

Insights from Learning Machine Operators on Integrating Peer Support and Technology to Minimize Language Barriers and Improve Self-Efficacy

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Abstract

Cost cutting measures have led to the elimination of apprenticeships and a focus on single language instruction, which has hindered migrant self-efficacy. A low-cost solution integrates peer support, Google Translate, and ChatGPT to support employee development. A four phased quasi-experimental approach examined 115 questionnaire responses from 28 non-native English speaking machine operators to determine how such an approach facilitates and constrains self-efficacy while exploring potential refinements for future innovation adoption. A thematic analysis uncovered ten major themes indicating that the approach facilitates self-efficacy by boosting problem-solving and providing rapid feedback while constraining self-efficacy via linguistic limitations. Refinements include only using ChatGPT while providing learners with extensive in-depth training to maximize its potential. Thus, the approach provides a relative advantage over alternatives because it is affordable, simple, sustainable, and effective while supporting inclusive training for a growing portion of the population. Shortcomings include the small sample, lack of extensive linguistic representation, and the novelty effect.

Keywords: Peer Support, Google Translate, ChatGPT, Workplace Learning, Non-native English Speakers, Migrants, Self-Efficacy, Self-Directed Learning, Machine Operators

1. Introduction

The need to maintain profitability has shifted workplace training away from costly apprenticeship models to one that requires lean and rapid learning (Gambin & Hogarth, 2017). In an interconnected global environment, these shifts become complicated by labor shortages, changes in employee commitment, and an increased reliance on migrants (Hajro et al., 2021; Krajcsák & Kozák, 2018). Thus, employers are forced to recruit from a pool of job hoppers and underqualified workers. As a result, non-native English speakers become a viable alternative; however, cash strapped organizations are challenged by difficulties training through linguistic barriers. This has resulted in limiting costly programs through English-only policies and minimizing supportive resources which has hindered migrant development (Moron & Mujtaba, 2018). Consequently, these actions impact learning employees by stagnating self-efficacy which involves an individual's thought patterns that enhance their motivation to accomplish goals (Bandura, 1997). Fortunately, the self-efficacy of learners can be supported by providing organizations technologies that reduce language barriers.

Innovative technologies such as Virtual Reality (VR) can enhance employee knowledge acquisition and specific skill development but are expensive to implement (Chiang et al., 2022; Kwick et al., 2024). Conversely, integrating peer support and digital technologies, Google Translate (GT) and ChatGPT, offers a practical and affordable method, compared to a lack of provisions, because it can increase the self-efficacy to engage in self-directed learning for non-native English speakers (Thurman, 2025). However, innovation refinement is necessary to ensure buy-in and successful adoption from potential stakeholders (Rogers, 2003). The objective of this study is to determine how Thurman's (2025) approach facilitates self-efficacy, constrains self-efficacy, and examines possible refinements to support non-native English speakers.

2. Literature Review

This literature review explores several aspects of a proposed integrated strategy including self-efficacy, peer supportive learning, GT, and ChatGPT for the purpose of providing a framework to aid non-native English speaking employees in workplace learning. This is necessary to determine how the innovative approach can be improved to increase

stakeholder buy-in through making it advantageous, compatible, and simple to avoid rejection (Rogers, 2003). Thus, the review uncovers potential strengths of each aspect and current limitations while justifying the implementation of an integrated learning strategy.

2.1 Self-Efficacy

Findings illustrate that the provision of resources is critical to growing and sustaining an individual's motivation to engage in learning activities. Studies show that self-efficacy is stifled when barriers restrict knowledge transfer but flourishes when learners perceive they have a proper level of support (Ahmad, 2017; Ennes et al., 2022). Meaning, sustaining the provision of supportive resources can eliminate learning barriers while increasing behaviors such as motivation and engagement to acquire knowledge for an indefinite period (Consiglio et al., 2016; Thurman, 2025). Thus, employees with higher levels of self-efficacy are motivated to learn and perform better which aligns to an industry focus on personalized learning (Ra et al., 2019; Tian et al., 2019; Wu et al., 2020). When individuals have higher self-efficacy, they are more likely to buy-in when choosing to adopt or reject digital innovations (Abbas & Bin, 2016). Consequently, offering a responsive learning approach that is simple and user-friendly ensures that the approach is adopted while enhancing employee development and productivity.

