

INNOVATIVE IDEAS REGARDING ICT USE IN EDUCATION

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This paper begins with the description of the Levinsky College Conference held on December 2012 and presented innovative methodology and innovation in education; it also included a competition between technology start-up ventures in the field of education, and post event gatherings of roundtable discussions. The IAEA 39th Annual conference held on October 2013, focused on incorporating technology into testing programs. This essay describes two computer based assessment programs testing collaborative Problem Solving Skills and Mathematics.

Keywords: *teacher training, innovation, technology, evaluation, assessment, collaborative skills.*

IDEI INOVATOARE ÎN CEEA CE PRIVEȘTE UTILIZAREA TIC ÎN EDUCAȚIE

Prezenta lucrare începe cu descrierea analitică a Conferinței de la Levinsky College, din decembrie 2012, în cadrul căreia au fost puse în dezbateră metodologii inovative și inovații în educație; de asemenea, se vorbește despre o concurență între tehnologiile ventures. Conferința anuală a IAEA din octombrie 2013 (39-a) s-a concentrat pe încorporarea tehnologiilor TIC în programe de testare. Acest eseu descrie două programe de evaluare pe bază de calculator și testarea abilităților de rezolvare a problemelor și de matematică prin colaborare.

Cuvinte-cheie: *formare a cadrelor didactice, inovație, tehnologie, evaluare, abilități de colaborare.*

Education is a socially intended activity. Quality education has traditionally been associated with teachers having high levels of personal contact with learners. In contrast, the use of ICT in education is a more student-centered process [1]. Therefore, with the world of education currently undergoing a massive change as a result of the digital revolution, the role of ICT in education is becoming more and more important. These new technologies create learning opportunities that challenge traditional schools [2].

100 years of Research, Innovation and Discourse in Education, Teacher Education and Music Education International Conference

As part of the celebration of 100 years to Levinsky College of Education, an International Conference was held on December 10-11. The conference was attended by professors and leading educators from Israel and abroad. It also included a competition between technology start-up ventures in the field of education, and post event gatherings of roundtable discussions, and formulating a position paper regarding the future of education in Israel. "The motto of the conference is the presentation of updated information in the research and theory fields and its implications for education, teacher training and music education" says Prof. Hanna Azar, the conference chair, in collaboration with Noah Greenfeld, director of the teacher training department at the Ministry of Education. "It deals with various aspects in areas such as technology, mathematics, language, science, pedagogy, multiculturalism and more".

The conference's topics were presented in 3 aspects:

- **Discourse in Education:** Dialogue and communication among various groups; educational dialogue as a means of change and empowerment in a changing pluralistic society; discourse analysis in various contexts – in preschool, in the classroom, in schools, in society; perception of personal, professional and cultural identity based on discourse analysis.
- **Innovative Methodology:** Relevant research genres in education; the role of research in professional development of teacher educators, teachers and student teachers; the relationship between research and practice in education.
- **Innovation in Education:** Exceptional projects to promote various domains in education; innovative educational models; technological innovations such as innovative collaborative learning models and their role in education; creation of a learning community; conflicts created by technology; cooperation in a global world through technology; multicultural education in an era of change; the changing face of literacy in school and society; educational-social involvement in the community; teacher-parent-pupil attitudes and relations; innovation and renewal in teacher education.

During the conference a startup competition was held for promoting technology start-up ventures in education, the first competition of its kind in Israel. The winners were awarded cash prizes and support in their academic research. A lecturer in this session was the high-tech entrepreneur, Yanki Margalit, who is the founder of "Aladdin" and a number of other social enterprises. The competition was directed by Mr. Teddy nice, CEO of "C Capital".

These are the six start-ups that reached the final competition:

