INTEGRATING DIGITAL KNOWLEDGE
IN TEACHING SYSTEMS AS GROUNDS FOR
DEVELOPING KNOWLEDGE ECONOMY

INTEGRAREA CUNOȘTINȚELOR DIGITALE
ÎN SISTEMELE DE PREDARE CA TEMEI PENTRU
DEZVOLTAREA ECONOMIEI CUNOAȘTERII

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SUMMARY
We currently live in a digital world, surrounded by and immersed in technology. The pace of
technological change and innovation is increasing and leading to massive changes in all aspects of
our lives, including the way we teach and learn. Nevertheless, the design of teaching and learning
in academic institutions in Israel hardly serves the needs of the digital revolution generation. In
some cases, and in a number of educational institutions, the digital space is small and limited,
and many student audiences are not exposed to it. Integrating digital knowledge is a key tool in
the development of knowledge-intensive professions associated with the employment world of
knowledge economy. This article attempts to examine how it is possible, and even required to in-
te grate the acquisition of digital tools into the world of teaching, students, and teachers, in order
to prepare the grounds for knowledge economy professions among learners.

Keywords: digital knowledge, higher education, internationalism and globalization, the
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Introduction. We currently live in a digital world, surrounded by and immersed in tech-
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Main materials. Why integrate technology into teaching? Many education experts argue
that lecturers at universities and colleges must face the challenge of integrating technology into
teaching in a beneficial way. Baek et al [2] offered three main reasons for this requirement: (a)
The necessity to adapt teaching to the students’ contemporary daily functional environment.
The need to prepare students to functioning in society. The future work and the great potential that lie in utilizing the new technological capabilities to promote learning. Creating a learning environment that suits the contemporary digital generation’s everyday functional environment. Today’s students are very different from those of previous generations; Unlike in the past, many of them do not belong to the elite, and socio-cultural diversity of students and in all that this entails is much greater than ever before.

According to Peggy et al [6; p. 206] this diversity requires consideration in adapting teaching methods to the needs and abilities of contemporary students. In addition, today’s students are „digital natives.” They have grown into digital technology and are therefore accustomed to the intensive use of mobile and social media. The percentage of students who come to lectures with smartphones, laptops or tablets is constantly rising, and they expect to make optimal use of these media and their abilities for learning [9; p. 128].

Per Olof [8] A well-known social and economic researcher argued that although the massive use of these means and social media software has completely changed students’ ways of learning and learning styles, methods and ways of teaching in most academic courses have remained as they have been for decades and have not been adapted to daily functioning nor to the students’ new ways of learning. Thus, Yang et al [10] adds that it is necessary to update the learning environment of previous generations of students to one that suits the current generation - students who on average have less academic readiness and abilities than those of previous generations, but with higher abilities using digital means. To this end, classroom teaching and homework should incorporate activities that rely on the capabilities of mobile media and social media [8; 5].

Preparing students for functioning in the future world of society and work. Aguilar-Tablada et al [1] noted that one of the most important goals of teaching in academic institutions is to prepare students for future teaching life in academia, in society and work in the digital age, in a complex and ambiguous functioning and employment environment of insecurity and instability. How can we achieve this? Per Olof [8; p. 869] argued that in order to answer the question we must reexamine our teaching and learning methods, identify appropriate teaching methods that will advance learning through technology, and understand the key features of diverse technologies for their integration into teaching and learning. The education system must design teaching strategies that integrate high quality technology. An analysis of future employment needs reveals that the importance of the components of knowledge and skills required for proper professional functioning is increasing significantly in all professions, even those that require primarily technical skills and abilities. Therefore, Mioduser et al [5] adds, in order to train students to function in the future world of work, teaching should impart to them the following skills and abilities:

Communication skills. In addition to the basic skills of speaking, reading and writing, one should also include communication skills in social media, for example, the ability to communicate with large numbers of people online, make films for presentations and YouTube distribution, share information with large audiences, identify media trends and ideas and more.

Independent learning ability. The world of work is constantly changing and employees need to be responsible and able to adapt to changes, that is, to be a lifelong learners. Employees should be able to independently develop skills of handling new equipment or using new ways to perform tasks.

