


## Open education as a mechanism for acquiring and refining the human resource with green skills, With reference to the case of Algeria (An analytical study)

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### Abstract:

The shift towards green activities led to a structural change in the nature of the skills which make up functions, so that the demand for green skills raised, which pushed to find a mechanism that could keep pace with this growing demand, by adopting open education models as an instrument that guarantees a large and continuous flow of required skills.

This study, aim to highlight the importance of open education in increasing integration into green life conducting students' educational stages to acquire green skills, the study reached interesting results that help governments move towards making open education an important source and resource for green skills.

**Keywords:** green professions, green skills, open education, Human resource, students.

**JEL Classification Codes :** I20, I21, J23, J24

## التعليم المفتوح كآلية لاكتساب وصقل المورد البشري بالمهارات الخضراء مع الإشارة إلى حالة الجزائر (دراسة تحليلية) أوراد فؤاد<sup>1</sup> (\*)

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### ملخص:

ان التحول نحو الأنشطة الخضراء أدى الى تغير هيكل في طبيعة المهارات المكونة للوظائف، فزاد الطلب على المهارات الخضراء، مما حتم إيجاد الية التي تستطيع مواكبة هذا الطلب المتزايد، ذلك باعتماد نماذج التعليم المفتوح كآلية التي تضمن تدفق كبير ومستمر للمهارات المطلوبة. فنهدف في هذه الدراسة الى ابراز أهمية التعليم المفتوح في زيادة الاندماج في الحياة الخضراء بغية اكتساب الطلبة بمختلف الأطوار الدراسية للمهارات الخضراء، وتوصلنا الى نتائج مهمة تساعد الحكومات على التوجه نحو جعل التعليم المفتوح مصدر وموردا هاما للتزود بالمهارات الخضراء.  
**الكلمات المفتاحية:** المهن الخضراء، المهارات الخضراء، تعليم المفتوح، المورد البشري، الطلاب.  
**تصنيف JEL:** J20، J21، J23، J24.

## **1. INTRODUCTION**

Regarding the requirements of green and sustainable economic transformation in accordance with the global agreement to reduce climate change, push governments to control their investments towards greening production technologies in existing projects and developing others, which led to fast growth in demand for talents which control several green skills, so starting from 2019 may the rate of green employment passed the rate of total employment in most economies of the world. Algeria, as other countries of the world, also tended in the middle of the previous decade to invest in some economic sectors and adopt some green programs, which will lead to an expansion of the area of green activities and increase the social integration of individuals, students and holders of innovative ideas in environmental life.

Conducting the global demand for green skills, the educational system must provide the labor market with appropriate skills, but the existing educational system has become incapable of keeping pace with the change in the nature of work, and its outputs are not in line with the requirements of green entrepreneurs or with the objectives of the ruler of green programmes which has interrupted students and teachers aspirations . Therefore, students find it very difficult to project their theoretical understanding on reality and are not affected by the environmental education information that is taught through the traditional program, which is negatively reflected on green practices, in addition to that, even the traditional education methodology excludes the student from participating in education and puts him in the pot of only receiving information, which will reduce his motivation to learn, and thus lead to a decrease in the percentage of integration into environmental life, which will negatively affect receiving and learning green skills.

Besides, the change required in the nature of work and the quality of skills push governments now to adopt modern educational methods that are more flexible, enabling them to involve all students in the various educational stages in environmental life, by making education enjoyable, and they must also increase student's desire and motivation to learn , by giving him the opportunity to learn in the environment in which he lives, such as the influence of the family on the student's tendencies to solve environmental problems, innovate sustainable ideas, or learn green skills, the more diverse, interactive, stimulating and involving the actors in society (such as business owners, universities, research centers and schools) in its various phases, vocational training centers and civil society associations) the greater the percentage of social participation in green life and the greater the amount of green talent that has become more than necessary in covering the deficit that the global market sharing on green skills.

In this context, open education as a modern education method can play an important role in providing the labor market with green skills, and this is because of its

characteristics that allow it to make education participatory, which leads to increased environmental awareness and increased social integration for all students of all stages, and makes the student focusing on education.

This research paper, aim to identify the reality of green skills at the level of the global economy, while highlighting the importance of open education in keeping pace with the change in the nature of work and its role in increasing integration into green life for the majority of students to acquire green skills.

Standing on this basis, this paper came to address the following issue :

### **. How can open education models integrate students to acquire green skills?**

In order to answer this question, we rely on the following two hypotheses :

- 1- There is a weakness in the percentage of acquiring green skills at the global level.
- 2- Open education models increase student participation in learning green life skills.

In order to prove the validity of the hypotheses, we review the reality of green skills by knowing the relative density of green skills according to the type of jobs at the global level, in addition to knowing the rates of labor transfer to green jobs.

Trying also to identify leading models of open education that increase the possibility of increasing the number of students mastering green skills.

Regarding to the previous studies, and after examining the aspects and depth of the subject, we relied on the following studies:

- A study by Fadela Boutoura, Nawfal Smiley, Norddin Qalqil, where they discussed in 2019 open education and its role in the sustainability of education in societies, taking Al-Quds Open University as a model, and they concluded that open education is an opportunity to achieve comprehensive higher education of high quality for all segments of society.

