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ICT4EDU:
Enhancing ICT Competencies of Early Childhood Educators at HEIs in MENA Countries

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Executive Summary

This document is a fulfilment to WP 2.1: Report on State of the Art of ICT in ECE (Curriculum Verification) through a questionnaire (survey) for exploring the state of the art of ICT in the ECE and relevant programs. The surveys were designed to target the university staff members and students at different universities from Jordan, Egypt and Palestine.

The main purpose of this report is to summarize accurately and identify the actual status of the ICT in ECE (curriculum verification) for further enhancement and improvement on courses and curriculum development. In addition, to define the current needs and establish clear road map to enhance and adopt ICT competencies among ECE curriculum.

The data were collected by circulating the survey online to the university staff and students in partner countries in Jordan, Egypt and Palestine. A total of 464 responses were collected for the survey that is targeting university staff and students. According to the received data, ICT makes teaching and learning more effective and fun for everyone involved. In addition, many experts and educators agree that primary education curriculum and courses need enhancement for modern ICT literacy. This is because technology is becoming increasingly important in our daily lives, and digital skills are essential for success in many domains. The survey data indicate that in order to improve the quality of ICT competencies among the students and the graduates in partner countries, it is essential to enhanced and improve the curriculum and courses with ICT integration. This includes supporting educators the required training and capacity building, embedding ICT in curriculum and in teaching and learning activities, creating new courses with special focus on ICT in ECE and relevant study programs, and providing appropriate ICT infrastructure.

Background and Objectives

Early Childhood Education (ECE) is considered an important base for life-long learning and whole person development and the most important and vital of all stages in the proper development of a child whether is in the emotional, behavioral or cognitive domain. Early years of child life are crucial as it is of the utmost importance in the child's physical, emotional and intellectual development.

In line with the current digital era, teachers are required to integrate ICT in their daily teaching and replace their traditional methods with modern tools and facilities. Carrying out this project is essential for undersetting practices, and impacting policies and curricula in school of educational sciences and for the integration of ICT teacher education to meet the requirements for digitally competent youth and children.

In this report, the surveys targets university staff and students. The survey's findings will be implemented within the project framework (ICT4EDU) such that to enhance ICT skills of early childhood educators at HEIs in partner countries. The primary objective of the surveys is to enhance the quality of ICT competencies of early childhood teacher and educators in higher education institutions in Jordan, Palestine, and Egypt in line with advanced EU practices, thereby enhancing the quality of education in pre-schools and primary schools in Jordan, Palestine, and Egypt.

This work package aims at scoping the current situation of ICT utilization in ECE in the beneficiary partners institutions including the extent of how the digital resources is represented in the study programs, as well as identifying the real competences that have to be provided to teachers and students and to verify the facilities of partners to develop the existing resources.

Scope and Procedure

The major activity of Work Package 2 aims at scoping the current situation of ICT utilization in ECE in the beneficiary partners institutions including the extent of how the digital resources is represented in the study program. The project will commence in a scoping and needs analysis exercise to investigate the real competencies that have to be provided to teachers and students. In addition, to investigate the facilities of partners institutions to develop the existing resources. The scope and procedure of the work package can be summarized as per the following points.

- A survey on the current situation of the level of ICT integration in early childhood education teaching and learning materials has been conducted at each partner institution and at each department level.
- Identifying the weakness and strengthen of the curricula, verifying the courses offered, what to update and what courses are needed. Taking into account the courses proposed by each partner at the proposal preparation stage. This is to be carried out on regional level by all beneficiary partners.
- To examine the ICT usage habits and the self-assessed ICT competencies possessed by undergraduate students in EC teacher preparation programs as well as to investigate the level of competences and then the needs of the teaching staff.
- Results in identifying the real ICT competencies that have to be provided to both target groups, and define the most competitive and high valued situation and trends in ICT as well as to figure out the new technologies and digital that should be integrated within the new curricula, this will assist in reviewing, modernizing and designing the new ICT-based teaching materials.
- Verifying partners facilities in order to build on existing resources available in partner universities, distribution of surveys with related parties inside each partners university and department level.
- Demonstrates the gap analysis, and the needs for capacity building, infrastructure, and human resources.

Organization of Work Package - 2

The Team of Palestine Technical University – Kadoorie (PTUK) was defined as leader for the work package 2. The co-lead universities are Irbid National University (INU), Mutah University Ltd (MU), and Suez Canal University (SCU). The following questionnaires prepared according to the project description, approved by all partners, and maintained by PTUK team online.

