

# SWANID: A Systematic Approach to Make Students Employable

Fahd M. Aldosari<sup>1</sup>, Mudasser F. Wyne<sup>2</sup>, and Ghazi I. Aldotiby<sup>1</sup>

<sup>1</sup>Umm Al Qura University, Makkah, Saudi Arabia

<sup>2</sup>National University, San Diego, USA

Email: {fmdosari, giotiby}@uqu.edu.sa, mwyne@nu.edu

**Abstract**—We all understand that University and College programs should be aligned with the latest technological trends as well as with the market needs to ensure graduates from the programs are employable. In addition, study programs also need to focus on raising the level of professionalism of the students by exposing them to best practices used by top organizations and companies in the relevant local market. In this paper, we present results of a thorough research with the main goal to develop a workable systematic approach to not only prepare and support students in the college but also to match the vision and the objectives of our college and university. The paper details the questionnaire and data collection from students and employers with the analysis, as well as results of the analysis. We also describe design and implementation of our initiative “SWANID” program and discuss the results of the system implementation in detail. The goal is to share our successful model, experiences and best practices with engineering and computer professionals from academia and industry around the globe who are engaged in similar novel engineering education initiatives.

**Index Terms**—employability, jobs, engineering, computer, education

## I. INTRODUCTION

In general, a graduate of an academic program is considered as a testimonial of a level of knowledge, skills and understanding. However, employability is concerned with the way in which those who have completed university courses can be integrated into national as well international employment [1]. This necessitates grasp of certain basic skills, that are more relevant to cultural and social setup, and may or may not, have been developed during the course of program. In general students, especially undergraduate, do not pay attention to developing skills to improve their chances of employability in their early years of education. Programs try to address employability skills of their graduates in the upper division courses that are taught towards end of the program. Professional education is expected to prepare students for jobs in specific professions based on their degree programs [2]. To support recruiting efforts and be able to identify the most qualified and eligible candidate for professional positions, organizations for quite some time have been tailoring their employee

recruitment and selection criteria and process; thus focusing on the assessment of interpersonal and communication abilities among other technical skills [3]. However, on the other hand, few professional schools in general, focus on developing intrapersonal and interpersonal capabilities of students, whereas typically professional programs focus on educating students in the latest theory and research in their respective discipline of study. It is also worth noting that faculty members rarely have the time, training, experience, or enthusiasm to help students gain the capabilities they will need to relate to their future workplace. Graduates of the programs will need to possess relevant skills necessary to their respective professional environment; however, academic program curricula are rarely designed to help students develop such skills, although research and professional practice have documented the connection between soft and technical skills, job performance, job satisfaction, and organizational commitment [4]. Few academic program curricula effectively address the intrapersonal and interpersonal skills that future employers of graduates want most and that employees find most useful in their work environment. In some cases, to address this issue organizations are providing necessary training for these unprepared graduates when they are hired.

A pilot study [5] argues for the value of engaging students early in the program regarding developing their professional skills. This will expose them to their own weaknesses and deficiencies in their skills very early in the program, this will help them to learn more strategically during rest of the program. Many of the academic institutes also have various programs to help and prepare students for job interviews and give tips on how to search for suitable job. Student job fairs, student job centers and student services are few of such programs and services. However, most student employment programs are not formally and directly associated with the academic experience. It is also understood that with the increased number of working students programs like student employment gain advantageous opportunities to link work with academic learning outcomes.

In summary following are some of the weaknesses amongst students that have been reported by various researchers:

- Weak communication and collaboration with the market and the employers.

- Unsatisfactory practical and applied skills for the students.
- Students have shallow knowledge about the role of innovation, creativity and entrepreneurship in the engineering and computing disciplines.
- Lack of strong personal skills for the college graduates.
- Students are not up to date with the latest advances and developments in their study field.

Authors report that through increased participation in departmental and campus events and increase in positive problem solving skills identified through student initiative with job assignments [6]; the employment supervisors indicated improvement in some learning outcomes such as more positive responses from customer services, stronger leadership growth in student's departmental loyalty. Eastern Michigan University offer a developmentally designed training program Leap to Excellence Acceleration Program (LEAP). It was started to identify strengths and areas for improvement to assist student employee to reach the agreed upon learning outcomes<sup>6</sup>.

