

# Information Systems Graduate Employability Readiness in Sudan

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## Abstract:

This study aims to assess the readiness of information systems graduates in Sudan and produce a valuable strategy that helps academicians and policymakers become more skillful and ready to join the public or private industry after graduation. This qualitative research has been guided by the following questions (1) Do you think Sudanese graduates of information systems are well equipped with enough skills and knowledge that allow them to work in business enterprises immediately after graduation? (2) If not well equipped Why do they miss this match between graduates' skills and business enterprise needs? (3) What are the most desirable skills needed by business enterprises for entry-level? (4) What skills and knowledge are provided by the curriculum to the graduates? (5) What suggestions can lead to narrowing the gap between graduates' skills and business enterprise needs? To answer these questions an interview was done with 12 participants of management information systems to answer questions about the skills that graduates need to have to get ready for the business industry, and how those graduates can gain these skills. The data that has collected is analyzed qualitatively using Microsoft Word inline with the data has been collected from the literature review. The results of the research show the Overall participants agreed that graduates are not ready to enter the market directly after graduation without extra

training, and also they agreed that the best strategy to be followed for better skills for the graduates, universities should go in partnership with private businesses and another strategy which is should be adopted is teaching style should be based on projects and based on solving problems. The Practical implications showed that the one of the most important outcomes of the research is the necessity of giving much focus to graduates and helping them to gain practical experience through training, internship, and practical learning styles. Another outcome is building mutual relationships between universities and private businesses. This study demonstrates how universities can shift the graduate skill level by changing the teaching styles, making mutual relations with private sectors, and considering the graduate perspective as a genuine partner in decisions that concern their career future.

**Keywords:** Graduate Readiness, Information Systems, University-Business Partnerships, Project-Based Learning, Skills Gap

### جاهزية خريجي نظم المعلومات للتوظيف في السودان

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المستخلص:

تهدف هذه الدراسة إلى تقييم جاهزية خريجي نظم المعلومات في السودان وإنتاج استراتيجية قيمة تساعد الأكاديميين وصناع السياسات على أن يصبحوا أكثر مهارة واستعداداً للانضمام إلى سوق العمل العام أو الخاص بعد التخرج. تم توجيه هذا البحث النوعي من خلال الأسئلة التالية (1) هل تعتقد أن خريجي نظم المعلومات السودانيون مجهزون جيداً بالمهارات والمعرفة الكافية التي تسمح لهم بالعمل في مؤسسات الأعمال فور تخرجهم؟ (2) إذا لم يكونوا مجهزين جيداً فلماذا يفتقدون هذه المهارة بين مهارات الخريجين واحتياجات مؤسسات الأعمال؟ (3) ما هي المهارات الأكثر مرغوبة التي تحتاجها مؤسسات الأعمال للمبتدئين؟ (4) ما المهارات والمعرفة التي يوفرها المنهج الدراسي للخريجين؟ (5) ما هي الاقتراحات التي يمكن أن تؤدي إلى تضيق الفجوة بين مهارات الخريجين واحتياجات مؤسسات الأعمال؟ للإجابة على هذه الأسئلة، أجريت مقابلة مع 21 مشاركاً في أنظمة المعلومات الإدارية للإجابة على أسئلة حول المهارات التي يحتاجها الخريجون

للاستعداد لسوق العمل، وكيف يمكن لهؤلاء الخريجين اكتساب هذه المهارات. البيانات التي تم جمعها تم تحليلها نوعيًا باستخدام برنامج Microsoft Word بما يتماشى مع البيانات التي تم جمعها من مراجعة الأدبيات. ومن أهم النتائج التي توصل إليها الباحث هي ان اتفق المشاركون بشكل عام على أن الخريجين ليسوا مستعدين لدخول السوق مباشرة بعد التخرج دون تدريب إضافي، واتفقوا أيضًا على أن أفضل استراتيجية يجب اتباعها لتحسين مهارات الخريجين، يجب أن تدخل الجامعات في شراكة مع الشركات الخاصة واستراتيجية أخرى يجب تبنيها هي أسلوب التدريس يجب أن يعتمد على المشاريع ويستند إلى حل المشكلات. تتمثل إحدى أهم نتائج البحث في ضرورة إعطاء قدر كبير من التركيز للخريجين ومساعدتهم على اكتساب الخبرة العملية من خلال التدريب والتدريب الداخلي وأساليب التعلم العملية. وتتمثل نتيجة أخرى في بناء علاقات متبادلة بين الجامعات والشركات الخاصة. توضح هذه الدراسة كيف يمكن للجامعات تحويل مستوى مهارة الخريجين من خلال تغيير أساليب التدريس، وإقامة علاقات متبادلة مع القطاع الخاص، واعتبار منظور الخريج شريكًا حقيقيًا في القرارات التي تهم مستقبلهم المهني.

