they seek praise and profit. Related studies found that people with proving goal orientation care about their ability to surpass others in a competition or comparison [17,44,45]. Based on the arguments of Dweck and Leggett [17], people with avoiding goal orientation regard further efforts as pointless and only reflective of incompetence. Therefore, their overall efforts and perseverance are lower throughout their learning or working process. Consequently, they would avoid challenges for the sake of their self-esteem, and such behavior hinders the enhancement and development of their competence [85,105].

Many studies reported that learning goal orientation is positively related to conduct and performance [16,31,103,104,106–108]. Proving goal orientation was found to have a significant positive effect on conduct and performance [16,107–109]. On the contrary, avoiding goal orientation was found to have a significant negative effect on conduct and performance [17,37,85,105].

In summary, proving and learning goal orientations are usually positively related to conduct and performance, while avoiding goal orientation is negatively related to conduct and performance. Therefore, this study proposed the following hypotheses.

Hypothesis 4a: *Employees' learning goal orientation has a significant positive effect on their learning satisfaction.*

Hypothesis 4b: *Employees' learning goal orientation has a significant positive effect on their knowledge acquisition.*

Hypothesis 4c: *Employees' learning goal orientation has a significant positive effect on their skill enhancement.*

Hypothesis 5a: *Employees' proving goal orientation has a significant positive effect on their learning satisfaction.*

Hypothesis 5b: *Employees' proving goal orientation has a significant positive effect on their knowledge acquisition.*

Hypothesis 5c: *Employees' proving goal orientation has a significant positive effect on their skill enhancement.*

Hypothesis 6a: *Employees' avoiding goal orientation has a significant negative effect on their learning satisfaction.*

H6b: *Employees' avoiding goal orientation has a significant negative effect on their knowledge acquisition.*

H6c: *Employees' avoiding goal orientation has a significant negative effect on their skill enhancement.*

2.5.3. Influence of Computer Anxiety on Learning Outcomes

As with other forms of anxiety, such as mathematics anxiety, English language anxiety, work anxiety, and learning anxiety, CA is a common phenomenon that affects the willingness to work and learning achievements [110]. Loyd and Gressard [111] further explained that CA includes users' resistance to computer technologies, fear of computers, and hostile and aggressive thoughts about computers. According to Bracey's [112] findings, users with higher CA are less likely to succeed in their use of computers. The effective reduction of students' CA would help to improve their success in using computers. Bloom and Hautaluoma [113] indicated that CA is an important factor of computer use in learning because learners' fear of computer technologies affects their self-confidence, learning emotions, and learning behaviors. Chiou [114] and Sun et al. [22] tested and verified a significant effect of CA on users' satisfaction. Chapell, Blanding, Silverstein, Takahashi, Newman, Gubi, and McCann [115] found that moderate anxiety increases learners' motivation to learn and improves their academic performance, whereas excessively low or high anxiety leads to poorer academic performance. The study by Thatcher and Perrewé [6] indicated that CA has a certain influence on the use of IT and individual learning efficiency.

In summary, being a form of learning anxiety, anxiety produced by learning computer operation and use (CA) affects the users' learning outcomes. Thus, the following hypotheses were proposed in this study.

Hypothesis 7a: *Employees' CA has a significant negative effect on their learning satisfaction.*

Hypothesis 7b: Employees' CA has a significant negative effect on their knowledge acquisition.

Hypothesis 7c: Employees' CA has a significant negative effect on their skill enhancement.

2.6. Control Variables

This study adopted the employees' gender and computer self-efficacy (computerSE) as control variables for the following reasons: (1) With regard to gender, changes in society have equalized employment opportunities for both sexes, and the percentage of women in the workplace has increased over the years. This phenomenon is relatively common in enterprises in Taiwan, where female employees account for a higher percentage of office employees. A study mentioned that gender influences a person's work identity and work demand [116]. In addition, another study argued that gender differences may not necessarily affect work demand [117]. In order to delineate the different responses that could possibly be generated during the operation and learning of office software, the gender of employees must be further controlled. (2) With regard to computerSE, empirical studies have indicated that it correlates with CA [4,7,118,119] and correlates closely with the learning outcomes of IT [120,121]. Therefore, computerSE is a variable that must be controlled.

3. Materials and Methods

All participants gave their informed consent for inclusion before they participated in the study. The study was conducted in accordance with the Declaration of Helsinki.

3.1. Research Framework

Drawing upon the research motivation and hypotheses, this study proposed the conceptual research framework shown in Figure 1.

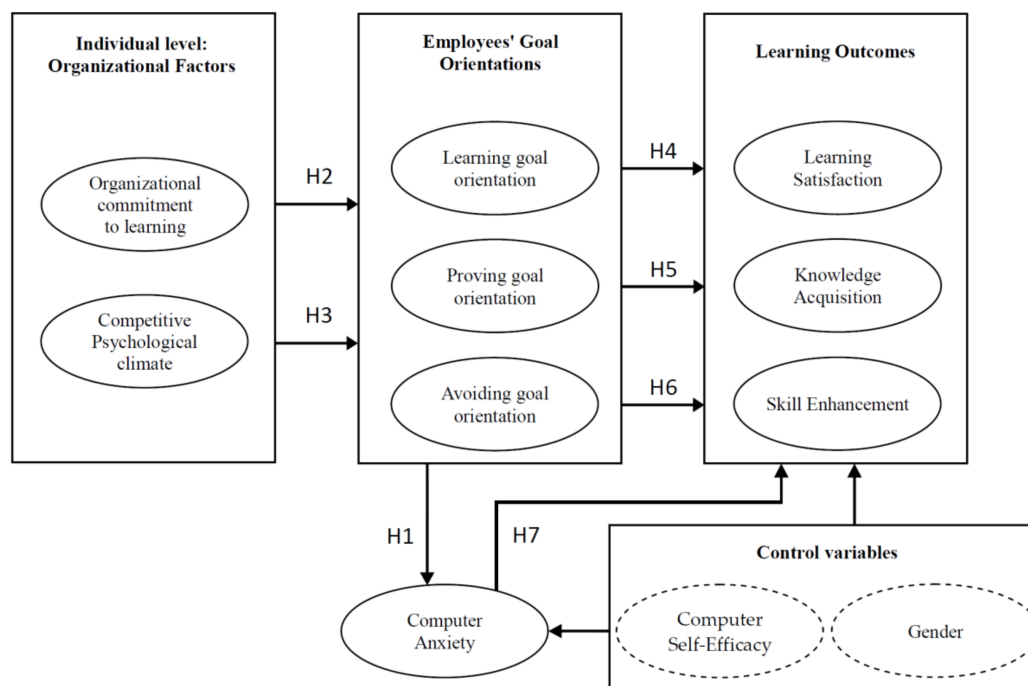


Figure 1. Conceptual Research Framework.