- A study by Alexandra Okada and ORCIDetPierre Gray in 2023, who discussed the role of open education in learning about climate change and sustainability, and found a model for education that enables the achievement of sustainability goals.

- Najwa Youssef Gamal El-Din's study in 2018, which touched on transformations in the economy and education for a green economy, and saw the need for greening headquarters such as schools and cities, in addition to greening educational programs.

- The study of Asmaa Abdel-Fattah Nasr Abdel-Hamid in 2022, which gave a proposed vision for green education policies and programs in Egypt in the light of some Arab and international models, the most important of which is the reform of political legislation that paves the way towards the transition towards green education and the implementation of educational programs in schools and universities.

- The study of Mustika Nuramalia Handayani, Mohammad Ali, Dinn Wahyudin, Mukhidin in 2020, where the study aimed at green skills among graduates of agricultural professions and business and concluded that graduates from universities have a severe shortage of green skills.

In addition to these studies, we also used some of the reports to feed the research with appropriate data, such as the report of the International Labor Organization on skills for the green future, a global view in 2019. The report of the Arab Planning Institute for the year 2023 on green growth is an entry point to achieving sustainable development.

So, after our review of previous works and studies, we found that there is a research gap represented in answering the research problem, by knowing the open education models that can be applied by decision makers in order to saturate the market with green skills.

The study relied on the analytical approach, which is compatible with the nature of the data selected from the reality of the skills market and green jobs, as well as in analyzing the importance of open education and its role in integrating students into green life. Accordingly, the research was divided into two main axes.

.Green skills.

.Open education to fuel green activities and increase integration into green life.

## **2. Green skills**

Green skills are among the skills required to fuel green businesses. For this reason, the formation of green human capital is important to innovate ideas and control new technologies, in order to ensure a rapid transition towards green activities and practices.

### **2.1 Concepts about green skills**

Green skills are defined as the technical skills, knowledge, values and attitude needed for green jobs and a green transition. As defined by the OECD ; those skills needed to adapt products, services and operations to climate change and to environmental regulations (Institute, 2023, p. 02) . It should be noted here that there are two terms related to green skills, which are low carbon skills and general green skills, but the commonly used term that includes both terms is green skills. (Z , C S , A F , M F , & N M , 2023, p. 02).

#### **2.1.1 Types of green skills**

Green skills can be identified according to three types:

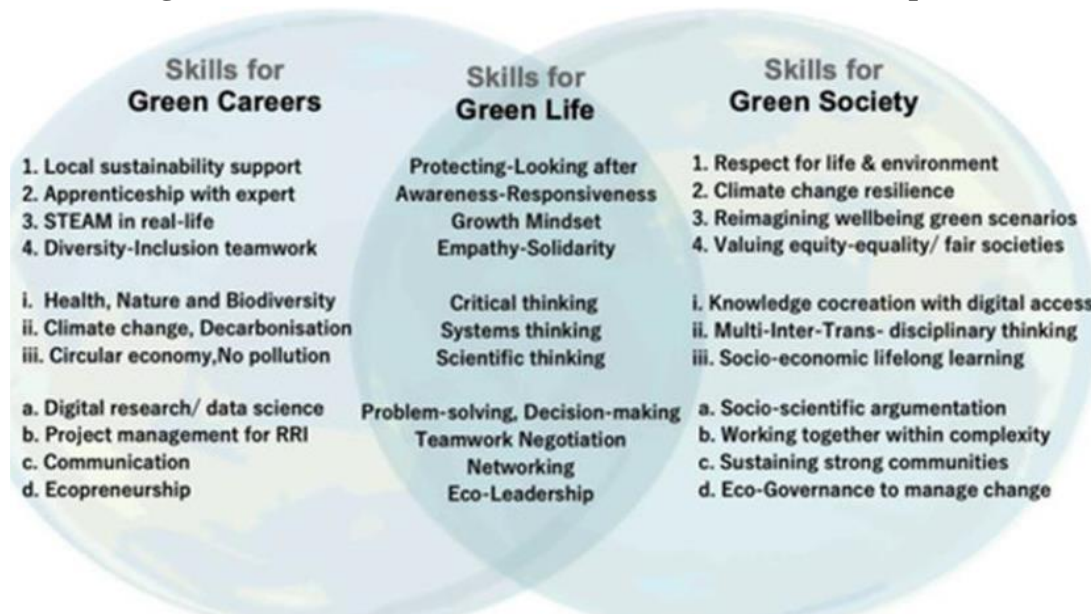
.Green professions skills: which is looking at the skills through the technical side and the ability they offer to provide environmental care to individuals such as (the ability to respond to local demands, the ability to identify life problems, the ability to work in teams, the ability to find a solution to a problem, the ability to create Project development, ability to communicate).