The College of Computer and Information Systems at Umm Alqura University in Saudi Arabia has conducted surveys to know student's understanding of their needs as well as to seek new ways to develop programs that would meet their expectations. The surveys conducted have shown some issues and concerns that needed to be addressed. The conclusions drawn from the surveys suggested putting more efforts towards improving certain student skills in order to increase their competitiveness in the market after graduation. These skills can be attained by introducing certain developmental programs that are different from their respective program curricula. These programs need to be aligned with the latest technological trends and market needs; and they should also raise the professionalism level of the students by exposing them to best practices required by top organizations and companies in the relevant market. Therefore, we did some research to look into these issues in detail and to come up with some suggestions and solutions. The main goal of such research was to figure out a scheme for the college to support its students in a way that is also aligned with the vision and objectives of our college as well as university.

## II. DATA COLLECTION

It has been our keen desire from the beginning to meet the wishes and aspirations of our college students. Therefore, in order to determine the goals of any initiative that we may start, we conducted a survey though questionnaire with several questions and collected some statistics in order to convert these desires into a well design program. Moreover, we have also contacted several governmental bodies and private sectors to seek their needs in terms of skills and knowledge required from their potential employees; and also to screen their available job opportunities. Such a program is then executed in a way that can achieve the ambitions of the students and the college goals. The questionnaire was

distributed to more than 800 students from the college and 484 students from different departments in the college responded. The respondents of the questionnaire was from both genders, Fig. 1 shows the gender distribution.

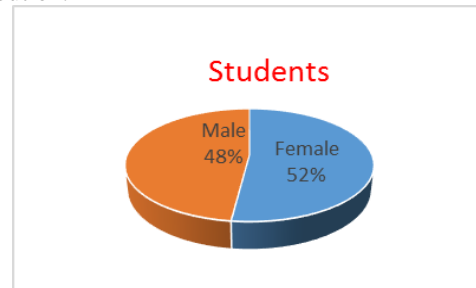


Figure 1. Gender distribution of students

The respondents of the questionnaire were from different levels of the program, Fig. 2 shows the distribution from 3<sup>rd</sup> to 10<sup>th</sup> level of the study program.

The questionnaire under discussion contains four main questions; which were designed and written based on the surveys and data that were conducted in the past by the college administration. The main objective of the questionnaire was to seek the students' preference towards four possible areas of developments, such as training, professional certificates, activities and innovation.

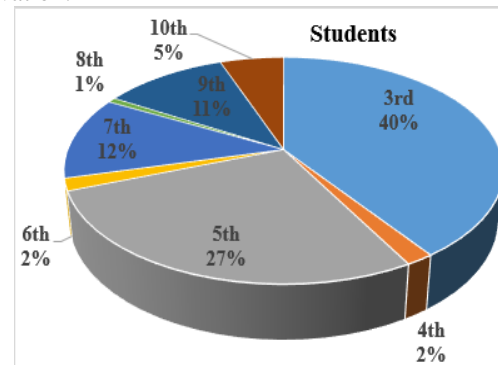


Figure 2. Student participation based on study level.

Following are the questions and the associated data distribution: Fig. 3, Fig. 4, Fig. 5 and Fig. 6 show these distributions.

- 1) How much do you prefer taking relevant training while studying?

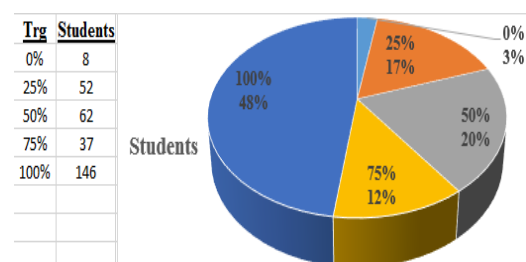


Figure 3. Student preference to relevant training.

- 2) How much do you prefer to undertake a training course to prepare you for certified professional certificate?

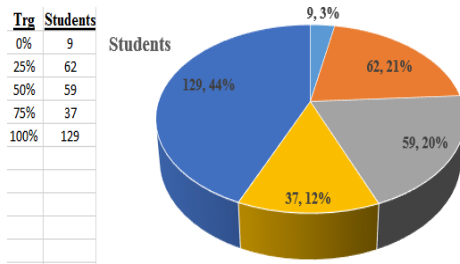


Figure 4. Student preference for certified professional certificate.