3.2. Participants and Data Collection

3.2.1. Industries and participants

The participants of this study were employees of small and medium-sized enterprises (SME) in Taiwan that use Company D's Enterprise Resource Planning (ERP) e-learning platform. The participants mainly included employees with extensive experience using the e-learning platform. The ERP e-learning platform was chosen in this study for the following reasons: (1) At present, ERP is the most extensively-used software; (2) The software developer has already established a complete digital system and learning environment for ERP e-learning; (3) The software developers has successfully promoted their products to users in SMEs for over ten years; and (4) Most of the developers' customers have already utilized the ERP e-learning system to train their employees. This shows that the ERP e-learning environment has been used thoroughly in the companies. The participants were selected as employees in SMEs in the manufacturing industry for the following reasons: (1) Relevant studies pertaining to e-learning revealed that, in the past, research on e-learning mostly focused on medium and large-sized enterprises; and (2) In Taiwan, SMEs in the manufacturing industry account for a higher number and ratio in the overall economy. Based on the aforementioned reasons, SMEs in the manufacturing industry were selected in this study, and a questionnaire was administered to the employees.

3.2.2. Questionnaire Design

The hypotheses of this study were validated through a questionnaire. The questionnaire mainly consisted of six sections: organizational commitment to learning; competitive psychological climate; computer self-efficacy; computer anxiety; goal orientation; and the learning outcomes. The variables included the sample population, industries, and departments. Each subscale was measured on a seven-point Likert scale, in which 1 indicated "Strongly disagree" and 7 indicated "Strongly agree." The operating definitions and number of items of each construct and variable were as follows:

(1) Organizational commitment to learning: This study regarded organizational commitment to learning as "the employees' belief that the organization considers learning to be the most important basic value." This study measured the employees' perception of organizational commitment to learning based on Baker and Sinkula [122] and Sinkula, Baker, and Noordewier's [77] organizational learning subscale "commitment to learning" (four items in total).

(2) Competitive psychological climate: This study regarded the participants' competitive psychological climate as "the employees' belief that the organization gives rewards to employees based on their comparison with each other." This study measured the employees' perception of competitive psychological climate based on Brown and Peterson's [123] competitive psychological climate scale (five items in total).

(3) Computer self-efficacy (computerSE): This study regarded the participants' computerSE as "a person's judgment on their ability to use a computer, and emphasizes that computerSE reflects their perceived ability to use a computer to complete their tasks." This study measured the employees' perceived computerSE level based on Compeau and Higgins' [118] computerSE scale (there were ten items initially, but this study adopted the four items pertaining to computer use without assistance from others).

(4) Computer anxiety (CA): This study regarded the participants' CA as "the psychological stress generated when a person learns, uses, or expects to come in contact with a computer, or an individual's anxiety reaction produced in the process of using, encountering, or learning with a computer, thereby generating adverse reactions such as resistance, avoidance, hatred, and concern." This study measured the employees' perceived CA level based on Cohen and Waugh's [124] CA scale (eight items in total).

(5) Goal orientation: This study regarded the participants' learning goal orientation as "a person's willingness to develop by acquiring new skills, becoming familiar with new settings, and improving their competence"; proving goal orientation was regarded as "a person's willingness to demonstrate

their competence or receive related praise”; avoiding goal orientation was regarded as “a person’s willingness to avoid criticism and negative feedback from others on their competence.” This study measured the employees’ learning, proving, and avoiding goal orientations based on the contents of VandeWalle’s [37] goal orientation scale (seven, six, and five items, respectively).

(6) Learning outcomes: This study measured the learning outcomes through three constructs—learning satisfaction, knowledge acquisition, and skill enhancement. The employees’ e-learning outcomes were measured based on Kirkpatrick’s [97] questionnaire, in which there were seven, seven, and five items pertaining to learning satisfaction, knowledge acquisition, and skill enhancement, respectively.

3.2.3. Questionnaire Administration

The questionnaire was administered to employees of SMEs in Taiwan’s manufacturing industry that use the ERP e-learning platform of Company D, which has a higher market share. Company D assisted the survey by administering the empirical questionnaire as hard copies or as soft copies by e-mail or as a Google form. Each SME was administered five to ten questionnaires. The hard copies were completed by the participants and mailed back to the researchers; the Google forms were completed online by the participants. (The responses were mostly hard copies, and there were fewer Google forms.)

3.2.4. Sample Structure

In total, 500 questionnaires were administered, and 235 questionnaires were returned, yielding a response rate of 47%. After excluding incomplete responses, 193 effective questionnaires were collected, yielding an effective response rate of 39%. Male and female respondents accounted for 36.79% and 63.21% of the sample, respectively. Employees aged 26–30 years old were the main users of e-learning, accounting for 70% of the sample. With regard to the educational level, most employees (70.47%) had a university degree. 51.30% of the employees had a year’s experience of using the e-learning system. With regard to job tenure, 25.91% had less than three years of experience; 25.39% had three to five years of experience; 26.42% had five to ten years of experience; and 22.28% had more than ten years of experience. The demographic statistics of the sample is shown in Table 1. With regard to the classification of companies, 42 companies responded to the questionnaire, of which metal products manufacturing, electronic products manufacturing, machinery and equipment manufacturing, motor vehicle parts manufacturing, and motorcycle parts manufacturing industries accounted for 14.29%, 16.67%, 11.90%, 14.29%, and 11.90%, respectively. The total response rate of the five industries was 69.05%. With regard to the employees’ affiliated department, there were 193 employees in total, and the business, manufacturing, and finance departments accounted for 21.76%, 17.10%, and 22.80%, respectively. The total response rate of the three departments was 61.66%. The sample structures of the companies and the employees’ departments are shown in Table 2.