.Green transformation skills (societal skills): from a broader social perspective, represented in possessing the transformational capabilities represented in (thinking about social issues, the ability to identify uncertain needs, the ability to contribute to teamwork, the ability to communicate understanding and evaluate the opinions of

others to build knowledge collaboratively, the ability to conduct scientific social debate and collaborative work).

.Green life skills: represented in cognitive competencies, personal skills, and skills that help in solving practical problems and making green decisions, such as (critical and scientific thinking skills, problem-solving and decision-making, the ability to negotiate and persuade, the ability to form social bonds for environmental leadership, and the skills of empathy and solidarity). (Barbara, Eliza , & Thibault, 2023, p. 10).

**Fig.1. Green skills in the (CARE-KNOW-DO) model of open education**



**Source:** Alexandra, Pierre ,2023, P128

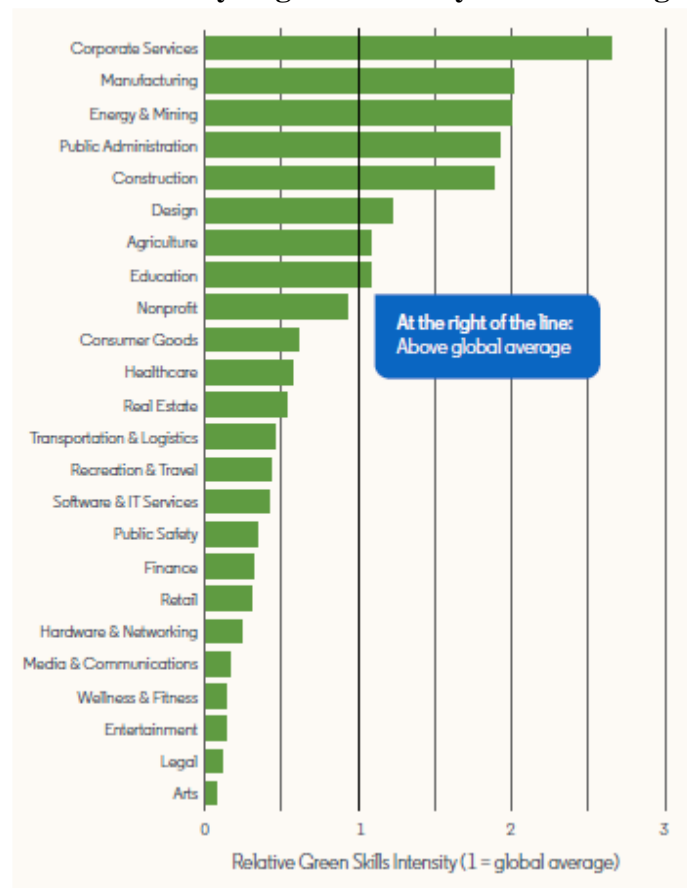
The three green skills combined are necessary to meet the growing demand for them, so that the number of new green jobs will reach approximately 2.5 million jobs by 2030 (Barbara, Eliza , & Thibault, 2023, p. 19), according to the Economic Linked report, issued in 2022 on the development of green skills at the global level, where between the high demand for green talent since 2017, the green employment rate exceeded the total employment rate in most economies around the world during the year 2019, which means that the percentage of hiring workers in green jobs is greater than hiring workers in other jobs. (Institute, 2023, p. 03) At the global level, green talent has also been on the rise, increasing from 9.6% in 2015 to 13.3% in 2021 (an annual growth rate of 6% and a cumulative growth rate of 38%) (Graph, 2022, p. 07).

That is why it is necessary to have accurate knowledge about the amount of current green skills and how they grow and spread across jobs in various economic sectors at the global level, in order to plan them in line with the needs of the labor market, by calculating the relative intensity of green skills for different types of jobs that enables us to know the percentage Current jobs govern green skills.

### 2.1.2 The relative density of green skills according to the type of jobs at the global level

The relative intensity of green skills reflects the extent to which jobs possess this type of skills. For example, if a particular job lists five green skills out of 20 skills, the green skills density is 25%. (Institute, 2023, p. 10). Numerous studies show that different jobs in many sectors have a disproportionately low potential for green skills, and that the global average green skill intensity is 1. Therefore, the jobs that have the most relative intensity in the world are found in the corporate services sector with a relative density of more than 2.5 percent, followed by manufacturing, energy and mining, public administration and construction with a rate of approximately 2 percent. As for jobs related to design, agriculture and education, the relative intensity of green skills passed 1 percent, then Non-profit organizations jobs by about 1%. While we find jobs in the consumption of goods, health care, and real estate sectors, the percentage of density did not exceed 0.5%. However, it is remarkable that the entrepreneurial sector, which is the main activity for revitalizing the green economy, did not exceed 0.3% of the possession of green skills. This percentage reflects the slow shift in green foals owning this type of job.

**Fig.2. Relative intensity of green skills by sector at the global level**



**Source :** Graph, L. I. (2022), P 16

According to the data of the previous figure, governments must take quick practical measures to provide jobs that are limited in the use of green skills, similar to

the skills of green entrepreneurship. Therefore, innovative talents must be available to produce new models and technologies that enable them to practice green activities, while working to find a mechanism That increases the injection of green skills into the labor market in order to raise the relative intensity of green skills to its maximum limits, in order to contribute to the greening of existing activities and professions and so that workers can move from traditional jobs to green jobs smoothly. (Graph, 2022, p. 16) .