- 3) How much do you prefer to engage and/or attend technical and social events within the college?

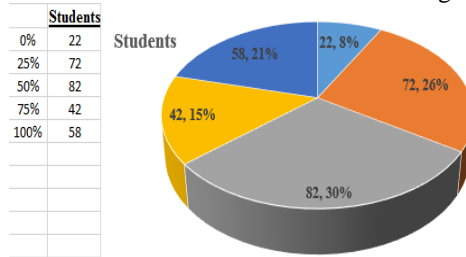


Figure 5. Student preference for technical and social event.

- 4) How much do you prefer to get support for innovation and entrepreneurship?

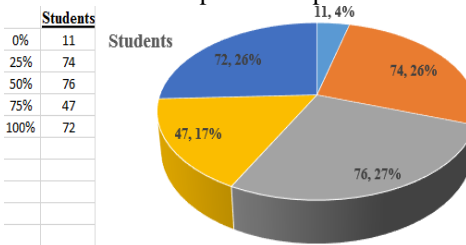


Figure 6. Student preference for innovation and entrepreneurship.

A separate survey was sent to prospective employers of our graduates to determine possible employment needs and to specify the main areas of specialization where employers are not finding skilled manpower. In addition, there are two most famous recruiting portals in our region namely “www.bayt.com” and “www.gulftalent.com”. We also searched and collected huge data from 34 employees for analysis from these portals. Fig. 7 shows classification and analyzes of the main specialization areas where these employers are recruiting.

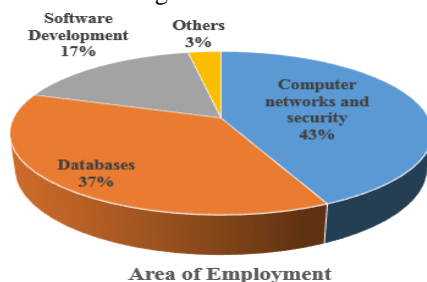


Figure 7. Areas of specialization.

### III. DATA ANALYSIS

As a result of detailed analysis of data from questionnaire, surveys and communications we

concluded that there should be some sort of an innovative solution to address all of the above stated issues and to put more effort towards improving student skills in order to increase their competitiveness in the market after graduation. As a result, we came up with a solution in the form of a developmental initiative to support college students to achieve required goals. This initiative has seven programs that were developed to serve the goals. These programs complement each other in order to help students to acquire more scientific knowledge, to raise their professional skills and to increase their marketability levels after graduation. In order for these programs to achieve their intended goals, they are implemented in a systematic way to ensure quality of the implementation in accordance with the academic directions. Therefore, an initiative called “SWANID” was launched to put these programs in place. In general, SWANID is an initiative to help and support the academic community of the computer and information systems College at Umm Alqura University in Saudi Arabia. Students, faculty members and outside community are supposed to participate and benefit from this initiative. One of the goals of the initiative is to create an interactive, innovative environment boosted with knowledge and enhanced with constructive engagement of its participating members. In addition to the above stated questionnaire we designed and distributed another questionnaire among the college students, we received responses from 320 college students that answered all the survey’s questions. The survey results showed that 43% of the participating students indicated their urgent need for suitable employment after graduation immediately. 32% of the respondents indicated their preference for more developmental programs to match the rapid advances in the market. While 13% of the participating students preferred to have some diverse activities within the college. Lastly, 12% of the students wanted support for innovation and invention training.

### IV. THE INITIATIVE GOAL

Careful study of the data analysis presented in the above section helped us to identify following goals for our initiative.