2.2 Supportive Peer Learning

Fostering a responsive workplace learning environment through minimizing communication barriers is essential for non-native English speakers. Research shows that this can be done by utilizing linguistically similar peers to aid in learning via translation, which has been shown to improve the self-efficacy of non-native English speakers (Karim & Mohammed, 2018; Yang et al., 2015). Moreover, learners lack confidence in instructors and environments that are linguistically different further underscoring the need for diversity (Gallagher & Haan, 2020; Hall Lang et al., 2023). Meaning, collaboration and linguistic familiarity are essential as differences can hinder effective support for learning (Gallagher & Haan, 2020). Thus, using same language peers as trainers offers a feasible solution to supporting employee self-efficacy.

2.3 The Potential of Digital Applications

Innovative applications, specifically GT and ChatGPT, offer non-native English speaker's tools that can improve learning and productivity. Findings show that GT is perceived favorably and learners prefer to use it instead of referencing a dictionary for text translation (Alsalem, 2019; Yanti & Meka, 2019). Moreover, both GT and ChatGPT's rapid translation capabilities have demonstrated success at supporting the vocabulary growth of non-native speakers (van Lieshout & Cardoso, 2022; Yanti & Meka, 2019). Both applications support diverse language demographics through aiding goal tracking and enhancing self-directed learning (Alhaisoni & Alhaysony, 2017; Lin, 2023; van Lieshout & Cardoso, 2022). Also, studies show that non-native speakers benefit from increased self-efficacy, confidence, motivation, and engagement when using GT, ChatGPT, and other AI-powered chatbots (Apriani et al., 2024; Lee et al., 2024). Furthermore, revelations from the literature indicate that these applications improve an individual's self-efficacy to make decisions, enhance performance, and aid in problem-solving (Han et al., 2025).

2.4 Technological Limitations

There are drawbacks to the accuracy and capabilities of digital applications which stifle effectiveness and foster distrust with users. Of note, neither GT nor ChatGPT can be used without access to the internet (Whalen & Mouza, 2023; Yanti & Meka, 2019). Even with internet, these applications may provide inaccurate translations while being completely incapable of supporting rare languages thereby making them ineffective for some learners (Alsalem, 2019; Yanti & Meka, 2019). Furthermore, there are concerns that GT and ChatGPT will stagnate a learner's ability to become an improved translator and reduce their motivation to learn (Alsalem, 2019). Moreover, these challenges are compounded because ChatGPT can provide users with false information and then justify the content as being correct (Sharma & Yadav, 2022).

2.5 Integration of Peer Support and Digital Technologies

The strategic integration of peer support and digital technologies can remove barriers which hinder non-native English speakers while driving self-efficacy to engage in self-directed learning behaviors (Thurman, 2025). This innovative approach has the potential to aid in performance and serve as a viable training pathway to personalized workplace learning (Ra et al., 2019). Thus, the study is focused through a dual-theoretical lens that determines the approaches perceived impact on the learner while identifying methods to increase buy-in from stakeholders.

Bandura's (1997) concept of self-efficacy serves as the basis to fostering increased confidence and motivation in learning for non-native English-speaking employees. This can be done by eliminating learning barriers through the provision of resources by leveraging same language peers to aid in training thereby increasing self-efficacy, minimizing anxiety, and reducing helplessness (Diamantidis & Chatzoglou, 2019; Karim & Mohammed, 2018; Yang et al., 2015). In turn, these peers support learners by showing them how to create prompts and effectively use technologies such as GT and ChatGPT

(Alhaisoni & Alhaysony, 2017; Lin, 2023). These factors can lead to higher levels of self-directed learning and knowledge growth. However, the complexities of the approach which include the utilization of multiple digital technologies and language mismatches serve as potential obstacles that prevent self-efficacy development.