## **2.2 The rate of employment transition towards green jobs**

Transition towards green activities does not take place without a large and rapid movement of workers compared to traditional activities. We find activities such as agriculture, corporate services, design, energy, mining, manufacturing, and public administration are leading sectors that witness rapid transformation, with a relative average density, as they have an increasing movement of workers, for example when 100 workers move to traditional jobs, 256 workers move to green jobs). As for the activities that know a positive transition such as (arts, consumer goods, entertainment, finance, health care, law, media and communications, real estate, entertainment and travel, retail, software and information technology services, transportation and logistics), the growth in the percentage of workers who move to green jobs are greater than workers moving to non-green jobs, where (for every 100 workers working in non-green jobs, up to 477 workers move to green jobs). While there is a negative transition in the construction and education sectors, which have a relative density above average, the growth of workers moving from green to non-green jobs is faster than the reverse labor transition (for every 100 workers who move to non-green jobs, less than 47 workers move to non-green jobs green). While we find an unclear transmission of activities (devices and networks, non-profit organizations, public safety) although the relative intensity is less than the average (Graph, 2022, p. 18).

### **2.2.1 green professions in Algeria**

During the past decade, Algeria tended to green jobs as a first step, by changing production techniques in some of the activities that came in the five-year program (2015-2019) in the sectors of agriculture, water, waste recycling and recovery, industry and tourism, and then moved as a second step towards creating green jobs by stimulating entrepreneurship.

Algeria has also recently carried out extensive reforms in the field of environmental management and redirected sectoral policies towards the strategic areas of energy, waste management, water and sanitation, agriculture, and aquaculture in addition to industry. These reforms were accompanied by the establishment of specialized agencies and the development of new environmental and sectoral systems and schemes. There are multiple plans such as (the soil field development plan, the national plan for the development of the region 2010-2030, the national climate plan 2015-2050, the national program for the development of renewable energies 2011-



2030, whose total cost is estimated at between 80 to 100 billion dollars), and the first power generation station was established. Electricity is based on solar energy and gas, which provides 150 megawatts, including 25 megawatts on thermal solar energy in “Hassi R’mel.” The government has recently moved towards adopting green entrepreneurship and establishing projects within the framework of Resolution 1275 as a strategic option to create green jobs and achieve economic diversification by encouraging university students. To break into the field of entrepreneurship and green entrepreneurship.

All these programs suggest that there is a gradual shift to encourage greening professions and the creation of new green jobs. For this reason, some studies indicated that this shift may contribute in Algeria by the year 2025 to the creation of about 1.4 million jobs ( bin Musa & Qaman, 2019, pp. 113-114).

### **2.2.2 The growth of green activities and the level of social inclusion in green practices in Algeria**

The efforts made by Algeria towards defining green professions, although they are a step in the right direction, remain short of aspirations and have not been reflected in green indicators, especially if they are compared with Arab countries. We find for example, the green growth index in the Arab countries issued by the International Institute for Green Growth for the year 2023, indicating that Algeria has a low green growth rate, unlike other Arab countries that have a medium growth rate such as Lebanon, Tunisia, Morocco, and Egypt. Algeria experienced a decline in its ranking from 15th place with an index of 32.36 in 2005 to 22nd place with an index of 28.02 in 2019 (Al-Darsi, 2023, p. 13).

As for the composition of this indicator for the year 2019, Algeria has low rates in creating opportunities for green activities, at an estimated rate of 7.20%, compared to Tunisia, which has a rate of 46.16%. As for the social integration rate, Algeria has a rate of 66.27, while Tunisia has a rate of 75.42 (Al-Darsi, 2023, p. 15).

This clear disparity in the level of growth of green activities and the level of social integration in green practices requires Algeria to make more efforts, especially with regard to environmental awareness of society, and work to bring about a qualitative change in traditional education methods in various educational stages towards methods that increase the flow of green skills and talents. Recently, Resolution No. 1419 issued on December 24, 2022 was issued, which clarifies the type of skills to be developed among third-cycle students at the university. Among them, we find skills (development of intellectual capabilities, inculcation of social sense among students, skills of analytical ability, development of initiatives and innovation, development of entrepreneurial spirit and leadership among students, enhancing critical thinking, teaching skills to adapt to the environment, and project management skills). All these skills will generate a desire among the graduates to break into the green business world. (Ourrad, 2023, p. 279). However, the rapid transformation towards green professions is not limited to only one stage of education, but rather it

must include all students and students in all educational stages, and a stimulating educational environment that encourages them to acquire green skills is provided for them.

According to recent experiences, increasing social participation in green life and increasing environmental awareness is achieved through the participation of actors such as business owners, universities, research centers, schools of all stages, vocational training centers and civil society associations. Some successful models of the open education approach that devote lifelong learning and promote social dialogue should be applied. Increasing integration into environmental life, which enhances the flow of green skills to the labor market.

