

# The future of E-learning as an educational innovation: Factors influencing project success and failure.

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## Resumo

Este artigo apresenta uma revisão inicial da literatura de fatores críticos para o sucesso e fracasso de iniciativas de E-learning segundo o revelado pela experiência de pesquisadores e praticantes no EUA. Também apresenta uma análise breve do relativo sucesso de inovações tecnológicas educativas, vistas de uma perspectiva das teorias aceitas sobre a difusão de inovações na sociedade. Em alguns aspectos, muitas inovações tecnológicas anteriores seguiram uma trajetória não característica de aceitação, seguida por rejeição geral. Será este o futuro cenário para o E-learning como inovação? E se tais tendências aparecem no país pioneiro, como outros países que adotam um pouco mais tarde os processos de E-learning, como o Brasil, evitam estes erros?

## Abstract

This paper presents a short literature review on critical factors for the success and failure of E-Learning initiatives, as revealed by the experience of researchers and practitioners in the USA. It also presents a brief analysis of the relative success of earlier educational technology innovations, viewed from the perspective of accepted theories of Diffusion of Innovations in society. In some respects, many prior educational technology innovations have followed a theoretically uncharacteristic trajectory of enthusiastic acceptance followed by widespread rejection. Will this be the future scenario for E-learning as an innovation? And if such tendencies do appear in the pioneering "early adopter" countries such as the USA, how may other countries a little later in the process of E-Learning adoption, such as Brazil, avoid the mistakes of the pioneers?

## Resumen

Este trabajo presenta una revisión inicial de la literatura en los factores críticos para el éxito y el fracaso de E-learning según lo revelado por la experiencia de practicantes en los E.E.U.U.. Este trabajo también presenta un breve análisis del éxito relativo de anteriores innovaciones educativas tecnológicas, visto desde la perspectiva de teorías de la difusión de innovaciones en sociedad. Vemos eso en algunos aspectos, muchas de las anteriores innovaciones educativas tecnológicas han seguido una trayectoria característica de aceptación entusiástica seguida por el rechazo extenso. Será este el panorama futuro para E-learning como innovación? Y si tales tendencias aparecen en los países pioneros tales como los E.E.U.U., cuáles son las probabilidades que los países un poco más tarde en el proceso de adopción de E-learning, tales como Brasil, pueda aprender para evitar los errores cometidos por los pioneros anteriores?

## E-LEARNING AS AN INNOVATION

### What exactly is E-Learning?"

It is hard to believe we were talking about online learning (OLL), web-based training (WBT), or even technology-based training (TBT) just a short year ago. Since the introduction of the term E-Learning it seems that it's become the unifying term to describe all these fields." (Quote from the Learnativity Website: [www.learnativity.com](http://www.learnativity.com) )

The above quote illustrates the all-inclusive manner in which the term "E-learning" tends to be used. In one hundred articles on E-Learning, recently accessed online, the term was defined nearly 50 times. I counted over 20 different definitions in those 50 articles. The chances of one author's understanding exactly matching that of the majority of the readers are therefore very low, unless the specific definition to be used is actually stated in the article. I shall not quote any of the definitions encountered in the literature, but simply present, in Table 1, the definition I plan to use here.

	(A)	(B)
	<b>INDIVIDUAL SELF-STUDY</b>	<b>GROUP/COLLABORATIVE</b>
	<b>Computer-Based Instruction / Learning / Training (CBI/L/T)</b>	<b>Computer-Mediated Communication (CMC)</b>

(1)	Surfing the Internet, accessing Websites to obtain information or to learn (knowledge or skill)	Chat rooms with(out) video (IRC; Electronic Whiteboards)
<b>ON-LINE STUDY</b>	(Following up a WebQuest)	Audio/Videoconferencing (CUSeeMe; NetMeeting)
<b>Synchronous</b> Communication ("REAL-TIME")		
(2)	Using stand-alone courseware / Downloading materials from the Internet for later local study	Asynchronous communication by E-mail, discussion lists or a Learning Management System
<b>OFF-LINE STUDY</b>	(LOD-learning object download)	(WebCT; Blackboard; etc.)
<b>Asynchronous</b> Communication ("FLEXI-TIME")		

This definition stresses that E-learning may be a solitary, individual activity, or a collaborative group activity. It also suggests that both synchronous (real-time) and asynchronous (flexi-time) communication modes may be employed. Also, the structured manner of presenting the definition reveals the true richness of possible E-learning systems and interventions. Not so long ago, in the media field, choices had to be made between one or another format or modality. For example, to present visual content, one had to choose between a slide show and a videotape. One choice gave the option of showing motion, but had very low levels of resolution. The other had high resolution but was static. What if one needed both at different points of a lesson? Now, all possible presentation alternatives are on the same CD-ROM, or online, accessible through just one presentation device - the multimedia computer.

Thus, an E-learning lesson could be composed of activities from several of the four quadrants of Table 1. Indeed, the example given in the A-1 (Individual - online) quadrant is a case in point. The WebQuest methodology usually initiates with an individual exercise, sparked by an assignment and some initial Sites to visit, in which the learner surfs the Web in search of relevant information. Note that even this stage could be performed in small groups, say dyads sharing a computer or online together at the same time, but it is more common to set this up as individual study. However, there is more to it than that. The information gathered should be restructured and commented by the learner - thus transforming information into knowledge that should then be shared with others. This last, knowledge sharing, stage is typically implemented in an interactive group environment. In the E-learning context, this would most often be an asynchronous discussion environment - anything in quadrant B-2. However, it is equally feasible, though less common in practice, to do the knowledge sharing via a Teleconference or Chat session - anything from quadrant B-1. And then we have the "hybrid" alternative of following the WebQuest exercise, performed as before by accessing the Web individually (as a homework exercise) and then bringing the acquired knowledge to share with colleagues during a conventional (non-E-learning) classroom-based discussion.