To maximize potential self-efficacy and increase buy-in from stakeholders, the concept of diffusion of innovation developed by Rogers (2003) is used to guide the development of future refinements. New innovations are more readily adopted by stakeholders when they provide a relative advantage over current state, are simple, and are compatibility with the needs of the stakeholders (Rogers, 2003). Through identifying the drawbacks of the approach as perceived by the learner, a refined approach offers a sustainable innovation that can be adopted by non-native language speakers in a manufacturing learning environment.

Thus, the objective of the research is to ascertain how the approach which combines GT, ChatGPT, and peer supports facilitates and constrains the self-efficacy of non-native English speakers while identifying potential refinements to increase adoption. Therefore, this framework and study are guided by the following questions.

RQ1: In what ways does the combination of Google Translate, ChatGPT, and peer support promote the self-efficacy of non-native English speaking machine operators?

RQ2: Which features of the integration of Google Translate, ChatGPT, and peer support limit learner self-efficacy?

RQ3: How can the innovative approach be refined to increase relative advantage and compatibility leading to a higher level of adoption for non-native English speakers.

3. Methods

The research utilized diverse individuals from a manufacturer based in the midwestern United States. A standardized four phase quasi-experimental design was used which involved establishing a baseline, peer-participant instruction, self-directed learning, and evaluation. Prior research found statistically significant changes in participant self-efficacy when compared to baseline measurements (Thurman, 2025) while this study is a follow up to derive a qualitative explanation of potential factors that drive self-efficacy from the perspective of the participants. This qualitative analysis provides a deeper explanation on the factors of how the integration of GT, ChatGPT, and peer support can facilitate and constrain the self-efficacy of non-English speaking employees. Potential limitations included the small sample size, selection bias, and selection-maturation. There were also risks from the novelty effect, translation bias, and self-reporting bias which could drive favorable feedback responses.

3.1 Recruiting

Approval for onsite research included anonymity protection for all stakeholders, an informed consent process, maintaining confidentiality, and not retaining direct identifiers in data gathering. Potential participants were assured that this study was voluntary and that they could leave at any point. Purposive sampling was necessary to ensure quick and adequate sampling size while minimizing variability which included two separate groups for roles of facilitators and learners (Etikan et al., 2016). The facilitators were either expert level machine operators or had a training background with 8 out of 10 recruits agreeing to participate. The learners were individuals who had been training in entry-level operator positions for 0 to 13 months with 30 out of 36 recruits agreeing to participate. Both groups included at least one language representative each from Arabic, Burmese, Spanish, Creole, French, and Amharic. Omission of individuals from languages that couldn't be represented by each group was necessary.

3.2 Applications, Devices, Instruments

To maintain integrity and minimize confounding variables, facilitators and learners were guided by a standardized process. Updated Apple versions, as of March 2025, for GT and ChatGPT-4 were used and uploaded onto two iPads, version 10, with high-speed Wi-Fi internet access. These mirrored the iPads used by production associates which minimized digital literacy disadvantages associated with non-natives (Alakrash & Razak, 2021). Peer-participant and self-directed instruction sheets were used to guide participants through two intervention phases. The peer-participant sheet utilized scenarios that guided participants through car starting theory while the self-directed learning sheet involved work specific scenarios (Thurman, 2025). Both GT and ChatGPT were used to translate procedures, troubleshooting guides, operational theory, and provide feedback on problem-solving scenarios. The peer-participant sheet was pilot tested on 14 individuals for clarity and functionality. Conversely, pilot testing, minus the researcher, of the self-directed sheet wasn't possible because of intellectual property and time limitation concerns. Yet this was beneficial since it reduced experimenter manipulation, illustrated the approaches' true capability, and promoted the feedback necessary to improve the innovation.

3.3 Facilitator Training

Not only were facilitators mimicking peer trainers from a real-world workplace, but they also minimized the impact of the

Hawthorne effect and observer bias during the training phase. These individuals were non-native language speakers and had a proficiency in English allowing for one-on-one training from the researcher. The researcher explained the purpose and capabilities of the digital applications then trained the facilitators through all the scenarios from both intervention phases. The facilitators then practiced the scenarios with the researcher until they were confident and displayed mastery of the process. This was untimed and ensured that the facilitators followed the standardized process while being able to answer potential questions from learners.