**الكلمات المفتاحية:** استعداد الخريجين، أنظمة المعلومات، الشراكات بين الجامعات والشركات، التعلم القائم على المشاريع، فجوة المهارات

### Introduction:

Recently the number of people who got interested in education become higher, and their desire to join higher education its always increasing, but despite of that still the number of graduates who are unable to get job and still unemployed also still higher, and a report determine their percentages is almost about 35%(OECD, 2018). And due to economic crises that hit most of the world, the employer become having a tendency to work temporarily with their employes and giving them a consultancy contract for specific period of time, and later the consultants find themselves trying to find another contract with another employer with a different terms and conditions, and also different skills required by the new company, so here the graduates or the employes need to adapt their skills to match the new trend, specially with the emergent of technology and the artificial intelligence (Coutinho et al., 2008).

### **Social Cognitive Career Theory:**

This theory show that the human being is able to build his efficacy toward being qualified and having the enough skills that help him to get a job more than the desire of others to help him to find his path in life, so the theory encourage the teachers and faculty staff to let the graduates participate highly in their decision toward how they perceive and see their future career (Lent, 2002).

### **The present study:**

This study aim to enhance the current literature by adding more contributions to the philosophy of putting the perspective of the graduates themselves as a main part of the employability, rather than the traditional perspective which is mainly focusing on the perspective of the employers and the university staff members.

### **Method:**

all the qualitative data analysis has been done manually using Microsoft word for documenting and editing responses of the participants. Firstly, data transferred from its original sources, which some of them was recorded as a voice and some data documented initially on papers, then these data has been coded into meaningful and short statements and then systematically sorted and organized into a thematic frame. Generally, the focus was mainly concentrated on the all responses as a hole, rather than focusing on individual to provide a thematic view for the data and its generated result which will lead to in depth information about the investigated phenomena.(McQuarrie & Krueger, 1989).

### **Ethics and Limitation:**

Consent and approval has been given to the participants to ensure their confidentiality towards their data through coddng their names and mention them anonymously within the research thesis. Although the interviewer used to send the transcripts answers to the interviewees or repeating to them their answers for the sake of confirming their information. Participants were used to be

comfortable in their answers and took their time to comment and giving their answers in details.

### **Interview Results:**

all the participants of the interview, 12 out of 12 believe those graduates are not yet ready to enter to the market without further training (Interview Data 2023), and they should go for extra training either by the company intending to hire them, or by themselves taking extra professional courses, and most of the participants 80% of them agreed this and academic issue and all the qualification should be done by the university (Interview Data 2023), and it's a university responsibility to graduate a ready person to join the industry without extra training, but 20% of the participants agree that is normal for the graduates to lack the knowledge and skills that should qualify them to enter to the market (Participant 2 & 10, 2023), and those participants they think university role is just to give a basic and foundation knowledge, but the mastering of what required by the market it's a graduate responsibility, and one of the participants mentioned that when he/she asked about the readiness of the graduates: and his/her answer was: *"Yes, they are capable to work immediately, and the employer is expecting a graduate that is lacking many skills which it could be developed over time by the company or by taking professional training. And normally new applicants can't work without extra training, so it's normal to be having some lack on their skills"* (Participant 10,2023).

