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# Artificial intelligence in education startups - Case study of some education startups in Algeria

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## *Abstract:*

*This study aims to identify the extent of the use of artificial intelligence technology in education startups, by presenting the experiences and case studies of some Algerian startups in the field of education. The following startups were chosen: Siamois QCM, Herd Academy, TalabaStore, Dzostad.com, and Academiatouna. As one of the best education startups in Algeria, according to Startupranking website.*

*Through this study, we have found that the education startups under study have succeeded in providing many electronic services and auxiliary digital educational supports, but there is an absence and lack of clarity as to the extent of these institutions' use of artificial intelligence techniques, as there are no manifestations of its use across the pages and websites of these education platforms. Finally, many challenges facing the application of artificial intelligence in the field of education were discussed.*

***MECHAALIBilal***

## Introduction

In our time, artificial intelligence (AI) applications surround us everywhere, affecting all aspects of our lives. In homes, schools, workplaces, movie theaters, art galleries, and especially on the Internet. The value of artificial intelligence is currently inestimable in various fields of science, especially among biologists, psychologists, and linguists. It helped to understand the processes of memory, learning, and language from new angles. Conceptually, AI has fueled and sharpened philosophical debates regarding the nature of the mind, intelligence, and the uniqueness of humans.

Artificial Intelligence is one of the most prominent revolutionary technologies that has witnessed remarkable development in recent decades, and has proven its ability to bring about radical changes in various sectors, including the education sector. Today, artificial intelligence is not just an advanced technological tool, but rather an active partner that contributes to reformulating educational curricula, developing teaching methods, and improving the learning experience in general.

Given the rapid progress in the business environment, staying ahead of the curve is crucial for individuals and institutions alike. This necessitates breaking out of the cycle of traditional thinking and innovating new solutions to meet market needs, which has made innovation an effective tool for creating new products, economic opportunities, and new markets. Since emerging enterprises are not isolated from these tremendous changes, they need to employ, improve and benefit from the tools, solutions and applications provided by artificial intelligence, starting from the early stages of the entrepreneurship journey until the advanced stages of development and growth.

Education startups consider artificial intelligence today not just an advanced technological tool, but rather an active partner that contributes to reformulating educational curricula, developing teaching methods, and improving the learning experience in general. The importance of artificial intelligence for education startups stems from its ability to provide customized educational experiences. For every student. By analysing learning data and student performance, AI based systems can deliver educational content that matches a student's level of understanding, learning speed, and individual interests. This contributes to improving the effectiveness of the educational process, in addition to enhancing students' motivation and interaction.

Algerian startups are striving to adapt the technical and technical aspects of these technologies to their advantage in order to create additional opportunities for competition as well as to ensure continuity in the market, with the expectation of positive repercussions of this technology on the performance of these enterprises in particular and on the Algerian economy in general. In

parallel, a group of education startups in Algeria are shining through the good educational services they provide to students, becoming pioneering models in Africa. Therefore, the following main question can be asked:

Is the study sample, composed of education startups using artificial intelligence, and what are the challenges facing the application of artificial intelligence in these startups?

This study aims to highlight many concepts related to artificial intelligence and startups and to clarify the uses of artificial intelligence technology by a sample of education startups in Algeria.

## 1. Literature Review

### 1.1 Industrial Revolution 4

Before discussing the topic of artificial intelligence, it is necessary to address the topic of the Fourth Industrial Revolution in detail and explanation. After the first industrial revolution (the revolution of steam engines using coal), the second (the revolution of internal combustion engines using oil and electricity), and the third (computers and robots using nuclear energy and natural gas) The fourth industrial revolution is coming, which depends on clean and renewable energies. (BAADI, 2022, p. 565)

