**E-DUCATION AS A POWERFUL TOOL IN STEM AND**

**BEYOND**

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“One of the most important

areas we can develop as

professionals is competence in

accessing and sharing

knowledge”

Connie Malamed

The word “school” derives from Greek σχολή (scholē), originally

meaning “leisure”, since in ancient Greece education was considered

a leisure pursuit only available to the privileged few. Society has come

a long way since then and at present, education in general and higher

education in particular, is viewed not as an end in itself but as an

investment in human capital, and a way to secure an adequate income

while contributing to society's needs. The number of young adults

wishing to obtain a degree is therefore constantly increasing.

Estimates show that the demand for higher education worldwide will

have expanded from 97 million students in 2000 to over 262 million

by 2025 [1].

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In discussions of higher education, academics are typically at the

forefront of conversation, and career and technical education, i.e.

specialized education programs in the skilled trades, health sciences,

applied sciences, modern technologies and other types of career

preparation, such as dental assistant, emergency medical technician,

computer networking, digital media, programming, carpentry and

even agricultural sciences, which might help alumni to have an easier

time finding jobs in today's difficult labour market, is often

overlooked. It also might be a more cost-effective way for students to

earn their degree, as it usually does not take as long as completing a

college degree. Another possibility to reduce the amount of money

students must borrow to complete their degrees, question especially

sharp for some of the western countries, for instance in USA, is a

competency-based learning, implied by Re-Inventing schools

coalition, Young Women’s Leadership Charter School and Western

Governors University, which allows students to move through course

material at their own pace through self-assessment and multisource or

360 feedback. Their exam scores rather than the number of hours spent

in a classroom dictate how quickly students move through course

material. Some institutions that are utilizing competency-based

learning are advertising that students can cut the time it takes to

complete a degree in half, and has appeared to be a successful model

for many residency programs across Canada [2; 3].

The ability to measure innovation is essential to an improvement

strategy in education. Knowing whether, and how much, practices are

changing within classrooms and educational organizations, how

teachers develop and use their pedagogical resources, and to what

extent change can be linked to improvements would provide a

substantial increase in the international education knowledge base. As

among the most important questions in nowadays education remain

globalization in education and education reforms and emerging

technologies in learning as well as learning for employment,

emphasizing an inevitable grand role of virtual labs and e-learning,

along with education economics, accreditation, quality and

assessment, as could be noticed by looking at the list of leading world

educational conferences like INTED topics.

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Students learn well when they take responsibility for their

learning. Learning increasingly takes place in an environment, which

is constantly evolving to respond to the personal needs of each learner.

The emergence of Open Educational Resources and Massive Open

Online Courses (MOOC; now being effectively developed in KazNU)

is expected to offer multiple advantages in terms of increased access

to higher education, reduced costs and flexible timetables, to name just

a few. However, there is little scientific evidence to prove the

efficiency of these new models. Some critics even argue that they may

well be just another attempt to further commercialise higher education.

Meanwhile, blended learning – a combination of traditional training

with digital online content – is seen by many as the best alternative.

Gibbs G. 1981’s notice is still correct. Awareness and reflection are

not merely symptoms of developments in learners, they bring about

the developments. It is through engaging students in reflecting upon

the process and outcomes of their studying that progress is made [4].

According to Wikipedia’s definition distance education or

distance learning is a mode of delivering education and instruction,

often on an individual basis, to students who are not physically present

in a traditional setting such as a classroom. Distance learning provides

“access to learning when the source of information and the learners

are separated by time and distance, or both”. Distance education

courses that require a physical on-site presence for any reason

(excluding taking examinations) have been referred to as hybrid or

blended courses of study [5; 6]

Michael Scott Cuthbert, Associate Professor of Music (Ph.D.,

2006, Harvard University) is a musicologist who has worked

extensively on music of the fourteenth-century, computational

musicology, and minimalism and other music of the past forty years.

His article, “Tipping the Iceberg: Missing Italian Polyphony from the

Age of Schism,” used computer simulations to contradict the

unquestioned assumption that most written medieval music has been

lost. Cuthbert’s research lab has produced “music21,” an open-source

toolkit for computer-aided musical analysis, which has an installed

user base in the thousands: “I think OCW (Massachusetts Institute of

Technology OpenCourseWare Educational Platform) is amazing. One

of the reasons I really love it so much is that, because I studied art,

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there were a lot of topics that I missed in the sciences. So OCW allows

me to really brush up on those topics that really interest me… OCW

is obviously great for self-learning. But what I think is sometimes

overlooked is how valuable OCW can be for faculty who are creating

their own courses. It allows anyone get an inside look at how other

professors are organizing and teaching their classes, in a way they

might never have seen. That kind of exposure is invaluable.” He has

recently published his own two MIT courses on OCW (21M.269

Studies in Western Music History: Quantitative and Computational

Approaches to Music History, 21M.262 Modern Music: 1900-1960,

and 21M.220 Early Music): “I hope that people find my course useful

– but I also hope they’ll tell me what they don’t like about it. At places

like MIT – all over the world, really – there are people who are trying

to actually change and evolve knowledge, not just report what’s

already known. Disagreements and feedback are what creates

diversity and new discoveries. That’s what really interests me most.”