The variety of possible instructional designs for viable E-learning exercises is great. The variety of tools and technologies that may be used to implement these designs is also great. Multiplying these factors, the number of different E-learning systems that could be invented and implemented is very great. However, all this implies that the number of possible reasons for E-learning systems to malfunction or fail is therefore very, very great.

How is E-learning doing?

The literature on E-Learning, although only a few years old, already contains stories of both fantastic success and resounding failure. Will E-Learning, in the long term, fulfil all the claims that are made for it and be recognized as a successful educational innovation, or will there be so many failures that in time the current enthusiasm will wane and the number of projects will decrease?

The last chapter of my book "Designing Instructional Systems" (Romiszowski, 1981) was entitled "Why Projects Fail?" This chapter distilled, in some twenty Information Maps, a large amount of information, based on evaluation and research studies, on the multiple causes of failure in Instructional Design and Development (IDD) projects, and indeed in educational technology innovations in general. This information

was organized around a systems-model composed of the several stages through which an instructional systems design and development project proceeds during its lifecycle and the typical activities executed in each stage. This chapter, the model it presents and the detailed information on typical problems encountered and their causes, has "stood the test of time", having been used in practice for project planning and evaluation for over a quarter century. I have recently had cause to review and revise this model. The revised version is included in this edition of the Review (see the "Job-Aids" section). Quite surprisingly (or maybe not) the principal reasons for project failure in the field of educational innovation have little to do with learning psychology or pedagogical theory. This paper examines the key success / failure factors as regards the new wave of E-Learning implementations.

However, the model and the suggestions contained in the Job-Aid do not cover all that may be relevant in the present case. Apart from instructional design and development, an E-learning project, to survive, must be sustainable in a given socio-economic or business context. There is also the question of the characteristics of E-learning field as compared to the typical educational innovation projects of twenty or more years ago. Typically, an earlier educational technology project would, to a greater or lesser extent, transfer some of the duties of the teacher to instructional media and materials. This changed the role of the teacher in some significant ways, for example, shifting the emphasis from being the sole source of knowledge to being the manager of a range of knowledge resources. It also changed the nature of the learning activities of the students - more emphasis on self-study and self-evaluation, student autonomy and self-reliance. All these changes were observed and submitted to decades of research and evaluation. The studies exist, can be accessed and analyzed, and general instructional design principles established.

In the new E-learning environment, the roles of teachers and students are also changing, but in different ways. The classroom teacher becomes an online teacher, having to master a series of new skills and competencies. The online student becomes a non-linear navigator through never-ending oceans of information - this also requires new skills and competencies. And the systems of instruction, that used to be tightly focussed on tightly defined target populations in specific organizational contexts, are often now in the public-access sphere, so there is little knowing who may participate until they are actually participating.

A further dimension of this is the global access of persons from all parts of the world to your one online course and the other side of the globalization coin - your course is in competition for students with courses from all parts of the world. All this is rather new. There has been insufficient time to systematically research and evaluate all these trends. The database of information on how such new E-learning systems might develop problems or fail outright is very incomplete.

## **THE DIFFUSION OF INNOVATIONS**

### **The Phoenix Phenomenon**

There are, however, some general observations that may be made and that may help to steer E-learning projects along a more secure path towards success and sustainability. One approach to understanding of the general phenomenon, is the study of E-learning as an example of educational innovation, and educational innovation as an example of innovation in general. The research base on diffusion of innovations in society is rich and well established. How might E-learning fare in comparison to other innovations?

This particular avenue of inquiry was stimulated by one of the documents identified in a literature search on "E-learning" and "failure". One particular document encountered was a PowerPoint presentation by Ellen Wagner, delivered at the Telelearn2000 conference (Wagner, 2000). One particularly relevant slide epitomized the core issues that really motivated this paper, as it suggested that maybe E-learning was already well on the way to repeating the errors that had prevented other educational technology innovations, such as educational television, to realize their potential. A somewhat simplified version of this slide is presented in Figure 1.



FIGURE 1. The E-learning "Hype Cycle"  
 A simplified adaptation of a slide presented by Ellen Wagner, Learnativity, courtesy RCA Wilson, at the TeleLearn2000 conference organized by the Masie Center ([www.masie.com](http://www.masie.com))

This figure shows some of the key (success and failure related) events in the short history of E-learning as a mainstream innovation, still in the process of dissemination and adoption by the education and training communities. The events are placed on a graph that implies that the meteoric rise of E-learning visibility and popularity has already turned and been followed by an abysmal crash. I do not believe that the graph in this figure is meant to represent any exact quantitative measures that have been made. Rather, I take it to be a visual effect used to illustrate in a particularly dramatic way that all is not well on the E-learning front. However, the choice of the shape for this graph is probably not entirely the result of artistic creativity, but rather it suggests that the author/artist was well aware of the trajectory of many of the "star" educational technology innovations of recent years. Figure 2 serves to illustrate my point. This figure, taken from my own research performed between 1960 and 1970, shows the rise and fall of Programmed Instruction, as a mainstream innovation, in the United Kingdom during the 1960's. The graph shows the actual number of Programmed Instruction titles on sale in the UK, as researched for the data sections of the "APLET Yearbook of Educational and Training Technology" (Romiszowski, 1974).

