Exploring the Impact of E-Learning on Employee Self-Efficacy with Recommendations for Practice

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EDIS 7076: Technology, Learning Systems, and Culture

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April 25, 2021

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Abstract

Albert Bandura's theory of self-efficacy has served as the framework that aims to explain the significance and cultivation of self-efficacy. Self-efficacy is the backbone of high workplace performance and employee well-being, serving as an indicator of an individual's ability to perform job-related tasks with confidence, resilience, and perseverance. However, there still remains little research regarding how companies foster resilience in its employees through training, especially web-based training or those delivered through e-learning technology. With more and more companies turning to e-learning and web-based training, it is critical to examine the correlation between training and employee self-efficacy, as well as investigate the implications of using e-learning technology to deploy such training. This literature review examines previous research in the field of self-efficacy and the role of technology in training programs. This synthesis results in recommendations for practice in regards to the design of e-learning and web-based corporate training programs that encourage employee success and well-being.

Keywords: self-efficacy, training, e-learning, web-based training, instructional design

Exploring the Impact of E-Learning Trainings on Employee Self-Efficacy with Recommendations for Practice

Learning and development has demonstrated a booming impact among companies in the United States. In 2014, spending on e-learning programs reached 165.36 billion dollars and it is predicted that spending will surpass 243 billion dollars by 2022 (Statista, 2015). It is clear that the demand for well designed training programs will only continue to grow as the use of web-based learning becomes more prevalent. Training programs vary widely in their focus and are developed based on the unique needs of individual organizations, all aiming to positively impact workplace performance as well as to provide employees with skills and knowledge that will support organizational missions and objectives. With more employees working remotely and companies aiming to provide flexible means for accessing training, many organizations are turning to e-learning to deliver training programs. The prevalent use of e-learning technologies or web-based training for learning and development alone demonstrates the significance of identifying best practices for creating these online learning experiences.

For the purpose of this literature review, E-learning refers to learning environments that are delivered using electronic media or computers (Keller & Suzuki, 2004, p. 230). E-learning may also be referred to as web-based training within this body of work. With the use of e-learning or web-based training, employees are able to access training programs through the use of a mobile device or computer for synchronous or asynchronous learning opportunities that aim to fill identified gaps in knowledge or skills to improve work-related tasks (Morrison, et al., 2019, p.10). There are many noted advantages to using e-learning versus a face-to-face delivery method for training purposes. Organizations often opt for web-based training over traditional face to face training because it allows for more flexibility, globalization, self-directed learning capabilities, and efficient use of time (Kimiloglu et al., 2017).

Despite the perceived advantages of web-based training, there is still limited literature regarding how both face to face or web-based training programs directly impact the self-efficacy of employees. Self-efficacy is the belief in one's ability to complete tasks and meet expectations with proficiency in personal, professional, or academic settings (Bandura, 1997). This literature review aims to analyze a variety of resources to identify the characteristics, sources, and impact of self-efficacy of employees and within the workplace, as well as identify e-learning technology's role and influence in the design of training programs. This synthesis aims to piece together these findings to further examine how employee self-efficacy in the workplace is impacted by e-learning technology used in corporate learning and development programs and consider recommendations for practice as they relate to the design of employee training programs.

Self-Efficacy

Albert Bandura is a prominent figure in the field of self-efficacy. Bandura created the framework of self-efficacy theory when he developed social cognitive theory, which emphasizes the significance in social interaction for learning (Bandura, 1982). Through his studies, Bandura (1994) has identified self-efficacy as "one's beliefs about their capabilities to produce designated levels of performance that exercise influence over events that affect their lives. Self-efficacy beliefs determine how people feel, think, motivate themselves and behave" (p. 71). Bandura's foundational research in this field has helped identify the characteristics of self-efficacy, the factors that contribute to self-efficacy, and developed an explanation of self-efficacy's impacts on an individual's mental and physical behaviors. Bandura's self-efficacy theory is commonly cited within the literature regarding self-efficacy in all areas of learning, including K-12, higher-education, and adult learning settings. However, this literature review will examine research stemming from all of these areas in an attempt to understand how self-efficacy impacts professionals within a workplace setting, as well as self-efficacy's systemic influence.

