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Factors Affecting the Distribution of Information and Communication Technologies in an Egyptian Public University: A Case Study of the Faculty of Education at Ain Shams University

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Factors Affecting the Distribution of Information and Communication Technologies in an Egyptian Public University

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Abstract

This research investigates the three main factors that affect the provision, access, and distribution of Information and Communication Technologies (ICT) among senior and junior faculty members in the Faculty of Education at Ain Shams University. These three factors include laws and regulations organizing the procurement of ICT in public universities in general and in the Faculty in particular, the organizational structure of the Faculty, in which the position of ICT can be determined, and the administrative and decision-making mechanisms that help distribute ICT across the departments of the faculty and the determinants that govern the execution of decisions related to ICT. The study conducted interviews with the dean (provost) of the faculty, the three vice-deans (vice-provosts) and seventeen heads of faculty departments and secretaries. The study revealed that the current elected faculty administration has shown real progress. After the election of the new administration, distribution of technologies was carried out according to new demands that priority should be given to departments that had not gotten equipment in the previous year.

Keywords: ICT, distribution, public university system, organizational structure

Factores que afectan a la distribución de las Tecnologías de Información y Comunicación en la Universidad Pública de Egipto

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Resumen

Esta investigación estudia los tres factores principales que afectan al suministro, al acceso y a la distribución de las Tecnologías de la Información y de la Comunicación entre los miembros del cuerpo docente en la Facultad de Educación de la Universidad de Ain Shams. Estos tres factores, como las leyes y reglamentos de la organización de la adquisición de TIC en las universidades públicas en general y en la Facultad, en particular, la estructura organizativa de la Facultad, en la que la posición de las TIC puede ser determinante, y los mecanismos administrativos que ayudan a distribuir las TIC a través de los departamentos de la facultad y los determinantes que rigen la ejecución de las decisiones relacionadas con las TIC. Se realizaron entrevistas con el decano de la facultad, los tres decanos vicepresidentes y diecisiete jefes de los departamentos de la facultad y secretarios. Se reveló que la administración de la facultad elegida actual ha mostrado un progreso real. Después de la elección de la nueva administración, la distribución de las tecnologías se llevó a cabo de acuerdo a las nuevas demandas que se debería dar prioridad a los departamentos que no habían conseguido equipamiento en el año anterior.

Palabras clave: TIC, distribución, sistema universitario público, estructura

The use of ICT among faculty members has been a priority in most Egyptian public universities, especially following the election of universities' administrations after the Egyptian Revolution of January 25, 2011 (Kolar, 2012). The election of the new administrations was carried out by senior and junior faculty members and not the State Security as was the case before the Revolution; elected were deans (provosts) and three vice-deans-deputies (vice provosts)—one for student affairs, one for graduate studies and research, and one for the environment. For the members of these newly-elected administrations, ICT represent the most essential aspect of enhancing not only the academic capacity of faculty members, but the educational process for teachers and their students as well (Machin, 2006; Nesbitt, 2008). Though the administration of the Faculty of Education has embedded ICT into its agenda as a necessary priority, it found that the provision, access, and distribution of ICT are uneven across the departments of the faculty in favor of the scientific disciplines in comparison with those in the humanities and education. This paper, then, investigates the Faculty's laws and regulations, its organizational structure, and its administrative and decision-making mechanisms all of which impact the provision, access, and distribution of ICT.

ICT is variously defined. The United Nation Development Program's (UNDP) definition states that ICT are tools that people use to gather, share and distribute information and to communicate with one another through the use of computers and computer networks (ESCAP, 2004). According to the World Bank, ICT consists of hardware, software, networks, and media for the collection, storage, processing, transmission, and presentation of information in the form of voice, data, text, and images. The Organization for Economic Cooperation and Development (OECD) defines ICT as a combination of manufacturing and service industries that capture, transmit and display data and information electronically (Chen, 2004). As long as the current study investigates the position of ICT in the Faculty of Education, the operational definition of ICT adopted in this paper is the following: a collection of technologies and applications, which enable senior and junior faculty members to process, store, and transfer information. These technologies and applications include computer equipment, PowerPoint projectors and access to the Internet.