- Facilitating the students’ recruitment for part time, short time and permeant jobs by building strong communication with several companies and governmental bodies.
- Raising the professionalism of the college graduates by improving the practical and personal skills of the students and by increasing their exposure to the latest technologies and knowledge in the relevant fields
- Enriching the academic environment within the college by conducting many social and technical events
- Motivating the students competitiveness by introducing different competitions and contests in fields related to the student’ majors

- Spreading the volunteering culture among students by allowing them to participate in organizing the events
- Building loyalty among students towards the college and their majors
- Helping in raising the students' outcomes quality by strengthening the ties between the students, the college and faculty members
- Building an exhibition in the college where students and faculty members can showcase their achievements and physical outcomes and products
- Utilizing different social media platforms to advertise for the college and its students by showing their achievements and activities to the outside

## V. SWANID INITIATIVE

*SWANID* is an initiative to help and support the academic community of the Computer and Information Systems College at Umm AlQura University in Saudi Arabia. Students, faculty members and outside community can participate and benefit from this initiative. The Swanid word in Arabic means providing support; thus reflecting its goal. The *SWANID* initiative creates an interactive, innovative environment boosted with knowledge and enhanced with constructive engagement of its participating members. This initiative has seven programs that were developed to achieve the initiative goals. These programs complement each other in order to help students to acquire more scientific knowledge, to raise their professional skills and to increase their marketability levels after graduation. The seven programs were named with unique Arabic names to reflect their purposes and nature as follows:

- 1- "Foras" means opportunities; it is a program to look for employment opportunities for the college students and graduates by building a comprehensive database of employers and available jobs. This program is to build strong connections with the industry and the employing bodies
- 2- "Masarat" means tracks; it is a program that help the college students to build up their knowledge and sharpen their skills in specific areas such as security or databases. This program offers professional training courses to students who show potential proficiency in these areas.
- 3- "Neqat" means points; it is a program that encourage students to collect rewarding points by engaging in different activities ran by the college. The goal of this program is to stimulate the academic life among the students and motivate them to participate more in the college activities. Each student is issued with a card where points will be added to his card with each activity engagement. Students with the highest points will have more privileges and can won prizes.
- 4- "Bazar" means the digital bazar; it is a online portal intended to support the students with excellent technical skills by introducing them to the market as part-time professionals. Students can through this program trade their skills for others under the

supervision of the initiative. Consequently, students can secure some income while practicing their technical skills.

- 5- "Ibtikar" means innovation. It is a program that supports outstanding students with the necessary skills, guidance and supervision in order to propose innovative products and solutions relevant to their study.
- 6- "Maarad" means exhibition; it is a show space for the college; where the college members can display their products, projects and achievements. The exhibition has different corners designated for displaying several sides of the college achievements. The exhibition has a small portable version which can be taken to malls, schools and other gatherings to exhibit the college in all aspects.
- 7- "Faaleyat" mean events; it is a program that initiate, organize and run all events in the college. The program has a dedicated team of students who handle the various events conducted within the college in all aspects. The program team members propose events; as well as receive proposals from others. Each event is studied well before approved as the outcomes of the event should be clear and aligned with the college objectives.

## VI. SWANID ACTIVITIES

Following are some of the initiatives under *SWANID* programs:

**Innovation:** Following are some of the training workshops of varying duration to -\*make students aware of some new programming paradigms.

- I-Application: A 10 days training program on IOS and Android development platforms.
- Hologram and 3D Design: A 10 days training program about wall mapping, hologram techniques and 3D Adobe After Effects.
- Gaming: A one month hands-on training for selected students to develop some expertise in video gaming development.

**Events:** Following are some of the events for giving students some recognition and encouragement:

- College Ambassadors: Sending some selected college students to schools and other social institutions to present some computer-related programs and short training as part of the college social responsibility
- Knowledge Glimpse: A one hour frequent seminar to introduce some latest and trending topics in computer-related fields
- Students trips to other universities and scientific institutions
- A Graduate Story: A seminar presented by one of the college graduate students to talk about his/her life in the college and after the graduations, along with some advices and discussions
- Employers Annual Gathering: A meeting with the some employers to talk to the students about the market needs and the required skills from students after graduation

- Soft Skills Development Workshops
- Open Day for students and faculty members
- Beginning of year reception for new students
- End of year ceremony

**Tracks:** Following are some of the tracks offered:

- Cloud Computing Infrastructure and Services: A comprehensive training about cloud computing presented to senior students in collaboration with EMC company.
- Mobile Application Development: Improving students skills and professionalism in developing mobile applications
- CISCO Training

Following are some of the expected collective outcomes from all of the above initiatives;