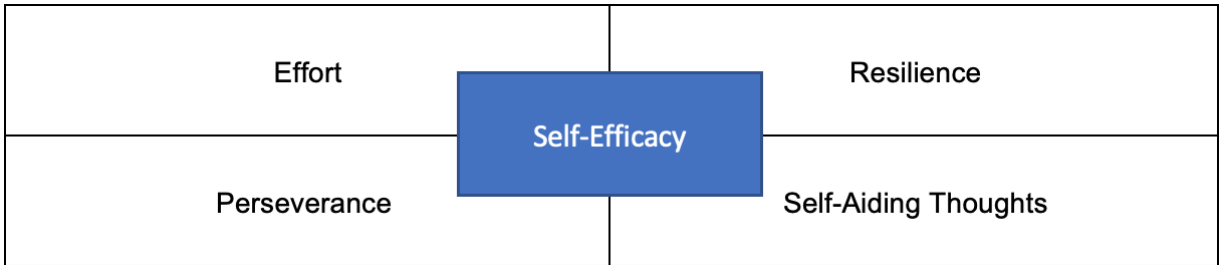
Characteristics of Self-Efficacy in Employees and the Workplace

Individual Characteristics. Before diving headfirst into examining how web-based training and e-learning impact self-efficacy, it is important to identify self-efficacy's characteristics and impact in order to see the significance of developing training initiatives that emphasize the cultivation of self-efficacy. According to Bandura (1997), individuals with high levels of self-efficacy exhibit multiple characteristics. These individuals display maximum effort towards work-related tasks. They persevere through difficult problems and scenarios. Those with high levels of self-efficacy are also resilient in adverse situations, recovering quickly from setbacks. These individuals also have self-aiding thought patterns, meaning they are intrinsically motivated and believe in their own capabilities. Charles Hodges (2004) echoes this statement, concluding that Intrinsic motivation by far has the most significant impact on one's ability to complete tasks with proficiency, as well as their ability to persevere when completing projects and assigned tasks (p. 3). As a result, intrinsically motivated individuals also consistently strive to learn more as well as take pride and ownership in the work they produce.

Bandura also shares that those with high self-efficacy often set achievable yet challenging sub-goals for themself. This is often known as goal setting. Setting distal goals as well as sub-goals provides the opportunity for an individual to gauge their current level of performance by setting short-term objectives for their performance in the workplace. This proves to be more successful than setting only distal goals, which are goals that aim to be achieved over a longer period of time (Bandura, 1982, p.134). Locke and Latham (2002) concur that those with high self-efficacy set high goals and, as a result, respond better to negative feedback and are more motivated to achieving assigned goals (p. 706). Overall, individuals with higher levels of self-efficacy feel more prepared to do the job, are confident in their abilities to complete tasks, and are up for professional challenges.

Figure 1

Self-Efficacy Characteristics in Individuals



However, individuals who lack self-efficacy demonstrate the opposite of many of these characteristics. Bandura (1982) states that people with lower levels of self-efficacy are prone to dwelling on their perceived failures or deficiencies. They also have a tendency to set the bar low for themselves, creating low aspirations and giving up quickly in adverse situations. This type of thinking can lead to higher levels of stress and can negatively impact performance in the workplace. (Bandura, 1994, p. 71).

Organizational Characteristics. Self-efficacy is not only an important characteristic for individual employees, but it is an element that plays an integral role in organizational systems. Donella H. Meadows (2008), the author of *Thinking in Systems* emphasizes the significance of resilience within organizational systems. Meadows (2008) stresses the importance of creating systems that are managed for resilience, not just productivity and stability (p. 78). Resilient systems often have the capability to bounce back and repair themselves even when unexpected challenges arise, just as Bandura suggests happens when individuals face challenges or perceived roadblocks at work. Meadows also shares that successful systems are hierarchical. This means that smaller subsystems (i.e., individual employees) support the needs of the larger systems (e.g., departments, projects, organizational missions, and objectives), which demonstrates the need to cultivate self-efficacy within each employee. When perseverance and resilience are developed, starting with the individual, the results of a positive work environment impact the organization as a whole.