Ability to integrate into teamwork - almost every professional performance requires work
in collaboration and knowledge sharing with others. Thinking skills. The world of work is built on creating new products, finding new ways to function or designing and planning new services and procedures. All of these require diverse thinking skills, such as critical thinking, problem solving, creativity, originality, strategic activity.

**Digital skills.** Most knowledge-based activities in the world of work today depend largely on technology. Employees should be able to learn and understand the use of required technologies and know how to use them well.

**Knowledge Management.** Every employee needs to know how to find information in a particular field and about a specific topic and be able to evaluate and judge the information, analyze and process it into knowledge, apply and disseminate it.

**Making use of the pedagogical benefits of technology to promote learning.** Studies [4; 8; 10] point to the pedagogical benefits of using teaching technologies. These include variety in teaching methods, increasing interest in and commitment to learning, advancing the processes of learners’ understanding knowledge acquisition and improving student-lecturer interaction and interaction among students. The researcher argued in the article “The knowledge economy and the development of children’s thinking of economic and financial concepts” [3] that the use of these technologies also allows for constant access to information and learning experience and aids in a continuous learning process throughout the semester. Since the latest technology is available to students anyway, both in and out of the classroom, it is advisable to plan teaching both in class and at home so that it will be based on the use of mobile media and social networks.

**How to adopt technology in teaching optimally?** In order to be successful, it is necessary to learn about the problems and difficulties that have failed previous attempts of this kind, and what the factors that promoted the absorption and successful use of technologies in teaching were [1]. Mioduser et al [5] noted that failed expectations in the use of innovative teaching technologies over the last hundred years have been made numerous attempts to adopt newly developed technologies for teaching. Yang et al [10] asserted that all of them initially had high expectations that they would lead to a revolution in teaching and that would dramatically advance the effectiveness of learning and the use of the Internet for course websites. School surveys have shown that teachers who have used new technology in the classroom have done so only diffusely, unsystematically and only marginally - in a minimal portion of teaching time [7].

Studies [1;3;10] have shown, for example, that decades after computers were integrated into teaching in schools with massive investments of expertise, manpower and money, they have not led to a large-scale revolution in teaching and learning. In general, in those academic institutions that received significant funding for a particular use of technology for its introduction and adoption, the change did not lead to a revolution in teaching methods or long-term student learning.

**What are the problems and difficulties in integrating technologies into teaching?** Why has there not been a revolution in teaching in schools and universities despite all the great innovations and investments in money, expertise, time and effort? There is a long history of applying technologies in school and higher education classrooms. The education system as a whole must learn from the documentation of this experience what the obstacles are and what the factors are for the correct and beneficial adoption and use of the technology. According to Baek et al [2; p. 230], below is a summary of the integration problems of technology in teaching and the main difficulties identified.
1. **Demanding a substantial investment of time and effort in planning and operating technology in classroom teaching** - Studies on the history of teaching technology integration reforms introduced in schools show that one of the main and essential reasons for failure, though not always apparent, was the significant burden they placed on teachers’ work. If we learn from this history, then technological applications that require faculty members to invest considerable time and effort in teaching in the traditional approach (planning lessons, preparing the technological aspects of the lesson, communicating with students in forums). Such an investment may reduce the amount of time faculty are able to devote to their academic advancement. Based on past experience, if some faculty members still decide to adopt such changes in their teaching, they will apply it for marginal use only, in a way that reduces the investment of time their operation requires.

2. **Demand for a change in teachers’ role** - Another major reason why teachers did not adopt technologies in their teaching was because of the changes required in the way the teacher functions as a teaching focus. Many of the innovative technologies require pedagogies that shift the emphasis in teaching from the teacher to the students, such as approaches of active learning among students during the lesson. Because teacher-focused teaching (as is customary in Israel) is highly ingrained among faculty members and many of them have difficulty changing attitudes, many feel uncomfortable making the transition to student-focused teaching approaches [9].

3. **Failures in adapting technologies to classroom teaching** - Some studies have tried to identify the reasons for the failure of the reforms for integrating technology in schools, arguing that the blame is not necessarily on teachers or academic institutions that oppose the changes, but that there are fundamental problems in adapting the technology to classroom teaching and they harm success of the change. The application of new technologies usually begins with difficulties but is more easily obtained if appropriate attention is paid in advance to the needs of users - to “human engineering”. When it comes to technological devices and applications, hardware and software companies nowadays pay much attention to the design of contact and communication with users. Similarly, teachers and all those involved in the application of technology in classroom teaching should pay deep attention to planning the communication of technology with students in the teaching and learning procedures.

