Towards a smart University in the light of 21st century skills

نحو جامعة ذكية في ضوء مهارات القرن الحادي والعشرون

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Abstract

In the recent years, the accelerated development of knowledge and the changeable demands of the technological learning put the educators on the face of many challenges. The 21st century skills promote the competitiveness and innovation capabilities of the organization. These skills are crucial for sustainability and development of organization. The main objective of this study is to evaluate the ownership degree of the faculty members at Al-Aqsa University of 21st century skills to propose a vision to transform Al-Aqsa University into a smart university in the light of the 21st century skills. The results show that (79.3%) of faculty members have high ownership degree of 21st century skills regardless of the specialization and academic degree; these skills are one of the most important elements for the transformation to smart universities.

Keyword: 21st Century Skills, Al-Aqsa University Faculty Members, Smart University.

ملخص

في السنوات الأخيرة، وضع التطور المتسارع للمعرفة والمتطلبات المتغيرة للتعلم التكنولوجي التربويين في مواجهة العديد من التحديات. وتعتبر مهارات القرن 21 من أهم المهارات

التي تعزز القدرة التنافسية والإبداعية للمؤسسات هذه المهارات ضرورية لمواجهة تحديات العصر ومهمة لاستدامة وتطوير المؤسسات. ويعتبر الهدف الرئيسي من هذه الدراسة هو تقييم درجة امتلاك أعضاء هيئة التدريس في جامعة الأقصى لمهارات القرن الحادي والعشرون واقتراح رؤية لتحويل جامعة الأقصى إلى جامعة ذكية في ضوء مهارات القرن الحادي والعشرون، وأظهرت النتائج أن (79.3%) من أعضاء هيئة التدريس يمتلكون درجة عالية من مهارات القرن الحادي والعشرون بغض النظر عن التخصص والدرجة الأكاديمية؛ هذه المهارات هي واحدة من أهم عناصر التحول إلى جامعات ذكية.

الكلمات المفتاحية: مهارات القرن الحادي والعشرون، أعضاء هيئة التدريس في جامعة الأقصى، الجامعة الذكية.

Introduction

Gaza Strip is a narrow coastal strip of land along the Mediterranean Sea with a total area of 365 km^2. This small area faces an unstable political and critical economic situation (UNDP, 2014). In spite of this situation, the Palestinian university faculty members and administrators are making hard efforts to follow the modernization and the universal educational technology trends. However, one of these trends is the transformation to smart university.

The 21st century is characterized by its rapid technological advancement. Our lifestyles and ways of interacting with people have changed significantly as digital technologies turn ubiquitous in our life. All terms broadly refer to and encompass skills, competencies, values, and attitudes required for the overall development of learners such as; collaboration, self-discipline, resourcefulness, and respect for the environment (UNESCO, 2015).

Innovation starts with people making the human capital within the work force decisive, therefore the fast changing knowledge at 21st century skills enforce organizations to increase their competitiveness and innovation capacity. (Van Laar, *et al*. (2017).

Educational institutions and leaders in the educational field are facing a gap between the current learning environment, the learning traits, and the owned skills outcomes of teachers. (Singh & Hassan, 2017).

Partnership for 21st Century Skills (P21), an American organization formed in 2002 by business leaders, consultants, and educators, conceptualized a framework for 21st century skills. This framework has become well-known in the field of Information and Communication Technology (ICT) in education (P21 2009). It consists of different competencies which could be classified into three categories as follows; (1) learning and innovation skills, (2) information, media, and technology skills, and (3) life and career skills (partnership for 21st Century Skills [P21], 2009).

In general, 21st century skills are including collaboration, communication, digital literacy, citizenship, problem solving, critical thinking, creativity and productivity (Voogt & Roblin, 2012).

However, one limitation of the 21st century skills models is while they specify prioritized learning objectives, they do not offer educators the means by which to achieve those articulated ends since school leaders, teachers, and decision-makers need clear understanding of what they will work. UNESCO is undertaking regional projects to assess transversal skills (UNESCO, 2015).