Table 1. Sample structure (N = 193).

| Demographic Variables | | Number (%) | Demographic Variables | | Number (%) |
|-----------------------|------------------------------|--------------|--------------------------|-----------------------|--------------|
| Gender | Male | 71 (36.79%) | Marital status | Unmarried | 117 (60.62%) |
| | Female | 122(63.21%) | | Married | 76 (39.38%) |
| Age | 25 years old and below | 51(26.42%) | Experience of e-Learning | One year and below | 99 (51.30%) |
| | 26~30 years old | 70 (36.27%) | | 1~2 years | 65 (33.68%) |
| | 31~35 years old | 42 (21.76%) | | 2~4 years | 19 (09.84%) |
| | Over 36 years old | 30 (15.54%) | | More than 4 years | 10 (05.18%) |
| Education level | Senior high school and below | 15(07.77%) | Work experience | Three years and below | 50 (25.91%) |
| | Junior college | 30 (15.54%) | | 3~5 years | 49 (25.39%) |
| | College degree | 136 (70.47%) | | 5~10 years | 51 (26.42%) |
| | Master’s degree | 12 (06.22%) | | More than 10 years | 43 (22.28%) |

Table 2. Structure of companies (N = 42) and number of employees in the departments (N = 193).

| Statistical Variables of Companies | | Number (%) | Statistical Variables of Departments | | Number (%) |
|------------------------------------|---------------------------------------|------------|--------------------------------------|-----------------------|-------------|
| Classification of industries | Food manufacturing | 4 (9.53%) | Type of department | Business dept. | 42 (21.76%) |
| | Beverage manufacturing | 2 (4.76%) | | Procurement dept. | 17 (8.81%) |
| | Leather manufacturing | 2 (4.76%) | | Manufacturing dept. | 33 (17.10%) |
| | Chemical manufacturing | 3 (7.14%) | | R&D dept. | 25 (12.95%) |
| | Plastics manufacturing | 2 (4.76%) | | Finance dept. | 44 (22.80%) |
| | Metal products manufacturing | 6 (14.29%) | | Management dept. | 22 (11.40%) |
| | Electronic products manufacturing | 7 (16.67%) | | Human resources dept. | 6 (3.11%) |
| | Machinery and equipment manufacturing | 5 (11.90%) | | Others | 4 (2.07%) |
| | Motor vehicle parts manufacturing | 6 (14.29%) | | | |
| | Motorcycle parts manufacturing | 5 (11.90%) | | | |

Note: The classification of manufacturing industries is based on the Standard Industrial Classification System last revised by the Government of Taiwan in 2016. In the type of department, others refers to departments that cannot be classified into the general departments.

4. Results

4.1. Common Method Variance (CMV) Test

The issue of common method variance (CMV) was likely to occur because all of the items were answered by the same participant during the questionnaire survey. The collection of a participant's cognition and motivation information via a self-report scale is very likely to cause CMV bias, which can lead to the overestimation or underestimation of the relationships between variables [71]. This study applied process control as proposed by Podsakoff, MacKenzie, Lee, and Podsakoff [125]. An anonymous questionnaire survey was conducted, and random allocation was applied to questionnaire items in order to reduce the possibility of CMV. Harman's single-factor test was used to examine CMV [126]. The fundamental assumption of the single-factor test is that if one main factor can explain most covariance between all variables, there exists the issue of CMV between variables. Factor analysis was performed for all questionnaire items, and the first principal component obtained in a non-rotation scenario reflected the amount of CMV. A single-factor analysis was performed for all questionnaire items, and the first principal component obtained in a non-rotation scenario had the loading of 24.428%, not reaching the majority value (greater than 50%). The results indicated that CMV was not a critical issue.

4.2. Verification of Research Hypotheses

This study used the partial least square (PLS) method to analyze the proposed research framework. In contrast to other statistical analysis methods, PLS can simultaneously process a large number of research constructs and variables and does not require the evaluation of multivariate normal distribution of raw data. This method is able to provide robust results related to parameter estimations while using a small sample [127,128]. The main analysis software used in this study included the SmartPLS M2 [129].

Table 3. Partial least square (PLS) scale analysis results.

| Construct | Research Variable | Factor Loading | Cronbach's α | Composite Reliability (CR) | AVE |
|--|----------------------------|----------------|---------------------|----------------------------|--------|
| Computer Self-Efficacy (computerSE) | computerSE1 | 0.901 | 0.920 | 0.943 | 0.806 |
| | computerSE2 | 0.887 | | | |
| | computerSE3 | 0.903 | | | |
| | computerSE4 | 0.900 | | | |
| Organizational Commitment to Learning(CTL) | CTL1 | 0.868 | 0.888 | 0.918 | 0.691 |
| | CTL2 | 0.798 | | | |
| | CTL3 | 0.817 | | | |
| | CTL4 | 0.790 | | | |
| | CTL5 | 0.878 | | | |
| Competitive Psychological Climate (CPC) | CPC1 | 0.777 | 0.740 | 0.851 | 0.656 |
| | CPC3 | 0.777 | | | |
| | CPC4 | 0.871 | | | |
| Computer Anxiety (CA) | CA2 | 0.785 | 0.921 | 0.941 | 0.763. |
| | CA3 | 0.810 | | | |
| | CA5 | 0.894 | | | |
| | CA6 | 0.938 | | | |
| | CA7 | 0.931 | | | |
| Learning Orientation (LO) | LO2 | 0.829 | 0.925 | 0.941 | 0.728 |
| | LO3 | 0.856 | | | |
| | LO4 | 0.872 | | | |
| | LO5 | 0.898 | | | |
| | LO6 | 0.847 | | | |
| | LO7 | 0.814 | | | |
| Proving Orientation (PO) | PO4 | 0.823 | 0.839 | 0.901 | 0.752 |
| | PO5 | 0.890 | | | |
| | PO6 | 0.887 | | | |
| Avoiding Orientation (AO) | AO1 | 0.848 | 0.902 | 0.928 | 0.721 |
| | AO2 | 0.909 | | | |
| | AO3 | 0.814 | | | |
| | AO4 | 0.749 | | | |
| | AO5 | 0.914 | | | |
| Learning Satisfaction (SAT) | SAT2 | 0.876 | 0.952 | 0.961 | 0.806 |
| | SAT3 | 0.898 | | | |
| | SAT4 | 0.918 | | | |
| | SAT5 | 0.918 | | | |
| | SAT6 | 0.875 | | | |
| | SAT7 | 0.900 | | | |
| | Knowledge Acquisition (KA) | KA1 | | | |
| KA2 | | 0.933 | | | |
| KA3 | | 0.933 | | | |
| KA4 | | 0.925 | | | |
| KA5 | | 0.932 | | | |
| Skill Enhancement (SKI) | SKI1 | 0.954 | 0.955 | 0.971 | 0.918 |
| | SKI2 | 0.971 | | | |
| | SKI3 | 0.950 | | | |

Note: computerSE = Computer Self-Efficacy, CTL = Organizational Commitment to Learning, CPC = Competitive Psychological Climate, CA = Computer Anxiety, LO = Learning Orientation, PO = Proving Orientation, AO = Avoiding Orientation, SAT = Learning Satisfaction, KA = Knowledge Acquisition, SKI = Skill Enhancement.

