# Importance of Employment Strategy to ADL Success: A Case Study

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## ABTRACT

Advanced learning technologies are being introduced into military training programs at an increasing pace, but the results are often different from those intended. This paper presents a case study of an attempt to integrate an advanced distributed learning (ADL) course into a longstanding, traditional training program, specifically one focusing on "sustainment" marksmanship training. Methods of participant-observation and open-ended interviewing were used at a single but representative site to gain insight into the training problems that prompted training administrators to seek an ADL-based technology solution, as well as to identify the organizational and technical factors that impeded its successful employment at that site. The study data demonstrates how successful integration of ADL technology can depend not only on the technology itself but also on the accompanying employment strategy. Examples of employment concerns that must be addressed during the ADL design, development and delivery process are presented and discussed.

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## INTRODUCTION

Every technological advance in education and training gives rise to a chorus of reformers who predict a fundamental change in the ways instructors teach and trainees learn. As employment challenges overburden and sometimes overwhelm end-users, however, organizations often abandon the new approach and return to instructional strategies that they already knew (Rosenberg, 2001). Such a sobering look at the past alerts us to the importance of carefully planning for, as well as closely monitoring, the technology employment process, rather than treating the delivery of the new tool as the final step in training reengineering. This case study illustrates some of the problems that can arise when employment issues are not addressed during technology design, development and delivery.

The learning technology discussed in this paper falls under the rubric of "advanced distance and/or distributed learning" (ADL). This broad category of new training tools and methods is usually considered in contradistinction to classroom-based learning, with the crux of the division focused on the decentralization of instruction, so that trainees receive information, guidance and feedback independently, at their own pace and/or at a self-selected place and time (Dede, 1996). ADL has captured the attention and imagination of today's educators and trainers because of its potential to provide training that is more flexible, engaging and cost-effective than classroom-based or practice-based modes of delivery.

Recognizing the importance of applying new technologies and techniques to deliver on-demand training, anywhere and anytime, all Service branches have become active in the implementation of computer-based, web-based, and other forms of ADL. This burgeoning interest in, and commitment to ADL development and application is evidenced by the creation of distance-learning centers, which seek to convert skills training courses to ADL formats. In the case examined here, a distance-learning center for one of the Service branches developed a digitized, automated marksmanship course (CD-ROM) for a weapons training battalion. The ADL-based course was intended to remedy deficiencies in the training program that were identified by administrators at this site.

Researchers conducted a field-based, qualitative study of marksmanship training at the weapons training battalion as part of an Office of Naval Research Capable Manpower Future Naval Capabilities program, with the overall goal of developing practical advice and procedures to support effective ADL employment in the future. The larger program encompasses a number of qualitative studies of training curricula as delivered under both traditional and ADL formats. These studies are providing data on how instructional content is being delivered to military personnel (in the Navy, the Marine Corps and other, select Service branches), and how organizational processes adapt (or need to adapt) to make effective use of ADL-based delivery. Once completed, the data from these studies will provide the basis for guidelines and supporting case studies intended to help the Navy and Marine Corps better design and use ADL technology.

Researchers arrived at the weapons training battalion a couple of months after the ADL course had been delivered and installed at the learning resource center (i.e., computer cluster) located at the site. The goals of this part of the study were (1) to capture the core features of the existing training program to provide a point of comparison for studying the upcoming employment of ADL and (2) to identify individual and organizational factors that facilitate or impede the technology-employment process. The original research plan called for researchers to return to the training battalion a few months later, after the ADL course had been integrated into the existing training program, in order to document and evaluate the transition process. For reasons that will be discussed in this paper, however, the new technology was never utilized in a systematic way at the training battalion. As a consequence, the follow-up study of the employment process was postponed and, later, canceled. Researchers shifted their focus from a longitudinal study of ADL integration to an examination of obstacles causing the proposed training improvement to become a stalled venture.