The idea of the equal distribution of ICT is connected to applying the

institutional system to both Ain Shams University and the Faculty of Education as a process and as a property variable (Zucker, 1977). The Faculty of Education is an entity with its own rules and regulations determining its relation with other entities; it is also an autonomous educational or a cultural system characterized by various features and properties (Scott, 2001). We also have to take into account that institutionalization is a process that has to develop its organizational structure and decision making according to its needs as well as global challenges that can help such entity to achieve stability and progress (Scott, 2001).

The argument of this study is based on three main claims. First, there is an imbalance in the distribution of ICT in the Faculty of Education in favor of the scientific disciplines in comparison with other disciplines in the humanities and in education. Second, a clear gap exists between the laws and regulations of ICT, on the one hand and the executive decision making practiced in the faculty, on the other. Finally, a claim could be made that the elected administration—whether the current one or the next, and in comparison with the previously appointed ones—can act to close the gap between laws and regulations and the decision making process by modifying the design and practice of the organizational structure of the faculty to include ICT as a separate unit like any other educational unit embedded in this structure.

The present study will examine two specific areas:

1. Investigating the effect of legislative, organizational and administrative factors in the Faculty of Education on the provision, access and distribution of ICT either across the three sectors or within departments.
2. Identifying to what extent there is a gap between the laws and regulations of ICT, on the one hand and administrative procedures in distributing ICT, on the other.

Research Questions

1. What are the laws and regulations that govern ICT in Egyptian public universities in general and in the Faculty of Education at Ain Shams

University in particular?

2. How does the faculty's organizational structure affect ICT provision, distribution and access to it by faculty members?

3. Is there a link between the decision-making system and executive mechanisms, on the one hand and access, provision and distribution of ICT, on the other within the faculty?

4. What are the possible solutions toward an equitable distribution of ICT across three divisions (scientific-humanities-educational) within the faculty?

Methodology

This research adopted a qualitative methodology. The selection of the sample is based on purposive and non-random technique. The first stage of the research sought to recognize the difference between the elected administration—including the dean (provost), all his three deputies (vice-provosts) and all heads of the seventeenth departments—and the previously appointed one.

Two focus group discussions were conducted: the first took place on April 24, 2012 with seven faculty members (three from scientific, two from the humanities, and two from educational departments). The second happened on May 5, 2012 with eight junior faculty members (four from scientific, two from humanities and two from educational departments).

During the second stage, the study explored the factors affecting the imbalance in the distribution of ICT across the three sectors. Three factors were identified: laws and regulations, which govern the procurement of ICT, the organizational structure of the Faculty of Education, as well as its administrative and decision-making mechanisms. Consequently, data and documents were collected about the laws and regulations of ICT in public universities in Egypt and in the Faculty of Education at Ain Shams University. It was also during this stage of the study when interviews were conducted with the dean (provost), the three vice-deans (vice-provosts), (ICT) program managers at Ain Shams University or within the Faculty. Additionally, questionnaires were sent to seventeen heads of faculty departments and secretaries.

Limits to the Study

1. It is very difficult to pass ICT laws and regulations in Egypt. All projects throughout either Ain Shams University or the Faculty of Education that aim to develop the technical skills of faculty members and to provide public faculties with ICT equipment and expertise, are only concerned with tangible mechanisms and procedures rather than with laws and regulations that would organize and legalize the availability and access to ICT.

2. Procuring a chart of the organizational structure of the Faculty of Education was difficult as it is not available either online or as a hard copy. I was able to obtain an outdated version of the chart, and only after several attempts, from the university's Educational Quality Unit, while a new version is currently being prepared.

Faculty of Education at Ain Shams University and ICT

Ain Shams University is the third oldest in Egypt. It was founded in July 1950 under the name Ibrahim Pasha University. Presently, it includes fifteen faculties and two high institutes. In 1950 there were only eight faculties: Arts, Law, Commerce, Science, Engineering, Medicine, Agriculture, and Women's College. In 1969, the Faculty of Education, known since 1880 as Teachers' College, became the ninth faculty in the university ([Al-Sayyid, 2010](#)).