4.2.1. Outer Model

The relationship between an indicator and a latent construct in PLS is referred to as an outer model. Table 3 shows the factor loadings of all construct items and reliability test results [130]. With the exception of Competitive Psychological Climate, the Cronbach's α and composite reliability values were greater than 0.8 for all constructs, meeting the reliability criteria [130,131].

Table 4 shows the correlation coefficients and the AVE square roots of each latent construct. With regard to the research model fit, PLS structural equation modeling (PLS-SEM) has only one overall

fit indicator GoF (goodness of fit), whereas covariance-based SEM (CB-SEM) provides up to 25 model fit indicators. The GoF indicator can be used to calculate the overall fit of the measurement model and structural model. It provides information about the expected utility of the overall model [132]. GoF is obtained by multiplying the mean value of the communality index by the mean value of R2 and calculating the geometrical mean (square root). Indicator values of 0.1, 0.25, and 0.36 represent a weak, moderate, and strong fit, respectively. The statistical results are provided below. The GoF value of 0.554 indicated the strong fit of the overall research model, meaning that the model used was good.

$$GoF = \sqrt{\text{communality} * R^2} = \sqrt{0.938 * 0.327} = 0.554 \tag{1}$$

Table 4. Matrix of means, standard deviations, and correlation coefficients of latent constructs.

| Factors | Mean | S.D. | 1. | 2. | 3. | 4. | 5. | 6. | 7. | 8. | 9. | 10. | 11. |
|---------|-------|-------|--------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| 1. | – | – | – | | | | | | | | | | |
| 2. | 4.470 | 0.988 | −0.061 | 0.898 | | | | | | | | | |
| 3. | 5.231 | 0.955 | 0.092 | 0.308 | 0.831 | | | | | | | | |
| 4. | 4.396 | 1.066 | −0.012 | 0.222 | 0.221 | 0.810 | | | | | | | |
| 5. | 2.276 | 0.933 | 0.087 | −0.391 | −0.206 | −0.198 | 0.873 | | | | | | |
| 6. | 5.413 | 0.752 | −0.086 | 0.282 | 0.384 | 0.320 | −0.436 | 0.867 | | | | | |
| 7. | 4.681 | 0.863 | −0.236 | 0.226 | 0.160 | 0.372 | −0.088 | 0.353 | 0.853 | | | | |
| 8. | 3.732 | 1.020 | −0.058 | 0.018 | −0.135 | −0.131 | 0.437 | −0.300 | 0.178 | 0.849 | | | |
| 9. | 5.339 | 0.886 | −0.165 | 0.295 | 0.320 | 0.416 | −0.262 | 0.641 | 0.435 | −0.155 | 0.898 | | |
| 10. | 5.369 | 0.839 | −0.019 | 0.311 | 0.362 | 0.333 | −0.456 | 0.694 | 0.335 | −0.304 | 0.668 | 0.925 | |
| 11. | 5.351 | 0.904 | −0.168 | 0.426 | 0.296 | 0.420 | −0.403 | 0.637 | 0.355 | −0.179 | 0.765 | 0.716 | 0.958 |

Note1: Values in the diagonal are AVE square roots of each latent construct; all other values are coefficients of correlation between constructs. Note2: 1. = Gender, 2. = Computer Self-Efficacy, 3. = Organizational Commitment to Learning, 4. = Competitive Psychological Climate, 5. = Computer Anxiety, 6. = Learning Orientation, 7. = Proving Orientation, 8. = Avoiding Orientation, 9. = Learning Satisfaction, 10. = Knowledge Acquisition, 11. = Skill Enhancement.

4.2.2. Inner Model and Hypotheses Testing

In PLS, the inter-construct path structure is referred to as an inner model. Inner model hypothesis tests and path analysis results are shown in Figure 2 and Table 5.

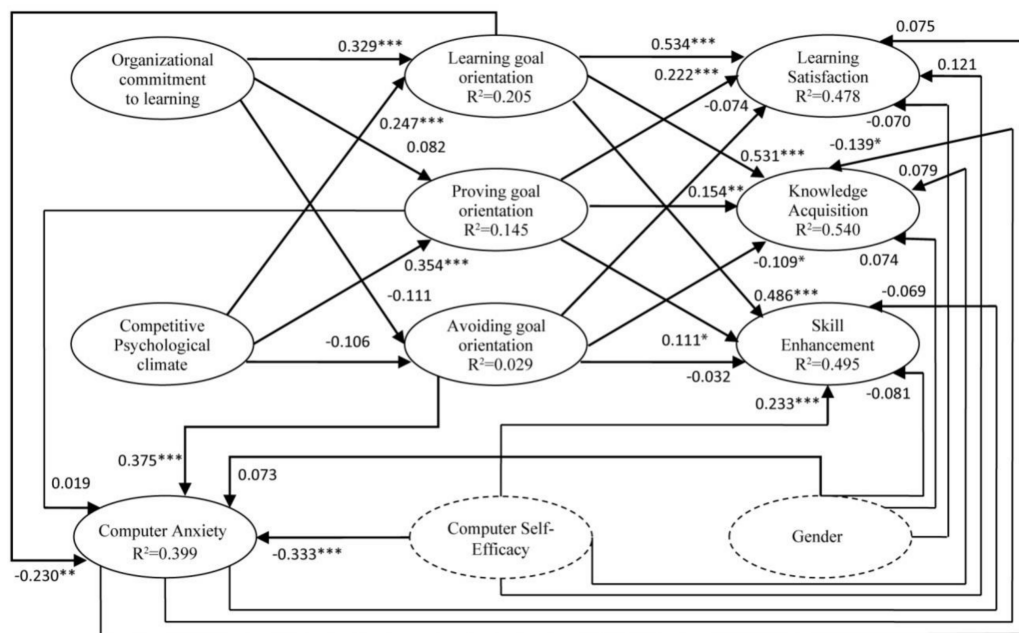


Figure 2. Path coefficients and significance of the inner model. One-tailed test, * *p*-value < 0.05; ** *p*-value < 0.01; *** *p*-value < 0.001.