1. In-depth survey on State of art of ICT in ECE (Curriculum Verification).
2. In-depth survey on Teachers and Students Digital Competences. This survey was divided into two different surveys for teachers and students.
3. In-depth survey on available facilities and resources at EC departments

Additionally

4. A complementary survey has been designed and distributed to targets school teachers and principals to investigate their needs in order to offer ICT skills and competences for university students and facility staff.

4. The surveys students was developed and maintained online by PTUK team with the help and approval of the co-leaders and all partners. The distribution of the surveys was carried out by the help of all partner institutions.

Teams from INU, MU, and SCU has translated the surveys from English into Arabic and maintained online by PTUK team. The partner universities in Jordan, Egypt and Palestine collected responses and filled surveys online. The analysis and reporting of the results from all surveys was completed by PTUK team, reviewed and approved by the co-leaders and all partners.

Table 1 Responsibilities distributions among partners

#	Name	Country	Survey on teachers and students ICT competencies
1	University of Jordan (JU)	Jordan	Coordination, approval, and collect responses from Jordan
2	Irbid National University (INU)	Jordan	Co-lead, approve, and collect responses from Jordan
3	Mutah University LTD (MU)	Jordan	Co-lead, approve, and collect responses from Jordan
4	Al-Azhar University (AZHU)	Egypt	Approve and collect responses from Egypt
5	Suez Canal University (SCU)	Egypt	Co-lead, approve, and collect responses from Egypt
6	Heliopolis University Association (HUSD)	Egypt	Approve and collect responses from Egypt
7	Palestine Technical University Kadoorie (PTUK)	Palestine	Lead, approve, maintain surveys responses online, and collect responses from Palestine
8	Palestine Technical College – Dier Elbalah (PTC)	Palestine	Approve and collect responses from Palestine
9	Al-Istiqlal University (PASS)	Palestine	Approve, and collect responses from Palestine

Surveys Results

This survey will help us accurately identify the actual status of the ICT in curriculum for further enhancement. In this report, the results of the surveys are divided in into two parts:

Part A: Contact Information & University Profile.

Part B: State of Art of ICT in Curriculum.

The sample properties for Part A are illustrated as per the following.

Table 2 Sample Properties

Variable	Level	Frequencies	Percentage
Choose your university	University of Jordan (JU)	101	21.8%
	Irbid National University (INU)	26	5.6%
	Mutah University LTD (MU)	41	8.8%
	Al-Azhar University (AZHU)	40	8.6%
	Suez Canal University (SCU)	9	1.9%
	Heliopolis University Association (HUSD)	137	29.5%
	Palestine Technical University Kadoorie (PTUK)	84	18.1%
	Palestine Technical College – Dier Elbalah (PTC)	22	4.7%
	Al-Istiqlal University (PASS)	4	0.9%
College/Faculty	Engineering	40	8.6%
	Applied Sciences	5	1.1%
	Business and Economics	123	26.5%
	Agricultural Science and Technology	4	0.9%
	Arts and Educational Sciences (Humanities)	179	38.6%
	Information Technology	43	9.3%
	Graduate Studies	6	1.3%
	Physical Education and Sport Sciences	2	0.4%
	Pharmacy	8	1.7%
	Others	54	11.6%
Gender	Male	183	39%
	Female	278	60%
	Prefer not to mention	3	1%
Age	Less than 25	290	62.5%
	25 - Less than 30	32	6.9%
	30 - Less than 40	38	8.2%
	40 - Less than 50	45	9.7%
	50 - Less than 60	43	9.3%
	60 or above	16	3.4%
Academic Level	Bachelor	295	63.6%
	Master	24	5.2%
	PhD	110	23.7%
	Other	35	7.5%
I am currently teaching in an ECE study programme	No	329	70.9%
	Yes	135	29.1%
Overall		464	100%

