Learners in a Changing Learning Landscape:
Reflections from an Instructional Design Perspective

Jeroen J. G. van Merriënboer

Open University of the Netherlands

Both learners and teachers find themselves in a learning landscape that is constantly and dramatically changing in terms of the modalities through which people learn, the purposes for which they learn, and the context in which learning acquires its meaning (Visser, this dialogue). I will reflect on this phenomenon from the perspective of an instructional designer rather than the perspective of a learner – simply because being a learner does not distinguish me from anyone else but being an instructional designer and, in particular, being a researcher in the field of instructional design is my profession. Instructional designers basically try to select instructional methods that make learning effective, efficient, and appealing. They typically do so on the basis of an analysis of, among others, what ought to be learned, in which context or under which circumstances it is learned, and by whom it is learned. Researchers in the field of instructional design carefully investigate the conditions under which particular methods yield desired effects and organize those methods in instructional design models or theories. In this short reflective paper, I will first sketch the new learning landscape in terms of changes in what is learned, changes in contexts, and changes in learners. Then, I will discuss the implications for selecting instructional methods, that is, the implications for the field of instructional design.

Changing What is Learned

In order to deal with rapid societal and technological changes, people more than ever need problem-solving and reasoning skills that allow them to deal with new, unfamiliar situations in their professional and everyday life. This focus on complex skills or professional competencies implies the integration of knowledge, skills, and attitudes in such a way that transfer of learning is enhanced. Thus, learning is no longer primarily about reaching specific learning objectives, but about the ability to flexibly apply what has been learned in new problem situations.

A related issue is that life-long learning, often in non-formal settings, is becoming a necessity to survive in a society in which jobs and technologies quickly change. This asks for higher-order and "metacognitive" skills that allow for independent, self-directed learning, such as information problem solving, self-assessment and self-regulation skills, and learning-to-learn. Consequently, in addition to flexible and transferable professional competencies, learning competencies are becoming increasingly important.

These developments in "what is learned" have clear implications for the use of instructional methods. In modern instructional theories, there is a focus on whole, meaningful learning tasks that are based on real-life tasks as the driving force for learning (Merrill, 2002; van Merriënboer & Sweller, 2005). The general assumption is that such tasks help learners to integrate the knowledge, skills and attitudes necessary to deal with real-life problems, and also provide a fruitful basis for the development of higher-order skills. Instructional methods primarily pertain to experiential learning in real or simulated task environments, and include the design of learning tasks or learning experiences, the sequencing of those experiences, and ways to scaffold the learning process (see van Merriënboer, Kirschner, & Kester, 2003). On-line learning makes experiential learning in *simulated* task environments only possible to a certain degree. That is, it should be perfectly clear that on-line learning alone would never be sufficient to educate medical doctors, who need to practice with patients of flesh and blood; lawyers, who need to practice in real court yards; or carpenters, who need to practice with real wood and tools.

Changing Contexts

In addition to changes in what is learned, there are also major changes in the contexts in which learning occurs. Learning in technology-rich, informal and professional settings is becoming general practice. In modern societies, people have 24-hour opportunities to connect to other people and to vast information resources through mobile phones, MP3 players, Personal Digital Assistants, laptop computers, and other mobile devices. These technologies allow for the realization of many instructional methods that sustain different types of on-line learning.

Even more important, new technologies allow for time- and place-independent learning and for individualization of instruction, because mass media (books, television, radio) are more and more intertwined and replaced with personalized media that provide on-demand information and support, tailored to the particular needs and preferences of individual users and learners. An enormous increase in the flexibility of education may be expected, a process that is driven by mass-individualization or mass-customization (Schellekens, Paas, & van Merriënboer, 2003).