3.4 Four-Phased Approach

The study included four linear phases which began with a pre-intervention that gathered baseline self-efficacy scores for a separate quantitative study (Thurman, 2025). The peer-participant phase paired linguistically similar facilitators and learners together which represented a real-world workplace scenario involving subject matter experts and trainees. For instance, a subject matter expert that was a native French speaker would be paired up with a counterpart learner who was also a native speaker of French. This was subsequently repeated for the other languages. This phase included a collaborative learning process to grow expertise with the iPad, GT, and ChatGPT using an instruction sheet. The instruction sheet included two separate scenarios that required the use of GT and ChatGPT. GT was used to translate a step-by-step procedure on how to start a car in the participants' native language while ChatGPT was used to learn about the theory of starting cars. The self-directed learning phase required learners to complete four learning scenarios based on work specific issues associated with entry-level machine operators. Two scenarios required the learners to use GT to translate a standard operating procedure and a troubleshooting guide that contained various causes and solutions to several problems. Two other scenarios required the learners to use ChatGPT to take pictures of equipment identification plates and machine HMI to learn machine theory and troubleshooting.

In the evaluation phase, participants completed the open-ended feedback questionnaire seen in Table 1 which was designed gather data on each approach facilitated self-efficacy (RQ1), constrained self-efficacy (RQ2), and identify areas that could be refined for re-invention (RQ3). Participants were self-paced and were not forced to complete tasks within a given timeframe while were encouraged to write honest answers pertaining to the approach in either their native language or English. The questionnaire was piloted on 14 individuals to ensure that the questions aligned to the scope of the study.

Table 1. Open-Ended Questionnaire

Questionnaire	
Question 1	<i>Does the approach and technologies improve your ability to work on your own compared to the previous condition?</i>
Question 2	<i>Did the technologies make the process, purposes, and functions of the equipment easier to understand?</i>
Question 3	<i>What features of Google Translate or ChatGPT were the most helpful? Examples?</i>
Question 4	<i>What were some of the challenges that you faced when using digital tools? Examples?</i>
Question 5	<i>Based on your experience, how can Google Translate and ChatGPT be used to best train non-native language speakers?</i>

3.5 Thematic Analysis

Thematic analysis was used to code questionnaire responses using the steps of data familiarization, initial coding, search for themes, reviewing themes, defining themes, and reporting (Braun & Clarke, 2006). Translation using GT, without correcting grammatical errors, was necessary when getting familiar with data and ensuring the integrity of the original responses were maintained since there were insufficient experts in each of the languages. The responses were then inserted into a codebook on a spreadsheet. Using both in vivo and descriptive strategies allowed for initial coding to be either verbatim or summarization (Saldaña, 2013). The study's three research questions aligned to the main themes of facilitates self-efficacy, constrains self-efficacy, and refinement guided the iterative process of deductive analysis in the search for subthemes which necessitated some to be grouped together based on meaning (Braun & Clark, 2006). Subthemes were defined through deriving the meaning of the responses while taking detailed notes and repeating the process to ensure confirmability (Halpren, 1983). These subthemes complement findings that show the integrated approach leads to self-efficacy growth thereby increasing validity and reliability (Thurman, 2025). Subthemes were then reported and organized from highest to lowest based on the frequency of occurrence under each main theme. This allowed for a focus on the more meaningful subthemes that were commonly reported by participants. These steps were repeated several times to ensure that coding was consistent.

To ensure transparency, consistency, and credibility of the findings, two other researchers reviewed the raw responses and coding from the codebook. During this peer debriefing process, these individuals independently reviewed the content then agreed with the conclusions of the researchers which resulted in no additional modifications or subsequent recoding.

4. Results

Learner feedback was examined from an integrated training strategy that combined peer support, GT, and ChatGPT, designed to enhance self-efficacy of non-native language speakers to engage in self-directed learning behaviors. Foresight

and slight adjustments were needed to ensure that each participant had enough time to complete experiments caused by small linguistic differences in the facilitator-learner relationship, query lag time, and slower learner task pacing. This was necessary because the time of completion ranged from 26 to 44 minutes, for an average of 32.3 minutes, depending on the variables encountered during each experiment.