The study of the training battalion was conducted in two phases. The first phase involved interviewing training administrators and instructors about existing practices and processes at this weapons training battalion. In the second phase, a researcher spent two weeks at the site, directly participating in all aspects of marksmanship training, just as any regular trainee would (and eventually qualifying as an expert). This full participation enabled the researcher to gain an insider's perspective on the way rifle skills are taught, or more accurately "refreshed," at the training battalion. In addition to the direct observation of and participation in the training cycle from a trainee's perspective, the second phase also involved conducting extensive interviews with many of the participants (i.e., administrators, trainers and trainees), documenting their experiences with the existing training program, as well as their attitudes toward and opinions of different ADL training strategies. To anticipate future impediments to ADL employment, participants were asked to discuss critical training processes and tasks, and to comment, specifically, on the role(s) that the ADL course should play, if any, in a revamped training program. During the observations and interviews, researchers paid careful attention to noting the subtle (and not-so-subtle) indicators of skepticism, optimism, frustration, enthusiasm and other important attitudinal variables, which signal the presence or absence of organizational support for the ADL.

The study data provides insight into the factors that turned a potentially useful digitized course into another instance of underutilized learning technology. The overarching lesson learned in this case study is that no matter how exciting and promising, ADL technology can produce valid training improvements only when accompanied by an effective employment strategy. The first section of the paper discusses the training problems that prompted administrators at the site to seek an ADL-based technology solution. The second describes the automated marksmanship course that was developed in response to the request made by training administrators. This section also identifies the organizational and technical factors that impeded successful employment of the ADL course. The third and final section discusses the implications that these study findings have for other training administrators and developers looking to integrate ADL technologies into training programs.

## A TRADITIONAL MARKSMANSHIP-TRAINING PROGRAM: CRITICAL PROCESSES AND LIMITATIONS

Traditional marksmanship training at the weapons training battalion provides trainees with "sustainment-level" rifle skills. Reviewing the basics is an essential function of the training program, since many trainees arrive at the training battalion with skills that are, in the words of trainers and trainees, "very rusty." Loss of proficiency is understandable considering how infrequently many of these individuals handle the rifle over the course of a year. Phase I of the training cycle is comprised of a lecture covering fundamentals as well as other preliminary exercises. Phase II moves trainees to the firing range for live-fire practice and qualification.

Researchers found that deficiencies in Phase I training stemmed from the inconsistency with which it appeared to be conducted. This results in a low degree of preparation on the part of many trainees for Phase II training. A negative effect of poor Phase I training is that it makes it difficult for trainees to receive full value from Phase II training, and ultimately to qualify at the highest level. This problem is what had prompted training administrators to seek an ADL-based technological solution.

### Problems with Phase I

The study found widespread dissatisfaction with the conventional Phase I training, reflecting problems with the classroom-based approach. The traditional program brings a large group of trainees together in a classroom for a day or two to listen to a lecture covering the mechanics and skills of shooting the rifle – the very basics of what a shooter needs to know in order to load, unload, adjust and fire his or her weapon safely and effectively. Unit commanders have the option of providing Phase I training at their home base, using their own instructors, or else relying on the PMI (primary marksmanship instructor) at the training battalion to provide this required component of training. Less than 10% of those going through the marksmanship course receive their Phase I training onsite. Thus, the vast majority of marksmanship trainees go through the classroom instruction at their respective units, prior to coming to the training battalion.

A number of factors undermine the effectiveness of traditional Phase I training. The majority of administrators at the weapons training battalion cited the absence of centralized command over Phase I as

one of the biggest problems – if not *the* biggest – with the current training program. Although unit commanders attest to the fact that their trainees have gone through the full set of lectures prior to arriving at the training battalion for field practice, supervisors at the training battalion strongly suspect that many trainees receive only cursory instruction. Even when trainees receive full Phase I classroom training, either at their units or at a weapons battalion, there are problems in retention of the material that is presented to them. Instructors have little time to cover many complex topics, including the internal workings of the rifle, the fundamentals of breathing, aiming and trigger control, and the mechanics of site alignment and site adjustment. Any one of these topics is difficult for an instructor to convey and for a trainee to assimilate. There is also a general lack of individualized instruction and reliance on a passive learning process. Given these factors, it is not surprising that many trainees reported getting relatively little out of Phase I. Other factors, including poor acoustics, lack of air-conditioning or heating, and dryness of content also make it difficult for trainees to pay attention to the instructor and, thus, to learn the basic concepts and procedures presented in Phase I lectures.