Each university in Egypt is governed by a president who is assisted by three vice-presidents. Their areas of competence vary to include student affairs, graduate studies and research, and community and environmental affairs. Each dean is assisted by three vice-deans. Heads of departments are appointed by the dean of the faculty. The Law of the Organization of Universities (Law 143) issued in 1972 gives Egyptian professors and faculty members the right to elect the dean of their faculty; the names of three front-runners are sent to the university president who appoints the candidate who has received the highest number of votes ([Reid, 1990](#)). However, in 1994 the situation changed as Dr. Hussein Kamel Baha' El-Din, then-Minister of Higher Education, decided that elections of deans gave rise to much infighting among professors ([Al-Sayyid, 2010](#)). He got one of his followers, a member of the People's Assembly who became a senior official at the

Ministry of Education, to amend the Law 143 related to the election of deans. Thus, since May 1994, university presidents have the privilege of appointing deans of faculties.

After the Egyptian Revolution of January 25, the president of the university, three vice-presidents, deans (provosts) of faculties, three vice-deans and heads of departments were elected by professors and faculty members. During conducting focus group discussions within the Faculty, senior and junior faculty members assured me that there was a positive relationship between electing these leaders and enhancing educational processes and outcomes for both teachers and students within the faculty. In comparison to the tendency of the former heads of department, provosts, and vice-provosts who were more inclined to represent the interests of the state before the Revolution, the loyalty of these elected leaders after the Revolution would be to their colleagues, to the faculty members, and to their students and they would not follow the interests of the president of the university or the interests of the state. In turn, the elected administration, based on the effectiveness of the educational services that it provides, can hope that senior and junior faculty members would reelect it.

Previously, the appointed leaders of public universities were focused on satisfying the corrupted political regime, including the members of the National Democratic Party (NDP) and the State Security. In the opinion of the members of the Faculty of Education, appointed deans were pro-regime, unwilling to be accountable, they were co-opted and unwilling to change the power structure and they enjoyed almost full discretion over the allocation of ICT resources. Also, they disregarded the demands of faculty members and showed passivity towards developing the educational process within the faculty. Elected deans, on the other hand, responded to the demands of faculty members, applied the principles of equity in all educational aspects (including ICT), and responded to accountability—faculty members have a say in changing deans (provosts) and monitoring their performance and decisions.

Factors Affecting the Distribution of ICT Devices

Laws and Regulations of ICT in Egypt

Since the late 1990s, the regulation and development of the telecommunication sector became a top priority to the Egyptian government. Two of the main objectives of the National Communications and Information Technology Plan (NCITP) announced in 1999 under the Ministry of Communications and Information Technology (MCIT), and which were used by the universities, were to create a robust IT industry in Egypt and to establish an information society to acquire and benefit from endless sources of information. In 2003, the Telecommunications' Law was enacted to regulate the communications' services sector and to disseminate and improve services using as a benchmark the most advanced technologies. Accordingly, the total investment in ICT exceeded USD 44 billion dollars by the end of 2010 (MCIT, 2013).

The new Communications' Law of 2003 included the establishment of the Telecommunications Regulatory Authority (TRA), which is responsible for licensing telecom operators and implementing government telecommunication policies (UNECA, 2009). With the belief that investment in education via ICT is the solution to ensure national development, MCIT worked closely with the Ministry of Education (MOE) and the Ministry of Higher Education (MOHE) on a number of projects with the goal to empower both teachers and students with IT skills.

There are no effective mechanisms, such as annual evaluation reports, for measuring the quality of teaching and accountability (formative or summative) in Egyptian public universities generally. Criteria for assessing performance, particularly in teaching, are insufficient. Deans and departmental chairs are not empowered to take any meaningful action following up on evidence of poor performance by their staff. Except for some individual and isolated initiatives, there is also limited expertise for developing strong standards for performance and there is no available data that could be used as indicator of educational quality (Becta, 2006; Parri, 2006). Also, there is no motivation in the workplace that can lead faculty members to innovative teaching or creative research. In addition, office space is limited and universities do not provide academic staff with computers.