That is why the United Nations Educational, Scientific and Cultural Organization (UNESCO) is working through its new strategy 2022-2029 to adopt methods of education and training in order to develop the skills of economic transition. In this regard, open learning can be lifelong, in various educational and university stages, and in a location work is the best way to achieve a qualitative leap in the growth of green skills (United Nations Educational, 2023, p. 04).

### **3. Open education "nourish green activities and rise integration into green life"**

The fast developments taking place in the field of work have led to the rapid growth in demand for green skills in order to keep pace with the process of creating activities and greening existing professions, by involving all individuals in green life and spreading environmental awareness. Here, open education can play this role, because early education will work to form an environmental knowledge base for the student. So that it enables him to use the acquired skills continuously throughout the period prior to joining green positions. Giving them the freedom to choose the practices they prefer ( Pirzada, Naz, & Jamil, 2023, pp. 45-49).

#### **3.1 Concepts about open education**

##### **3.1.1 Open Schooling**

Open education can be defined from its traditional perspective as a system that includes arrangements that make individuals learn at the time, place, and speed that suit their circumstances and requirements, so that the focus is on finding more opportunities for learning by overcoming difficulties or personal obligations ( Boutoura, Smiley, & Qalqili, 2019, p. 135) .

aFrom its modern perspective, it is a term promoted by the European Union that enables students in various educational stages (secondary, primary, and intermediate) to cooperate and interact with actors in society (local companies, universities, and society), which will motivate and push the student to learn in the environment in which he lives. Learning ecology”, the more diverse, interactive, stimulating and engaging these environments are for the actors, the richer their learning. It is similar to participatory research based on knowledge, co-creation and design thinking. And it makes students learn from dealing with real-world issues, which leads them to acquire

green skills and behaviors through the various stages of education (Okada & Gray, 2023, p. 145).

Also, in open education, it is not primarily the preparation of a specialized teacher nor in a specific subject of knowledge, but rather it is a collective responsibility in which knowledge flows through all directions, not only from teacher to student, but from student to student and from the world to all learners. Therefore, the goal of open education is to transcend knowledge boundaries and create green behaviors (Youssef Gamal El-Din, 2018, p. 40).

Among the successful examples related to open education, we find the Green Schools program in the Emirate of Dubai, which has implemented many environmentally friendly projects within the school, in order to develop environmental awareness among students and promote positive environmental behaviors, in addition to teaching students and encouraging them to innovate, as it planted school roofs with vegetables and fruits, ornamental plants, medicinal and aromatic plants ( Abdel Fattah Nasr Abdel Hamid, 2022, p. 184) .

There is also the Keep Britain Tidy program, which aims to promote practical education related to environmental issues and the development of environmental awareness, in cooperation with universities and local authorities in order to implement joint projects to protect the environment, as it educates about 2.3 million children and youth ( Abdel Fattah Nasr Abdel Hamid, 2022, p. 188).

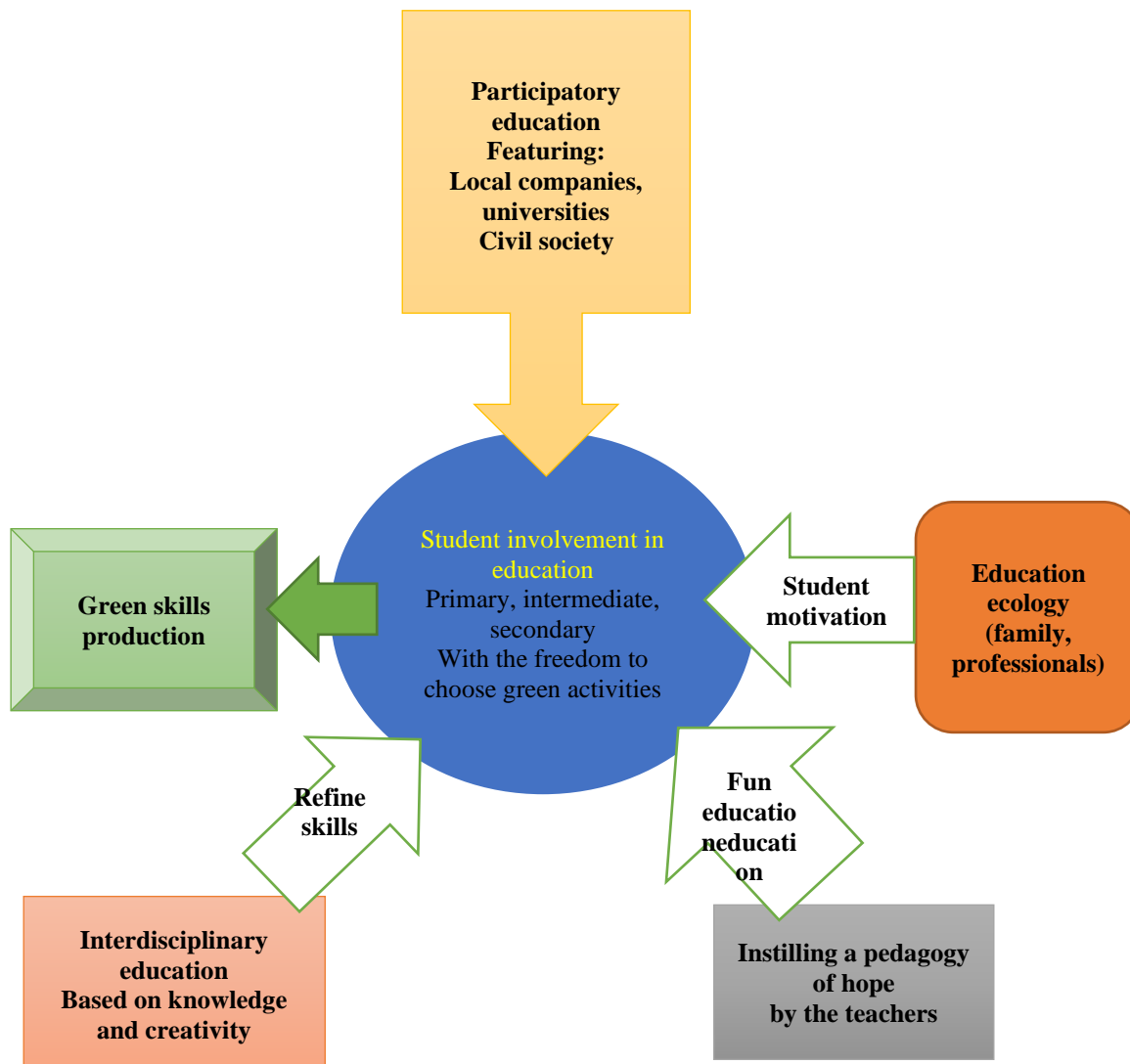
### **3.1.2 Open education "elements of success"**