**Problems with Phase II**

Participant-observation on the firing range confirmed just how difficult it is for shooters who have not mastered the fundamentals during Phase I to use their time effectively during the Phase II, which involves going through the qualifying course (firing at targets from different distances and different body positions) for three practice days and then one qualifying day. Without a clear understanding of the fundamentals, trainees cannot effectively diagnose and remedy their deficiencies during the practice time. Trainees have particular difficulty determining whether their inaccurate firing patterns are the consequence of poor body positioning, incorrect site adjustment, or both. As a result of this confusion, struggling shooters spend a significant portion of their valuable practice time floundering, rather than systematically honing their skills for qualifying day. In some cases, trainees become so frustrated that they attempt to qualify early, despite being unprepared to do so, because the practice does not seem to be improving their skills. Another clear sign of frustration is the refusal of many of those who fail to qualify, on their first attempt, to take advantage of the additional qualification opportunity at the end of Phase II.

Coaches sometimes provide critical assistance on the firing range to struggling shooters hoping to qualify, or good shooters hoping to qualify as experts; but this attention only benefits trainees who already have a firm grasp on the basic concepts covered in Phase I. By observing shooters, coaches point out problems with breathing, aiming and trigger pull that the shooters, themselves, would have difficulty identifying. Coaches also make helpful suggestions about adjusting sites to compensate for the effects of weather and distance. To have a lasting affect on shooting proficiency, however, the help that trainees receive from coaches must be internalized and integrated into their own thought processes, so that trainees can competently perform such actions as adjusting windage and elevation settings on their own. Trainees also have to rely on their own knowledge in order to choose between, or attempt to reconcile, the conflicting advice that they sometimes receive from coaches. It is not unusual for one coach to tell a struggling shooter one thing, and then another to come along and tell him or her the exact opposite, as coaching appears to be as much art as science. In such situations, trainees must be discriminating, selectively integrating the opinions of others into their own personal diagnoses and remediation strategies. Only by becoming self-sufficient, in this way, can shooters take the lessons learned during the practice days (when coaches are available) and apply them effectively on qualification day (when they are not).

## ADL TECHNOLOGY: PROMISE AND REALITY

Administrators at the weapons training battalion realized that an important step toward improving the shooting proficiency of trainees was to develop a more engaging and dynamic way of teaching the fundamentals of marksmanship during Phase I. They further recognized that ADL could play an important role in a revamped marksmanship program by providing trainees with instruction that is more interactive, flexible and individualized. ADL was also envisioned as a tool for making the curriculum more standardized or consistent from one trainee to the next. Administrators acted on their inspiration by requesting (from their Service branch's distance-learning center) an ADL course that could supplement or even replace the traditional, instructor-led training. Some months after requesting the ADL course, the training battalion received a fully operational, automated marksmanship course, on CD-ROM. This ADL product was installed on the approximately two-dozen computers housed in the

learning resource center (also a relatively recent delivery to the training battalion courtesy of the distance-learning center).

The digitized marksmanship course met or exceeded expectations of training administrators, in terms of enhancing the learning experience through creative and effective use of multi-media and interactive exercises. But despite the potential of this ADL technology to improve the quality of training, employment of the automated course was impeded by several technical and organizational factors. Study data revealed that the ADL course had been delivered to the training battalion with no accompanying employment guidelines/strategies. Under current organizational definitions, the distance-learning center's responsibility for ADL technology ends with delivery of the product. Thus, once the new product is in the hands of the end users, it is up to them to determine how to best use it. This lack of guidance meant that training administrators, at this and other weapons training battalions, had to devise their own plan for incorporating the new tools and methods into the existing training program. Despite rising to this challenge, training administrators' efforts to employ the digitized course (at the site studied) were hampered by a number of obstacles, some of which proved to be insurmountable.

The most pressing issue facing administrators was the gross disparity between the number of trainees (hundreds) and the amount of technology available at the site (only 20 or so computers). By the time researchers conducted their study, training administrators had developed an innovative plan, which would overcome this technological limitation by focusing on a small group of trainees – specifically, those who had just recently failed to qualify (usually around twenty or so individuals). Proponents of this ADL-based remediation program acknowledged that the plan was too limited in scope to meet the original goal of improving Phase I for all trainees; but they also insisted (rightly so) that helping a few was better than helping none.