The Fourth Industrial Revolution began at the beginning of the millennium and continued until now. The beginning of this revolution was from a country destroyed by World War II, the state of Germany, which today has become a destination for the latest emerging technologies and amazing innovations that turn the tables upside down on old technologies. The term Fourth Industrial Revolution is considered comprehensive; It is used to describe a group of connected technical developments that provide a basis for increased digitization of the business environment. It is a revolution driven by a number of key drivers. In other words, it cannot be reduced to a single technology. This revolution is driven by a wide range of technical trends that build on each other to create economic, social and political transformation. (BAADI, 2022, p. 566)

So, the Fourth Industrial Revolution is a new phase that expresses a clear change and an amazing development that is difficult to believe due to the distinct technical and technological development it entails that has a visible impact on the global economic structure and on social life. It is a world that combines virtual and real systems in a flexible manner. (HAMMANI, 2023, p. 396)

### 1.2 Artificial intelligence

Artificial intelligence is a theory and science related to the ability of a machine to act and perform actions that require intelligence as humans do. (Chekirine & Sakri, 2024, p. 606) It is a term whose use has increased recently in light of the technical renaissance that the world is witnessing in the field of machine development. Although "artificial intelligence" was just a dream proposed by directors in fantasy films until the middle of the twentieth century, today it has become a tangible reality that we resort to often, even if we do not realize it sometimes. In fact, determining whether the machine we use has artificial intelligence is difficult and relative, as there is no specific definition of intelligence. But we can say in brief that artificial intelligence is a branch of science that is concerned with machines that can solve the problems that humans resort to their intelligence when solving them. (ALFARA, 2012, p. 1)

Although, it is well known that there is no widely accepted definition of artificial intelligence as it is an ever-evolving field, the term has been used in many senses, both within the field and outside it. Some authors define it as the part of computer science concerned with designing systems that exhibit characteristics we associate with intelligence in: understanding language, learning, reasoning, and solving problems. (BELKACEMI, 2022, p. 272)

Marvin Lee Minsky defined it as "building computer programs that perform human tasks satisfactorily because they require very precise mental processes such as perceptual learning, memory organization, and critical thinking" (BOUBAHA, 2022, p. 93)

AI is the ability of a digital computer or computer-controlled robot to perform tasks normally associated with intelligent beings. This term is frequently applied to the project of developing systems that have intellectual processes characteristic of humans, such as the ability to reason, discover meaning, generalize, or learn from past experiences. (Copland, 2024)

Despite all the differences in the definition of artificial intelligence, common characteristics can be detected based on the previous definitions

- it is concerned with machine simulation of human intelligence and skills;
- Preparing software and hardware;
- Considering it a science independent of computer science.

Artificial intelligence is being used in education in the different ways and among its tools we can find: (Bouras, 2024, pp. 43-44) Virtual Mentors and Voice Assistant, Smart Content, Global Courses, Automatic Assessment,

Presentation Translator, and Personalized Learning. Artificial intelligence has several benefits for the student, including the following: (BEKKARI, 2022, p. 297)

- The ability to learn at any time he wants, as the educational process takes place between the student and the artificial intelligence;
- Reducing the effort and time wasted while commuting to and from school, institute or university, as most daily tasks are now accomplished through technology and electronic applications;
- Adapting educational solutions based on artificial intelligence to the student's level of knowledge and the topics of interest to them, it also provides them with educational materials based on their weaknesses;
- Receive guidance and advice from virtual mentors, and get real-time feedback and answers.

Therefore, the main goal of artificial intelligence is to emulate human intelligence by using advanced software to solve or train to solve a typical problem.

**1.3 Startups**

The term “startups” has become popular and has a wide resonance in innovative companies and public discussions, and entrepreneurship in the form of startups is a political activity with high priority all over the world. Every year, 100 million startups are created around the world. (Al Ehsan, 2021)

So the term startup refers to a company in the first stages of operations. Startups are founded by one or more entrepreneurs who want to develop a product or service for which they believe there is demand. These companies generally start with high costs and limited revenue, which is why they look for capital from a variety of sources, such as venture capitalists. (GRANT, 2024)

A startup is a company, a partnership or temporary organization designed to search for a repeatable and scalable business model. (Rupali, 2019) Through the startup phase, new ideas are brought to the market and transformed into economically sustainable enterprises. New firms are artifacts for transforming entrepreneurial judgment into profit.