For the success of open education as a methodology for providing activities with appropriate skills, four components must be adopted:

- The educational program should be flexible, easy to update, and appropriate to prepare students for real-life environmental issues.
- Adopting an interdisciplinary approach that combines many sciences and fields, such as combining biology, chemistry, natural history, sociology, and climate change policy.
- Searching for how to enable and train teachers to increase their teaching skills.
- Create an atmosphere of collaboration between researchers educators and community members, including students and policy makers (Okada & Gray, 2023, p. 149).

The availability of these four components will make education perform its functional tasks and be enjoyable for the student and the teacher. The latter must be equipped with tools to deal with social issues outside the curriculum, through their treatment of the social and emotional aspects of the student. Known as "the pedagogy of hope".

**Fig.3. Open education to increase the environmental integration of students and the flow of green skills**



Source: prepared by the researcher

The figure shows that the green skills that flow from the open education system in the appropriate amount which corresponds to what is required in the labor market, we must first take care of individuals outside the school by activating the role of the environment surrounding students from the family and neighboring professionals, as the latter is a factor motivational for students in order to motivate them to learn green skills at school, and then work during the classroom to involve all actors to contribute in creating an educational atmosphere that gives the student the choice of the activity that he likes, with a focus on interdisciplinary education.

### 3.2 Some examples of open education

The interest of some leading countries, such as the United Kingdom and Malaysia, in open education, as an option to provide green skills and green traditional

professions, in order to expand the area of green practices and increase environmental awareness.

Environmental awareness, when it is refined among students, will affect the personal and practical lives of students, because it includes environmental knowledge, emotional participation, and environmental attitudes. ( Nuramalia Handayani, Ali, & Wahyudin, 2020, p. 25) .

### **3.2.1 (CARE-KNOW-DO) model (subscribe-learning-work) for open education**

The (CARE-KNOW-DO) model was proposed in the year 2020 in the United Kingdom by those charged with planning and designing educational process, aiming to make education perform functional tasks and make it fun, clearer, attractive and appropriate, which will improve students' knowledge, skills and attitudes with all ability, and make the process greener by producing talents that possess various green skills, through the support of partnerships and universities for educational schools. Therefore, it can be said that this model looks at education from a broader and more comprehensive perspective of the needs of the members of society, according to the theory of the hierarchy of needs, as follow :

- **Stimulation and Emotional Engagement (CARE)**

Philosophically, it is only Orwell's that nature is complex and its course can be directed through the exercise of force ( $2 + 2 = 5$ ). The strength here lies in the collaboration between researchers, companies and individuals to develop ethical values, responsible attitudes and practices for students and push them to be innovative professionals with real problem solutions that align with the needs of society, which develops emotional involvement and increases their motivation. By involving real issues that provide knowledge to understand the problem and discuss its solutions.

It is at this stage that the education is informal with professionals and the family, because it is designed to create a 'need to know' that teachers can work with in the next step.