The aim of Boholano study is to determine the 21st century skills possessed by the pre-service teachers in terms of social networking. Pre-service teachers use computers in very advanced ways, but educators must remember that they still need guidance to use technology safely and effectively. The results of the study confirmed that technology in the 21st century serves as an extraordinary tool to shape and enhance the learning environment. Digital literacy skills are absolutely necessary to ensure that technology is used to supplement and not substitute for high quality instructional methods (Boholano, 2017). Therefore, there is recognition of the need to promote the model of higher education in order to make the faculty member able to work effectively with 21st century skills and build the skills they need not only for education but also for life. Moreover, we believe that the university should not only focus on main materials, but also on the understanding of academic content according to 21st century skills and developments.

Universities are always striving to keep up with the challenges of the times and the best investment and strive to improve the quality of education. The Smart University is one of the basic and effective pillars of raising the quality of the university, producing and disseminating knowledge, raising the level of creativity and increasing efficiency.

Morze, *et al*. (2017) indicated that smart education is an emerging paradigm in education, interacting and adapting to the environment, new format specialist training and successful and competent to work in the Smart Society rely on new universities – Smart Universities. The conceptual basis of the Smart University is a large number of different scientific sources, and information and educational materials, multimedia resources that can be easily and quickly designed, assembled as a certain set, adjusted individually for each student's needs and special characteristics of educational activity and the level of educational achievements.

The smart campus is: "Smart campus is an inevitable trend in the development of digital campus construction. It's a new development stage of educational information, and a long term systematic process". (Torres, *et al.* 2015, p1956)

Coccoli, *et al*. (2014) by "smarter university" we mean a place where knowledge is shared between employees, teachers, students, and all stakeholders in a seamless way.

According to Zhu, Yu, & Riezebos (2016)" the objective of smart education is to improve learners' quality of lifelong learning. It focuses on contextual personalized and seamless learning to promote learners emerging intelligence and facilitate their problem-solving ability in smart environments" (p. 15).

Tikhomirov & Dneprovskaya (2015) presented their vision of smart education that Smart University is a concept that involves a comprehensive modernization of all educational processes. The smart education is able to provide a new university where a set of ICT and faculty leads to an entirely new quality of the processes and outcomes of the educational research, commercial and other University activities. The concept of Smartness in

education area entails the emergence of technologies such as smart boards, smart screens and wireless Internet access from everywhere.

Gros, (2016) indicated that knowing more about students' learning performance and perceptions is vital for developing more effective smart learning environments. An evaluation can be conducted using various aspects, such as learning achievement, problem-solving ability, self-efficacy and self-regulation, moreover in-depth understanding of learners' behaviours and learning patterns will be very important to educators in developing more effective learning tools and strategies.

Smart campus has three pillars: infrastructure, operations and of course, people. Each of these pillars would be infused with intelligence, but more importantly they would work in an interconnected and integrated fashion to utilise resources efficiently (Kumar & Gupta, 2015).

Kwok, (2015) emphasizes that there are some elements which may facilitate the process of achieving intelligent campus. A good supporting infrastructure is an important element. This supporting infrastructure does not only include networks, computers, systems and processes, but also involves people as part of the infrastructure. Automation of systems and processes requires a large amount of work in knowledge extraction on human intelligence. Without the necessary support and training to these people working on intelligent campus, the systems and processes will not be able to work effectively as they should be. A clear policy from a higher authority in supporting the development of intelligent campus, preferably as part of the plan in smart city development, is an essential assurance to its success.

Kumar & Gupta (2015) suggested a plan for Smart Campus initiative with three phases, and adopted an Implementation Strategy. They declared that it would become a reference model for many organizations with residential campuses, it would pave the path for further research opportunities across domains like electronic governance, administration, internet of things, smart technologies and process re-engineering, to name a few.

Therefore, according to the recommendations suggested by (Claro, *et al.* 2012; Janssen, *et al.* 2013; Pacific Policy Research Centre, 2010; Siddiq, *et al*. 2016). We can introduce a number of the most important 21st century skills that the university lecturers should own the following skills:

− Technology Literacy.

− Communication & Collaboration.

− Creativity & innovation.

− Design of digital assessment tools.