It can also be defined as a young company created by one or more entrepreneurs to create unique and irreplaceable products or services. It aims at bringing innovation and building ideas quickly. (Sendpuls, n.d.)

The characteristics of startups compared to classical enterprises can be summarized in the following points: (LALAOUI & SAFRRA, 2024)

- Using modern technologies such as digitization and artificial intelligence.
- It requires a small capital to be launched, unlike other economic enterprise.
- It moves flexibly within the economic environment, regardless of the risks that characterize it. One of the advantages of these enterprises is that they are active in new markets

From the above, it can be said that startups are those new economic entities that have the ability to grow and develop in a "market" environment characterized by risks, and perhaps the most important advantage they enjoy is that they produce a new idea or product that is viable.

### 1.4 Education startups (EdTech Startups)

An education startup or EdTech Startup is a company that focuses on developing and providing technology-based solutions and services in the field of education. "EdTech" is a combination of the words "education" and "technology" These startups leverage digital technology to enhance and innovate various aspects of the educational process, from teaching and learning to relevant administrative tasks. (appetiser apps, n.d.)

Education startups can offer a wide range of products and services, including: (appetiser apps, n.d.)

- E-learning platforms. Online platforms that provide educational content, courses, and resources for students, professionals, or lifelong learners.
- Learning Management Systems (LMS). Software applications that facilitate the administration, delivery, and tracking of educational content and courses.
- Digital content and educational applications. Development of digital content, interactive textbooks, and educational applications for mobile devices and tablets to make learning more engaging and accessible.
- Adaptive learning platforms. Systems that use data and algorithms to personalize learning experiences for individual students, adapting to their needs and pace.
- Virtual classrooms. Online environments that simulate traditional classrooms, allowing for real-time interaction between students and teachers.

## 2. Analysis

### 2.1 Artificial intelligence in Algeria

The current state of artificial intelligence in Algeria is characterized by strong momentum and significant commitment from the government and academic institutions. In 2023, Algeria declared this year the Year of Artificial Intelligence, indicating a special focus on developing and integrating artificial intelligence into various sectors. The Ministry of Higher Education and Scientific Research played a major role in this initiative, especially by establishing a Scientific Council for Artificial Intelligence. This council is a scientific advisory body that aims to propose strategic elements for the development of artificial intelligence across sectors in the country. Algeria also focused on establishing specialized institutions, such as the Higher School of Artificial Intelligence, and a significant increase in laboratories dedicated to artificial intelligence across universities and research centers. This development demonstrates the national commitment to integrating AI into economic, educational and research development. This commitment to artificial intelligence reflects Algeria's recognition of the strategic importance of this technology for competitiveness and innovation at the national and international levels. Moreover, in education and economics, AI is revolutionizing these fields by providing automation and data analysis capabilities. In education, platforms and its equivalent, use AI to personalize learning, while in economics AI helps predict market trends and improve business processes, for example. (KAHLANE, 2024)

**2.2 The reality of startups in Algeria**

The Minister Delegate to the Prime Minister in charge of the knowledge economy and startups stated during the regional meeting on startups that “63% of startups were classified between the years 2020 and 2021,” and he also noted in this context that 624 startups were classified at the national level. 6,657 people registered on the official website of the Ministry Delegate for Startup, of whom 2,000 applied to obtain the Startup mark. (Algérie Presse Service, 2021)

Among the most important measures aimed at promoting entrepreneurship among young people and the financial inclusion of lucrative activities outside the official framework, the promulgation of the law on self-entrepreneurs, which grants entrepreneurs eligible for this status of tax advantages, with a preferential tax regime, at the rate of 5% reduced to 0.5% in the 2024 finance law, as well as social security coverage. (Algérie Presse Service, 2023)

In addition to self-entrepreneurs, academics have been directly involved in the field of entrepreneurship and innovation, by establishing the university diploma-Startup and the university diploma-Patent of invention, or even the creation of the status of student-entrepreneur, making it possible to bridge the gap between the student world and that of entrepreneurship.