Egypt's administrative-to-teaching staff ratio is 4:3 in public universities, which is considered high by international standards. Personnel management regulations make the intervention to reduce the number of employees in the administration extremely difficult and university officials cannot remedy this situation. Therefore, the share in public spending devoted to actual teaching is low. In addition, there is no mandatory retirement age, in which means that there are more senior faculty members and fewer junior teaching staff. In the absence of a funding formula, university budgets are determined by the Ministry of Planning (MOP) and Ministry of Finance (MOF) and are based on individual discussions and needs assessments for each university.

It is impossible to continue developing this industry and adopting innovation strategies without establishing cooperation channels between business and academia (Oliver, 2002; Angel, 2004; Unwin, 2009). The Information Technology Academia Collaboration (ITAC) is a program of the Information Technology Industry Development Agency (ITIDA) designed to foster cooperation between ICT companies and Research and Development (R&D) institutions in order to shed light on the importance of linking industry research with market needs. To empower competition in local and global markets, ITAC programs promote collaboration between industry and academia creating more opportunities for undergraduates and graduates in getting advice on ICT and access to the Internet within ICT companies (MCIT, 2010).

Recent initiatives to improve ICT infrastructure in higher education in Egypt (currently, the first of six, such projects is being considered) include upgrading operations of the unified high-speed information network inaugurated in January 2007, linking Egyptian universities, research centers, and the Bibliotheca Alexandrina. The upgrade operations include updating the technological environment of seventeen Egyptian universities via the establishment of 315 IT clubs inside the different colleges (MCIT, 2010).

The Egyptian University Network (EUN) was established in 1987 by the Supreme Council of University (SCU) with the major objective of linking Egyptian universities to the Internet as part of an effort to facilitate communication and the exchange of information between them. Egypt introduced its first Internet use in 1993 through a link between the EUN and France. EUN serves twenty universities in addition to various government and research institutes. Its mission includes the following: establishing the

leading portal of information at the national and international levels, an e-library that provides researchers and decision makers with significant information; integration, co-ordination and linkage between Egyptian universities to maximize the use of available information and informatics resources; and creating an e-learning center to enhance the system of higher education (EUN, 2013). Large disparities exist between universities regarding ICT resources and use of e-learning as some universities have established e-learning centers while others have not provided any e-learning facilities.

Said (2001) argues that the lack of an overall technology plan, coupled with a short-term funding model and the absence of a clear acquisition and replacement plan, has led to "an inconsistent and unproductive approach to IT implementation (El-Shenawi, 2005). Within individual universities, there is a shortage of up-to-date ICT for teaching, libraries and research. In this context, El-Shenawi observes that in spite of the efforts of the MOHE to integrate technology into the education system, results are far behind what was intended. This is due to a lack of coordination between universities and between different departments within each faculty.

To sum up, and in regard to the laws and regulations of ICT in the Faculty of Education, Ain Shams University, there is a lack of forming laws by public universities in tackling ICT. Also, there are no integrated regulations that can coordinate the activities of ICT within different departments in each faculty and across universities (Fox & Yuan, 2007). The laws enacted by the Ministry of Communications alone, without laws formed by the Ministry of Higher Education, cannot guarantee establishing cooperation channels between business and academia.

The Organizational Structure

The organizational structure is one of the most important factors that can determine the efficiency of the institution (the Faculty of Education, in this case). The structure has to include three specific variables: the total number of the workforce in the faculty (administrative staff, senior and junior faculty members, professors, office boys, etc.), the extent of complexity of the faculty vertically as well as horizontally (diversity of organizational activities, jobs, and departments), the legitimacy of the faculty [the extent to which the faculty is subject to written rules and regulations enacted through procedures,

instructions, and communications] (Blankshtain, 2004; Bates, 2006; UNDP, 2010). Such official legitimacy includes the role of each person involved in the structure, the authority relations that determine the extent of professionalism and the main features of the professional hierarchy, communication between such persons--whether oral or written, and the main criteria and sanctions based on written rules and policies applied in case of violations (Mohamed, 1997).