Table 5. Summary of the inner model results.

| Hypothesis | Direction | Structural Path | Path Coefficient | | t-Value | Result |
|--|-----------|-----------------|------------------|-------|---------|---------------|
| H1a(-) | → | CA | -0.230 | *** | 2.974 | Supported |
| H1b(+) | → | CA | 0.019 | | 0.291 | Not Supported |
| H1c(+) | → | CA | 0.375 | *** | 5.414 | Supported |
| H2a(+) | → | LO | 0.329 | *** | 4.581 | Supported |
| H2b(+) | → | PO | 0.082 | | 0.985 | Not Supported |
| H2c(-) | → | AO | -0.111 | | 1.204 | Not Supported |
| H3a(+) | → | LO | 0.247 | *** | 3.754 | Supported |
| H3b(+) | → | PO | 0.354 | *** | 4.485 | Supported |
| H3c(-) | → | AO | -0.106 | | 1.213 | Not Supported |
| H4a(+) | → | SAT | 0.534 | *** | 7.368 | Supported |
| H4b(+) | → | KNO | 0.531 | *** | 8.698 | Supported |
| H4c(+) | → | SKI | 0.486 | *** | 7.051 | Supported |
| H5a(+) | → | SAT | 0.222 | *** | 3.630 | Supported |
| H5b(+) | → | KNO | 0.154 | ** | 3.066 | Supported |
| H5c(+) | → | SKI | 0.111 | * | 1.753 | Supported |
| H6a(-) | → | SAT | -0.074 | | 1.131 | Not Supported |
| H6b(-) | → | KNO | -0.109 | * | 1.746 | Supported |
| H6c(-) | → | SKI | -0.032 | | 0.473 | Not Supported |
| H7a(-) | → | SAT | 0.075 | | 1.018 | Not Supported |
| H7b(-) | → | KNO | -0.139 | * | 2.275 | Supported |
| H7c(-) | → | SKI | -0.069 | | 0.892 | Not Supported |
| Explained variance for each dependent variable (R ²) | | | | | | |
| LO | PO | AO | CA | SAT | KA | SKI |
| 0.205 | 0.145 | 0.029 | 0.399 | 0.478 | 0.540 | 0.495 |

Note1: computerSE = Computer Self-Efficacy, CTL = Organizational Commitment to Learning, CPC = Competitive Psychological Climate, CA = Computer Anxiety, LO = Learning Orientation, PO = Proving Orientation, AO = Avoiding Orientation, SAT = Learning Satisfaction, KA = Knowledge Acquisition, SKI = Skill Enhancement. Note2: One-tailed test, * p -value < 0.05; ** p -value < 0.01; *** p -value < 0.001. Note 3: Number of bootstrap samples = 1000.

4.3. Verification of Hypotheses

The analysis results shown in Table 5 indicated the following: (1) Employees' computerSE and learning goal orientation had a significant negative effect on employees' CA, whereas avoiding goal orientation had a significant positive effect on employees' CA. Thus, Hypotheses 1a and 1c were supported. The employees' proving goal orientation did not have a significant effect on their CA. Thus, Hypothesis 1b was not supported. (2) The influence of organizational commitment to learning on employees' proving and avoiding goal orientations was not significant, whereas learning goal orientation was significantly and positive affected by organizational commitment to learning. Thus, Hypotheses 2b and 2c were not supported, while Hypothesis 2a was supported. (3) Competitive psychological climate had a significant positive effect on employees' proving and learning goal orientations. Thus, Hypotheses 3a and 3b were supported. Competitive psychological climate did not have a significant negative effect on employees' avoiding goal orientation. Thus, Hypotheses 3c was not supported. (4) Employees' learning and proving goal orientations had a significant positive effect on learning satisfaction, knowledge acquisition, and skill enhancement. Thus, Hypotheses 4a, 4b, 4c, 5a, 5b, and 5c were supported. The employees' avoiding goal orientation did not have a significant negative effect on learning satisfaction and skill enhancement. Thus, Hypotheses 6a and 6c were not supported; the avoiding goal orientation had a significant negative effect on knowledge acquisition. Thus, Hypothesis 6b was supported. (5) The influence of employees' CA on learning satisfaction and skill enhancement was not significant. Thus, Hypotheses 7a and 7c were not supported. However, employees' CA was found to have a significant negative effect on knowledge acquisition, supporting Hypothesis 7b. (6) Employees' computerSE had a significant positive effect on learning satisfaction and skill enhancement. Thus, Hypotheses 8a and 8c were supported. The influence of employees' computerSE on knowledge acquisition was not significant. Thus, Hypothesis 8b was not supported.

4.4. Additional Analysis: Testing of Mediation Effects

Mediation effects are usually determined using the causal steps proposed by Baron and Kenny [133] and tested using the z-value as developed by Sobel [134]. However, empirical studies have shown that the causal steps approach is not very effective at detecting mediation effects [135]. Furthermore, many mediation effects do not meet the normal distribution requirement of Sobel's test. Therefore, in addition to using Sobel's [134] z-value test, this study followed the suggestion of Tofighi and MacKinnon [136] and MacKinnon, Cox, and Baraldi [137] and used the product of distribution to calculate the mediation effects of proving goal orientation, learning goal orientation, and CA, as well as the related confidence intervals (CIs).

With the exception of three constructs: (1) The influence of organizational commitment to learning via proving and avoiding goal orientations was not significant; (2) The influence of a competitive psychological climate on avoiding goal orientation was not significant; and (3) The influence of proving goal orientation on CA was not significant; the mediation effects relating to the other constructs were verified. The results are presented in Table 6. In the Sobel Test analysis of the mediator variables' influence, a z-value greater than the absolute value of 1.96 indicates significance, that is, the presence of a mediation effect [134,138]. When the product of distribution is used to calculate the mediation effect CIs, the presence of a mediation effect is indicated by a CI not containing zero at the confidence level of 95%. Both analyses showed that mediation effects in all constructs were significant, apart from (1) the indirect effect of a competitive psychological climate on the learning outcomes via proving goal orientation, which was only partially supported; and (2) the effects of learning goal orientation on knowledge acquisition via CA, which were not supported.