Sources of Self-Efficacy

Bandura's (1982) theory of self-efficacy indicates that there are a variety of contributing factors that have evidenced negative and positive impacts on self-efficacy. Each of these factors has proved to contribute to an individual's motivation and confidence, impacting their overall performance and sense of well-being in the workplace. Past and vicarious experiences, verbal persuasion, and physiological and emotional states are sources of self-efficacy (Bandura, 1997). The following section describes the impact of these sources, as well as provides examples of these sources applied within the workplace.

Past Experiences and Vicarious Experiences. Self-efficacy can be heightened or lowered based on past experiences. If an individual has experienced failure in a specific task, this will most likely lessen confidence in their future abilities, lowering their self-efficacy (Bandura, 1982). However, the more success an individual has with a task or an assignment the higher their confidence level will become in the future and in turn heightening their self-efficacy. This is one of the most effective means to enhance self-efficacy, according to Bandura.

Individuals can also watch others succeed or fail in performing a task and can have a secondary effect on self-efficacy. This is known as a vicarious experience. When individuals see others perform a task proficiently or witness others achieving their goals, it can inspire the observer to do the same. For example, an employee may see a co-worker receive a promotion and as a result feels inspired to work towards his or her own career advancement. Individuals can watch colleagues, particularly those they feel have similar capabilities to their own, fail or succeed this and as a result this can alter their own perceived self-efficacy (Bandura, 1982, p, 127).

Verbal Persuasion. According to Bandura (1982) verbal persuasion is the act of using words to convince others of their ability to succeed (p.127). However, verbal persuasion alone does not demonstrate significant gains in self-efficacy. This is similar to providing verbal affirmations. Other scholars, such as Fred Ludenberg (2011), have found similarities between verbal persuasion and Rosenthal and Jacobson's (1968) Pygmalion Effect. This study revealed

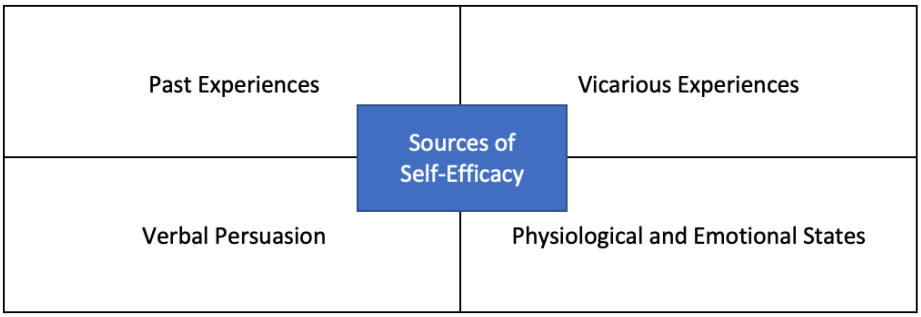
that when instructors have reasonably high expectations of students in the classroom, those students yielded higher performance. However, there is a fine line between generating false beliefs and providing credible feedback. For example, Margolis and McCabe (2006) suggest providing examples of how an individual has exhibited successful behaviors when providing verbal feedback (p. 18). This allows learners to not only receive verbal praise and affirmations but provides the learner with concrete examples of their success.

Another example of using verbal persuasion to impact self-efficacy is evidenced in a study by Wei-Tao Tai(2006). Within this study, employees who were selected to participate in a computer-based training program received training framing before participating in the training. This meant that managers had discussions with their employees about how the training will be helpful to their job and their professional development before the training began (Tai, 2006, p.56). The overall results demonstrated increased levels of self-efficacy based off of survey results before, during and after the training.