Contextual changes clearly affect the use of instructional methods. More and more instructional methods can be realized in on-line tools and mobile devices, and new media-method combinations emerge with their own specific affordances. For instance, methods that stimulate learners to construct knowledge may use the interactive possibilities of hypermedia; methods that help learners to learn from each other may take form in on-line learning communities, and methods that aim at the just-in-time provision of information during professional task performance may take advantage of mobile technologies (e.g., presenting operating instructions on-demand on a mobile phone, PDA, or augmented reality glasses). Furthermore, the selection of instructional methods will no longer be based on the general characteristics of a whole "target group" but on the specific characteristics of the individual learner.

Changing Learners

This takes us to the changing learner. At an abstract level, it is tempting to describe the emergence of the "on-line learner", who is directing his own learning, who is focusing on the development of flexible problem solving skills, who is having a rich mix of (on-line) media to his disposition, and who is expecting instruction that is fully tailored to his personal needs. But on the individual level, differences between individual learners may have far greater implications for the selection of instructional methods than the emergence of the so-called on-line learner. I will give three examples. First, life-long learning will evidently mean that more and more elderly people become involved in goal-directed learning. And there is research evidence that effective instructional methods for older on-line learners are quite different from effective methods for younger on-line learners, due to a significant decrease in working memory capacity of the elderly (van Gerven, Paas, van Merrienboer, Hendriks, & Schmidt, 2003).

Second, life-long learning also implies that more and more learners are not novices in a particular learning domain, but are at various stages of expertise development. Recent research points out that this level of expertise is a major factor to be taken into account when selecting instructional methods. For instance, Kalyuga, Ayres, Chandler, and Sweller (2003) provide a review of research results on the "expertise reversal effect", which indicates that instructional methods that are effective for low-expertise learners are often ineffective for high-expertise learners, and vice versa. For instance, low-expertise learners learn more from studying worked examples than from solving the equivalent problems, while the opposite pattern is found for high-expertise learners.

Third, a common claim is that young learners (the "gaming generation") learn in new ways and have a new conception of learning. They would be better able to learn by trial and error, to seek helpful resources, to try out solutions, and so forth. This may be true for a subgroup of young learners, but research also points out that there are surprisingly large differences in students' perceptions of instructional methods and learning environments. For instance, Könings, Brand-Gruwel, and van Merrienboer (in press) studied the perceptions of young students (13-14

years of age) who were confronted with an educational innovation, characterized by the use of meaningful learning tasks, more independent learning, and individualization. Whereas some students perceived this innovation as desirable and an impetus for their learning, others perceived it as undesirable and *not* helpful for promoting their learning.

Implications

No doubt, the learning landscape is drastically changing. With regard to what is learned, there is more emphasis on complex skills and higher-order skills; with regard to contexts, new technologies allow for flexible time- and place independent learning and mass individualization; and with regard to the learners, there are better opportunities to adapt instructional methods to individual characteristics such as age, level of expertise, and learner perceptions. High-quality instructional design research is badly needed and should focus on the question which instructional methods or method-media combinations are effective, efficient and appealing for teaching complex and higher-order skills, in a highly flexible fashion, and taking learner's individual needs and preferences into account.

In my opinion, notions such as "on-line learning" and "the on-line learner" are not very helpful for the research field of instructional design. On-line learning refers to a motley collection of methods (presenting text on the screen, asking ready-made questions, showing video clips and animations, evoking discussions in asynchronous and synchronous discussion groups, engaging learners in highly interactive games and simulations, etc.) that invoke very different types of learning. This is not helpful to generate valuable research questions. And the term "on-line learner" suggests a homogeneity that simply does not exist: Effective instructional methods for different subgroups of on-line learners (e.g., young vs. old, high- vs. low-expertise, positive vs. negative perceptions) seem to be much more different from each other than methods for so-called on-line learners and "traditional" learners. Moreover, what we need to develop for the future are not methods for an intangible group of on-line learners, but methods that are tailored to the personal needs of individual learners. Only then, we are serious in putting the learner at the center of the learning environment, whether it is on-line or not.

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