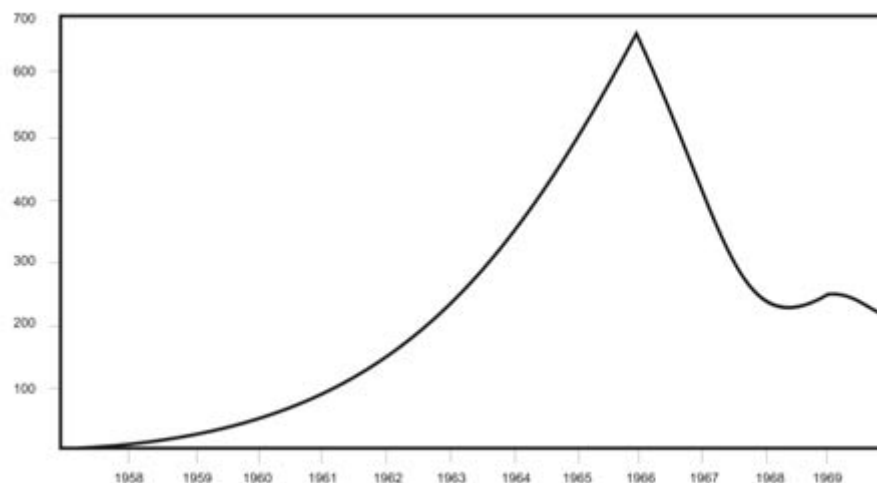


FIGURE 2. Cumulative count of the number of Programmed Instruction titles on the market in the United Kingdom through the 1960's (adapted from Romiszowski, 1976)

The similarity of shape of the graphs in Figures 1 and 2 is striking. Both start climbing slowly, then accelerate steeply, only to peak after a few years and then take a plunge almost as steep and deep as the ascent. Then, both "bottom out" at a much lower level and proceed to maintain that position, possibly climbing again, but much more slowly. This phenomenon has been observed in relation to many innovations in the educational field, not only but especially in relation to technology-based innovations. The

intensity of adoption and use of instructional television (ITV) usage in USA schools through the 1950-1960 period showed the same pattern of rise and fall, followed by a plateau at a much lower level of adoption and from there a much shallower upward trend. This phenomenon was studied in the ITV area by several researchers including John Tiffin, who showed that the same pattern of rise and fall may be observed in other countries, thus seeming to be a generalizable phenomenon rather than a local accident. Figure 3, below, shows some data from John Tiffin's research on educational television in Latin American countries.

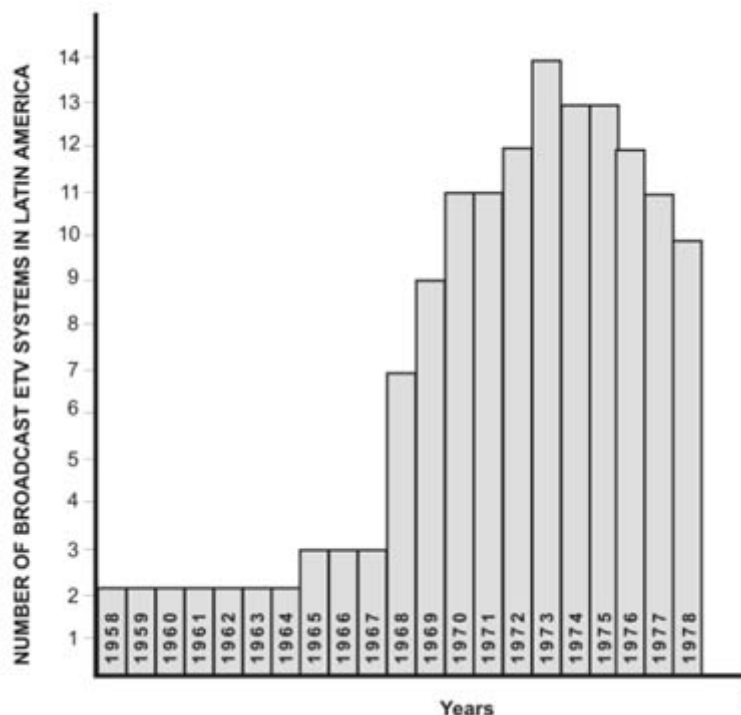


FIGURE 3. Total number of Broadcast Educational Television stations operating in Latin America, 1958 - 1978. (Adapted from Tiffin, 1980)

The above graph was published in a paper entitled "ETV: a Phoenix in Latin America" (Tiffin, 1980). The title refers to a name that was coined for the "rise-fall-plateau-rebirth" effect, first studied in relation to instructional television in the USA, where it gained the name "Phoenix Phenomenon" by comparison to the mythical Phoenix bird that is supposed to die by fire in order to be reborn from its own ashes. The ITV phenomenon, the Programmed Instruction phenomenon and other educational innovations were likened to the Phoenix. The early adopters of the innovation, managed, through their enthusiasm, to obtain much support and acceptance from official bodies and private organizations who then supplied the funding and organizational support for a rapid rise. However, the same early adopters were so inexperienced and overconfident that the bulk of the innovative projects were poorly designed and ineptly implemented, so that inevitably the expected benefits and returns on investment did not materialize. In time this was noticed by the public bodies and private organizations alike, who then began to withdraw their support and cut off the sources of funding. The ensuing downside was as rapid as the previous climb.

Typically, some of the better or more appropriately placed projects survive for longer, creating a plateau at a much lower level of market penetration than the earlier peak. And the project implementers, including any of the early adopters who managed to survive the head-chopping that usually accompanies the downside, eventually learn from their own mistakes how (and when and where) it is possible to get the innovation to deliver the expected benefits. A process of slow and cautious rebirth of the innovation may then take place. Like the mythical Phoenix bird, the adopters of the innovation first kill it through inappropriate and unsustainable projects, in order to allow it to be reborn in a more appropriate and sustainable form.