4.1 Thematic Analysis

Data was collected via questionnaire from a population of 30 entry-level machine operators across three equal shifts ($n = 10$) who were in training for 0 to 13 months. Both participant-level and response-level exclusions were necessary to provide a quality analysis. At the participant level, two entire questionnaires had to be excluded because they were not completed leaving the remaining questionnaires from the other 28 participants to be analyzed. Since each questionnaire had 5 questions, this left a possible 140 responses from the remaining sample. From a response level, 25 responses were too insufficient to code because they were left blank, were less than 3 words, or were N/A'd by the participants. This left a total of 115 responses that were deemed sufficient to analyze as seen with the sample in Appendix A. The subsequent analysis led to the identification of 62 unique codes derived from each of the answered questions as seen in Table 2.

Table 2. Samples of Initial Codes for Participant Responses

Questions	Initial Codes	Response Examples
Question 1	Solving Issues	"Using ChatGPT helps a lot to understand how to solve the issues" (Participant A).
Question 2	Specific Details	On ChatGPT, "It can be very specific with the technical knowledge and improve my practices" (Participant D).
Question 3	Language Flexibility	"ChatGPT is easy because it helps you to get answer for example you can type, talk. I use in French and was surprised with trying in my specific tribal language somewhat" (Participant O).
Question 4	Lacks Videos	"Needs videos to show me what to do I would use because it slows me down trying to understand readings" (Participant I).
Question 5	ChatGPT Flexibility	"My experience between Google Translate and ChatGPT I can get some basics but ChatGPT can be like a professional teacher make you understand precisely" (Participant T).

Similar codes such as "Making Decisions" and "Solving Issues" were converted and defined into a single subtheme such as "Boosts Problem Solving" due to the fundamental meaning behind learner responses on how the approach impacts self-efficacy along with potential refinements (see Appendix B). Ten overarching subthemes were defined then ordered by frequency in as seen in Figure 1. The subthemes that occurred more frequently indicate a stronger consensus on the most prevalent factors influencing the learners while the subthemes on the lower end of the spectrum illustrate a lower perceived impact.

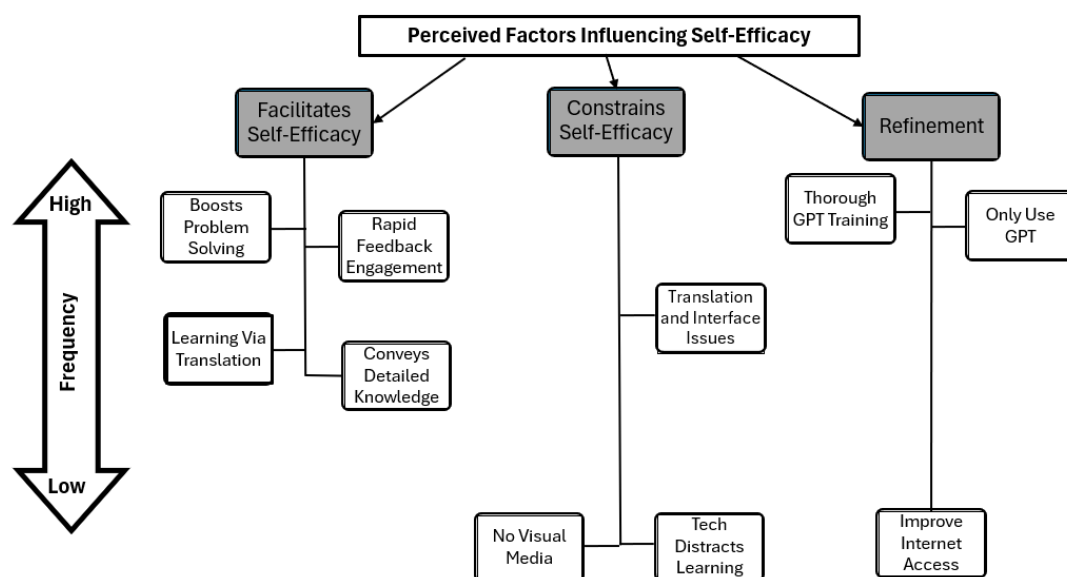


Figure 1. Thematic Map

For facilitates self-efficacy (RQ1), most responses were grouped under the subtheme "Boosts Problem Solving" ($n = 11$) with "Rapid Feedback Engagement" being the second most frequent ($n = 10$). Moderate rate responses were "Learning Via Translation" ($n = 8$) and "Conveys Detailed Knowledge" ($n = 7$). Thus, the variety of moderate to high-rate responses illustrate that learners had positive perceptions of the approach.