Table 6. Mediation effects of learning and proving goal orientations and computer anxiety (CA) (N = 193).

| Mediator Variable | Path | Sobel Test's z-value | | Product of Distribution | | | |
|---------------------------|----------------|----------------------|-----|-------------------------|----------------------|---------|---------|
| | | | | Mediation Effect | | LL95%CI | UL95%CI |
| Learning Goal Orientation | CTL → LO → SAT | 3.890 | *** | $\mu = -0.176$ *** | ($\sigma = 0.045$) | 0.093 | 0.271 |
| | CTL → LO → KA | 4.053 | *** | $\mu = -0.175$ *** | ($\sigma = 0.043$) | 0.095 | 0.265 |
| | CTL → LO → SKI | 3.842 | *** | $\mu = -0.160$ *** | ($\sigma = 0.042$) | 0.084 | 0.248 |
| | CTL → LO → CA | -2.459 | * | $\mu = -0.076$ * | ($\sigma = 0.031$) | -0.143 | -0.023 |
| | CPC → LO → SAT | 3.345 | *** | $\mu = -0.132$ *** | ($\sigma = 0.040$) | 0.060 | 0.215 |
| | CPC → LO → KA | 3.447 | *** | $\mu = -0.131$ *** | ($\sigma = 0.038$) | 0.060 | 0.211 |
| | CPC → LO → SKI | 3.314 | *** | $\mu = -0.120$ ** | ($\sigma = 0.037$) | 0.054 | 0.197 |
| | CPC → LO → CA | -2.331 | * | $\mu = -0.057$ * | ($\sigma = 0.025$) | -0.112 | -0.015 |
| Proving Goal Orientation | CPC → PO → SAT | 2.822 | ** | $\mu = -0.079$ ** | ($\sigma = 0.028$) | 0.030 | 0.140 |
| | CPC → PO → KA | 2.531 | * | $\mu = -0.055$ * | ($\sigma = 0.022$) | 0.017 | 0.103 |
| | CPC → PO → SKI | 1.633 | | $\mu = -0.039$ | ($\sigma = 0.025$) | 0.004 | 0.093 |
| Computer Anxiety | LO → CA → KA | 1.807 | | $\mu = -0.032$ | ($\sigma = 0.018$) | 0.003 | 0.073 |
| | AO → CA → KA | -2.097 | * | $\mu = -0.052$ * | ($\sigma = 0.025$) | -0.106 | -0.007 |

Note1: computerSE = Computer Self-Efficacy, CTL = Organizational Commitment to Learning, CPC = Competitive Psychological Climate, CA = Computer Anxiety, LO = Learning Orientation, PO = Proving Orientation, AO = Avoiding Orientation, SAT = Learning Satisfaction, KA = Knowledge Acquisition, SKI = Skill Enhancement, LL = Lower Limit, UL = Upper Limit, CI = Confidence interval. Note2: * p-value < 0.05; ** p-value < 0.01; *** p-value < 0.001.

5. Conclusions and Discussions

This study evaluated the influence of organizational factors (namely, the organizational commitment to learning and a competitive psychological climate) on goal orientations and found that, apart from (1) There was no significant and positive influence of the organizational commitment to learning on proving goal orientation, nor a significant and negative influence on avoiding goal orientation; and (2) There was no significant and negative influence of competitive psychological climate on avoiding goal orientation; the other effects were significant and positive. It must be noted that the personal factors of computer self-efficacy (computerSE) and gender-based goal orientations

may influence computer anxiety (CA) and the learning outcomes [4,7,116]. Therefore, the participants' computerSE and gender were introduced into the research framework as control variables. In addition, with regard to the association of goal orientations on CA, with the exception of the absence of a significant positive influence of proving goal orientation on CA, computerSE and learning goal orientation had a significant negative effect on CA, while avoiding goal orientation had a significant positive influence on CA. This study also verified that (1) The Organizational commitment to learning indirectly affects the employees' e-learning outcomes through their learning goal orientation; (2) A competitive psychological climate indirectly affects the employees' e-learning outcomes through their learning and proving goal orientations; and (3) The employees' learning and avoiding goal orientations indirectly affect their e-learning outcomes through the mediator variable of CA. Furthermore, further comparisons (see Table 7) showed that learning satisfaction was most strongly influenced by the organizational commitment to learning and competitive psychological climate, followed by knowledge acquisition and skill enhancement. Theoretical and empirical studies have suggested that organizational environment-related factors play an important role on the influence of goal orientations. Even though a handful of studies argued that a competitive psychological climate may have a negative effect on employees. However, while the findings of this study were in line with such arguments, there were some inconsistencies. Empirical studies similar to this study also had the same viewpoints, which could be due to the differences in the theories applied and the directions of research (such as the types of goal orientation, personal traits, participants, and environments). Therefore, the explanations were offered according to the findings of this study. The results showed that a competitive psychological climate can increase the employees' learning propensity (i.e., learning goal orientation) and desire to perform well (i.e., proving goal orientation), thereby positively influencing their e-learning outcomes. This indicates that a competitive psychological climate has a correlative influence on the learning outcomes. If an organization is able to incorporate a competitive psychological climate into their work environment in a progressive and timely manner, they will reduce the stress of their employees, which will initiate or contribute to the generation of positive effects on the employees' learning behavior.

Table 7. Summary of the effects of organizational environment and employees' goal orientation on their e-learning outcomes.

| Research Variable | Learning Outcomes | | | | | | | | |
|---------------------------------------|-----------------------|-----------------|--------------|-----------------------|-----------------|--------------|-------------------|-----------------|--------------|
| | Learning Satisfaction | | | Knowledge Acquisition | | | Skill Enhancement | | |
| | Direct Effect | Indirect Effect | Total Effect | Direct Effect | Indirect Effect | Total Effect | Direct Effect | Indirect Effect | Total Effect |
| Organizational Commitment to Learning | 0.000 | 0.202 | 0.202 | 0.000 | 0.199 | 0.199 | 0.000 | 0.173 | 0.173 |
| Competitive Psychological Climate | 0.000 | 0.218 | 0.218 | 0.000 | 0.197 | 0.197 | 0.000 | 0.163 | 0.163 |
| Learning Goal Orientation | 0.534 | −0.017 | 0.517 | 0.531 | −0.032 | 0.499 | 0.486 | 0.016 | 0.502 |
| Proving Goal Orientation | 0.222 | 0.001 | 0.223 | 0.154 | 0.003 | 0.157 | 0.111 | −0.001 | 0.110 |
| Avoiding Goal Orientation | −0.074 | 0.028 | 0.046 | −0.109 | 0.052 | 0.057 | −0.032 | −0.026 | −0.058 |

5.1. Results and Discussion

5.1.1. Learning Goal Orientation on CA

Employees' learning goal orientation has a significant negative effect on CA ($\beta = -0.230$, t -value = 2.974); employees' avoiding goal orientation has a significant negative effect on CA ($\beta = 0.375$, t -value = 5.414). Therefore, Hypotheses 1a and 1c were supported. These results corresponded to the findings of Dweck and Leggett [17] and VandeWalle et al. [43]. It was confirmed that employees

with learning goal orientation invest more effort when faced with a challenge, which reduces their CA. On the contrary, employees with proving goal orientation care about winning and gaining more praise, which results in lower CA [42,44]. Employees with avoiding goal orientation are concerned about making mistakes when they face challenges, which results in higher CA [37,45]. Overall, the employees' avoiding goal orientation is more able to predict the degree of their CA compared to their learning goal orientation.