1. **LEARNI**- develops a learning platform for tablets allowing interesting, challenging, cooperative and updated learning. Learni's platform includes tools for teachers and students, content creation tools, and tools for managing and producing conclusions from the learning results. Every word in Learni's digital book allows in-depth studies in the form of various researches. The platform allows students with reading disabilities to instruct the book to read them a specific paragraph. The system allows the student to refer to his study material while conducting a research (can write footnotes on the page), sharing it with other children and learning from other students' work. Teachers receive evaluation and can reflect on the student's activities in the classroom, for example: the teacher knows what page the student is reading, and has the ability to challenge students with questions. In addition, Learni has developed software which enables the creating of a digital book by teachers and students, with the ability to distribute it directly to the students' or teachers' tablets.
2. **Piano Dust Buster**- is a Joy Tunes application to practice music. It transforms musical skills into engaging experiences - activated by playing regular musical instruments. It encourages kids and adults to discover (or rediscover) a love for music and the piano. The app is activated by playing a real piano
3. **Slate Science**- Specializes in developing educational materials for tablets and smartphones, with an emphasis on mathematics. Their goal is to create an excellent attractive tablet software for teaching mathematics in early childhood. They are currently developing a series of products for 2nd graders to 6th graders, with focus on problematic learning contents. The company's products operate in Hebrew, Arabic, and English, and can be translated into other languages easily.
4. **SpeakingPal**- is a mobile education company with a unique focus on speaking skills. High-end multimedia rich content is combined with automatic speech recognition to deliver a highly engaging and interactive solution for practicing speaking. Their award-winning solution has been approved by ETS, creator of the well-known TOEIC and TOEFL tests and administrator of over 50M tests annually worldwide. SpeakingPal lets you simply talk into your mobile with a video character and get instant feedback on how well you have said all words and sentences. Feedback is provided with easy-to-understand 'traffic-light' color-coding, along with native videos for comparison.
5. **Tucoola**- is an Israeli start - up company established in 2009. It develops a platform that analyzes and improves skills and expertise such as: memory, attentiveness, eye-hand contact, of children aged 2-8 through fun games. For each child, the system automatically builds a personal improvement program that prepares him for life and for school and also provides information for the parents about the child's development process and a variety of reports and tips for improvement. The concept of Tucoola was developed in collaboration with leading academics from Israel and the world, child development specialists, and psychologists. Its technology is based on the company's patent involving algorithms, data collection and software. The company offers the service over the internet and is currently working on a new version to the network and parallel platforms products such as: Mobiles and Smart TV.
6. **Wikibrains**- Extraordinary conceptual idea on how to improve the search process online. This is a search engine who works by associations and not allusions. It is actually based on collaborative brainstorming of all users. By writing a word, a number of different associations to the word come up. Students simply insert the topic they want to explore and the software serves them with new and fresh ideas from other students. Within a couple of minutes they can build a map with all the relevant content and connected ideas. WikiBrains offers a tool to search, view, discuss and share the vast content available on the internet, which is based on the concept of brainstorming and mind mapping.

Slate-Math won first prize in the startup competition, Learni reached second place and Tucoola won third prize.

Levinsky College of Education held a post event roundtable conference on "Education System -Future thinking outside the box" and the leading question was "Leading high-tech, leading -Education How?" Officials, involved in promoting education in Israel from the public sector -and the private sector took part. The purpose of the event was to discuss issues that concern educators from different perspectives and formulate

suggestions and ideas for education in contemporary society. The opening event was a panel discussion attended by public officials and educators. All panelists presented their perspective on the future of education. The discussions objectives were to draw lines of and to characterize the future education system and visualize the future teachers.

Summary of discussions concluded that the contemporary education system does not provide satisfactory reply to the characteristics of the postmodern age. There was a consensus that one of the major functions of the school is to educate "to be human". The awareness to changes in society and the implications of these changes on the education system and teacher education are in the background of the perception of the future education system. The call was for change and the creation of an educational space that will allow those involved to find meaning and develop skills, strategies and expertise needed for the learner in the postmodern age, an age of relativism, pluralism, multi-lingual, and advanced technologies. The center of the discussions was the need to develop a holistic identity, grounded in the world of values and personal, interpersonal and literacy skills.

**The 39th Annual Conference IAEA:
The International Association for Educational Assessment,
October 20-25, 2013, Tel Aviv**

Educational Assessment 2.0: Technology in Educational Assessment [4]

The International Association for Educational Assessment (IAEA), founded in 1975, is a not-for-profit, non-governmental association of educational measurement agencies around the world. The general purpose of IAEA is to improve the quality of education by assisting educational agencies in the development and appropriate application of educational assessment techniques. According to IAEA this is best achieved through international cooperation that helps nations learn from each other with respect for their cultural autonomy. IAEA has consultative status with UNESCO in the achievement of mutual goals.

The conference was hosted by the National Institute for Testing & Evaluation (NITE), established by the Associated Heads of the Universities in Israel in 1981, its aim to centralize the development and administration of admissions and placement tests for tertiary education. NITE enables Israel's leading professionals in the field of psychometrics and measurement to join forces, thus enhancing the quality and efficiency of university admissions testing on a national scale.