The organizational structure in the Faculty of Education at Ain Shams University does not include several components mentioned above such as size of the faculty and the legitimacy. These components were not part of the previous organizational structure, but are included in the current diagram of the hierarchical organization, which shows that the faculty still needs to undergo several institutional developments. Concerning ICT, the organizational structure of the Faculty of Education does not include an Information Technology (IT) unit. This unit is embedded in Ain Shams University's new strategy. Accordingly, an IT unit within each faculty is planned, which is included as part of the Information and Communication Technology Project (ICTP) (Abd El-Latif, Personal Interview, April 2013).

According to Abd El-Latif, ICTP, in coordination with the university, aims to decentralize the developed capacity-building of faculty members and students. It is supposed that some faculty members and trained employees are responsible for running such IT unit efficiently through an activated consultancy and a maintenance and help desk unit. An experienced engineer associated with each faculty provides technical help in case of a break-down of equipment (such as hardware- and software- operating system-networks). However, the matter was different at the level of university administration—when asked to establish a faculty IT unit, university officials told the elected administration that the unit needs two rooms of forty five square meters each, that the focus of the unit would be on the consultancy aspect and that the unit cannot provide the faculty with help on technical maintenance. In response, the faculty rejected the proposal of two rooms permanently available to the IT unit. Thus, the principles that the regulations ratified and acknowledged are more idealistic than what was actually enacted.

Although the organizational structure does not include an ICT component, it does have a Center for Electronic Learning. The establishment of this center is extremely important but, at the same time, its existence is

conditional on the equal access to ICT of faculty members in different departments and programs, something that has not been acknowledged until now. Also, the position of ICT in the organizational structure is limited to the establishment of the center and does not take into account other important components like establishing technological infrastructure and providing all departments with equal number of equipment (computer devices and PowerPoint projectors) and with equal access to the Internet (Yasser, Personal Interview, 22 April 2013). According to Khalil, "the maintenance unit in the faculty does not have guidelines or a systematic vision and therefore, it does have neither executive managers nor technicians". (Khalil, Personal Interview, 24 April 2013).

However, with the application by the elected administration of transparency and complex work processes and directions, the organizational structure of the faculty can extend to include more sophisticated, productive and regular provisions for ICT through the establishment of IT and maintenance units. In such a way, the unit can get several considerable projects underway, providing faculty members with equipment and access to the Internet and training, and it can establish database site to monitor the number of ICT equipment in each department (Kageto, 2002; Bauer & Kenton, 2005; Abd El Reheem, 2006). This monitoring can in turn show discrepancies in the numbers of equipment provided to each faculty and unfair distribution to some sectors. Ultimately, priority should be given to those departments that have the smallest ratio between the number of equipment and the number of faculty members.

The Administrative and Decision-Making Mechanisms

How Faculties Such as the Faculty of Education Get Technological Equipment?

Two things can be noted here. First, any one of ICTP's five projects can provide faculties with only a small number of equipment. Second, faculties can acquire devices either autonomously through their links with centers, projects and other sources or, as is most often the case, through the Continuous Improvement and Qualifying for Accreditation Project (CIQAP), which provides the faculty with large number of computers and PowerPoint

projectors (Yasser, Personal Interview).

The procedure for distributing computers and PowerPoint projectors is this: the faculty informs the storekeeper that the university has supplied the money for acquiring various tools like computer equipment, projectors, office furnishing, chairs, etc.; a committee convenes to determine the needs of each department and after purchasing the equipment, the storekeeper informs the departmental secretaries of the time of delivery of the devices and the process of equipment distribution begins (Abo-El-Ela, Personal Interview, January 2013).

After the storekeeper receives the numbers of equipment required, the procurement office makes a supplying order. Once the storekeeper receives this order, he calls on forming a committee to examine the equipment acquired and to add it to the total number of technological devices that have been received before. The distribution of this equipment is then the responsibility of the vice-provost of post-graduate studies. For instance, in 2010-11 the Faculty of Education requested hundred and seventy-nine computers and nine PowerPoint projectors, but in 2011-12 the number of computers declined to forty-four and that of PowerPoint projectors increased to fifty. There is a clear disparity in the number of equipment distributed not only in time as it differs from year to year, but also in the types and numbers of equipment distributed each year.