− Citizenship and digital responsibility.

Smart infrastructure

The infrastructure of the smart university consists of two main components; hardware and software, first; hardware takes the form of Smart Buildings, advanced wire Mesh network, smart devices, modern Labs, cameras, storage space, communication Systems, liquid-crystal display (LCD), and smart board. Second software is in the form of learning management systems, control systems, security and protection systems, social networks, digital library and electronic pages. (Van Laar, *et al*. 2017).

Smart Environments

The environment of the smart university consists mainly of four components; smart learning, smart social, smart green environment, smart health care. The Smart Learning includes; smart curricula, interactive electronic lectures, electronic courses, electronic books, digital repositories, Internet resources, and electronic learning portals. The smart Social includes sharing information electronically, social activities within the university where social networks are used for education, communication and information exchange. The smart green environment includes a wide green natural environment of gardens and playgrounds and a wide green natural environment of gardens. The smart health care includes; preventative health care, Distance health awareness and care

system, Distance Treatment System, Electronic health records, and smart biological information. (Singh, & Hassan, 2017).

Smart management

The smart university provides strategic plans for the use of technology and its tools in the educational process, the use of smart management systems for education systems, management systems and developed plans that support innovation and competition, effective communication with students and employees, and the provision of necessary services.

Smart database includes; a comprehensive smart information system for all parties to the University's educational process. Smart people, all university staff and students have 21st century skills to cope with emergencies, provide strategies to develop staff skills and community participation outside the university for faculty members.

Doulai (2002) developed a system for a smart campus. This system offers an integrated series of educational tools that facilitate student's communication and collaboration along with a number of facilities for student's study aids and classroom management through the application of two technologies, namely dynamic web-based instruction and real-time streaming, in providing support for "smart and flexible campus" education is demonstrated. It is shown that the usage of technology-enabled methods in university campuses results in a model that works well equally for distance students and learners in virtual campuses.

Yu, Liang, *et al*. (2011) argue that with the development of wireless communication and pervasive computing technology, smart campuses are built to benefit the faculty and students, manage the available resources and enhance user experience with proactive services. A smart campus ranges from a smart classroom, which benefits the teaching process within a classroom, to an intelligent campus that provides lots of proactive services in a campus-wide environment.

Coccoli, *et al*. (2014) assumes that universities can be regarded as smart universities, as they profitably use available technologies to improve their performance and to enhance the quality of their graduates. Such smart

universities act in the context of smart cities which offer smart services and applications to their citizens to enhance their quality of life.

The 21st century skills are viewed as one of the most important principles that contribute in the interaction and employment of technology in the learning process, therefore, the researcher introduced a proposed vision to transform Al-Aqsa University of Gaza from the traditional form into a smart university in light of the of the 21st century skills though answering the following questions:

1. What are the 21st century skills that must be owned by Al-Aqsa University faculty members?

2. What is the owning ship degree of Al-Aqsa University faculty members regarding the 21st century skills?

3. Are there statistically significant differences at the level of significance ($\alpha \leq 0.05$) between the means of specialization (human sciences, natural sciences) in the ownership degree of the 21st century skills?

4. Are there statistically significant differences at the level of significance ($\alpha \leq 0.05$) between the means of academic degree (Associate Professor and Professor, Assistant Professor, Master degree) in the ownership degree of the 21st century skills?

5. What is the proposed a framework to transform Al-Aqsa University into a smart university in the light of 21st century skills?

Objectives of the study

1. Preparing a list of 21st century skills that must be owned by Al-Aqsa University faculty members.

2. Determining the ownership degree of 21st century skills that must be available in Al-Aqsa University faculty members.

3. Detecting the differences among the means of the specialization (human sciences, natural sciences) in ownership of 21st century skills in Al-Aqsa University faculty members.

4. Detecting the differences among the means of the academic degree in ownership of 21st century skills in Al-Aqsa University faculty members.

5. Proposing a vision to transform Al-Aqsa University into a smart university in the light of 21st century skills.

Importance of the study

The study aims to represent strategies that transform university into smart university; therefore, it is regarded as a response to a lot of educators and administrators recommendations and that insists to follow technological and educational developments, in addition some suggestion from students.