Studies of digital integration and computer work in schools have identified large and significant gaps between the expectations and goals of technology-based learning environment designers, and the unexpected results obtained during application - when students actually functioned in the learning environment. The unexpected [1] results identified are:

A. **The conduct of students’ interaction with the learning environment** and its outcomes may be very different from those planned by the application designers of the particular technology or by teachers. Studies have shown that when students and teachers adapted to an innovative learning environment inspired by technology, they used this environment in their learning in ways and purposes that were completely different from those planned and expected by the technological application designers. As a result, even when teachers planned a particular use of technology, many times the learning outcomes based on that use were different from those expected by them.

B. **Each uniquely designed learning environment imparts to it unique learning conditions** that materially affect the interactions between student, teacher, and context. The design of communication between technology and users, and aspects of human engineering significantly and decisively influence teaching and learning. For example, two hardware products
designed for the same purpose but differently, may be operated differently by students and lead to completely different learning outcomes. A particular teaching method that has been proven to be successful in one learning situation may not lead to the same success if used in a slightly different teaching/learning context.

C. The benefit of learning from interacting with a particular learning environment depends significantly on students’ characteristics and abilities. For example, certain features of the hardware or software may be „unfriendly” to certain users, such as weak students or those without adequate basic preparation and interfere with their learning. For example, limiting response time or evaluating an activity while performing it may interfere with some users’ learning, but may greatly promote the learning of users with other attributes (successful students for example, or students with good basic preparation). Differences in hardware and software user-friendliness contribute to large differences in learning, especially between students who have high academic abilities and those who have low abilities. Thus, hardware, software and teaching methods designers in innovative learning environments should pay particular attention to promoting the learning environment’s friendliness, especially with regard to vulnerable populations, as opposed to requiring students to adapt to work in a uniform environment.

D. Designing technology-integrated teaching based on philosophies, beliefs and teaching/learning theories developed for non-technological learning environments as is done today, does not guarantee achievement of desired learning goals. Previous generalizations have indicated that we do not have enough research-based knowledge about designing teaching integrated with technology so that it will lead to increased learning.

To bridge the gap and enrich our knowledge in these matters, studies need to be conducted on various aspects of the design of learning environments and its impact on learning. Identifying learning problems in an innovative learning environment requires invested, in-depth and long-term research of observations and interviews. Short, superficial and simple studies cannot identify the problems responsibly. Thus, technological innovation in the classroom does not always lead to the planned and desired results. Some of the innovative methods fail because they do not lead to a significant change in learning or because while using them, unexpected side effects are discovered, not all of which are positive.

In conclusion, in order to be successful at integrating technology to promote learning, it is important to consider all the factors that may influence implementation - both the factors that interfere with technology application in classroom teaching and those that promote application.

The researcher has identified promoting factors in the successful integration of technology in the curriculum, which are:

A. Teacher’s positive attitudes toward technology integration in class teaching. Positive attitudes increase the motivation to integrate and overcome difficulties.

B. Background of successful experience integrating technology in teaching. It was found that teachers who have already successfully used a certain technology in teaching have positive attitudes toward integrating this technology and other technologies in teaching, while teachers who did not experience such use tend to have fewer positive attitudes. The explanation presented was that accumulating experience in using certain technology in teaching gives teachers’ greater self-confidence and comfort in this use. Therefore, previous experience and satisfaction with the results of such integration are essential for future use in this particular technology and even of another technology in teaching.

C. High personal motivation to teach well and develop as teachers and personal com-
mitment to promoting student learning, which is expressed in dedication and devotion to considerable time and effort to lesson preparation.

D. **Getting significant support from the learning institutes to use technology in teaching** - both basic, in publicly announcing, at a verbal level, and one that involves financial investment by the institute like paying an expert for support.

E. **Good access to technology in class** - getting help from a technician sent by the institute in operating technology in the classroom so the teacher will not fail in technical aspects, and accessibility to hardware and software equipment and applications to an appropriate extent for all students.

F. **Having a support group** (usually online) of staff members who use the same technology for advice and feedback.

**Bibliography**