Physiological and Emotional States. It is also important to note that Bandura (1982) cites physiological and emotional states as the fourth source of self-efficacy. He conducted studies that demonstrated that self-efficacy levels impact an individual's level of stress and fear p. 7). Those with lower levels of efficacy demonstrated higher heart rates, a symptom often resulting from stress or fear (pp.138-139). Bandura states that individuals with low self-efficacy feel that they have little control or influence over performance and outcomes, which in turn can cause anxiety (p. 140).

Figure 2

Sources of Self-Efficacy



Systemic Impact of Self-Efficacy

When organizations recognize the significance of the well-being of its employees by implementing practices that create a positive work environment, a culture that encourages, motivates, and empowers employees is created. A variety of literature supports self-efficacy's role in these areas (Bandura, 2000; Hodges, 2004; Margolis & McCabe, 2006). Cameron,et al. (2011) investigated the correlation between positive practices and organizational effectiveness within a large financial institution and a healthcare facility, and examined the institutions as they implemented "positive practices" that aimed to impact a variety of areas such as employee retention, organizational climate, and organizational performance. Some areas of positive practices included expressing care, creating meaningful experiences, and demonstrating respect to employees. Some of these practices were implemented during employee training. The results indicated the links between positive practices and areas such as positive well-being, satisfaction, engagement, and retention. These findings share similarities to the organizational impacts of self-efficacy demonstrating the critical role of self-efficacy development (Bandura, 2000, p.122).

These results are noteworthy in terms of creating training programs with ethical designs that support positive work environments. Beard and Longstaff (2018), who have developed their own framework of ethics, share that designers should create opportunities and innovations that allow for self-determination (pp. 71-73). This means that instructional designs should be created in ways that gently "nudge" learners to become the best version of themselves and encourages

individuals to achieve their goals. Beard and Longstaff also highlight the principle of responsibility (pp. 78-85). They encourage designers to consider how their designs support the values of the users and organizations alike and consider how their selections in technology match those values. This requires designers to evaluate not only how training programs teach employees new skills and knowledge, but how these programs can be used bring about positive change in individuals and workplace culture.

Training Designs for Self-Efficacy

Training can look different from organization to organization. This is because training topics vary based on the needs of the learners and as a result the instructional strategies and designs used to teach the new information can look very diverse. As a result, there is limited research regarding how "training" impacts self-efficacy specifically, seeing as training can be perceived as a broad term. However, the overarching role of training remains consistent. That is to provide employees with the knowledge and skills to effectively perform the roles within their job description (Morrison et. al, 2019, p. 5). This requires designers of corporate training to consider evidence-based practices to support learning and skills transfer.

Bandura (1994) stressed the significance of designing instruction that provides opportunities for guided mastery, which in turn promotes efficacy (p. 75). His meta-analysis concludes that instructors should provide instructive models, opportunities for guided skill perfection, and feedback (Bandura, 2000). All of these experiences aim to promote learner competency and confidence through experiences that are relevant to their past experiences and work to gain confidence in their abilities through practice and relevance. M. David Merril's First Principles of Instruction and John Keller's Attention, Relevance, Confidence, and Satisfaction (ARCS) model both echo these principles, demonstrating how instructional strategies and designs can be used to develop self-efficacy (Keller & Suzuki, 2004; Merrill, 2000).

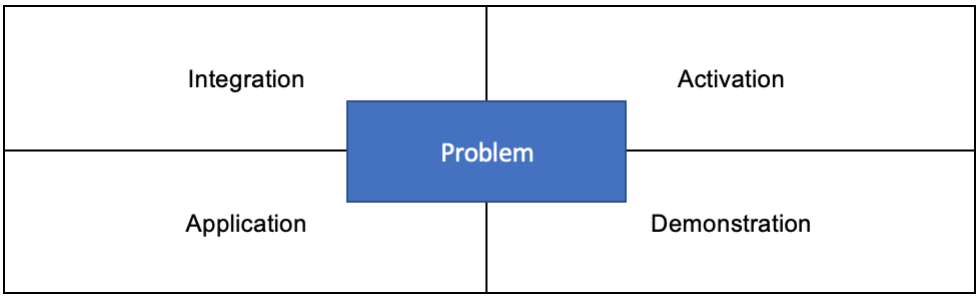
Merrill's First Principles of Instruction. M. David Merrill (2002), has developed instructional principles which fall in line with some of Bandura's identified sources of

self-efficacy. For example, M. David Merrill's First Principles of Instruction states that learning occurs when learners participate in learning opportunities that engage them in real-world problem solving. This means building creating lessons that do the following:

1. Engage learners in problem solving activities.
2. Activate learning by adding onto the learners' previous knowledge and experiences.
3. Demonstrates what needs to be learned by adequately modeling relevant information
4. Apply newly learned skills and knowledge with opportunities to practice using their new knowledge.
5. Integrate skills into the learner's own life or work

Figure 3

Merrill's First Principles of Instruction



ARCS Model. John Keller is known for his work in developing motivational instructional designs. Keller developed the ARCS model, which is based on a variety of motivational techniques and problem-solving approaches (Keller & Suzuki, 2004, p. 229). ARCS stands for attention, relevance, confidence, and satisfaction. Keller and Suzuki describe how instructors can motivate learners through attention, relevance, confidence, and satisfaction. By gaining the learner's attention, their interest is captured by using novel visuals or through the use of intrigue. Keller and Suzuki then state that relevance is delivered through the use of clear goals and material that relates to the job experience. Next, confidence can be developed when tasks allow

the learner to attribute their success to their own abilities. Finally, satisfaction is developed when learners feel intrinsically and/or extrinsically motivated. Keller and Suzuki found that empirical studies revealed that the use of the ARCS design in e-learning proved to be effective on motivation by the development of systematic instruction (p. 236) Below is a figure that provides examples of how to use the ARCS to create opportunities to develop motivation and efficacy.

Figure 4

Examples of ARCS Techniques

Attention	graphics and videos, problem solving tasks
Relevance	clear goals, tasks that align with personal goals, information and tasks relate to the job
Confidence	tasks that are challenging but able to be accomplished
Satisfaction	opportunities to apply what one has learned, rewards or recognition

Although these sources of self-efficacy stem mostly from the work of Bandura, the literature of many others have echoed that relevance and motivation are consistent themes among the sources of self-efficacy (Hodges, 2004; Keller & Suzuki, 2004; Merrill, 2002). This demonstrates the importance of further examining current literature as it relates to e-learning technology and its role in the design of motivational e-learning opportunities for training purposes.

E-Learning Technology

As noted in the introduction of this paper, e-learning or web-based training is more prevalent than ever before, which is why it is important to take a look at the role of technology in

training programs from a systemic point of view. Donella Meadows (2008) describes systems (e.g., companies, nonprofit organizations, government agencies, etc.) as entities that are composed of a variety of elements that are interconnected with one another. These connections can have intended or unintended functions or consequences within the system. For example, instructional designers are responsible for analyzing how their training programs will have positive or negative impacts on employees, as well as recognizing the implications of their design decision on the organization as a whole. This challenges instruction designers to ask the following questions: “How will integrating e-learning technology impact the design of training programs?” or “How will web-based training affect learner self-efficacy?” These are just a few examples, but these musings demonstrate the need to further examine the role of technology integration in training program designs.

The Role of E-Learning Technology in Training

There has been much debate surrounding technology’s role in instructional designs and delivery. Richard Clark(1994) and Robert Kozma’s(1994) “Great Media Debate” is one that is frequently referenced. Clark has argued that media is merely the vehicle that is used to deliver instruction and is not a source of learning. His discussion supports the belief that effective teaching methods and strategies are what contribute to learning, not the technology that delivers it. Kozma responded with a rebuttal, arguing that media is more than just a vessel that delivers instructional materials. He argues that the relationship between media and learning needs to be examined and discusses the significance of better understanding technology’s impact into the instructional design process, especially as new technologies and innovations continue to be introduced for learning purposes. There is a lot to take away from both sides of the discussion.