For constrains self-efficacy (RQ2), “Translation and Interface Issues” ($n = 9$) was the moderately occurring subtheme, while “No Visual Media” and “Tech Distracts Learning” were low rate ($n = 3$) subthemes. This indicates an alignment on the approach’s linguistic limitations but little consensus on other issues illustrating potential challenges finding major issues with the approach.

For refinement (RQ3), Figure 2 illustrates that a high rate of responses aligned to the subthemes of “Thorough GPT Training” ($n = 13$) and “Only Use GPT” ($n = 11$) which indicates that learners strongly agreed on how to improve the approach. Although “Improve Internet Access” was a low-rate response ($n = 3$), no other responses occurred more than once. Subthemes classified as minor, quantities with less than 3 responses, were not analyzed to maintain a strong focus on higher frequency items.

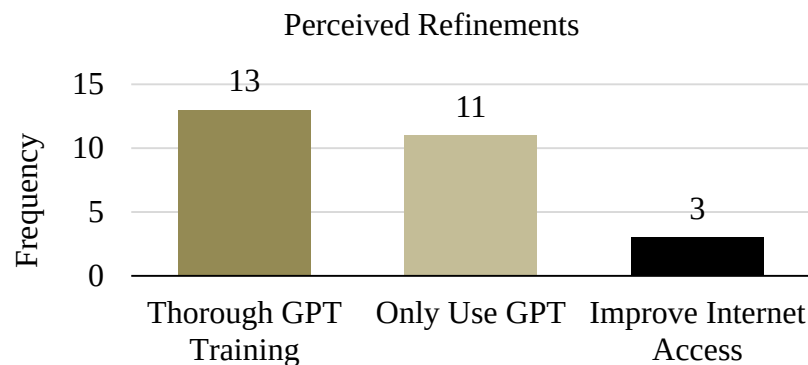


Figure 2. Learner Perceived Refinements for Approach

5. Discussion

The thematic analysis illustrates consistent findings on how an integration of peer support, GT, and ChatGPT impacts learning self-efficacy in a manufacturing environment which addresses the objective of the study while answering the research questions.

5.1 Facilitates Self-Efficacy

RQ1: In what ways does the combination of Google Translate, ChatGPT, and peer support promote the self-efficacy of non-native English speaking machine operators?

Learners had four subthemes classified at least at a moderate level ($n = 7$) of responses. Thus, learners commonly perceived that the approach boosted their ability to solve problems and acquire knowledge on specific items in the environment. Subthemes such as “Conveys Detailed Knowledge” and “Learning Via Translation” support the acquisition of knowledge while “Boosts Problem Solving” and “Rapid Feedback Engagement” relate to individuals learning how to deal with novel issues in the work environment. This was underscored by one learner who noted “I feel confident and the process is easy to understand” (Participant D). The subthemes in Figure 1 provide a qualitative answer to the quantitative findings that show increases in self-efficacy after tools were provided to learners when compared to baseline measurements (Thurman, 2025). These results also align to previous literature which shows that the provision of supported resources drives learner self-efficacy (Ennes et al., 2022). This is evident through participant perceptions that the approach helped them through boosting problem-solving and provided needed feedback in the learning process.

5.2 Constrains Self-Efficacy

RQ2: Which features of the integration of Google Translate, ChatGPT, and peer support limit learner self-efficacy?