In this context, Sayed, the storekeeper, asks: “According to which criterion did the university specify that this year only four-four computers will be acquired while in the previous year the number was hundred and seventy-nine and why did the university specify that this year fifty PowerPoint projectors will be had and the previous year the number was nine? What is the justification of such disparity?” The numbers for equipment for this year were sent late because of the Revolution and when the storekeeper and the vice-provost for graduate studies asked about the statistics determining the distribution of ICT devices across all faculties and departments, they realized that such statistics had not been produced. In this case, the storekeeper and the vice-provost used old copies of the departments’ applications reflecting their needs of ICT equipment in previous years and distributed the equipment acquired by Ain Shams University according to these applications, which did not necessarily reflect the committee decisions about the distribution of such equipment. Computers are most commonly

distributed through a corporation called The Arab Institution of Industrialization; the majority of acquired projectors are from the Sony Corporation.

Dr. El-Gamal, the dean of the faculty mentioned "the acquisition of ICT, before the revolution, was based on favoritism to specific corporations, not on the efficiency of particular technologies or the quality of a company's products". He added "The selected brand-name equipment was the cheapest available; therefore its quality was lower in comparison with other high-cost ones. The committee is obligated to select and examine the equipment intentionally disregarded high-quality technologies and selected equipment that broke down sometimes even during the first year" (El-Gamal, Personal Interview, April 26 2013).

To explain the causes of such misdistribution across departments within the same faculty, Yasser claims that some departments did not know when equipment would be delivered and whether faculty members from other departments had been informed about such deliveries and had the chance to take the entire equipment quotas available in faculty stores. He comments: "I did not see any secretary asking for equipment and did not take them." Sometimes, under the pressure of bureaucratic procedures, some secretaries do not ask for any tools or equipment that would require long and complicated acquisition process and paperwork (Yasser, Personal Interview).

The technical unit in each department is responsible for determining the quality of the devices that the faculty receives per year. The university is mainly concerned with acquiring and delivering those devices at a low cost, however, the technical unit has the right to select technological devices of good quality; if professors insist on high-quality devices, they have to get them (Khalil, Personal Interview). The deputies of the faculty agreed on the fact that "Having Internet access empowers departments in the faculty; however, the person, who is supposed to distribute the Internet quotas between departments is a switch worker, not an engineer. In this regard, the administration of the Faculty of Education sent petitions to the university to regulate the network". In addition, for them, there is no dependable technical maintenance unit in the faculty and there is a proposed plan from the current elected administration to establish such a unit based on the principles of anti-censorship and transparency.

Findings

In comparison with those who were appointed by the president of Ain Shams University before the revolution, the new administrative members of the Faculty of Education have positive and progressive attitudes concerning following-up the principles of loyalty, rationality and accountability in a way that actualizes its members' interests in operating the faculty and facilitating the activities of their faculty and junior members.

Public universities in Egypt initiated five-year strategies, which include the maintenance of IT units as they can facilitate the long-term implementation of IT in all universities, including Ain Shams University. If such five-year strategy is sustained, there would be no gap between the rules and regulations on the one hand, and the policies on the other, a gap which was noticeable over the last decade. Two such strategic plans have been put in effect so far—in 2007-2012 and 2012-2017.

The Minister of Higher Education decentralized university IT units by designating 20 percent from faculties in which to establish IT prototypes with the intention to select a larger sample in the future. Instead of relying on a central line (ICTP) and seeking to entrench the capacity-building of faculties, the university tended to establish similar IT units and projects.

One of the major factors contributing to the misdistribution of ICT across sectors in the Faculty of Education in favor of scientific departments is that the appointed provost was always a faculty member from a science program. This situation creates a conflict of interest where the incumbents tend to disregard the required neutrality of their administrative position and are inclined to prioritize services for their own scientific departments, including ICT equipment and online access. For instance, the provost was in close contact with his colleagues from the same discipline and fulfilled all of his departments' demands. In addition, there is no common plan of organizing ICT and that each faculty has its own priority.