According to the Startup Ranking website, which is concerned with discovering, ranking and promoting startups from all over the world, and contributing to the digital appearance and development of startups, by providing services that help them obtain a global vision and transform data into strategic decisions. According to this site, the ranking of the top 10 most popular startups in Algeria that are less than 10 years old is as follows:

Table 1. *top 10 most popular startups in Algeria*

| The world rank | The Algerian rank | Startup | Description |
|---|---|---|---|
| 857 | 1 | Yassir | Enhancing the way services are provided in Africa |
| 2,636 | 2 | Siamois QCM | The first Medicine MCQ platform in Algeria |
| 3,556 | 3 | Zawwali | Connect Users to Retailers with the Best Price |
| 3,660 | 4 | MdinJdida | multi-seller online sales platform in Algeria |
| 3,770 | 5 | Herd Academy | Online learning revolution in Algeria |
| 4,068 | 6 | Lafirist | Your Financial Freedom Starts Here |
| 4,900 | 7 | Batolis | Buy with confidance |
| 7,450 | 8 | TalabaStore | No. 1 choice of students in Algeria |
| 8,887 | 9 | Dzostad.com | Algerian education in a single site |
| 9,523 | 10 | Academiatouna | E-learning platform |

Source: *Prepared by researcher based on: Startupranking. (2024, July 23). Top - Algeria. Retrieved July 23, 2024, from Startupranking: https://www.startupranking.com/top/algeria*

The above arrangement was adopted according to the standard of **SR Score** which is a number between 0 and 100,000. It reflects the importance of a startup on the internet and its social influence.

The ten best startups in Algeria are enterprises that rely primarily on modern information and communications technology, as it provides them with a suitable work environment to provide innovative and pioneering services, each according to its specialty. It is also mentioned that the best Algerian startup ranks 857th in the world, which is “Yassir”, the leading super Application for on demand, ride-hailing, last-mile delivery, payment services and more, set to

change the way daily services are provided. It currently operates in 45 cities across multiple countries.

It is also noted that among the ten best startups in Algeria, there are five enterprises active in the education sector, namely: Siamois QCM, Herd Academy, TalabaStore, Dzostad.com, and Academiatouna. This is evidence of the strong presence of education startups in Algeria to serve students.

Algeria is ranked seventeenth (17) globally and first (1) in Africa for the number of startups, according to the Startup Ranking website, at eight hundred and eleven (811), shared equally with Nigeria.

## 3. Case study of some education startups in Algeria

In order to achieve the objectives of the study and answer the questions raised, we will analyse the situation of a sample of five startups in the field of education that were chosen because they are the best national enterprises in this field, to know the extent of their use and dependence on artificial intelligence applications in their various activities.

***Siamois QCM***

***https://www.siamois.co/***

Siamois QCM is an Algerian E-training platform for Algerian medical students and those preparing for the residency exam. It allows them to save a lot of time and money, but above all, it helps them to be more organized in their work.

It contains more than 50.000 MCQs and clinical cases classified by subjects, by topics, by source and soon by difficulty. Student can add their filter questions by type, faculty, and some other preferences, they can add their notes and organize questions into Playlists. (startupranking, 2024)

Siamois QCM is an example of a startup in Algeria that uses technology to provide innovative solutions in a specific field. The company's vision reflects its commitment to developing advanced technical solutions and promoting innovation in the digital fields.

***Herd Academy***

***https://www.herd.academy/***

Heard Academy is an Algerian online education platform for students to learn from educational videos, and for teachers to reach more students.

The Foundation seeks to advance online education in Algeria in the fields of technology, design, development and marketing to the global level.

By offering both online and offline courses, significant progress was seen for everyone who participated in the courses. The educational method depends on disaggregating and simplifying data and constantly searching for the best experts in the field in order to provide the best and strongest content in Algeria.