**Diffusion of innovations: the classical model and the educational technology reality.**

One of the best known researchers and writers on the subject of the diffusion of innovations is Everett Rogers. His book, aptly entitled "Diffusion of Innovations" (Rogers, 1983), is used as a basic text in many universities and by many practitioners in the field. It was first published in 1962. A revised third edition was released in 1983. The book deals with the diffusion of innovations of any form in any context. It is a

treatise on the "general theories of the diffusion of innovations". Much of the general theory can be summarized by the graphs shown in Figure 4. In an ideally "normal" group or society, an innovation would be adopted, initially slowly by enthusiasts and early adopters, and then as the innovation is seen to be beneficial it is adopted with increasing frequency. However, as the innovation "saturates the market", there are fewer people or organizations left to climb aboard, so the frequency of adoption starts to decline. The frequency of adoption would thus follow a normal distribution "bell" shaped curve, as shown in the lower graph on Figure 4. But on the assumption that all the earlier adopters of the innovation continue to be users, the cumulative number of adopters follows the classic "S" curve shown in the upper graph.

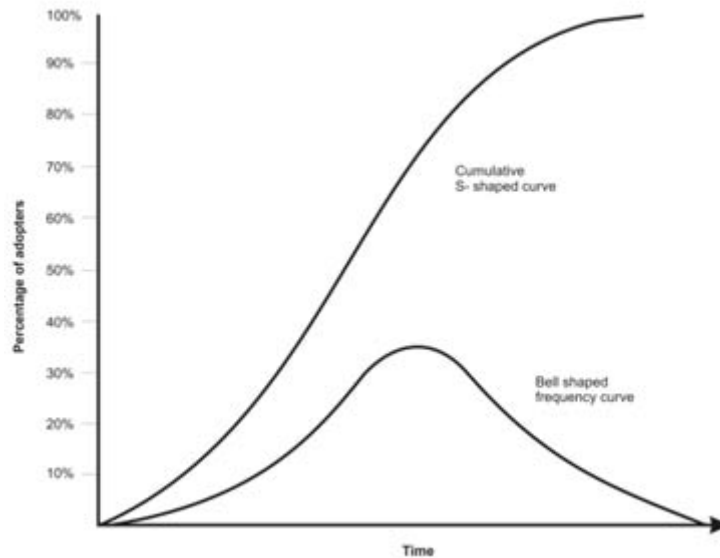


FIGURE 4. The classic "S-curve" of the successful dissemination of an innovation: the result of a "normal distribution" of adopters over time (Adapted from Rogers, 1983)

This figure is adapted from those shown in Everett Rogers' aforementioned book. The book gives many examples that are slight variations on the "classic" diffusion model. Two that are relevant to our present discussion are shown in Figures 5 and 6. Figure 5 illustrates the reverse of the adoption of a new product or service - the rejection or abandonment of a previously adopted product or service. Rogers (1983) presents such a graph together with the example of an effective anti-smoking campaign. Another example: when one product or service is replaced by another more modern and better, the proportion of users of the older product or service will follow a curve as shown in Figure 5. A practical example would be the number of users of mainframe computers during the boom of the microcomputer networks and client-server configurations.

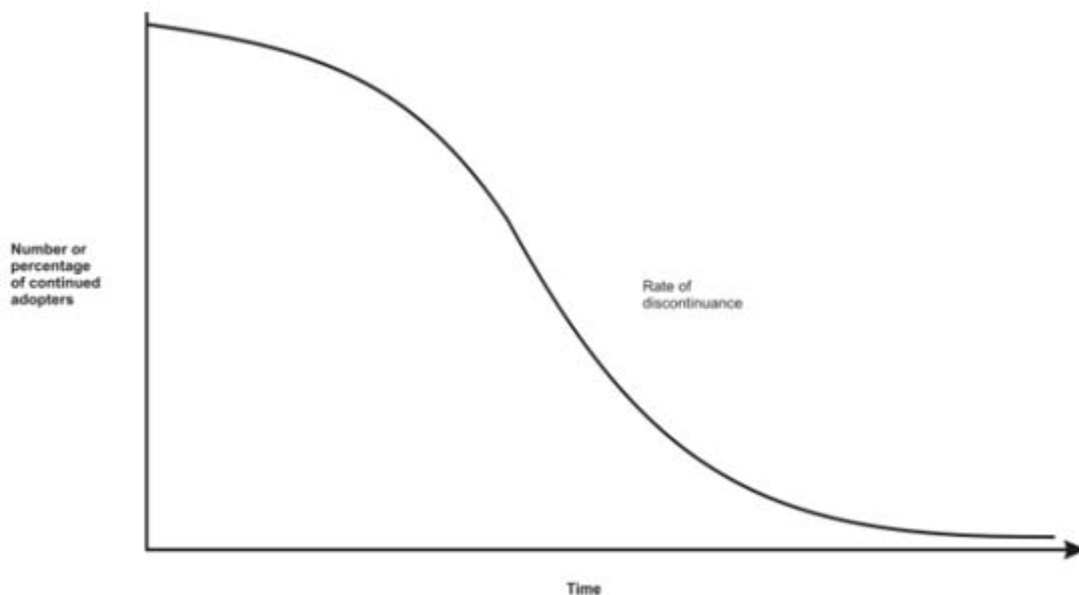


FIGURE 5. Discontinuance - the opposite of adoption (adapted from Rogers, 1983).(Result of an anti-smoking campaign, or replacement of one technology by another)

Figure 6 illustrates the diffusion of a not-so-popular innovation, or one that is only appropriate for some of the population, or can be obtained only by a percentage of the population, For example, a new super-car launched by a luxury sports car company can be expected to produce a curve somewhat like Figure 6. As soon as the new car is launched, a few early adopters (who can afford it) buy it. Then, as these people spread the word and other marketing strategies are employed, the rate of purchasing increases and the total cumulative number of owners climbs according to the S-curve. However, the car has a very high cost and this limits the possibility of ownership to a subset of the population. Therefore, the market penetration of this new car flattens off to a plateau at a level way below mass adoption of the product.