The gaps in research regarding how media and learning directly correlate still exists in regards to in regard to training programs. However, Judith Strother’s (2002) research indicates that although there are studies that have evidenced that e-learning can be just as effective, if not more at

times, than traditional classroom instruction there have still not been enough studies to determine if the technology plays a direct role in the success of learners. To this day, many of the studies regarding e-learning place emphasis on how to design effective instruction and how to integrate technology that meets the needs of the learners and instruction (Bower, 2008; Morrison, et al., 2019).

Morrison, et al. (2019) argue that technology makes instruction more efficient versus more effective. They note that the use of educational technology is not a one size fits all intervention and that its use should be considered if it meets the needs of instructors and students (p. 240) There are endless design elements to consider when creating a web-based and e-learning training programs. For example, designers should consider how instructors will present information, how learners will interact with the content, or how feedback will be provided to trainees, etc. Because technologies' wide range of uses, Matt Bower (2008) has emphasized the significance of affordance analysis within the instructional design process. This analysis states that learning tasks should be matched with the affordances, or action capabilities, offered by learning technologies. He also states that when creating e-learning designs, instructors should follow a process of identifying educational goals, postulating suitable tasks accordingly, and determining affordance requirements of the task before selecting technology and designing e-learning (Bower, 2008, p. 8). This step-by-step process encourages designers to plan their instruction first and then determine how or if technology's affordances will support the needs of the instruction.

Discussion

Research Recommendations

Upon the completion of this literature analysis, it is evident that there is an abundance of research regarding the characteristic of self-efficacy, the sources of self-efficacy, and the implications self-efficacy has on behaviors and thought patterns. Most of this research can easily be applied to K-12 settings, higher education, adult learning, and workplace training

programs. However, most of the current research takes an approach that aims to see how self-efficacy impacts performance within the completion of a coursework and training, and less of how coursework and training impact self-efficacy in academic and professional settings. There is also an abundance of research regarding motivational instructional designs for adult learners, but less on how the affordances of e-learning technology support initiatives to enhance self-efficacy. These gaps evidence a need for further research regarding the relationship of corporate training and how self-efficacy translates into the workplace. Although there is a continued need for research in these areas, this synthesis was able to identify the significance of self-efficacy in the workplace and align instructional designs practices in order to provide recommendations for practice in regard to cultivating higher levels of self-efficacy.

Recommendations for Practice

Meadow's (2008) has provided a thorough understanding of how organizational elements are interconnected and how these working relationships impact decisions related to the development of training programs. Those who do not think from a systems perspective may see the use of technology to deliver training programs as solely having positive or negative consequences based on their previous experiences and attitudes towards technology. However, the decision to integrate e-learning technology into training programs interconnects with a variety of elements. As a result, ethical designers should consider the vast impact their training programs have on individuals, and then ask themselves if technology affords tasks that contribute to the well-being of its employees. The development of self-efficacy through training should be thought of throughout the analysis, design, development implementation, and evaluation phases of the instructional design process, just as ethical designers consider culture and accessibility. Below are recommendations of how this could be achieved.

Analyze. The first recommendation for instructional designers of training programs is to begin thinking of how to cultivate self-efficacy at the beginning of the design process. This can occur when conducting a needs assessment and gathering data to help drive instruction.

Designers can include questions on surveys or within their interviews that ask the employees to share their short term and long-term professional goals. Data collection within the needs assessment should also aim to determine what skills the trainees are already demonstrating with success. This information should be collected from potential trainees, supervisors, and any other potential stakeholders. All of this information will be insightful as it will help with the development of training tasks and activities that are relevant to the learners goals and previous skill sets.

Design. The next recommendation is that designers should consider instructional strategies and designs models that aim to not only teach content, but that cultivate self-efficacy through motivation. Layering strategies from Keller's ARCS model and Merrill's First Principles within other instructional design models will help motivate learners and create learning opportunities that are relevant to the trainees. These design implications will help sustain the results of training beyond the course. By taking this approach designers can engage learners with relevant models and provide opportunities to practice newly learned skills. Designers should also create opportunities to include feedback as learners practice their new skills.