10 out of 12 of the participants think the curriculum is not taking students to application level, its only focus on theory level, introduction, history, and its based on remembering and listing things without giving the students a chance to apply what they have study and without giving them a chance to work on real projects (Interview Data 2023), and some participants refer this shallowness on teaching subjects due to the staff experience, and they think most of the teaching staff only have an academic background,

and some time they have never been in the industry or get involved on real project that produce real products or artifact to their communities (Participant 2&3&9,2023), in another words, if the teacher is not qualified, I will not expect to have a qualified graduates that are able to work and become productive in the industry(Issa & Khataibeh, 2021) . And here I will give an example of a computer college that has been investigated by the researcher, when you look to this college, you find them doing all of their administrative works manually, how it comes for computer college, having a shortage in their software and applications that could help the administrators to fulfil their manual work, how those graduates will help the other company to builds effective software and application while they can't build their software that of help to their college administration work (Primary Data, 2022). To come over this problem, students before getting graduates should work on solving their internal problems to get used on how to build areal applications and software with the assistance of the staff (Wyke et al., 2022).

*Good curriculum but bad implementation*, here almost half of the participants think the problem is not with the curriculum itself and this curriculum is very recent, updated, and even based upon highly recommended international bodies, but the problem is in the implementation and the teachers are not well qualified to teach and show the students practically how the subjects and problems should be solved (Interview Data, 2023).

*Infrastructure limitation*, and here two of the participants reflect the poor level of the graduates is due to the poor infrastructure which they have, because there a shortage in electricity and laps are not always available and open to students, but also in the same time even for the students whom they have their own laptops or for the universities that have a well and nice infrastructure, but also the level of graduates is still poor and need more training to be

ready to join the industry (Participant 4 & 12, 2023).

### **Competencies of graduates:**

*System analysis and design* comes on the top of the competencies should be mastered by the graduates, and almost it's been referred to by all the participants (Primary Data, 2023), while some of the participants think this competency considered as the initial step for graduates and then should continue to become a programmer while other participants think this is the last step should be reach by the graduates, because those participants think programming and software developing is a field should be occupied by computer science and software engineering, not by the information systems graduates (Interview Data, 2023).

*Web application development*, on the second place with the eight participants interviewed mentioned that the information systems graduates are capable and able to develop and design web application systems in very efficient manner, because they combine between the information technology skills and the business skills that allow them think about how the web site should look like and what exactly the customer from business perspective wants (Primary Data, 2023).

*Soft skills and business background* are both demanded by information systems employer, while the interviewees think these skills are important for hiring, but in the same time they think it's shared and common for all the graduates to get hired and get a job, they should possess a high level of the soft skill and acceptable level of understanding the business (Participant 2 & 8, 2023).

*Data management*, five participants think its important for the IS graduates to be equipped by the data management skills, and that is due to the increment level of the competencies among enterprises and non-governmental organizations, they tend to show their power through analyzing the data and extract useful information to the enhance the decision making process, and that is why

the data management science become highly needed by both graduates and employers (Interview Data, 2023).

*Network and Android application development*, three participants think also it's important for the graduates to be equipped with these competencies, while the rest of the participants believe those field of Networking and Android application development, are mainly should be mastered by the computer science graduates, due its nature which it should the students to master this competency, should also have a good knowledge with computer architectures and computer operating systems, and both of these subjects are taught very slightly and on awareness level only for the IS graduates, so it's better to focus on other filed and not on Network or Android application development (Participants 2&3&9, 2023).

*Learnability*, this competency mentioned by three participants, think it's not necessary for those graduates to master the competencies needed by the employer, while they should learn it by themselves or by their potential employer, and that is why those participants think that is important for the IS graduates to be able to learn by themselves.

*Digital marketing*, while it's become very important specially due to Corona pandemic and due to the increasing level of using internet and online media it's become more important for the graduates to be very skilled in the digital marketing, but in spite of the importance of that, only two participants mentioned this competency in their answers(Participant 4&8&11, 2023).

Digital marketing is very suitable for IS graduates because it's not only about technology it's about technology and business and the behavior of the users and needs of the clients, so this field should be well covered by the IS graduates.

*Database design*, while only two participants mentioned the importance of the database design skills for IS graduates, but these skills is very related in nature to the IS major due to the link be-

tween what clients' needs and what the technology can do to make these process come true (Participant 2&12).

### **Suggested strategies to fill the educational gap:**

*University – industry collaboration*, as a strategy to fill the gap has been mentioned by 75% of the interviewed participants, which is really important because yes it's a mutual relation between the university and the industry, while employer looking for staff to hire, also graduates of the university looking for enterprises to hire them, and here if there is a good collaboration, the university can produce graduates with exact skills needed by the industry, and here the enterprises will never be in need to give those graduates extra training because they are already ready to take over their role as an high skilled workers (Luthra et al., 2022).