Although there were less prevalent subthemes, the findings do illustrate that learners encounter similar barriers which could stagnate self-efficacy. Learners commonly perceived “Translation and Interface Issues” which were present in the form of peer dialect differences, GT, ChatGPT, and even the English iPad. This was underscored by one comment “Google Translate don’t make good sense when translate. Same for ChatGPT” (Participant AB) and supported in prior literature (Alsalem, 2019; Yanti & Meka, 2019). Moreover, some learners were concerned with “No Visual Media” that was specific to work and that the “Tech Distracts Learning.” Thus, these subthemes illustrate that the approach may not be as effective in more supported environments thereby decreasing the relative advantage of the approach. This can be evident in work environments that offer extensive training resources, multilingual trainers, and more skills subject matter experts that drive the learning environment. Such an example can be seen in a previous study where first shift learner’s experienced lower self-efficacy increases than their second or third shift counterparts after the approach (Thurman, 2025).

The better supported learners on first shift, and other highly supported environments, could find the approach is not as helpful as their immediate alternatives.

5.3 Refinement

RQ3: How can the innovative approach be refined to increase relative advantage and compatibility leading to a higher level of adoption for non-native English speakers.

The findings reveal that a consensus among participants learners on how the approach could be refined. The implementation of these recommended improvements could better support self-efficacy than the current iteration of the approach. There was a strong desire for “Thorough GPT Training” which was supported by the quote “I lack familiarity with ChatGPT features and functions to use good. I need someone to explain this more to me” (Participant Y). This indicates that self-directed behaviors could be fostered by improving a learner’s ability to utilize ChatGPT to its fullest potential. Learners also expressed “Only Use GPT” which was indicated by the comment “ChatGPT is much better with flexibility. Google Translate got in the way. Wanted to use ChatGPT for everything” (Participant AA). This aligns to literature showing that ChatGPT is favored over GT because it provides more nuanced translations and aids in problem solving (Chen & Lin, 2025; Han et al., 2025). Thus, the feedback from participants shows that in-depth training and utilization of a single technology, ChatGPT, could support the knowledge growth of non-native English speaking learners through various language barriers.

6. Conclusions

The revelations illustrate the perceived impact that the integration of GT, ChatGPT, and peer support could have on the self-efficacy on non-native English speakers. These perceptions were derived from the feedback of diverse individuals who had been training as machine operators at a United States manufacturer. The subsequent design and research questions focused on determining the potential factors which contribute to approach’s success, how it struggles, and provides future researchers and managers solutions.

6.1 Theoretical Implications

The research suggests that the approach can support growth of self-efficacy while being a feasible training alternative for organizations looking to enhance personalization via digital applications (Ra et al., 2019). This qualitative study builds on Bandura’s (1997) self-efficacy framework by enhancing motivation and confidence via mastery experiences and social persuasion. Mastery experiences are promoted through the elimination of language barriers which streamlines workplace learning for non-native employees thereby allowing for repeated success in tasks associated with workplace development. Furthermore, the utilization of same language peers provides non-native speakers with a source of encouragement and positive reinforcement, a form of social persuasion, as they master new technologies to complete tasks. As a result, the use of GT, ChatGPT, and peer support creates a formula that can foster self-efficacy and confidence.

Moreover, the study illustrates that subsequent refinements can be simplified to meet the needs of the stakeholders, thus increasing innovation adoption (Rogers, 2003). This happens via relative advantage where only using ChatGPT provides learners with a resource that supports development while remaining a cost-effective option for leaders that are wary of more expensive technologies. Additionally, ChatGPT provides compatibility when compared to English-only practices or GT because of its translation ability and expansive ability to aid in problem-solving via feedback engagement. Finally, complexity is minimized by training learners to become experts on using a single technology that has near limitless generative capabilities.

6.2 Practical Implications

The study illustrates that diverse learners had favorable perception of the inclusive strategy while suggesting that the removal of the GT could minimize distractions and increase their expertise on ChatGPT. Thus, the participants’ insights provide a formula that could extend the ceiling for self-efficacy development. This indicates the need for organizations to prioritize the use of the more versatile ChatGPT which can be used as an interacting problem-solving tool as opposed to GT. Therefore, the provision of these low-cost supportive resources to non-native English speakers will add value to organizations by potentially reducing training times, increasing expertise, and maximizing production.