5.1.2. Influence of Organizational Commitment to Learning and Competitive Psychological Climate on Goal Orientations

(1) Although the organizational commitment to learning was found to have a positive effect on employees' proving goal orientation ($\beta = 0.082$, t -value = 0.985), this effect was not significant; furthermore, the organizational commitment to learning was found to have a positive effect on employees' avoiding goal orientation ($\beta = -0.111$, t -value = 1.204), and this effect was not significant either; the organizational commitment to learning was found to have a significant positive effect on learning goal orientation ($\beta = 0.329$, t -value = 4.581). Thus, Hypotheses 2b and 2c were not supported, while Hypothesis 2a was supported. (2) A competitive psychological climate was found to have a significant positive effect on employees' learning goal orientation ($\beta = 0.247$, t -value = 3.754) and proving goal orientation ($\beta = 0.354$, t -value = 4.485), and thus Hypotheses 3a and 3b were supported. A competitive psychological climate was found to have a negative but not significant effect on avoiding goal orientation ($\beta = -0.106$, t -value = 1.21), and thus Hypothesis 3c was not supported.

The organizational commitment to learning communicates to employees that learning is important, that the organization supports the improvement of employees' competence via learning, that mistakes made in the learning process can be tolerated, etc. Owing to this information function, employees perceive the importance of their learning outcomes for the company and their personal value in future work, which affects their goal orientations. With regard to the influence of organizational environment factors on personal goals, Farr et al. [30] indicated that, in addition to personal differences, the setting in question must also be considered as a factor that can influence individuals' learning and proving goals. However, some studies maintained, drawing upon the theory of goal orientation used in educational psychology, that competition hinders learning among an organization's members [64] and may even promote proving goal orientation in employees [63]. In this study, in addition to promoting employees' proving goal orientation, a competitive psychological climate was found to have the same effect on learning goal orientation. Why would a competitive psychological climate encourage learning goal orientation in learners? A study conducted by Kohli, Shervani, and Challagalla [73] indicated that a results-oriented organizational environment promoted employees' learning goal orientation. They suggested that these findings could be attributed to the positive environment created by results-oriented competition, which encouraged employees to search for information and strategies and strengthened their learning goal orientation [88]. Clearly, the use of competition-induced pressure to explain the negative effects of intra-organizational competition (e.g., suppressed learning, encouragement of avoidance behaviors, etc.) is too simplistic an approach. When exploring the effects on intra-organizational competition on employees' learning attitudes, motivations, and behaviors, researchers must also consider the necessity and importance of differences in employees' individual characteristics and needs [139].

5.1.3. Influence of Goal Orientations, CA, and computerSE on Learning Outcomes

(1) Employees' learning goal orientation was found to significantly and positively influence learning satisfaction ($\beta = 0.534$, t -value = 7.368), knowledge acquisition ($\beta = 0.531$, t -value = 8.698), and skill enhancement ($\beta = 0.486$, t -value = 7.051). Thus, Hypotheses 4a, 4b, and 4c were supported. Employees' proving goal orientation was found to significantly and positively influence learning satisfaction ($\beta = 0.222$, t -value = 3.630), knowledge acquisition ($\beta = 0.154$, t -value = 3.066), and skill enhancement ($\beta = 0.111$, t -value = 1.753). Thus, Hypotheses 5a, 5b, and 5c were supported. The influence

of employees' avoiding goal orientation on learning satisfaction ($\beta = -0.074$, t -value = 1.131) and skill enhancement ($\beta = -0.032$, t -value = 0.473) was not significant not negative; employees' avoiding goal orientation was found to significantly and negatively influence knowledge acquisition ($\beta = -0.139$, t -value = 2.275). Thus, Hypotheses 6a and 6c were not supported, but Hypothesis 6b was supported.

(2) The influence of employees' CA on learning satisfaction ($\beta = 0.075$, t -value = 1.018) and skill enhancement ($\beta = -0.069$, t -value = 0.892) was not significant. Thus, Hypotheses 7a and 7c were not supported. However, employees' CA was found to have a significant negative effect on knowledge acquisition ($\beta = -0.139$, t -value = 2.275). Thus, Hypothesis 7b was supported.

This study indicated that employees' personal goal orientations (learning and proving goal orientations) had a significant and direct positive effect on the learning outcomes, while avoiding goal orientation had a partially significant and direct positive effect on the learning outcomes. These findings corresponded to the ideas proposed by Albert and Dahling [106] and Dweck and Leggett [17]. Employees with learning goal orientation aim to improve their self-efficacy, focus on learning-related progress, and usually perform well in learning. In contrast, employees with proving goal orientation focus on demonstrating their competence and receiving positive evaluation from significant others; they tend to have an adaptive reaction to the difficulties they encounter. On the other hand, employees with avoiding goal orientation are concerned that their poor learning skills will reflect their incompetence, and consequently develop feelings of anxiety and avoidance. Therefore, employees with proving goal orientation may also have a good learning performance [16,108]. The present study indicated that goal orientation influences learning outcomes, which is a finding that is consistent with those reported by Dweck and Leggett [17] and VandeWalle [37].

The next question concerns why employees' CA would affect their learning outcomes. First, with regard to the effect of CA on learning satisfaction and skill enhancement, it was found to be insignificant, meaning that CA did not affect learning satisfaction and skill enhancement. A possible reason for such findings is that most employees have sufficient experience dealing with computers, since computers are widely used today. As a result, there are few situations that may generate CA, which reduces its effect on users' learning satisfaction and skill enhancement. Secondly, the significant influence of CA on knowledge acquisition should be discussed. According to Wadsworth, Husman, Duggan, and Pennington [140] and Warr and Downing [141], learning anxiety is negatively related to learning strategies. From the viewpoint of educational psychology, learners' learning strategies ultimately affect learning outcomes. The use of learning strategies belongs to more in-depth learning. Hence, CA may negatively affect more in-depth learning outcomes (e.g. knowledge acquisition).

Finally, with regard to the effects of the control variables, employees' computerSE was proven to have a significant positive effect (skill enhancement) on learning outcomes. This result corresponded to the findings of previous related studies [51,142]. On the other hand, the employees' gender had no effects whatsoever on the research framework of this study.