***TalabaStore***

***https://www.talabastore.dz***

TalabaStore is the first Startup labelled in Algeria by the Ministry of Startups, financed by the Algerian Startup Fund from the ANPT incubation program and registered in the Algeria Venture acceleration program in partnership with Google for Startups. Founded by architect Sami ALIOUCHE in 2017, known in the e-commerce sector.

TalabaStore is an electronic platform that provides products and services at competitive prices to students, with delivery in 58 Wilaya, and provides electronic payment technology with payment cards. It currently has 20 members. (TalabaStore, n.d.)

Among the goals of TalabaStore is to provide students' needs for products and services and provide its services quickly at the national and international levels. It has agreements with driving schools and medical institutions that provide discounts for students, such as contributing to the digitization of national and private institutions through a digital services package that is available under its trade name: Not easy Algérie.

***Dzostad.com***

***https://www.dzostad.net***

A special educational page for the first site for studying in Algeria, a comprehensive educational site for all years from preparatory primary to intermediate and secondary, second generation.

***Academiatouna***

***https://www.academiatouna.com***

Academiatouna provides multifunctional services: complete coverage of the school program for the majority of levels granted by the Ministry as well as follow-up through practice sessions and correction of everything online with live teachers who will overcome difficulties with one click.

From the analysis, and through our review of the websites of the startups under study, it can be said that the use of artificial intelligence by these enterprises is unclear, and is not mentioned on the pages and websites. Even if

there are goals to integrate artificial intelligence technology in the future, especially by the Siamois QCM, in general, it can be said that the use of artificial intelligence by the startups under study remains weak and does not meet the aspirations. This conclusion is due to the lack of opportunities to use artificial intelligence:

- Lack of electronic trainers and mentors, and virtual professors
- The absence of a personal or individual learning style
- Not integrating interactive elements such as audio and video into the educational process
- Inability to diagnose the student's intelligence
- There is no database and therefore it is difficult to obtain conclusions and make specific decisions.

**Conclusion**

The startups under study (Siamois QCM, Herd Academy, TalabaStore, Dzostad.com, and Academiatouna) are considered a pioneering and successful young experience that has proven its success in the digital educational field, in distance support lessons in Algeria and in the quality of services provided to students. With the development of technology and after artificial intelligence has proven its effectiveness in developing distance education, especially after the development of expert systems that have replaced human advisors in many fields, which raises the need for these startups and other educational institutions to move to virtual education based on artificial intelligence in the future, It helps to achieve a better result for students, by teaching each student individually according to his degree of understanding, and this will speed up the education process and reduce time and effort by integrating the student with technology, because today's student will need to work in the future with artificial intelligence.

Despite this boom in startups, where 811 enterprises were counted active in various fields, the Algerian experience, despite its importance, remains young and requires time to mature and for these economic entities to have the ability to compete internationally, and this can be achieved through exploiting artificial intelligence technology not only in the educational field, but also in many other fields. In this way, Algeria rises economically and socially and achieves comprehensive and sustainable development.

Given the extreme importance that the topic of artificial intelligence acquires and its relationship with education startups. Some recommendations can be proposed, which we summarize as follows:

- Establishing artificial intelligence research centers, recruiting and preparing experts, investing in research, and advanced training;
- Qualifying startups to work with artificial intelligence, and empowering entrepreneurs with the new digital skills necessary to apply artificial intelligence and exploit the opportunities it provides;
- The university has a fundamental and important role in forming students and enhancing their entrepreneurial thinking. The work of the Entrepreneurship House and the artificial intelligence centers must also be activated;
- Benefit from successful international experiences in the field of artificial intelligence and startups. And simulating leading models in e-learning;
- Issuing legislation and laws regulating the use of artificial intelligence, in order to control its uses to benefit the economy and society only;
- Educating parents about the importance of distance education by relying on digital platforms and websites, and intensifying training courses and workshops to create a digital educational culture in Algeria.
- Finally, it is necessary to achieve parity between artificial intelligence for education and education for artificial intelligence.

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