- **Choosing the appropriate knowledge (formal or informal knowledge) (KNOW)**

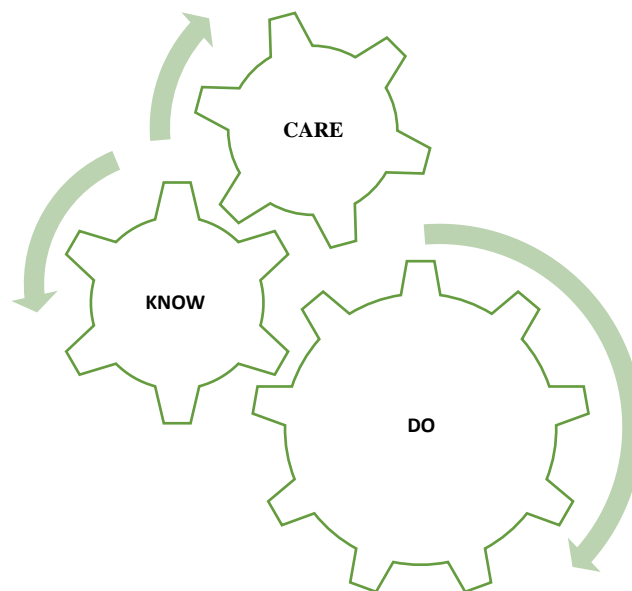
According to "Skovsmose", the knowledge and content of the process should be chosen on the basis of the degree of individuals' need to learn job skills, the source of which is the individuals' inner vision of their future potential. By choosing the knowledge that can be taught to students, open education can be a potential approach to reduce the gap that exists between the outputs of the educational system and the ever-changing nature of work, by helping students to link formal and informal knowledge within and outside the school environment, as well as developing general skills. This will create opportunities for students to expand their knowledge and skills in the context of real-life actors (community, teachers, experts, family and community members).

At this stage, the education is formal and focuses on providing students with the scientific knowledge and skills they need to make decisions and take actions related to the final stage.

- **Procedures for Operation (DO)**

The success of this model requires some procedures and changes in the student's assessment methods. The evaluation methods must be changed in the tests, as it is still based on the test in the first place, which is considered a statistical exercise that has a weak connection with the real world. The process of honing green skills requires the best way to assess academic achievement by looking at the actions taken or the activities that result in learning rather than formal tests and other forms of traditional assessments. Since the skills learned mean nothing if they are not used in context. At this stage, students apply the skills and knowledge gained, and define the working methods necessary for the success of the green project (Okada & Gray, 2023, p. 154).

**Fig.4. Model (CARE-KNOW-DO) for Open Education**



**Source:** prepared by the researcher

In each of the three stages of this model, students must inculcate the skills they need, which were previously mentioned in Figure (01), represented in green job skills, community skills, or green transformation and green life skills. This is in order to take into account the local values and lives' needs of individuals, and here the behavior of individuals as agents of change towards a sustainable green lifestyle is highlighted by their possession of green skills.

It can be said that the (CARE-KNOW-DO) model focuses on the individual and collective development of a group of students, through interaction between students, and this will promote the balanced development of each student within the group (collective learning). These interactions will work side by side to solve real-life problems and expand students' capabilities. Therefore, open education within this

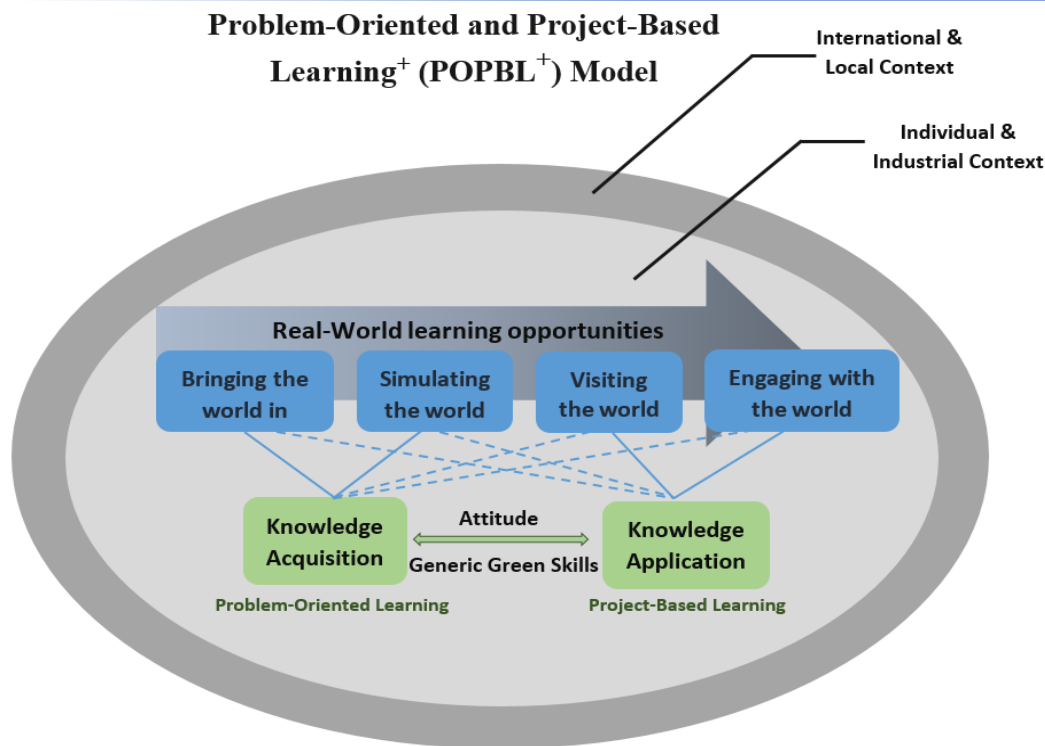
model is an ideal way to nurture and enhance students' emotional and mental development.