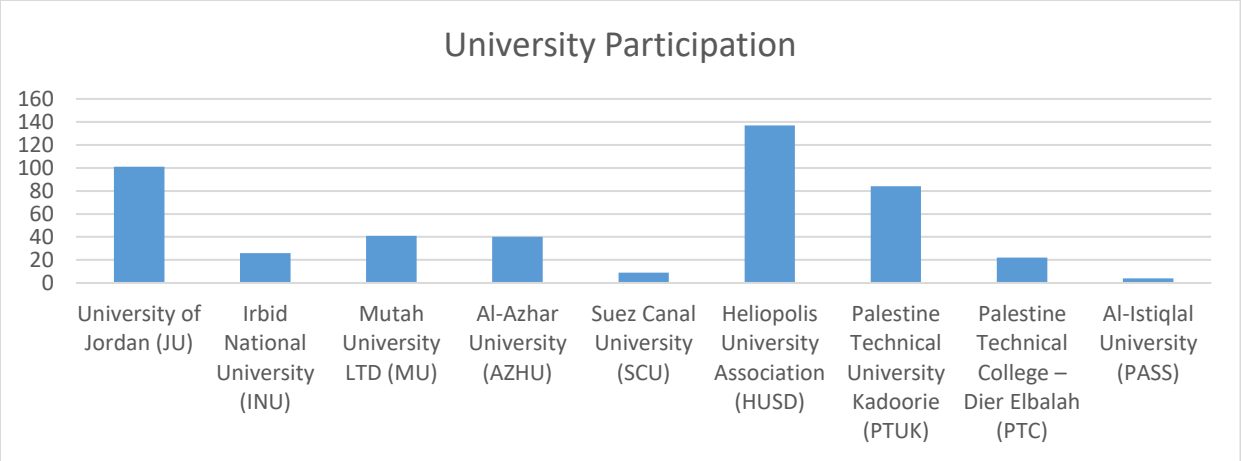

Figure 1. University participation

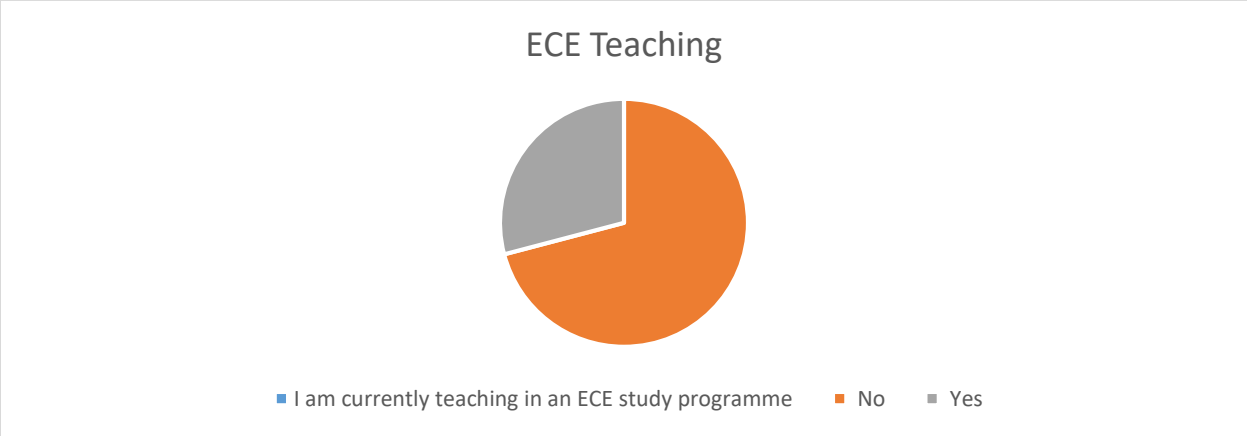

Figure 2. ECE Teaching

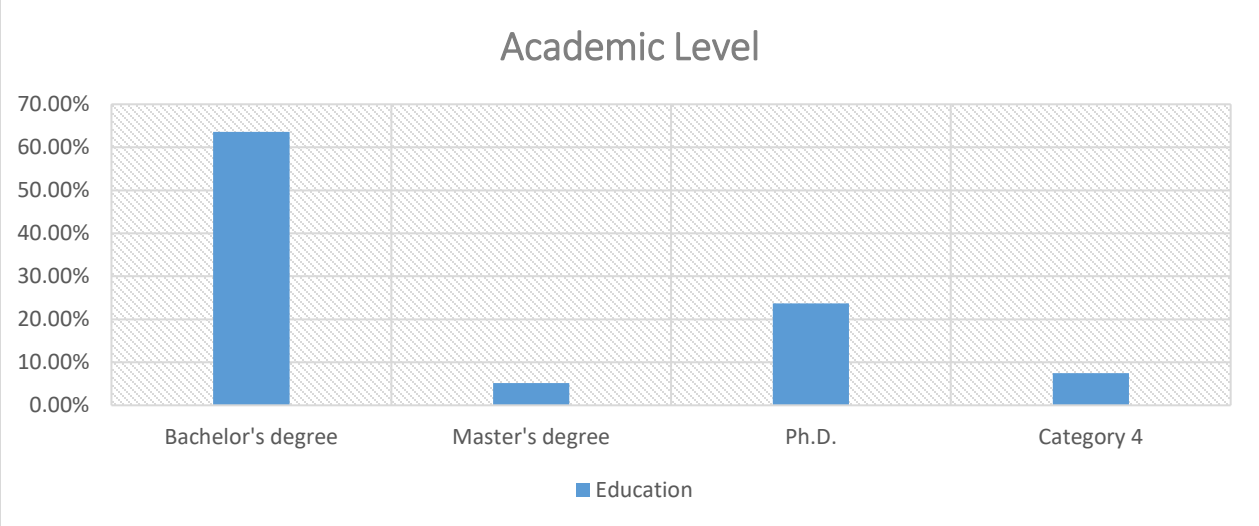

Figure 3. Academic Level

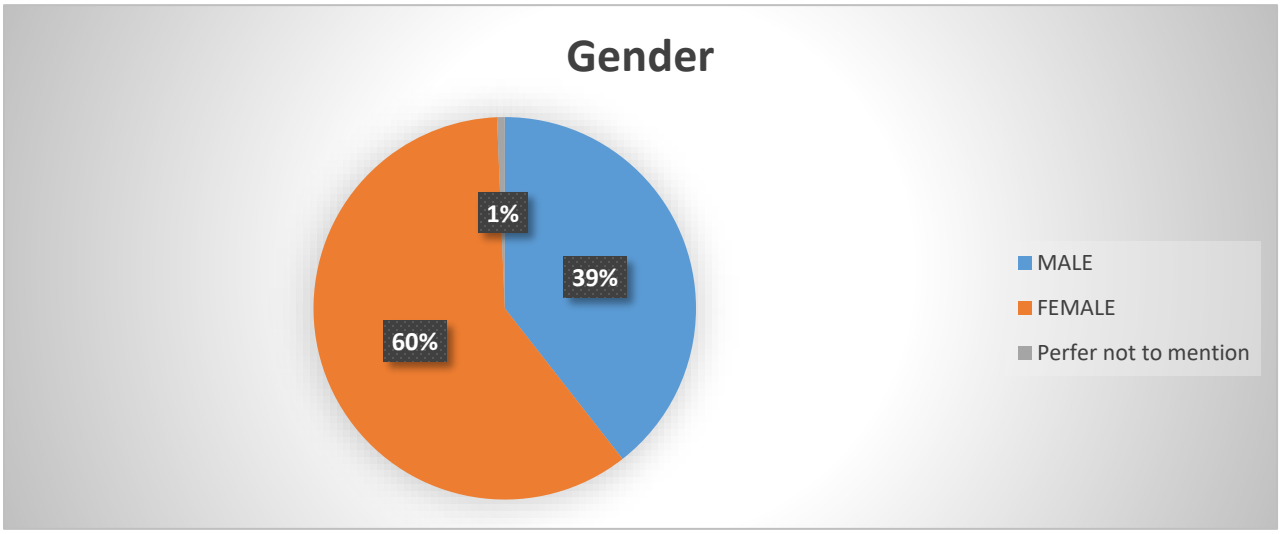

Figure 4. Gender

Stability of the study tool

The stability was verified by calculating the stability Cronbach's Alpha equation. Cronbach's Alpha stability coefficient was calculated and this is evident from Table 2 below.

Table 3 Cronbach's Alpha stability values for the questionnaire items

Items	Number of Items	Cronbach's alpha values
State of the Art of ICT in Curriculum	14	0.970

Table 4 Correction key to interpret the study paragraphs

Arithmetic Mean Period	Degree/Class
less than 1.8	Very low
1.8 - 2.59	Low
2.6 - 3.39	Medium
3.4 - 4.19	High
4.2 and above	Very High

Table 5 The sample properties for the state of the art of ICT in curriculum

State of Art of ICT in Curriculum Items	Arithmetic Mean	Standard Deviation	Degree
Our curricula give limited space for ICT tools and digital resources used in teaching and learning.	2.93	1.217	Medium
Part of the assessment process uses ICT tools, computers, or online.	3.10	1.239	Medium
The curriculum goes beyond a concentration on primary education topics and knowledge through the use of ICT resources.	2.94	1.198	Medium
The curriculum guides students to use multiple networked devices, digital resources, and electronic environments to produce knowledge and collaborative learning.	3.14	1.265	Medium
The curriculum covers ICT related topics such as using the Internet for open educational resources.	3.16	1.298	Medium
The curriculum helps students make connections between technology topics they might be interested in and teaching practices.	3.15	1.248	Medium
The curriculum develops ICT employability skills needed for educators.	3.08	1.257	Medium
The curriculum connects students to the world by using modern e-learning tools.	3.15	1.264	Medium
The curriculum emphasizes creating artifacts using different ICT tools and resources that meet the developmental characteristics of students in pre-schools and primary schools.	2.98	1.263	Medium
The curriculum is enriched with software-based learning activities such as creating presentations and game creation suitable for primary education.	3.11	1.263	Medium
The curriculum emphasizes on modern ICT literacy and integration.	3.06	1.262	Medium
The curriculum broadly attempts to equip university students in primary education specialization with the ability to use various ICT devices, applications, and resources.	3.06	1.221	Medium
The curriculum includes the necessary ICT skills in variety of specialised courses.	3.06	1.233	Medium
I am willing to learn and enhance my ICT skills in teaching and learning.	3.49	1.347	High
Overall	3.10	1.065	Medium