"The 21st century abounds in technological advances that affect virtually every area of our lives. The field of education is no exception, and new computer technology is increasingly being incorporated into teaching and learning. Mirroring the use of technology in education, 21st century testing programs are focusing more and more on incorporating technology into their tests. This trend has facilitated the use of multifaceted and authentic tasks, thus allowing for the assessment of more complex and high-order skills. In addition, technology offers solutions to many other challenges faced by testing programs." [Conference Theme]

Computer-Based Assessment of collaborative Problem Solving Skills: Human-to-Agent Versus Human-to-Human, by: Yigal Rosen, Maryam Tager

The central question arises is how can we standardize environments and activities in which collaborative skills of an individual are measured. In order to understand how students perform on collaborative problem-solving (CPS) computer based assessment, it is necessary to examine empirically the multifaceted performance that may be distributed across environments, collaboration methods, and problem-solving spaces. The aim of the study was to explore patterns in student CPS performance and motivation in human-to-agent (H-A) settings compared to human-to-human (H-H) settings. 179 students at the age of 14 from the United States, Singapore, and Israel participated in the study. In Both H-A mode and H-H mode students were able to collaborate and communicate by using identical methods and resources. However, while in the H-A mode, students collaborated with a simulated computer-driven partner, in the H-H mode, students collaborated with other students to solve a problem. Overall the findings showed that in standardized CPS settings, students assessed in H-A mode outperformed their peers in H-H mode, in collaborative skills. Cps with a computer agent involved significantly higher levels of shared understanding, progress monitoring, and feedback. However, no significant difference was found in a student's ability to solve the problem and in student motivation with a computer agent or a human partner. According to the researchers of this study, it is among the

first of its kind to investigate systematically the effect of collaborative problem solving in H-A and H-H standardized assessment settings.

Computer-Based Interactive Tasks: A new Approach in Mathematics Evaluation

By: Sara HersHKovits, Yaniv Biton, Tali Freund

Computer based evaluation (CBE), especially with interactive tasks, is appropriate for the math domain, given its diverse teaching-learning goals: conceptual knowledge ideas and processes, procedural knowledge, problem solving and inquiry processes:

1. CBE can be used to evaluate student problem-solving and inquiry processes and not only products ("the correct answer"). Computerized labs designed according to principles in the domain can present phenomena, processes and connections between attributes. Students can use labs to demonstrate their abilities to solve problems, make predictions and observations, record data and draw appropriate conclusions. Interactive tasks can assist in documenting processes and gathering information which could not be otherwise collected.
2. CBE can be used not only for summative but also for formative purposes. CBE can capture student strategies and inquiry skills, determine if they are systematic or random and identify student misconceptions. This data can be used by teachers to improve their teaching of diverse learners, and by students to help avoid repeating their errors.
3. CBE help to neutralize student dependency on verbal skills, especially for the populations with special needs (second-language learners and students with learning disabilities). Interactive tasks, which invite students to demonstrate practical skills, not readily mediated by verbal expressions, can promote such improved measurements.
4. CBE allows for measuring the exact amount of time students need to arrive at a solution to a problem.
5. The interactive assessment tasks can be integrated onto the digital text-book.

The lecturers presented a new approach for computer based interactive tasks:

- a. Not only summative assessment tasks but also formative assessment tasks integrated throughout the learning.
- b. Not only assessment tasks within a test but also assessment tasks integrated into the learner's digital text-book and constitute an integral part of the learning process.
- c. Not only individual assessment tasks (each learner by himself) but also assessment tasks which invite group assessment.

They also chose to show examples that highlight 3 important features for a computer-based task:

- a. The task involves interactive activities.
- b. The task would be difficult to accomplish with paper and pencil, or with paper and scissors.
- c. The solving process enables the teacher to learn more about the student's ability.

One of the examples for computerized based assessment given in the lecture was "Magic with Numbers", this software main characteristics are:

- Computerized assessment not based solely on single answer questions.
- Tasks which encourage questions of higher-order thinking skills.
- Tasks which allow the tracking of thoughts process / resolution process.
- Tasks which invite collaborative assessment / peer assessment.

In the example of "investigating the area of the Parallelogram", given as another computer based assessment, another aspect was presented:

- The teacher can participate in the editing / construction of the computerized task (assessment which is not predetermined).

During the lecture, other examples of interactive tasks in math were presented, in order to illustrate the power of computer-based evaluation.

As for the question why assessment literacy? The researchers answered- Teacher quality:

- Teachers as object of assessment.
- Teacher quality... "single most important in-school factor" [OECD, 2005].
- "No education system can be better than the quality of its teachers" [Cameron, 2010]
- Sets of interlocking standards, for graduates, teachers, principals.

The researchers also addressed future challenges, including the challenge of building tools for automatically evaluating student responses to questions that include interactions, as well as documenting and analyzing the processes of student work.

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