Rather than revamping Phase I for all trainees, the ADL-based program that administrators proposed would create an additional component of training just for unqualified trainees, who otherwise would not have an opportunity to improve their scores until the following year. According to this plan, trainees, after failing to qualify, would remain onsite to go through an intensive, three-step remediation program. First, trainees would work with the ADL-based marksmanship course, focusing on those automated lessons that pertain to their specific skill deficits (presumably identified by themselves or coaches). After having their knowledge and skills reinforced with the new ADL technology, this group of trainees would receive follow-up lessons using the hardware simulator that had been present at the site for several years. The hardware simulator reproduces the experiential components of shooting the rifle and provides some feedback to the trainee (the poor history of this simulator influenced perceptions of the new ADL course, as will be discussed later). Third, and finally, trainees would have a chance to re-qualify on the firing range.

At the time that researchers conducted their field-based study, administrators at the training battalion had not attempted to use the ADL course in a systematic way, but were intent on doing so within the "very near future." The assumption of researchers was that collecting data at the training battalion at this point (i.e., before the automated marksmanship course had been incorporated into the formal training cycle) would provide a point of comparison for studying the future ADL-integration effort. Beyond documenting the way training has been traditionally done at the training battalion, the field study was designed to provide a better appreciation for the organizational and individual factors that would support or hamper the ADL technology employment process.

The combination of participant-observation and interviews shed light on a number of issues that would likely affect ADL integration. Triangulating the perspectives of different participants in the training program (i.e., trainees, instructors and administrators) helped to identify issues that were likely to constrain the employment process. In particular, researchers took note of the concerns, both overt and covert, that some administrators and instructors had about the remediation program. Such sentiments could not help but undermine organizational support for the proposed ADL program.

Although nearly all interviewees were complimentary of the content and design of the automated digitized course, several of them also expressed reservations. The chief complaints voiced by interviewees had to do with problematic sequencing (i.e., the point in the training cycle that the automated course would be made available) and inadequate motivation (of prospective trainees). Interviewees who spoke about the sequencing problem pointed out that selecting trainees for remediation on the basis of results during qualification meant that ADL technologies would be used after Phase II field practice had been completed. They explained that this would preclude participants

from applying, on the firing line, the lessons that they presumably learned through ADL. They further argued that follow-up lessons with the hardware simulator would be of little help since practicing in this environment is a poor substitute for shooting a real rifle on the firing range. In their opinion, the automated course would be effective only if the ADL lessons were followed by a day or two of field practice – an addition to the proposed program that, they admit, would be difficult to put into effect, given severe constraints in the availability of the firing range, as well the reluctance of unit commanders to have their personnel away from their regular work duties for extended periods of time.

Another problem with the proposed ADL program, noted by interviewees, is that trainees who completely fail to qualify are often less motivated than other shooters and, thus, would be unlikely to put forth the effort necessary to benefit from the digitized course. Interviewees explained that most trainees who fail to qualify on their first attempt, but stay for the additional attempt at qualification, are ultimately successful (i.e., receive a qualifying score). The high success rate with re-qualification is due, in part, to the personal attention that these individuals receive from coaches, as well as to the more relaxed environment on the firing range (e.g., only twenty or so shooters instead of three hundred on the firing line). In addition, trainees who have failed to qualify on their first attempt often feel that they have "nothing left to lose," and so are less anxious than they are during Phase II. The few trainees who go completely unqualified are often those who are not willing (e.g., too frustrated, tired, etc.) to go through the qualification course one additional time.

Yet another issue undermining support for the ADL program was the poor history of the hardware simulator at the site. The consensus opinion of those interviewed was that the hardware simulator had never become an integral part of training, and had gradually fallen out of favor and into disuse, due to technical problems that had plagued the technology. One common complaint concerned the difficulties that instructors and technicians have had keeping the simulator operational. It apparently takes a considerable amount of time for a technician to get the simulator working correctly, and even then, the simulator frequently breaks down during use. Some interviewees went so far as to suggest that frustrations and disappointments with the simulator have created a less than hospitable environment at the training battalion for the introduction of a new ADL product, such as the digitized marksmanship course, regardless of the latter's merits. Researchers noted that linking the two technologies, as the proposed remediation program does, only makes matters worse, by rendering the new, automated course guilty by association.

Training administrators who supported the remediation program had a powerful vision of the future, in which ADL would make a real difference in the performance of trainees. Unfortunately, apparent limitations of the proposed remediation program have undermined organizational support for the new initiative. After documenting these issues, researchers predicted that integration of the ADL technology into the formal training cycle would be an uphill battle for administrators. This pessimistic assessment is supported by the work of other researchers, suggesting that lack of support for any change effort, especially one involving the introduction of new technology, severely hampers the employment process (see, e.g. Rosenberg, Coscarelli, & Hutchison, 1999). Without strong backing, even the best-designed product faces formidable challenges when it comes time to put the technology into use. Subsequent events at the training battalion have validated the initial evaluation: a year after the study was conducted the ADL technology still had not been systematically used at the training battalion.