For the foreseeable future at least, Cuthbert seems to be close enough

to the cutting edge of musical history research, that we can probably

afford to listen and learn from him, rather than disagree.

Good example of online learning destination and MOOC provider

is edX, founded by Harvard University and MIT in 2012, which offers

950+ high-quality courses in subjects such as humanities, math, and

computer science from the world’s best universities and institutions to

learners everywhere with 2,300+ faculty and staff teaching courses

and discussing topics online and 840,000+ certificates proudly earned

by edX students. It has 90 global partners, including: The Laura and

John Arnold Foundation, which supported the development of the edX

platform and increase the number of high-quality courses available to

learners; The Gates Foundation, which helps edX to develop courses

as well as partner with community colleges to experiment with the use

of the courses in a “flipped classroom”; Modern States, working with

edX to help more students enter or return to the traditional college

system and to make quality education more accessible; LaunchCode,

which creates pathways to economic opportunity and upward mobility

through online learning, apprenticeships and job placement in

technology.

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**E-ducation does not just happen. It requires careful planning and**

**implementation. The success of the distance learning throughout the**

**semester within the framework of the course “Organization of**

**scientific research on creation of naturally based medicines” taught by**

**Professor Galiya E. Zhussupova to two graduate students (who**

**currently are at the University of Valencia, Valencia, Spain) was in**

**providing the complete list of information, including guidelines and**

**recommendations to the study of theoretical material, set of material**

**for lectures and seminars, including a complete list of normative**

**documents in the form of temporarily administrative normative**

**documentation, industrial regulations for production of medicines in**

**the form of substances, ointments, tinctures, syrups, capsules,**

**suppositories, developed at the Department of Chemistry and**

**Technology of organic substances, natural compounds and polymer of**

**al-Farabi Kazakh National University. In general, distance learning**

**technologies at our University are used in the learning process for**

**students of corresponding department (second higher education and**

**the first higher education on the basis of medium-specific), as well as**

**for students who went abroad on scientific and language training**

**programs.**

**Another example is a set of electronic lectures, including**

**Polymerase Chain Reaction (PCR) developed in correspondence with**

**Center for distance education, KazNU. The PCR course is intended**

**for a full-time study in computer classes and online learning network**

**(as present on introductory and supplementary level to the general**

**training or upon becoming a part of a larger on-line course or**

**electronic manual) and might be useful not only for the students of our**

**own faculty, School of Biology and Biotechnology (as was shown on**

**third year bachelor students specialty “Biotechnology” during the**

**course “Molecular diagnostics”), but also during classes with the**

**students of other specialties (for instance such as law, mathematics**

**and computer modelling).**

**International experience valuable for teaching at the Department**

**of Molecular Biology and Genetics, School of Biology and**

**Biotechnology:**

**- Own training through local and international programs and**

**Institute for Advanced Studies;**

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**- Involvement of international readers for a year (Prof. Asim**

**Esen), semester (Dr. D.Utepbergenov), two weeks (international**

**consultants of PhD candidates) as well as independent experimental**

**workshop on yeast two hybrid system for bachelor students by**

**Erasmus+ Program Awardee Prof. Thierry Berges, Uni-Poitiers,**

**France;**

**- Teachers and students training abroad through Bolashak and**

**various international programs (including but not limited to Fulbright,**

**British Council’s Researcher Links, TechWomen, etc.);**

**- Webinars and other Internet-based resources and courses (like**

**Coursera, TedX), including Department initiated International**

**scientific-practical Internet-based Conference “Modern achievements**

**and perspectives of molecular biology and genetics” and the recent Gglobal**

**conference held with participation of researchers from UK.**

**REFERENCES**

**1. Bjarnason S. et al. A new dynamic: private higher education. UNESCO, 2009.**

**2. Neal S. Competency-based education will redefine how future degrees are**

**attained // Dean and Provost, 2015, Vol. 16, No. 5, P. 8.**

**3. Charles L. et al. Effectiveness of a core competency-based program on**

**residents learning and experience // Can Geriatr J., 2016, Vol. 19, No. 2, P. 50-57.**

**4. Higher education in the EU: Approaches, issues and trends. European**

**Parliament, 2015.**

**5. Strategy for Academic Mobility in the Republic of Kazakhstan for 2012-2020.**

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