Terminology of the study

The 21st century skills: It is defined as a set of skills of technological culture, communication skills, creativity, skills of designing digital assessment tools, citizenship skills and digital responsibility, which must be owned by faculty members of the university to help them in order to create a smart learning environment, as it indicated in table (2).

Smart University: Tikhomirov & Dneprovskaya (2015) presents a smart university concept that involves a comprehensive update of all educational processes as a group of ICTs and faculty members that are integrated to achieve a complete quality of operations, outcomes of educational research, business and other university activities such as; smart panels, smart screens and wireless Internet access from everywhere. Moreover, it is defined as an educational institution that provides an interactive digital learning environment, which utilizes intelligent systems technology among the used systems, thus allows faculty members to promote the goals of the 21st century making them participants and officials in the development and upgrading of the quality of university education.

Methodology: A descriptive approach was used as the most appropriate research methods to conduct such studies that rely on the study of reality or phenomenon as it is, and then express quantitative expression.

According to Fox & Bayat (2007), descriptive research is "aimed at casting light on current issues or problems through a process of data collection that enables them to describe the situation more completely than was possible without employing this method." (p.45)

Population of the study: The study population includes all faculty members at Al-Aqsa University (446) member in the academic year (2018/2019).

Sample: self-administrated questionnaire was distributed to the study sample composed of (89) members of the teaching staff at Al-Aqsa University which selected as a stratified random sample, with a percentage of (20%) of the total population. Table (1) indicates the distribution of the study sample according to the study variables. Even the sample is small; selection of Stratified random sample will be more representative of the population. However, it can be considered in the limitation of the study.

Table (1): Study sample distribution.

Variable		Number	%
Specialist	Human sciences,	59	66.3%
	Natural sciences	30	33.7%
Total		89	100%
Academic degree	Associate Professor and Professor	23	25.8%
	Assistant Professor	37	41.6%
	Master degree	29	32.6%
Total		**89**	**100%**

Tools

After literature review, the researcher developed a scale of 21st skills (Claro, *et al.* 2012; Janssen, *et al.* 2013; Siddiq, *et al.* 2016). This scale consists of (46) item distributed into (7) domains, the scale has been offered for arbitration by a number of specialists in the educational filed, modifications of the scale have been done according to their advice and the scale become on its final form, which consists of (34) item distributed into (5) domains; technology literacy (8 items), communication and collaboration (7 items), creativity and innovation (6 items), 21st century

assessment designs (6 items), digital citizen and responsibility (7 items). In front of each item a gradient of with three choices has been used (high, moderate and low) rated 3, 2, and 1 respectively. The researcher adopted the flowing criterion (more than 2.33 high, 1.66-2.32 moderate and less than 1.66 low).

The researchers calculated the validity of internal consistency on pilot study (30) persons outside study sample. Pearson correlation Coefficients between the score of each item and the total score of its domain was used. The results were, technology literacy (0.54-0.85), communication and collaboration (0.49-0.74), 21st century assessment tools design (0.46-0.64), creativity and innovation (0.49-0.84) and digital citizenship (0.48-0.75) all of the items are significant at level (0.01). To ensure the reliability of the tools, the researcher used Cronbach's Alpha test and it was (0.89) which indicated a high reliability level.

Results

To answer the first question "What are the 21st century skills that must be owned by Al-Aqsa University faculty members?", the researcher reviewed the related literatures, the 21st century skills were detected to be (34) items divided into (5) domains (Technology Literacy, Communication and Collaboration, creativity and innovation, 21st century design citizenship assessment tools, digital citizenship and responsibility (table 2) .

To answer the second question" What is the owning ship degree of Al-Aqsa University faculty members regarding the 21st century skills? ". The researcher calculated the means, present and rank of owning ship degree of faculty members at the University of Al-Aqsa skills of the 21st century. Its clear form table (2) that the following results were obtained:

− Al Aqsa faculty members have a high ownership degree level (total mean 2.38, percentage 79.3%).

− The Technology Literacy domain is in the first order (mean 2.61, percentage 87%) with high level.