## LESSONS LEARNED

Let us now assess the lessons learned in this case, and consider some strategies that trainers, administrators and developers looking to integrate ADL technology into an existing program can use to produce a more successful outcome, or at least make one more likely. Analyzing the events that transpired at the weapons training battalion suggests some general principles of technology employment, which are likely to influence the success or failure of ADL initiatives in other contexts. These principles will come to light as we address the following questions: What shortcomings in planning and/or execution prevented training administrators and ADL developers from effectively employing the promising (but now underutilized) digitized marksmanship course? And what can be done differently in the design, development and delivery process to ensure better integration of advanced learning technology?

### Obstacles to Employment

Obstacles to employing the ADL course at the training battalion arose largely because ADL developers and training administrators did not arrive

at a clear, shared understanding of how the proposed technology would fulfill training needs and coordinate with organizational structures and practices. Formulating an effective strategy, early in the technology-development process, would have ensured that developers and training administrators were on the same page regarding the requisite capabilities and intended purposes of the new ADL technology. At the same time, doing this kind of extensive planning for and monitoring of employment would have required administrators and developers to work much more closely with each other than they did.

Many of the employment obstacles encountered in this case stemmed from the fact that the ADL design/development process did not incorporate an analysis of the organizational context in which the product would actually be used. With this integral step in the employment process missing, ADL developers and training administrators never worked together to find the right fit between the digitized course, on the one hand, and the technological infrastructure and organizational dynamics of the training battalion, on the other. The initial request for a digitized marksmanship course was based solely on the training administrators' own, independent assessment of the weaknesses of their traditional training program. They rightly concluded that a digitized curriculum could make the instruction component of marksmanship training more dynamic and effective, and thereby improve the shooting prowess of trainees during field practice and, ultimately, qualification. These administrators were thinking "outside the box" here, and should be commended for doing so; unfortunately, they lacked the knowledge of ADL that would have allowed them to foresee and, thus, circumvent some of the employment problems that arose. To effectively deal with such issues, they would have needed regular feedback and guidance from ADL experts, advising them how to incorporate the new techniques and technology into their training program.

Rather than forming an alliance with ADL designers/developers, training administrators were asked to wait, while the designers/developers worked to capture the content of the classroom-based lecture in digitized format. The developers eventually produced an exemplary product, one that had the potential to enhance marksmanship training. But the lack of communication between developers and training administrators had a negative consequence: the new ADL course had no apparent practical application at the training site. Administrators responded to this situation by devising an employment plan that overcame one of the major technical limitations of the new technology: namely, the disparity between the number of trainees and the accessibility of the digitized course. This effort, though, was not enough to make the technology employable.

The plan proposed by training administrators was a creative solution to the predicament in which they found themselves, and a testament to their "can-do" spirit and enthusiasm for ADL. Nevertheless, the plan had little chance of succeeding, since the decision to focus exclusively on unqualified shooters created as many problems as it solved. Most notably, the proposed remediation program appended the ADL course to the end of the training cycle, rather than integrating it seamlessly into Phase I (as initially envisioned), thereby creating problems with sequencing (i.e., field practice before, rather than after, ADL) and scope (i.e., only a few could receive ADL training). In addition, linking the ADL course with the hardware simulator engendered a negative anticipation (guilty by association), due to the latter's poor track record at that training site. These problems created a negative environment for the introduction of the new learning technology.

The disadvantages of the proposed ADL program that contributed to its demise are a clear reflection of poor employment planning. Most notably, the plan was created after the ADL technology had been delivered to the training battalion, rather than during the design/development process. Delaying employment considerations until the very end, in this way, shifted attention of both developers and administrators away from the organizational context and toward the content of the technology-based system. By the time anyone took a hard look at how the ADL course would actually be used at the training battalion, it was too late to modify the technology so that it could do what the trainers actually needed it to do, which was to enhance the instructional component of Phase I for all trainees. This oversight put trainers in the difficult position of having to identify a training need that could be solved by the already-completed technology. The only option left for the training administrators, at this point, was to redefine the training need/problem so that it was consistent with the ADL technology's capabilities.