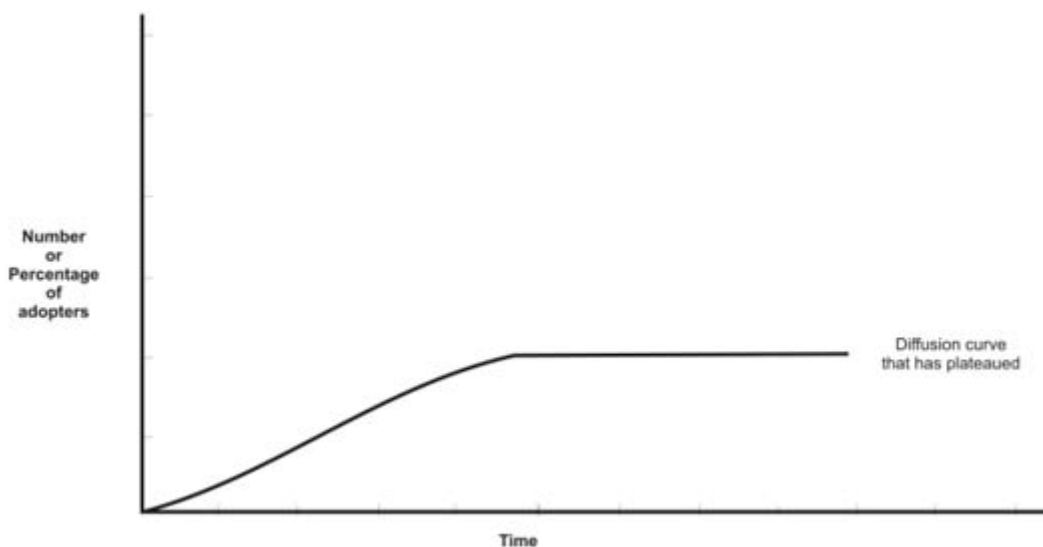


FIGURE 6. A "Special Interest Group" innovation - partial, but faithful, adoption. (Could be caused by limited interest in, or limited availability of, a product/service)

Rogers (1983) discusses many more examples of special cases of the diffusion of innovations. This includes, for example, cases where the innovation slowed to a plateau, then after a time started to climb rapidly again. Such cases are explained in the real world by the presence of events that either stimulate or inhibit the adoption and spread of the innovation, but which exert only a temporary influence.

What has all this to do with the situation of E-learning as an innovation? Or with the tendency of educational innovations to peak and drop? The typical diffusion curve observed in many cases of educational innovations is like the examples in Figures 2 and 3, or even closer to that shown in Figure 7 below. Figure 7 is a theoretical curve, suggested by Tiffin (1980) and based on the USA ITV experience and other studies, that predicts how most large scale educational innovations are likely to diffuse into the educational system. This curve can be seen as a combination of all three of the theoretical curves shown in Figures 4, 5 and 6. The graph in Figure 7 is divided into three phases. Phase one is the initial euphoric "flight of the Phoenix" up into the sky much higher than is wise, driven by the enthusiasm of the early adopters and fuelled by funding and support from a variety of stakeholders who have been led to expect certain benefits in return. Phase two is the tumble back to earth as the projects fail to deliver promised benefits and the stakeholders withdraw their support - the Phoenix flies too close to the sun and is consumed by flames. Phase three is the slow and careful rebirth of the Phoenix from its own ashes - the technical experts have learnt from their mistakes that the world is not quite as predictable and well ordered as they thought, and that each new project has to be not only well planned, but also most skillfully implemented and managed if the theoretical benefits are to be reaped in practice.

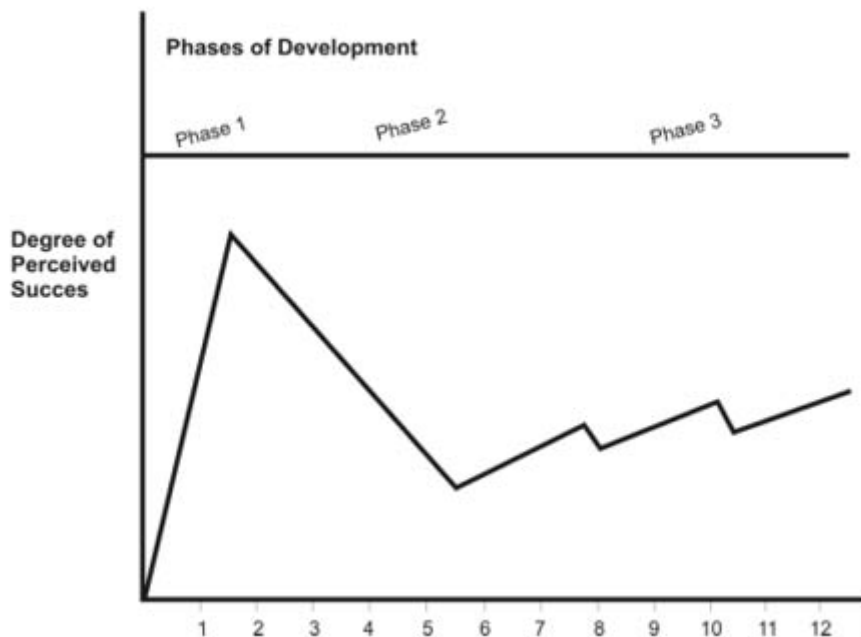


FIGURE 7. Typical diffusion pattern shown by many recent educational innovations. (Adapted from Tiffin, 1980).