6.3 Limitations

The short-term nature of the research brings concerns that novelty effect can skew responses toward favoring the approach which can be remedied via a longitudinal design thereby allowing for a better representation of its true influence on learners. Responses could further be skewed via risk of the Hawthorne effect and self-reporting bias leading to participants providing more favorable feedback on the questionnaire. Furthermore, shortcomings impact the generalizability of the findings due to the small sample size and the limited number of diverse languages involved.

Resolutions include increasing the sample size and providing more extensive linguistic representation. Moreover, the omission of participants who did not have expert shared linguistic peers removed potential data sources while illustrating a drawback of the approach considering that it relies on responsive peer support to drive learning. Finally, restrictions on intellectual property prevented pilot testing outside the organization with work specific materials. Conversely, this was not possible within the research site to prevent risk of pre-exposure of materials to the sample and significant time limitations due to site accessibility.

6.4 Future Directions

Although this study provides an integrated framework to fundamentally improve the workplace training environment, additional research is needed to determine if a modified approach can foster sustained growth in self-efficacy. Such longitudinal research addresses challenges brought forth by the novelty effect while identifying the true range of the technologies capabilities in supporting both translation and problem solving in the real-world workplace. Moreover, there is also a need to analyze how the approach impacts training time, real knowledge growth, and employee performance. This gives organizational leaders tangible data that reduces barriers and eliminates unknown risks of a major philosophical change in employee development strategies.

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Obtained.

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The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

Data sharing statement

No additional data are available.

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Appendix A. Excluded Feedback Survey Responses

Survey Questions	Total Responses	Excluded Responses	Responses Analyzed	Exclusion Reasons
Question 1	28	6	22	Single word, left blank, N/A'd
Question 2	28	5	23	Single word, left blank, N/A'd
Question 3	28	4	24	Incoherent, left blank, N/A'd
Question 4	28	7	21	Two words, left blank, N/A'd
Question 5	28	3	25	Single word, left blank, N/A'd

Appendix B. Theme Grouping and Sampled Responses

Theme	Subtheme	Rate	Description	Example Quote
Facilitates Self-Efficacy	Boosts Problem Solving	11	Learners could confidently and effectively resolve complex problems.	“Yes, the use of the AI of ChatGPT and Google Translate helped me improve my ability to diagnose and fix hard things” (Participant M).
Facilitates Self-Efficacy	Rapid Feedback Engagement	10	Could engage in questioning and receive feedback on topics.	“At all steps I could ask questions and give fast answers that I understand. The teacher was helpful and tablet guided me through my concerns” (Participant W).
Facilitates Self-Efficacy	Learning Via Translation	8	Utilization of applications and peer support reduced barriers to learning.	“Translation with the trainer and the technologies helps when don't speak English learn work easy and fast” (Participant B).
Facilitates Self-Efficacy	Conveys Detailed Knowledge	7	ChatGPT's valuable in providing information on job related concepts and theories for learning.	“ChatGPT app gave me good details on all items that I used it on. Learned things that I did not know after many months on job” (Participant G).
Constrains Self-Efficacy	Translation and Interface Issues	9	Inaccuracies in translations, dialects, availability, and the technological interfaces.	“The device and apps are formatted in a different language. The interface not being in my language gave me problems” (Participant D).
Constrains Self-Efficacy	Tech Distracts Learning	3	Technologies were inconvenient when attempting to complete intervention activities.	“I like having fewer distractions when learning things. It gave me another tool to use. There were too many things going on the device. Rather have a person showing me” (Participant X).
Constrains Self-Efficacy	No Visual Media	3	ChatGPT more helpful if it provided specific pictures and videos on work tasks.	“Needs videos to show me what to do I would use because it but it slows me down trying to understand readings” (Participant I).
Refinements	Thorough GPT Training	13	More in-depth training on ChatGPT to maximize its capabilities.	“Need more time to understand how to ask questions and it can help learn better” (Participant G).
Refinements	Only Use GPT	11	ChatGPT is dynamic. Google Translate becomes redundant.	“ChatGPT is much better with flexibility. Google Translate in the way. Wanted to use it for everything” (Participant AA).
Refinements	Improve Internet Accessibility	3	Internet is slow or delayed. Improved through Wi-Fi upgrades or cell service.	“I can not think of any problems now but it loaded slow” (Participant N).