With no clear way of reaching their original goal of revamping Phase I training, administrators found that they had in their possession an ADL solution that had no clear, practical purpose. The creation of a remediation program provided the technology with a function, but not one that made sense to the trainers

who would be required to use the new training tool. Given this shortcoming, it is not surprising that the proposed training improvement has become a stalled venture at the site. One of the important lessons learned, in this case, is that shaping the training problem to fit the solution is not a recipe for successful technological integration; it is, in fact, just the opposite: a perfect setup for technological marginalization.

**Recommendations**

Examining the issues that have impeded employment of the ADL course at the training battalion underscores just how important a comprehensive analysis of the training context is to the technology design, development and delivery process. Having the right content for ADL is essential but insufficient. Trainers and developers have to examine the proposed training improvement in a much larger, organizational context, so that complex and often hidden problems can be anticipated and circumvented. Adopting this more global perspective compels designers/developers and administrators to keep the training context in the forefront of their minds, thereby preventing them from making the mistake of envisioning and, thus, treating the proposed ADL initiative exclusively as a content-delivery problem, which it is not.

In any organizational change effort, a multitude of factors – human as well as technological and structural – intermingle to produce, or preclude, successful outcomes. Appreciating the myriad factors at work in a given context is indispensable to ensuring employability of new learning technology, regardless of the quality of the ADL content. Achieving a broad field of view is especially important when the organizational change requires individuals to adopt new work patterns or to utilize new methods and tools – as was the case with the introduction of the digitized marksmanship course at the weapons training battalion. Only by addressing these complexities can end users turn a proposed training improvement into an executable plan.

The key questions driving any ADL-based change effort must be: how will the learning technology actually function in the organizational context? Will the new product work in a way that allows trainers to realize the intended training improvements? What may be some of the unintended consequences of transitioning to this form of ADL? Considering employment issues from a variety of perspectives – from the perspectives of trainees and administrators/instructors as well as the broader organizational context within which they are embedded – is a crucial part of planning and implementing ADL.

Understanding the factors likely to affect employment can only happen if end-users work closely with designers/developers to anticipate and address the inevitable incompatibilities that will exist between the proposed learning technology and the organizational context. A comprehensive analytical process requires ADL developers to learn about the end users' organizational reality – that is, the physical, social and technological environment in which training takes place. As part of this effort, developers have to ask end users about such matters as: What results are expected for the technology-based training? How are training tasks currently executed, described and communicated in the training context? What is the history of learning technology at the site? End users, for their part, must query developers about the realistic opportunities afforded by different ADL technologies, as well as the inherent limitations and requirements of the various approaches. An ongoing dialog of this kind ensures that employment issues are kept front and center throughout the ADL design, development and delivery process.

The integrated approach to ADL employment recommended here contrasts with the bifurcated approach that was followed in the marksmanship case. Designers/developers and training administrators at the site focused on their own, respective spheres: developers worked on the technological tools, while training administrators waited for delivery of the final product, which would then, presumably, be put to use. The two groups never determined how these two pieces of the puzzle – the ADL product and the training context – would come together in the end to form an effective training program. As a result, important questions about technology use were not considered until it was too late to do anything about such issues.

The assumption of designers/developers and end users was that building an ADL product with terrific content would be enough to ensure its applicability. As this case study has shown, such an assumption is a dangerous one to make. To improve the likelihood of successful outcomes for ADL initiatives, designers/developers and end users need to bring a more holistic perspective to the complex task of integrating new learning technology. These two groups must combine their expertise and experience for the purpose of identifying and resolving the

technical, human and organizational issues that, if left unaddressed, diminish the effectiveness and efficiency of the proposed training improvements – or even derail the employment process altogether.

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## REFERENCES

Dede, C. (1996). Distance learning to distributed learning: Making the transition. *Learning & Leading with Technology, 23*(7), 25-30.

Rosenberg, M., Coscarelli, W., & Hutchison, C. (1999). The origins and evolution of the field. In H. Stolovitch & E. Keeps (Eds.), *Handbook of Human Performance Technology*, 2nd ed. (pp. 24-46). San Francisco: Jossey-Bass/Pfeiffer.

Rosenberg, M. (2001). *E-learning: Strategies for delivering knowledge in the digital age*. New York: McGraw Hill.