− The creativity and innovation domain is located in the last order (mean 1.92, percentage 64%) with moderate level.

- The citizenship, digital responsibility and design of 21st century digital assessment tools domains have (mean 2.59, 2.56 with percentage 86.3%, 85.3% respectively). All of these results proved to be high level.

- Communication and collaboration domain was in moderate level (mean 2.18, percentage 72.7%). This result can be attributed to the acceleration of the technological IT revolution and the availability of modern technology that the faculty members engaged in this process to update their technological skills, and knowledge of 21st century skills in order to improve learning quality and facilitate the transformation to smart university.

Table (2) Means, Standard Deviation, percentage and rank of Al Aqsa University Faculty members 21st century technology skills ownership degree.

	Skill	Means	SD	%	rank	Ownership degree
Technology Literacy						
1.	I have good ICT knowledge	2.78	0.42	92.7%	4	high
2.	I can obtain information from multiple digital sources.	2.90	0.30	96.7%	2	high
3.	I can use technology as a searching tool to get, organized and transfer information	2.33	0.49	77.7%	7	medium
4.	I can use a variety of sources for information management	2.13	0.63	71%	8	medium
5.	I am versed in employing IT applications in educational process	2.54	0.58	84.7%	5	high
6.	I am able to use mobile applications skilfully in educational process	2.85	0.41	95%	3	high
7.	I have the skills of employing LCD monitors in the educational process skilfully.	2.92	0.27	97.3%	1	high

	Skill	Means	SD	%	rank	Ownership degree
8.	I am versed in using multimedia technology in educational process skilfully and efficiently	2.40	0.54	88%	6	medium
Total		2.61	0.19	87%		high
Communication & Collaboration						
9.	I have sufficient skills to use ICT to transfer the information to the others.	1.85	0.49	61.7%	7	medium
10.	I have the ability to communicate effectively in diverse environments (including multi-language environments)	2.07	0.39	69%	3	medium
11.	I have the ability to employ communication tools and social networks appropriately to reach knowledge.	2.79	0.46	93%	1	high
12.	I am versed in using the digital media to transfer knowledge and ideas to students effectively.	1.92	0.46	64%	6	medium
13.	I can innovate modern teaching methods by academic exchange through using information technology	2.03	0.38	67.7%	4	medium
14.	I can effectively share publications with colleagues and experts by using different digital media	2.66	0.56	88.7%	2	high
15.	I have participation skills in local and international learning communities to discover novel applications to improve student education.	1.92	0.41	64%	5	Medium
Total		2.18	0.25	72.7%		Medium

... continue table (2)

	Skill	Means	SD	%	rank	Ownership degree
creativity & innovation						
16.	I have the skill to use ICT to generate ideas and develop new ways of doing things.	1.97	0.32	65.7%	3	medium
17.	I am able to use a wide range of techniques to create ideas (e.g. brainstorming)	2.11	0.46	70.3%	1	medium
18.	I can develop, implement and communicate new ideas to others digitally in effective manner.	2.12	0.33	70.7%	1	medium
19.	I can use ICT to get digital knowledge about the nature of the problem.	1.81	0.54	60.3%	4	medium
20.	I have the ability to provide students with the skills to explore local environmental issues and solve problems using digital resources.	1.74	0.47	58%	6	Low
21.	I can provide students with the best thinking skills using digital tools to demonstrate their creative work.	1.76	0.50	58.7%	5	High
Total		1.92	0.20	64%		medium
Design of 21st century digital assessment tools						
22.	I can develop a digital learning environment to encourage students in participation and exploration	1.64	0.57	54.7%	6	low
23.	I am versed in using immediate and self-assessment using modern techniques	2.33	0.74	77.7%	5	medium
24.	I have the ability to use diverse learning activities, methods and strategies suited to digital development	2.87	0.34	95.7%	2	high