Tiffin has shown this rebirth process to be erratic and bumpy rather than smooth and constant. This is possibly drawn from his many years of experience in Latin America, where every change of government (typically every 4 years) tends to result in a total halt in all projects and reversal of all policies of the previous government. Then, after a time, good sense prevails and the "good" policies of the past are reinstated, though dressed in the livery of the new order. This lack of political continuity, endemic to Brazil and many other countries in South America, would tend to produce the saw-tooth effect in the enlightened rebirth of our major educational innovation.

The above discussion has been developed very much in the language of the public education system, or the civil service. However, much of the development and implementation of the current boom in E-learning is taking place in the private sector and in for-profit organizations. Can we expect similar patterns of growth and retraction there? Well, for sure, there are already quite a number of cases of private corporations that have "pulled in their E-learning horns", so to speak. One case is that of the Xerox Corporation in Brazil, that invested quite heavily in a major E-learning initiative that was aborted before it really even started. However, this initiative was to set up an educational portal and a full range of E-learning system design, development and implementation services to be offered to client organizations. This is an example of a corporation entering into competition with other education providers for a share of the E-learning market. It is somewhat different from the case of a business corporation that invests in E-learning for internal training and development purposes. But here also, we are beginning to read ever more often that some projects have been closed down as the expected benefits or savings were not being delivered. Is this just a small percentage of early adopters "making a mess of things" by flawed design or incompetent management of a project, or is it rather that E-learning solutions have frequently been applied where they never had any hope of delivering the expected benefits. Is the Phoenix phenomenon also apparent in the context of corporate E-learning initiatives? What can we do to avoid the Phoenix phenomenon in both the formal education and the corporate training contexts?

### E-LEARNING SUCCESS AND FAILURE: WHAT THE LITERATURE SAYS

The intended focus of this paper is on the "L for Learning", rather than "E for Electronic" aspects of the E-Learning phenomenon. This is contrary to the bulk of the literature on the topic that, as Zenger and Uehlein (2001) comment, tend to stress the "E" rather than the "Learning". However, when analyzing cases of success or failure, one has to look more broadly and systemically at all possible sources of problems. We shall do so in this section. However, at this time, one general observation may serve to introduce the following small sample of the growing body of existing literature on factors that affect the success or failure of E-learning: there are many opinions, a few documented cases or examples, but very little systematic research.



One other observation is that the opinions and case/example analyses expressed in the bulk of this literature can be classified into four major categories related to the topic of E-learning. In addition to those that emphasize the "E", or the "Learning" implied by the name, there are others that focus primarily on the project (or process) "Management" issues involved and yet others that stress the organizational or personal "Needs" that justify the project in the first place. Many articles of course address a mixture of these factors, but most tend to emphasize one factor more than the others, probably reflecting whether the authors are coming from the information technology, education, management or performance improvement disciplines.

### **"E for Electronic"**

"History is littered with failed attempts to "revolutionize" learning through innovative technology. Fortunately, these struggles have taught us one very important lesson: in order for technology to improve learning, it must "fit" into students' lives ... not the other way around. As a result, E-Learning was born." (Clarke, 2002).

As I browsed the relevant literature, this opening paragraph of Clarke's (2002) article caught my attention. As I strongly agreed with the view expressed in the first sentence of this quote, I was interested in how the author would develop the idea implied by the second sentence. Was E-Learning technology really born, like the mythical Phoenix bird, out of the ashes of previous educational technology disasters? What lessons, learnt from the earlier "struggles", led to this rebirth of the Phoenix?

Reading on, I immediately became concerned by the author's "biographical sketch" of the first ten years' growth of E-learning: (1) "traditional" CBT (Computer Based Training) with added Internet Forums; (2) Online CBT; (3) Online CBT with added mentoring/tutoring; (4) Learning Management Systems (e.g. WebCT; Blackboard); (5) eClassroom with Simulation; (6) Synergy E-Learning with Live Labs.

This seemed to be a particularly technology-driven view of the growth process of E-learning as a succession of ever more complex technological tools. This was confirmed by the description of the sixth of these developmental stages as "the most advanced learning technology to date":

"This sophisticated asynchronous methodology combines three key elements of a successful E-Learning program: Prescriptive Assessment (to create personalized lesson plans), Live Labs (to allow students to have a hands-on, performance-based learning experience), and Multi-Sensory Learning Tools (to keep students engaged and improve retention".

Now, my initial concerns were confirmed. There is, after all, nothing particularly new about the creation of personalized lesson plans. It was implemented into self-instructional materials design by means of diagnostic branching in some programmed instruction materials of the 1960's (the concept of "feed-forward" as a corollary to "feed-back"). And in conventional instruction, this was the basis of the tutorial system of teaching practiced in many "traditional" European universities since their inception centuries ago and only discontinued quite recently when the "massification" of higher education rendered that approach no longer economically viable.

