Kokand University

RAQAMLI TEXNOLOGIYALARNING YANGI O‘ZBEKISTON RIVOJIGA TA’SIRI

Xalqaro ilmiy-amaliy konferensiyasi to'plami

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ВЛИЯНИЕ ЦИФРОВЫХ ТЕХНОЛОГИЙ НА РАЗВИТИЕ НОВОГО УЗБЕКИСТАНА

IMPACT OF DIGITAL TECHNOLOGIES ON THE DEVELOPMENT OF NEW UZBEKISTAN

Xalqaro ilmiy-amaliy konferensiyasi maqolalar to'plami

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KOKAND UNIVERSITY

"O‘zbekiston Respublikasi Oliy ta’lim tizimini 2030 yilgacha rivojlantirish konsepsiyasini tasdiqlash to‘g‘risida" O‘zbekiston Respublika Prezidentining 5847-sonli Farmonida ko‘zda tutilgan vazifalardan biri – ilmiy izlanish yutuklarini amaliyotga joriy etish yo‘li bilan fan sohalarini rivojlantirish, ya’ni xalqaro ilmiy hamjamiyatda e’tirof etilishiga xizmat qilishdir. Shu va boshqa tegishli farmonlarda va qarorlarda belgilangan vazifalarini amalga oshirish maqsadida 2023 yil 21-iyun kuni Qo‘qon universiteti “Raqamli texnologiyalar va matematika” kafedrasi “Raqamli texnologiyalarning Yangi O‘zbekiston rivojiga ta’siri” mavzusidagi xalqaro miqyosida o‘tkaziladigan ilmiy-amaliy konferensiyasi maqolalar to’plamini e‘lon qiladi

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WHY STEM LEARNING IS IMPORTANT IN ENGLISH LEARNING

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Abstract: This study discusses one of the important issues of today's educational field: the relationship between English learning and STEM learning. It also approves the view that why STEM learning and English language learning is becoming most common.

Keywords: STEM, P21, The 4Cs, ELs. Content learning, English learning.

English is one of the most core subjects that students must acquire for greater social understanding. The language is also massively used in technology-based scheme. At the same time, education in the current era of modernization requires schools to be able to create students who are not only possessing cognitive skills but also 21st-century skills. Partnership for 21st Century Skills (P21) elaborated the skills as part of individual competencies known as "The 4 Cs" - communication, collaboration, critical thinking, and creativity. These four skills should be possessed by individuals to face the challenges of the 21st century.

STEM (Science, Technology, Engineering & Mathematics) education could be one of the efforts to equip the 21stcentury skills. The term STEM Education was first coined in the year 2001by the scientific administrators of the US National Science Foundation. The word is an acronym for its four component subjects which are Science, Education, Technology, Mathematics. The model was thus conceptualized as an integrated and holistic learning experience for students in these disciplines. STEM offers students to learn to apply the main content and practice each of the STEM disciplines in all situations that students face in their lives[6] . It provides an opportunity to communicate, collaborate, think at higher levels, and increase creativity as the requirements of the 21st century. With STEM, students are expected not only to be able to solve problems in science, technology, engineering, and mathematics, but also to be able to solve various types of complex problems that can also develop their higher-order thinking skills, besides that STEM can also prepare 21st-century human resource needs and develop competencies in the STEM field. For these reasons, teaching English and connecting this with STEM educational technology is becoming one of the crucial requirements of this period.

[6] Bybee, R. W. The Case for STEM Education- Challenges and Opportunities, NSTA Press, 2013

Over the last decade, STEM employment grew at a much faster pace than non-STEM jobs; 24% versus 4% [7]. Moreover, STEM employment is predicted to continue to grow much faster than other occupations for the foreseen future. Individuals in STEM fields enjoy 29% higher wages and 50% higher rate in obtaining a college degree compared to their counterparts in non-STEM fields[8]. Taylor claimed that during the next three decades 90% of the U.S. labor force growth will come from new immigrants and their children and predicted that ELL students will constitute a significant portion of the work force. Hence, STEM education becomes a critical component in preparing ELL students with the skill level needed to make them prosper in a job market that is fueled by advancements in science and technology.[9]

Having read related literature it has been found that college- and career-ready standards present both opportunities and challenges for ELs, necessitating that educators at multiple levels of the education system develop new areas of expertise. Historically, within the classroom, STEM content learning has been considered the province of STEM content educators, while language learning has been considered the province of language educators. Current understanding of the co-development of language and content necessitates that educators of STEM content are familiar with the nature of language, language learning, and exemplary STEM instruction that includes attention to language. To achieve this objective, educators of STEM content must learn to interrogate their preconceived notions and tacit assumptions about language, starting with the most fundamental, though rarely discussed, question, “What is language?” In the same way, language educators will need to become familiar with the nature of STEM content areas.

Research on Language Among English Learners as ELs increased in numbers and became a focus of attention in K–12 classrooms, the first response was to prepare ESL teachers who would teach English to ELs in separate classrooms and then send them to “content” classrooms once they had developed sufficient proficiency. An early response of the field of TESOL (Teachers of English to Speakers of Other Languages) to the challenge of ELs keeping up with grade-level learning in K–12 contexts was the emergence of “content-based language teaching”. This approach recognized that children best learn language if it is taught in meaningful contexts of use, and that for children in school, the meaningful contexts are the subject areas. This idea was further supported by the

[7] Howard, N. R., & Ifenthaler, D. (2018). Integrating STEM opportunities for young learners, Tech Know Learn, 23, 195-197.
[8] Langdon, D., McKittrick, G., Beede, D., Beethika, K., & Doms, M. (2011). STEM: Good jobs now and for the future. U.S. Department of Commerce; Economics and Statistics Administration. Retrieved from http://www.esa.doc.gov/sites/default/files/reports/documents/stemfinaljuly14.pdf
[9] Taylor, P. (2014). The next America: boomers, millennials, and the looming generational showdown (1st ed.). New York: Public Affairs.

work of Cummins [10]; in particular, he made a distinction between informal conversational language and more formal academic language in his research on children developing bilingual competence at school. This distinction generated controversy from the beginning, but has nonetheless proved valuable in drawing attention to the many ways that individuals use and understand language in education, as well as more generally. Nevertheless, as “content-based language teaching” developed, it was unclear how the relationship between “content learning” and “language learning” was to be articulated. During the same time period, research was increasingly pointing to the need for explicit attention to language itself as part of the second-language learning process in school contexts, as exposure to the language alone did not lead to development of proficiency. Whereas initially this research primarily studied the ways teachers helped ELs use English with greater accuracy by providing feedback on errors, subsequently the main focus of research on English development has changed in recognition that learners inevitably make errors as they expand their meaning-making repertoires.[11]

This study concludes that english learners (ELs) bring a wealth of resources to science, technology, engineering, and mathematics (STEM) learning, including knowledge and interest in STEM-related content that is born out of their experiences in their homes and communities, home languages, variation in discourse practices, and, in some cases, experiences with schooling in other countries. ELs are those students ages 3 through 21, enrolled in an elementary or secondary school, not born in the United States or whose native language is a language other than English, and whose proficiency in speaking, reading, writing, or understanding the English language may be sufficient to deny the individual the ability to successfully achieve in classrooms where the language of instruction is English. The diversity of ELs includes heterogeneity in cultures, languages, and experiences that may have an impact on these students’ education (including the contexts that expose them to risk factors that may have negative impacts).

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