	Skill	**Means**	**SD**	**%**	**rank**	**Ownership degree**
25.	I can use evaluation results to improve learning and progression.	2.87	0.34	95.7%	2	high
26.	I can assess recent research for the optimal use of digital tools to support student learning.	2.91	0.29	97%.	1	high
27.	I can judge the accuracy of scientific information from printed and electronic sources	2.73	0.54	91%	4	high
Total		2.56	0.38	85.3%		high
Digital Citizenship and responsibility						
28.	I can facilitate the effective usage of digital tools	2.91	0.29	97%	1	high
29.	I have the skill to encourage the safe and ethical use of IT	2.40	0.63	80%	5	high
30.	I am trying hardly to provide students with equitable access to appropriate digital tools and resources	2.91	0.29	97%	1	high
31.	I have the ability to convince students and colleagues to adhere to good behaviour in the digital environment	2.91	0.29	97%	1	high
32.	I am versed in employing digital communication tools to integrate students with other cultures to develop their awareness and cultural understanding	2.30	0.46	76.7%	6	medium
33.	I have the skill to act in a socially responsible manner while demonstrating awareness and knowledge of the legal and ethical aspects of using ICTs.	1.80	0.69	60%	7	medium

	Skill	Means	SD	%	rank	Ownership degree
34.	I can take proactive steps in decisions making or actions when using ICTs.	2.91	0.29	97%	1	high
Total		**2.59**	**0.28**	**86.3%**		high
Grand total		**2.38**	**0.15**	**79.3%**		high

To answer the third question "Are there statistically significant differences at the level of significance ($\alpha \leq 0.05$) between the means of specialization (human science, natural science) in the ownership degree of the 21st century skills? Independent Samples T test is used table (3).

Table (3): Independent Samples T for specialization variable.

Domain	Means		t	Sig P (0.05)
	Human sciences	Natural sciences		
Technology Literacy	2.5742	2.679	.199	.657
Communication & Collaboration	2.2058	2.129	1.214	.274
creativity & innovation	1.9266	1.99	.045	.833
Design of 21st century digital assessment tools	2.5424	2.59	.003	.959
citizenship and digital responsibility	2.6295	2.52	.012	.913
Total	**2.3888**	**2.37**	**.109**	**.742**

Table (3) shows that there were no significant differences between the means of sample response to Possession degree of 21st century skills attributed to specialization variable (human science, natural science). This result may be due to the passion in new technologies, up-to-date learning modules of faculty members regardless their scientific background.

To answer the fourth question: Are there statistically significant differences at the level of significance ($\alpha \leq 0.05$) between the means of academic degree (Associate Professor and Professor, Assistant Professor, Master degree) in the ownership degree of the 21st century skills? ANOVA test was carried out as seen in table (4).

Table (4): ANOVA test for academic degree variable.

Domain		Sum of Squares	df	Mean Square	F	Sig.
Technology Literacy	Between Groups	.008	2	.004	.113	.893
	Within Groups	3.196	86	.037		
	Total	3.205	88			
Communication & Collaboration	Between Groups	.102	2	.051	.845	.433
	Within Groups	5.215	86	.061		
	Total	5.318	88			
creativity & innovation	Between Groups	.057	2	.029	.678	.510
	Within Groups	3.616	86	.042		
	Total	3.673	88			
Design of 21st century digital assessment tools	Between Groups	.502	2	.251	1.736	.182
	Within Groups	12.439	86	.145		
	Total	12.941	88			
		Sum of Squares	df	Mean Square		
citizenship and digital responsibility	Between Groups	.021	2	.010	.128	.880
	Within Groups	6.941	86	.081		
	Total	6.961	88			
Total	Between Groups	.057	2	.029	1.296	.279
	Within Groups	1.899	86	.022		
	Total	1.956	88			

Table (4) shows that there were no significant differences between the means of sample response to ownership degree of 21st century skills attributed to academic degree. This result indicates that all faculty members regardless of their academic degree have the same ability to implement the university policy in transformation from traditional university to smart university. This is due to the rapid development of technology and the challenge of the 21st century to use it, and because they work in university institution that they have to possess the technology skills to employ in their profession.

Answering question five: "What is the proposed vision to transform Al-Aqsa University into a smart university in the light of 21st century skills?'' In the light of the previous results, and the literature review the researcher developed a conceptual framework to transform from traditional university to smart university as describe in figure (1).