Develop. The decision to integrate e-learning technology into training should be well thought out and purposeful. Once the learning tasks have been designed, instructional designers should consider incorporating Bower's affordance analysis into their instructional design process. This will help guide decisions regarding the selection of technology and to determine how it will be used to effectively support modeling, guided practice, discussion, and/or feedback. Although the use of e-learning can provide many benefits (eg: financial, time, flexibility, etc.), it is critical that the integration of technology is considered with explicit purpose.

Implement. Designers and trainers should consider collaborating with supervisors and managers to help frame training and continue to provide genuine feedback to those who have participated in training (Kimiloglu et al., 2017; Margolis & McCabe, 2006) Training should not be considered an isolated occurrence that will enhance self-efficacy. In order for self-efficacy to be

sustained, supervisors and managers should continue to provide opportunities of verbal persuasion that aim to promote confidence in employee capabilities.

Evaluate. Finally, instructional designers should consider developing training evaluations that incorporate questions regarding how training has shaped self-efficacy, as suggested by Strother (2002). These surveys should be given before training begins, immediately after training, and weeks or months after training to examine sustainability. The survey questions could inquire about employees' perceived ability to complete specific tasks or job functions that are covered in training. Questions could also ask about motivation, confidence, and perceived levels of stress within the workplace. By embedding these questions within surveys, designers and organizational leaders can determine if training is having positive implications of self-efficacy and make future adjustments to training as necessary.

Figure 5

Instructional Design Recommendations

Analyze	Conduct Needs Assessment that identifies employee current knowledge, professional goals
Design	Create lessons and instructional tasks that are relevant and motivating. Create models that are relatable to employee job functions Design lessons that provide opportunities for practice Develop opportunities for feedback during instruction
Develop	Align learning experiences to technologies with affordances that will support instructor and/or student needs (action capabilities) Use this alignment to select appropriate technology for integration.
Implement	Collaborate with employee supervisors to encourage training framing before training begins. Collaborate with employee supervisors to encourage continued feedback within the workplace for sustainability.
Evaluate	Evaluations before training, immediately after training, and weeks or

	months after training - Ask questions regarding perceived capabilities, motivation, and confidence

Much of the research gathered within this literature review pinpointed design considerations as the largest contributing factor to cultivating employee self-efficacy. This is not to say that technology is not significant, it is. However, in order to create training opportunities that teach new skills and knowledge, as well as contribute to self-efficacy, organizations need to put motivational design in the forefront of their mind when developing training programs and consider how or if the use of technology will support those learning tasks.

Conclusion

E-learning and web-based training continues to flourish and appears to have no indication of slowing down. No matter how training is delivered, employees will always require support, so that they can be successful and satisfied within the workplace. As a result, it is significant that organizations examine how employee self-efficacy in the workplace is impacted by e-learning technology used in corporate learning and development programs and consider recommendations for practice as they relate to the design of employee training programs. There continues to be gaps in research regarding the direct correlation between technology and learning, as well the direct impact of training on employee self-efficacy. However, this analysis did identify some relevant findings.

1. High levels of self-efficacy positively impact an individual's motivation, perseverance, resilience, and levels of stress and anxiety.
2. Self-efficacy can be heightened or lowered by an individual's past experiences, vicarious experiences, verbal persuasion, and physiological and emotional state.
3. Motivational instructional designs and workplace initiatives can support the development of self-efficacy through the exposure of instructive models, guided mastery opportunities, and feedback.

4. E-learning technology can facilitate a variety of learning activities that support self-efficacy when selected on the basis of how the technology affords particular action capabilities.

These key findings demonstrate that e-learning technology can be used to support the cultivation of self-efficacy. However, it is up to those who sit in the driver's seat, the instructional designers, to make purposeful decisions regarding technology integration, as well as to select learning strategies that aim to positively develop employee self-efficacy.

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