The incorporation of performance-based learning experiences has a history at least as long, being the basis of the medieval master-apprentice systems of professional development. In the self-instructional or distance-learning contexts, this was also a principle incorporated in well-designed programmed instruction materials. It has more recently been revived in the contexts of humanist, cognitivist and constructivist instructional models under such guises as "experiential learning", "situated cognition" and "cognitive apprenticeship". The basic principle of relevant performance-based learning experiences remains the same, even if the details of its implementation vary.

And multi-sensory learning - together with near-synonyms such as multi-media and multi-channel learning - have also been advocated, researched and practiced in education since well before the invention of the computer. The very term "multi-media instruction" was listed in the first ever thesaurus of major descriptors used to locate research in the ERIC database, signifying that by 1966 there was already a large and recognized body of research on the topic. And that was some twenty years before the invention of the multimedia digital technologies of today.

### **"N for Need"**

Other authors stress the importance of a full and accurate needs analysis as the basis for success. For example, McGraw (2001) presents a business-case-based approach to the planning and implementation of E-learning initiatives. She argues:

"A successful e-learning initiative should reduce costs over the long term, improve individual and business unit performance, help maintain core competencies, and enable the organization to react quickly to competitive pressures and market needs. Therefore, an e-learning strategy should motivate people, improve productivity, enable skill development, and aid retention across the enterprise. Those outcomes are wide in range and require thoughtful consideration of the benefits and limitations of learning technologies and a comprehensive look at business, technology, and learning needs."

Although it is not clear why the second sentence should be a consequence of the first, both sets of requisites enumerated in the two statements would seem to be important to success and, most certainly, the broad and comprehensive look advocated in the third sentence is an essential part of a needs-based planning approach. McGraw continues:

"But ask an organization about its E-learning strategy and the reply will likely include only two components: content and delivery. Although content and delivery are important, they alone don't equal E-learning success. Focusing on content and delivery can create a myopic E-learning vision".

### **"M for Management"**

In an article, entitled provocatively as "How to fail at E-learning", Broadbent (2001) emphasizes the lessons learned that have much more to do with the implementation and management of HRD projects, independent of the specific technologies (or indeed of any technologies) used. The flavour of the article is illustrated by the following list of tips for "HR managers, training directors and consultants who are intent on failing". The "tips" are presented together with the present author's comments (in parentheses) of the areas of theory, research and praxis that are implied by each one .

- "Think training, not business". (Stresses the importance of a front-end analysis).
- "Promise the moon". (Stresses importance of a realistic and relational approach).
- "Outsource everything". (Stresses importance of maintaining management control).
- "Make it available and see if employees use it". (Lack of an implementation plan).
- "Force e-learning on resistors". (Diffusion of innovations should be research-based).
- "Don't evaluate". (No comment necessary!)

### **"L for Learning"**

In a paper entitled "The Illusion of E-learning" Greenagel (2002) argues that many E-learning projects fail or under-perform for one or more of the following reasons.

(a) Developers don't seem to be aware of how people learn, so they use flawed models of instruction.

(b) A flawed model of cost-effectiveness is used, based return on investment (ROI) in the technology and in courseware development, rather than valid measures of effectiveness developed from analysis of organizational and individual performance goals and how effective learning will impact them.

(c) A flawed approach to the understanding of technology in education. The available platform drives the instructional strategy, which may not be appropriate to the learning style of trainees or to the learning objectives. The strategic planning process is often driven by technology, not by corporate objectives.

(d) A distorted valuing of technological solutions for the planning of education. The development of standards such as SCORM (Shareable Courseware Object Reference Model) and IMS (Instructional Management Systems) is a distraction as "there is nothing in any of those standards that focuses attention on the effectiveness of the Learning Objects".

(e) Failure to take into account that effective e-learning experiences for complex competencies are rarely

scalable. What works in a known and predictable manner on a small scale may work quite differently on a much larger scale, or may not even work at all.

This last point has less to do with a focus on learning and more on project planning. The so-called "scale effect" is., generally well known to engineers, economists, biologists and many other professional groups, but seems to be largely unknown or ignored in the field of technology-based education projects - until problems arise in the large-scale implementation phase of the project. See more on this and other relevant project planning / management issues in the Job-Aids section of this Review.

### **THE INTEGRATED "SYSTEMS" APPROACH.**

"Failure in E-learning can occur at three interlocking levels: the product level (poor course design; inadequate technology infrastructure); the learner level (poorly prepared learners, lack of motivation, no time); or the organizational level (low managerial support, lack of reward structure)". (Phillips, 2002).

Phillips expands this tri-partite model of the sources of failure as follows.

#### **Product Level**

- Poor course design (chunks of theory and facts with very little real-life application)
- Poor e-classroom design (complex navigation, chat rooms that crash, ugly interfaces)
- Ill-performing technology (poor audio, jerky video, interrupted data downloads, etc.)
- Poorly managed course social interactions (untrained or untried online moderators)
- Slow instructor/mentor response times

#### **Learner Level (Internal Context)**

- Lack of time
- Low interest in subject matter
- Low motivation for learning
- Poor self-study skills
- Poor time management skills
- Disrupting life interruptions (divorce, shift change, parental duties)
- Lack of necessary e-skills (downloading files, subscribing to e-mail lists)
- Psychological resistance to losing F2F learning perks (social networking, travel, snacks)

#### **Organizational Level (External Context)**

- Poor internal marketing of courses and events
- Lack of clear reward structure
- Failure to provide quality learning environment
- Failure to provide quality learning equipment
- Failure to provide managerial feedback and support of learning
- Failure to provide time on-the-job to train
- Corporate-wide lack of dedication to a learning culture
- Blanket mandate of e-learning as the new-new thing; removal of all other methods
- Failure to match Internet training to its most appropriate purposes

This list of possible failure factors is the closest thing to an overall, total systems, analysis of the E-learning phenomenon and possible sources of problems that was located in the literature analysed. Although the analysis is presented in three subsystems, or "levels", the list really covers (albeit scantily) all four of the E, L, M & N factors that were used as an organizing structure in the earlier paragraphs. Much could, however be added to this list. Even a cross referencing exercise that compared this list with the many partial lists analysed in the preceeding pages, would produce an integrated list well over twice as long.