Transforming to smart university needs various disciplines (smart infrastructure, smart Environments, smart management, smart people and smart Database) intergrade and interconnected with each other's.

Smart infrastructure consist of two components hardware infrastructure (smart buildings, sufficient energy and water supply, advanced wire network, smart devices, advanced communication systems, smart board and LCD) and software infrastructure (learning management systems, control systems, security and protection systems, social networks, digital library, and electronic pages).

The other component is smart Environments which based on a variety of disciplines such as cloud computing, sensor networks, multimedia and software, on other hand smart environments are able to acquire and apply knowledge about the environment and its inhabitants to improve their expertise in that environment. Smart environments may be divided into four sections:

− Smart learning includes smart curriculum, interactive electronic lectures, electronic courses, electronic books, digital repositories, Internet resources, electronic learning portals.

− Smart society can encourage fostering creativity and innovation through collaboration in sharing information electronically, social activities within the university where social networks are used for education, communication and information exchange.

− Green environment includes a wide green natural environment of gardens and playgrounds, improving quality of community living support creativity and interdisciplinary collaboration in smart university environments.

− Smart health care which includes preventative health care, distance health awareness and care system, distance treatment system, electronic health records, smart biological information.

Smart management has the power to drive the change of staff performance manner to increase university competition effectively, and integration of technological invitation within the educational staff and educational process to achieve the best strategies and best management of the university.

Smart Database doesn't mean only collecting large volumes of data but are also learning to understand the relationships between entities by mapping their connection to the system; it includes a comprehensive smart information system for all parties to the University's educational process.

Smart people constitute a human capital and a source of competitive advantage, smart university focusing on training and preparing staff and students to be able to teach according to modern digital developments, and the to use of educational technology and employing it on teaching process. Also the university teacher must have an innovation, intelligences and excellence in performance character.
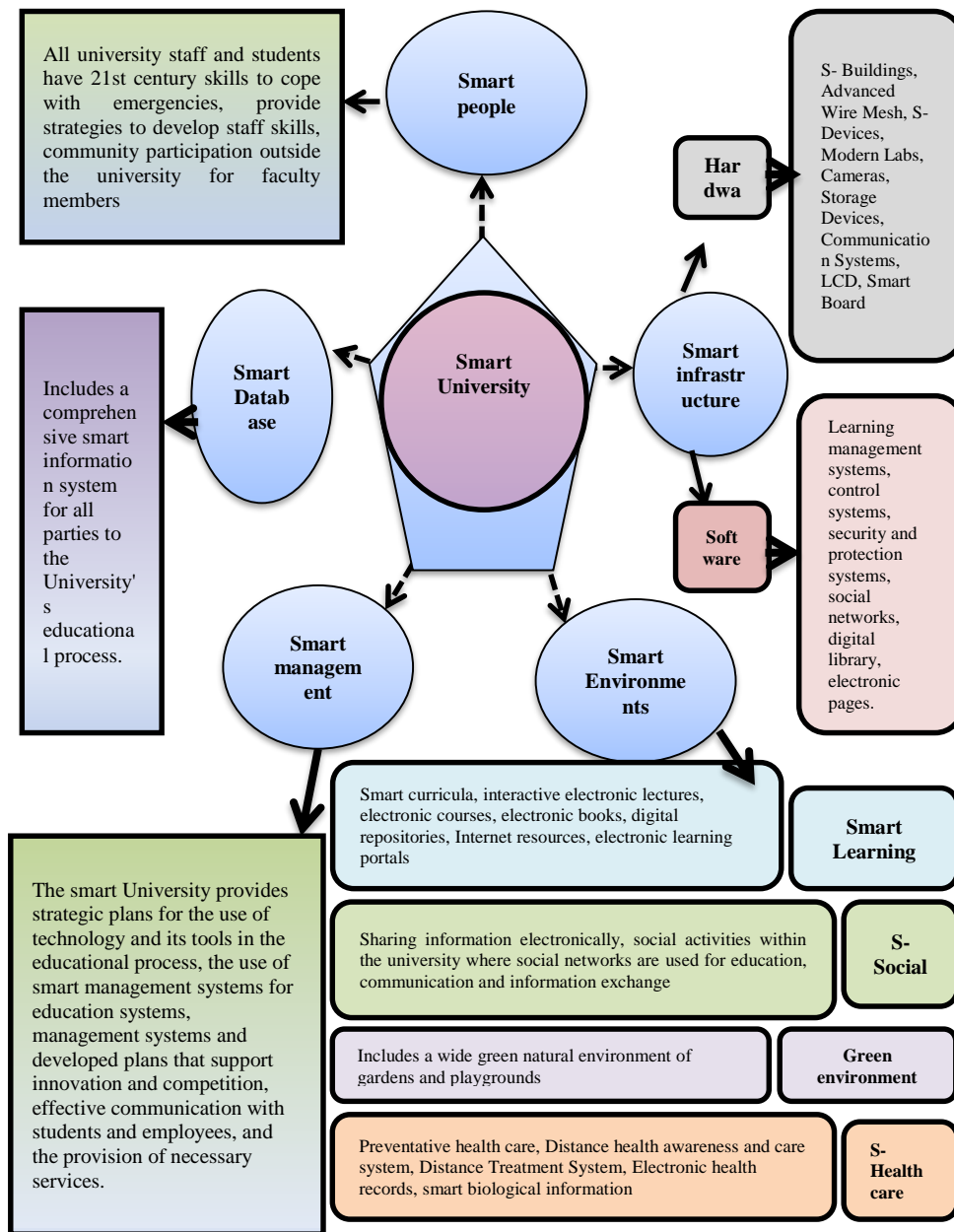
All university staff and students have 21st century skills to cope with emergencies, provide strategies to develop staff skills, community participation outside the university for faculty members