5.2. Managerial Implications

In order to achieve goals and increase core competitiveness, a company must implement constant learning to promote its competitive advantage and sustainable management. Moreover, an organization must grasp every opportunity to implement perpetual learning and rely on the continuous and effective learning of its employees to strengthen its own learning abilities. In this IT-dominated era, many companies incorporate e-learning that is not bound by any time and space constraints to help employees improve their professional competencies. However, the question is what can be used in addition to e-learning integration to improve the employees' learning outcomes after their educational training. This has been a focus of attention among department managers, human resource managers, and high-ranking executives, as well as in academic circles. The following suggestions were made in this study, based on the empirical results. They provide a reference for high-ranking executives, department managers, and human resource departments in small and medium-sized businesses.

1. Establishing an organizational environment that values perpetual learning. In the face of a rapidly changing and highly competitive economic environment, organizational members' learning and knowledge assimilation are important sources of competitive advantage [68]. However, employees' learning may be encouraged or hindered by the organizational culture or intra-organizational environment. As found in this study, the organizational commitment to learning can promote employees' learning goal orientation. Moreover, a competitive psychological climate was found to promote employees' proving and learning goal orientations. According to previous studies, enterprises' understanding of the changes in the organizational environment has been proven to have a correlative effect on their employees. Therefore, a company can implement the following measures: (1) Instruct and encourage employees in a timely manner, so as to enable them to understand and perceive the company's goals, which does not create large psychological stress and counter effects; (2) Utilize progressive methods to give employees time to adapt to the impacts caused by changes in the environments; and (3) Systematically plan and adjust the organizational environment with the goal of consolidating the organization in mind, so as to reinforce the employees' motivation to develop learning goal orientation and reduce the potential negative effects of avoiding goal orientation. Timely assistance to employees can also help achieve the learning outcomes.

2. Increasing employees' motivation to participate in learning. As pointed out by educational psychologists Dweck and Leggett [17], learners' personal motivations affect their learning behaviors, which results in different learning results. With regard to employees, the expectation of certain results from the learning process has a substantial influential power. Furthermore, employees may rely on their own learning experience to increase learning motivation, which improves their learning outcomes and the achievement of learning goals. This study showed that employees' learning and proving goal orientations had a considerable effect on the learning outcomes. Learning motivations always play an important role in the learning outcomes. Therefore, the cultivation of good learning motivations in employees helps to improve their learning efficiency and performance, which affects the learning outcomes [143]. The implementation of e-learning can start with the explanation of its value to employees, in order to increase their expectations and motivations. Managers can show their care and support to increase employees' learning confidence and, consequently, their desire to learn, which will ultimately generate positive learning motivations and contribute to the output-related learning outcomes.

3. Increasing employees' computerSE and reducing their CA. ComputerSE is an important factor for IT use or learning [6,7]. Past studies indicated that computerSE and CA might have an interaction effect on the use of IT [6,119,144]. This study showed that, in addition to reducing employees' CA, an increased computerSE also significantly contributes to skill enhancement.

A study by Coffin and MacIntyre [120] revealed that computer experience has a significant effect on computerSE. Enhanced computer training can promote computerSE and improve the learning of the training content. Thus, it is suggested that companies conduct user training by providing employees with the procedural knowledge required for system operations and demonstrating the use of systems. This will advance the company's goals, as well as individual work competence and efficiency goals, and reduce or eliminate the feelings of uncertainty and anxiety among users. Moreover, computerSE confidence can be increased and hindering motivations can be reduced through the provision of technical support, which includes the solution to technical problems, system adjustment, response to users' inquiries and needs, and continuous training aimed at increasing employees' proficiency in using computer technologies.

4. Selecting the right employees. This study showed that learning and proving goal orientations had a significant positive effect on all types of learning outcomes. However, employees with learning goal orientation outperformed those with proving goal orientation with regard to the learning outcomes. Therefore, it is suggested that department managers should favor employees with learning goal orientation when selecting trainees, which will promote hard work and active learning among employees. Furthermore, despite its significant effect on personal goal orientations, the organizational

environment had limited explanatory power, indicating the presence of other factors that affected employees' goal orientations. Therefore, this study suggested that while companies should improve their organizational environment to promote employees' goal orientations, the human resources department and unit managers should also focus on computerSE, and not only strong learning goal orientation, when recruiting new employees. Companies may refer to the scale used in this study to select employees with strong learning goal orientation and, afterward, run on-site computer tests to select candidates familiar with computer and software operations. These measures will help companies build an environment for perpetual learning, foster talents, and increase their competitive advantage.

5.3. Limitations and Directions for Future Studies

This study had certain limitations due to limited time and resources, leaving some room for further testing and discussion in future studies. First, the participants in this study were recruited only from small and medium-sized businesses in the manufacturing industry, which limits the generalizability of the results. It is suggested that future studies include employees from other industries (e.g., the service industry and large-scale manufacturing industry) as their participants, to test the external validity of the theoretical model used in this study. Second, all the questionnaire survey data were cross-sectional. Future studies could collect longitudinal data to verify the effects of employees' personal factors (e.g., personal beliefs, computerSE, etc.), organizational environment factors (e.g., organizational commitment to learning, shared vision, open-mindedness, competitive psychological climate, etc.), and factors related to important people (e.g., superior leadership behaviors, leader-member exchange theory, etc.) on employees' goal orientations. In addition, with regard to measuring the learning outcomes, methods apart from self-assessment should be taken into account, such as the supervisor's assessment of employee outcomes, which is able to reflect their learning outcomes in a better way. Measurement of the results level should be based on the collection of relevant data with the organization as a unit. In practice, if information such as the changes in organizational performance can be collected, the actual benefits of training toward the company can be further elucidated. Third, this study only used a single-factor model to test the mediation effects. Multi-factor models could be applied in future research to explore related mediation effects. Fourth, only three constructs of goal orientations were used in this study. Future studies could add the fourth construct. Fifth, further research can be conducted on organizational factors such as the organizational commitment to learning and a competitive psychological climate, so as to examine whether these factors affect learning outcomes through CA or other variables. Sixth, this study explored organizational factors on an individual level, and other factors on an organizational level can be included in subsequent empirical research. Finally, learning motivations and learning strategies are closely related and can have an interaction effect on learners' internal cognitive processes, which affects their external learning performance. Thus, it is suggested that related studies examine the influence of goal orientations on the learning outcomes via learning strategies.

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