### **THE NEED FOR SYSTEMATIC RESEARCH ON E-LEARNING**

One further limitation on the value of such a list is that it is largely composed of the opinions and unsubstantiated insights of practitioners, or in some cases, non-practicing theoreticians, rather than on empirical data. Only some of the principles that have emerged from the literature analysis have any significant research to back them up. This can be seen as a limitation, but also as an opportunity to structure a research agenda that may build on what has been established and verify what has not. Another

limitation of the literature analyzed is that very little of it presents detailed accounts of actual projects that have failed or exhibited serious problems. The writers reviewed all refer to such phenomena as high dropout rates, student dissatisfaction, puerile and irrelevant learning materials, or lack of return on investment. But the specific cases where these problems have been observed are not documented. This makes it difficult to go beyond the generalizations reported here and examine the actual problems in their context, thus making some judgements about the underlying causes of the problems.

Maybe it is too early yet in the history of E-learning to expect a rich and well organized research knowledge base. However, it is not too early to plan for it. An example of an approach that appears applicable to and promising for the current case, is a project currently being performed by Badrul Khan. After the publication of *Web-Based Instruction* (Khan 1997) the author communicated with learners, instructors, administrators, and technical and other support services staff involved in E-Learning (in both academic and corporate settings) all over the world. Also, as the editor of *Web-Based Training* (2001) he had the opportunity to work closely with more than 100 authors worldwide who had contributed chapters to these two books. Through these activities, he came to realize that e-learning represents a paradigm shift not only for learners, but also for instructors, administrators, technical and other support services staff, and indeed the institution as a whole.

This amassed experience led Khan to formulate an extensive list of issues that are organized around eight key dimensions that form a course designer's "Framework for E-Learning" (see Figure 8). These critical dimensions are: pedagogical, institutional, technological, interface design, evaluation, management, resource support, and ethical considerations. Each dimension has several sub-dimensions, and each sub-dimension consists of issues related to a specific aspect of an e-learning environment. These issues generate many questions that course designers can ask themselves when planning or designing an e-learning system.



Figure 8. An eight-dimensional "Framework for E-Learning" project design and development. (Morrison & Khan, 2003)

More detail on the framework and how to use it may be found in Morrison & Khan (2003) and soon in two new books that are to be published in several languages. **E-Learning Strategies** (in press) is a detailed description of the framework and all the planning issues it raises. **E-Learning QUICK Checklist** (in press) presents questions that one can use to design and evaluate e-learning materials and distance education programs. This work is an attempt to integrate in a systematic way the practical experience of those who have "tried and sometimes failed" so as to serve as a set of guidelines for those who follow on. In the first instance, this project is more an integration of praxis than of research evidence, for as mentioned before, there is much practice but little hard research on E-learning so far. However, the available research is also

being integrated into the framework and the process of integrating the experience of the pioneers is in itself a qualitative research study of sorts. Furthermore, the resultant guidelines themselves may act as a stimulus for other researchers to identify key questions that require further investigation and perform the necessary studies.

#### **CONCLUSION: SOMETIMES PRAXIS PRECEDES RESEARCH.**

Some years ago, I was working in a large and long-existing management consulting organization. When I first joined the organization, I was exposed to several key maxims for successful project execution that the organization used in their internal staff training. One of these maxims was "A successful project is just 20% technique and 80% tactics". In this context, the term "technique" was understood as all that you can learn from books or courses, and "tactics" are what you learn on the job, from the "university of life". As is the case with most maxims, this may well be an exaggeration of the reality. However, it makes the point that, quite often the case in the human sciences, the hard research studies are performed later and corroborate what "reflective practitioners" have already identified from their praxis and transformed into a set of heuristic principles, or "maxims".

We may conclude, from praxis if not from empirical research, that the factors that most strongly impact the ultimate success or failure of an E-Learning project, are little related to the technologies used and the technicalities of designing courses for these technologies. They have much more to do with the broader and more general factors that impact the success or failure of any innovation in the context of human-activity systems - education and training systems are prime examples, but the principles are far more generally applicable.

These principles are unfortunately less formally studied - even less capable of being studied - than the mainstream ID models of our field. However, there is some progress. As regards the first major phase of a project - initial project design (as depicted in the Job-Aids), much knowledge has recently been contributed by the research and praxis that we now refer to as performance improvement technology, or "performance engineering". As regards the study of the Integrated Systems Approach and its application across all project phases, but most importantly in the third (full-scale implementation and management) phase, we are still somewhat behind where we should be. It would be natural to look at the management sciences in general, and especially the knowledge base on project management. However, if the sages at my old management consulting organization were correct (and I think that they were), then much of the really important learning in this area is not classroom or theory-based, but is achieved on-the-job, by working in real project contexts and dealing with real people.

The key question is whether the proponents and practitioners of E-Learning projects will themselves learn (and in time) what they need to learn as regards the Systems Approach and its effective application to project planning, implementation, management and evaluation. Or will the "E-Learning phenomenon" trace a similar "rise and fall" trajectory as was the case of so many promising innovations in the recent history of education and training? Time will tell. But the indications are that we shall find out sooner rather than later!

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