Smart people

S- Buildings, Advanced Wire Mesh, S- Devices, Modern Labs, Cameras, Storage Devices, Communication Systems, LCD, Smart Board

Har dwa

Includes a comprehensive smart information system for all parties to the University's educational process.

Smart Datab ase

Smart University

Smart infrastr ucture

Learning management systems, control systems, security and protection systems, social networks, digital library, electronic pages.

Soft ware

Smart managem ent

Smart Environme nts

The smart University provides strategic plans for the use of technology and its tools in the educational process, the use of smart management systems for education systems, management systems and developed plans that support innovation and competition, effective communication with students and employees, and the provision of necessary services.

Smart curricula, interactive electronic lectures, electronic courses, electronic books, digital repositories, Internet resources, electronic learning portals

Smart Learning

Sharing information electronically, social activities within the university where social networks are used for education, communication and information exchange

S- Social

Includes a wide green natural environment of gardens and playgrounds

Green environment

Preventative health care, Distance health awareness and care system, Distance Treatment System, Electronic health records, smart biological information

S- Health care

Figure (1): Proposed vision for a smart university.

Limitations, conclusions and recommendations.

There are some limitations of this study. One of the most important limitations is sample size, the researcher was able to assess only (89) university faculty members, this may be due to time and financial limitations.

Moreover, inability to reach local and regional recent references related to this topic. With the limitation of small sample size kept in mind, the researcher offers same conclusions.

The development of high education in Gaza Strip is facing multiple obstacles in different ways. The technological capabilities of faculty members could overcome any issue.

The ownership of 21st technological skills are one of the fundamental needs in transformation from traditional university to smart university.

The researcher found that the faculty members at Al Aqsa University have a high level of 21st skills regardless of the academic degree and speciality.

The researcher developed a list of 21st century skills, a conceptual framework to transform from traditional university to smart university frameworks which is also facilitate the transformation to smart university.

The researcher suggests the following to the Ministry of Higher Education.

1. Develop a plan for promoting the Palestinian universities to smart universities in the light of 21st century skills.

2. Offer smart university; smart learning, smart health, smart culture, smart building, in the context of smart city.

3. Develop the 21st skills for student and faculty members.

4. Further related works are extracted to be as follows:

    – The effects of smart university in developing student's skills.

- Dose University have smart university requirements and how to develop them.

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