Compared to the previous situation when provosts were appointed, the current elected faculty administration has shown real progress as faculty members have better access to the equipment, which has been added to the assets of their departments. Previously, departments' needs for technology were set aside once the new equipment arrived. The new process of distributing equipment began in 2012, regardless of whether or not the

previous demands of all departments had been fulfilled or not, as they had not submitted requests for technological devices in the previous year. After the election of the new administration, distribution of technologies was carried out according to new demands that priority should be given to departments that had not gotten equipment in the previous year. Under the elected administration, the storekeeper himself calls the departments and informs their secretaries that the shipment of ICT is ready for distribution according to the needs of the departments. The storekeeper also has to inform the vice-provost of graduate studies about the accurate time when faculties will receive the equipment and other tools that they have requested. Khalil added: “During this transitional stage, there is no time schedule for improving access to the Internet. But there are ongoing efforts of the faculty, although such efforts are not in parallel with those of the university.”

The Future Vision

1. It is crucial to establish laws governing higher education in general, and ICT specifically, laws that would impose measures for accountability (Ouda, 2011). Currently, there is no code of ethics, no transparency, no sense of belonging, while mistrust and disrespect among senior and junior faculty members are common, especially when compared to the situation in European and American universities.

2. All departments and the administration of both the faculty and the university should move to computerized and digital working environment with regular access to the Internet. This will enable faculty members to send exams, request vacation times and receive assignments electronically.

3. The issue is not about management; it is about “thinking management” which encourages flexibility and avoids subordination to the interests of a single person, a single department, perspective or schema (Zaky, 2002; Nguyen & Frazee, 2009; Renes & Strange, 2011). Emphasizing variety and flexibility provides justification for strategies based on the development of human resources and for tactics based on informed decisions. In this way, the workforce in the faculty will become more flexible. Such flexibility is supposed to be encouraged, not exploited, through the provision of education and training schemes.

4. Strengthening basic and long-term research with the partnership of the

private sector on new ICT systems (Zhao & Alexander, 2009; Fahim & Sami, 2011) as such research can contribute to:

- The growth of the whole ICT sector and lead to its openness
- The development of the sector in public universities
- Financing the research into the innovation process
- Developing appropriate conceptual tools to analyze and shape the evolving new ICT systems (Collis & Moonen, 2001; Fransman, 2010).

In addition, the focus should be on developing appropriate conceptual tools to analyze and shape the evolving new ICT systems.

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Appendix: Questionnaire Concerning the Three Factors Affecting the Distribution of ICT in the Faculty in Education

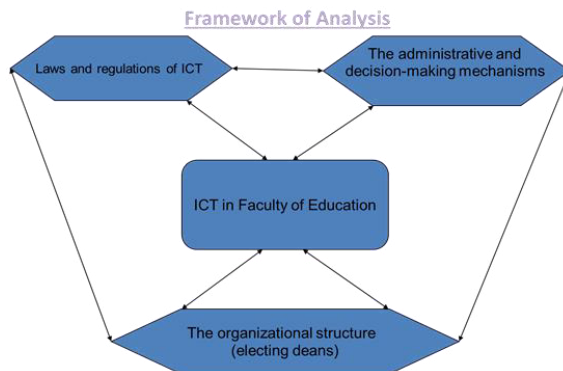


Figure 1. The three factors affecting the distribution of ICT

1. What are the main laws and regulations organizing the ICT in higher education in general and in public universities in specific?
2. What are the procedures of bringing equipments of ICT?
3. How does the committee select equipment? Is there a specific criterion?
4. How were the devices of ICT distributed?
5. Who is responsible for distributing the equipment?
6. Who is responsible for the access to the Internet?
7. Why is there imbalance in distributing the devices of ICT in favor of scientific departments in comparison with educational and humanities departments?
8. Is there a gap between the laws and regulations of ICT on the one hand and the policies executed in public universities? If the answer is "Yes," why is this so?
9. What are the obstacles that hinder the faculty to distribute the equipment equally?
10. What are the visions of the future development of ICT at the level of the Faculty of Education as well as in Ain Shams University?