- Improving the students' technical knowledge, various skills and self confidence
- Spreading the conception of social work and responsibility among students
- Spreading the importance of the computers and their usage within society
- Strengthening the students understanding of academic technical knowledge by practice and training
- Increasing the students readiness for job market after graduation
- Attracting more good students to enroll in the college academic departments
- Building up the students loyalty toward the college and the discipline
- Establishing strong connections between the college and the employers
- Making the college activities and events more attractive and enjoyable for students to participate

## VII. CONCLUSION AND FUTURE DIRECTION

We contacted several governmental bodies and private sectors, informally, to understand their needs and expectations in terms of skills and knowledge from our graduates of different programs. Some of the above mentioned programs and events are being implemented and few are planned for the future. We described design and implementation of our initiative "SWANID" program and discussed in detail the results of the system implementation. The objective of this paper is to share our successful experiences, models and best practices with computer and engineering professionals from academia and industry from around the globe who are engaged in novel engineering education initiatives. This may also help institutes, especially with students from our region, to be able to setup similar programs to better prepare students so that they can be active contributor on their return to home country. We plan to conduct some additional surveys in the future to gauge the success of our initiative and benefits to the students.

## REFERENCES

- [1] D. Glover, S. Law, and A. Youngman, "Graduatness and employability: Student perceptions of the personal outcomes of university education," *Research in Post-Compulsory Education*, vol. 7, no. 3, pp. 293-306, 2002.
- [2] A. J. Jaeger, "Job competencies and the curriculum: An inquiry into emotional intelligence in graduate professional education," *Research in Higher Education*, vol. 44, no. 6, pp. 615-639, December 2003.
- [3] S. F. Sullivan, *Feeling Smart, Emotional Intelligence and Selling*, Life Association News, December 1995, pp. 18-53.
- [4] R. Abraham, "The role of job control as a moderator of emotional dissonance and emotional intelligence-outcome relationships," *Journal of Psychology*, vol. 134, no. 2, pp. 169-185, 2000.
- [5] S. McKinnon and J. J. McCrae, "Closing the gap: preparing computing students for employment through embedding work-related learning in the taught curriculum," *Industry and Higher Education*, vol. 26, no. 4, pp. 317-322, August 2012.
- [6] A. Broughton, E. Sarah, and K. Otto, "On-campus student employment: Intentional learning outcomes," *Journal of College Student Development*, vol. 40, no. 1, pp. 87-89, Jan./Feb. 1999.



enhancements.

**Fahd M. Aldosari** born in Saudi Arabia in 1976. I have a Ph.D. in computer networks, M.Sc. in mobile and satellite communications and B.Sc. in computer engineering. Currently I serve as the dean of computer and information systems college in Umm AlQura university in Saudi Arabia. My research currently focuses on cloud computing and computer networks. I am also interested in higher education development and



**Mudasser F. Wyne** I have a Ph.D. in Computer Science, M.Sc. in Engineering, and B.Sc. in Electrical Engineering. Currently I serve as a Chair for Department of Computer Science, Information and Media Systems and Professor of Computer Science at School of Engineering and Computing, National University. I am also the Program Lead for MS in Information Technology Management and have also served recently as the lead for

BSc in Information Systems, the co-Lead for MSc Computer Science and Program Lead for MSc in Database Administration programs. My association with ABET (Accreditation Board of Engineering and Technology) US dates back to 2001, as a certified program evaluator for BSc in Computer Science and BSc in Information Systems. At present, I am also serving as the Commissioner for the Computer Accreditation Commission (CAC). Previously, I have taught at 6 different countries for over 25 years. I have been privileged to be part of the DESY Group (Deutsches Elektronen Synchrotron), Hamburg Germany, as a research fellow, and worked with an MIT group, led by a Nobel laureate. I have served on more than 200 international conference program committees. Furthermore, I have published number of articles in peer-reviewed international journals and conferences. I am also an active member of ACM, ASEE, ASEE/PSW and CSAB.

**Ghazi I. Alotiby** I hold a BSc in computer engineering and working as a research assistant in the college of computer and information systems in Umm Alqura University, Saudi Arabia. I was part of many developments that occurred in the college and currently I am responsible for SWANID follow up and monitoring its progress and participating in its enhancement.