Table 5 indicates that the responses of the study sample towards the state of the art of ICT in curriculum are in a medium degree, and the most approved paragraphs are (I am willing to learn and enhance my ICT skills in teaching and learning) with a high degree, and the most unapproved paragraphs is (Our curricula give limited space for ICT tools and digital resources used in teaching and learning.) and with a moderate degree. According to the received feedback, the curricula at the university level must be reformed such that more technological tools to be employed, ECE teachers and students must be trained on the latest technologies, teaching methods, and on software

that can support children's learning in an innovative way. Students and educators should also be trained at university level on how to take advantage of technological sites in designing and managing formative and summative assessment tools, and to realize the role of technology in activating the role of educational works and innovative software that encourages the design of activities to inspire children to learn such as games, electronic stories and other methods.

The scope of ICT in teaching and learning is enormous. The obvious benefits include access to information from the internet and use interactive tools which can assist students to better understanding of the subject matters, and the removal of the need to spend long hours of reading in traditional way. ICT based curriculum broadly attempts to equip students with an ability to negotiate a range of devices, tools, application, information and resources. Students can better achieve curriculum outcomes through effective use of ICT. As such, they can develop the knowledge, skills and capacity to select and use ICT to inquire, develop new understandings, create, and communicate with others effectively.

In order to answer whether there are differences between the sample answers about the curricula due to the teaching variable in the early childhood programs, the following group statistics calculated.

Table 6 Group Statistics – I

	I am currently teaching in an ECE study programme?	N	Mean	Std. Deviation	Std. Error Mean
Mean A	Yes	135	2.9677	1.02477	.08820
	No	329	3.1562	1.07812	.05944

Table 7 Group Statistics – II

		t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
							Lower	Upper
Mean A	Equal variances assumed	-1.735	462	0.083	-0.18848	0.10864	-0.40197	0.02502

It is clear from the level of significance (0.083) that it is greater than its value (0.05), which means that there are no differences in the answers of the study sample about the curricula due to the teaching variable in the early childhood program.

Concluding Remarks and Recommendation

Today technology has become an important part of the education process, especially after the Corona pandemic. What was acceptable before Corona of traditional education is no longer welcome at this time. With the development of all fields in education, it has become necessary to prepare teachers in professional manner and to keep pace with the current era of technology advancements. It is essential to bridge the gap between the market needs and the skills and competences delivered by the university programs. For example, children begin their education with varying degrees of technology literacy due to the increasing presence of ICT around them. Therefore, educators and university students should be equipped with an up-to-date ICT skills and tools. There are many benefits of ICT in early childhood education. One of those benefits is contributing for students' focus and attention, which, compared to traditional learning methods, is maximized when technology is involved. Based on the conducted survey, the implementation for ICT4EDU project should emphasis on the following aspects in ICT based courses and curriculum development.

1- Continuous review of the curricula to keep balance with the current digital transformation especially in education, teaching methods and related technology.
2- Any update on the curricula and teaching courses should highlight the practical development in the field of ICT in education and teaching methods.
3- University staff and students should receive continuous capacity building and training on the latest used of technology, providing the tools that facilitate the use of technology in learning and teaching.
4- An ICT competency-based curriculum needs to focus on developing professional ICT competencies that would support students at their workplace after their graduation.

5- Partner universities need to utilize ICT in ECE and relevant educational departments classrooms, such as using interactive whiteboards, collaborative software, and other digital resources.
6- Partner universities need to follow-up the continuous and latest development in ICT in education and teaching methods such as personalized teaching, problem solving, cooperative collaborative learning, and learning projects using ICT. Teachers can create engaging and stimulating learning experiences for students.
7- Promote and introduce motivating courses such as computer driving license in the curriculum courses.

References

Nannally, J. C., & Bernstein, I. H. (1994). *Psychometric theory (3rd ed.)*. New York: McGraw-Hill.