*Staff development*, seven of the participants think that the staff development is really critical, and they think it's not a curriculum problem and the curriculum is very well designed, and the main cause of why graduates lack skills is due to the implementation of the staff, and because those staff is only having the academic backgrounds and they never been involved in real project with real company to solve real projects or real problems (Interview Data, 2023).

*Internship*, is a training period given by the enterprise to one of the students to spend a time learning practically from this enterprise, while half of the participants think it's very important for the students to spend a time in training, but some of them mention many obstacles toward making this internship possible, and one of these obstacles is the management of the training, like how to divide the students, how the employer is going to evaluate them, how to find even an enterprise whom are happy to have those students and willing to give them a time to let them learn. Finding a mutual benefit between the enterprise and the university will lead to better collaboration, while enterprises looking for opportunities to

grow through learning, research and development, also the students looking for a place where they can find some to adopt and give them real problems to solve it with or without payment, but at least an effort recognition letter could be a great motivation for those students (Awadhiya & Kumar Awadhiya, 2022).

*Curriculum update*, while many of the participants think there's no problem with the curriculum, and the curriculum is having all of the required knowledge, and those participants believe if there's a problem the problem is the students, because they don't give the full tension to the curriculum and to their lectures. But despite the good quality of the curriculum as it mentioned by some of the participants, but also it should be updated from time to time, because every day there's a new technology or a software, and this new technology should be included in the curriculum (Primary Data, 2023).

### **Discussion:**

This study revealed that, the way of teaching it should be updated and changed from the traditional way of teaching which it focuses on the teacher as a main concern of the education process and as the main source of information to shift the focus toward the students to become the heart and central of the education process (Robinson & Persky, 2020). Teaching should be interactive and based on project and solving a real problem and adopt problem based solving as one of the education mechanisms as its suggested by the literature (Aheisibwe, 2021). As stated by the literature review regard the potential career of the graduates, the graduate themselves have the capability to think and determine their future and the already have the information and the awareness of what they want to be in the future (Johnston, 2016), also the, but the result of the analysis revealed that still teachers and academician treat students not too much as a partner, with less room for them as students to participate in their decision regard how to build their

future career to become more adaptable to change happening outside the university. The study also revealed that the teaching style should go up to application level and not only giving students definition and concepts, and this is also supported by the literature and rubric as a mechanism for measuring the depth of education level can be used (Tractenberg, 2021). Another point which is also revealed by the study is the necessity of making good collaboration between the business sector and the universities based on achieving a mutual relationship. The study also revealed that most of the teachers think that those graduates are not ready to enter to the job market and they need more training or extra work to get prepared either by studding some courses or getting a training by the employers themselves, and this is also supporting the literature mention by lee (Lee, 2016)

### **Practical implications:**

This study sending a message to academican and policy maker at higher education to foster serious dialogue and relationship with the private business sector and make them as genuine partner working with a academican on the same page inspiring them to build the curriculum and their study cases based on the real need of those business and enterprise interest (Camilleri, 2021). Using best practices of the industry and injected back as lesson learnt to help students and graduates get involve in solving real problems could lead to better skills enhancement and this it could be through using professional certificates and curriculum and to be used at least in the practical side in the lap (Guo et al., 2020).

### **Limitation and further research:**

One of the limitation that should mentioned clearly is the nature of the qualitative research, which is not intended in first place to be generalized to a wider community rather it give more focus

on exploring and studding the issue of educational gap thoroughly for the specific community, but conducting another interviews with different participants from different specialization for example from marketing or finance, can add a new perspective or new ideas that could lead to better strategies toward filling the gap between education and academia.

### **Conclusion:**

Overall result is that, the data has been collected from all participants showed their agreement upon that, the graduates are not ready to enter to the industry directly after the graduation, and they still need more practical experience through training and internship, so career building through internship program in collaboration between the universities and private sector is very essential for the graduates to get prepared for the market (Chen et al., 2020).

The most important recommendation for this study is to put more focus on coming up with practical strategy that give a close attention to the economic barriers that prohibit many higher education institutes from being ideal on the way that they teach and deliver their information to students, the study put more focus on building mutual relation with interested business parties, and giving more space to the students to get engaged on their career decision.

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