### **3.2.2 Pedagogical Model for Problem-Oriented and Project-Based Learning (POPBL+)**

This model was applied in Malaysia, by making education more open with all actors in society, as it works to facilitate education by providing learning opportunities based on solving problems from reality throughout the semesters, as it aims to help students link problems with their daily lives and with their practical experiences. It is based on transforming the process of acquiring knowledge towards the application of knowledge in the environmental reality, through four sequential and interrelated processes that start with “bringing the world to the world” and then “motivating the world and students” to explore problems from reality, then encouraging the processes of “visiting the world” and finally engage in the world.

In the stage of bringing the world into the world, environmental problems from the real world are identified and formulated, which can be solved through modifications in the practices of productive activities. In the stage of simulating the world communication dynamics are developed through the process of identifying solutions and learning how to deal with different points of view and resolving conflicts. While in the visiting the world stage students should relate their learning to specific issues in order to broaden their practical experience. And in the last stage related to the stage of engagement in the world, which is the important stage in this episode, which requires proposing possible solutions and strategies to deal with specific issues. As shown in the following figure ( Pavlova & Chen, 2019, p. 14).

#### **Fig.5. Pedagogical Model for Problem-Oriented and Project-Based Learning (POPBL +)**



**Source:** Pavlova & Chen, 2019, p. 15 .

Considering the four stages of this model, that is based on visiting the world and interacting with it. It will facilitate the acquisition of knowledge by helping students identify the knowledge and skills that help them engage more in solving problems in the real world. The students are engaged in ecological living that gives them green skills.

#### **4. RESULTS AND DISCUSSION**

After discussing the two models, it can be said that in order to increase the flow of green talents and increase the spread of green practices, all students at various educational levels must be integrated into environmental life, within open education models, which push the student towards learning green skills within an enjoyable educational system (ILO, 2019, p. 120).The student acquires green skills in various educational stages, which will increase social participation in environmental life and grow environmental awareness, which will all positively affect the rate of orientation towards green jobs and activities in the future, and thus will be able to keep pace with the growing demand for green skills and implement the programs set by business owners and governments.

Through the above narration and analysis, it can be said that the first hypothesis of the study is correct, and this was evident to us through statistics related to the growth of green professions and the relative intensity decline of green skills for the majority of jobs with the failure of the traditional educational system to keep pace with the growth of demand for green skills, which led to Poor possession of green skills for business owners. As for the second hypothesis, it is also correct because open



education models work to expand the base of participation in education among all educational stages and among all actors, which will create an enjoyable and stimulating atmosphere for the demand to acquire green skills throughout the educational years.

## **5. CONCLUSION**

Green skills are of great importance in nurturing green professions, it is expected as mentioned in the analysis that the number of the latter will increase in the coming years in many countries, similar to Algeria, due to the programs and investment in this field. That is why we must work to increase the flow of green skills from the educational system in order to raise the relative intensity of green skills in all jobs and in all activities. Open education models such as the (CARE-KNOW-DO) and (POPBL +) models can meet the needs of the market for green skills, because the latter is based on the idea of "Bildung" that refers to self-maturity, meaning that personality, cultural maturity and development Individuals as actors in society. It must be that they change the idea of career into an idea of satisfying life in which individual and group needs are harmoniously balanced.

That is why governments like Algeria should work on a "bottom-up" approach, rather than "top-down" decisions, by making public school education more environmentally conscious and more broadening the base of community participation towards acquiring green skills.

Algeria is also concerned with adopting open education models by virtue of its orientation towards investment in some green activities and its adoption as well as some programs, but it is still witnessing low rates of creating green activities and in rates of social integration, which requires it to make a significant leap in public education, relying on education Open as an instrument to provide green activities and programs with the necessary skills. Instead of being limited to teaching some students in some environmental disciplines in university seats, because as we mentioned earlier that in order to increase the speed of the flow of green skills, all students must contribute to all educational stages, which is not limited to the university only, so it is necessary:

- . Focusing on the environment inhabited by students, the "learning ecology", by encouraging informal education with professionals and the family to create a need for knowledge among students and motivate them to acquire green skills.

- . Making knowledge flow in all directions, i.e. shifting towards participatory education.

- . Preparing multidisciplinary educational process that combine many sciences and fields.

- . Paying attention to the pedagogy of hope in dealing with the social and emotional aspects of the student.

- . Changing the way academic achievement is assessed, by looking at activities resulting from learning.

. Increasing engagement in environmental life through teachers' reliance on smart educational methods.

. Motivating them to produce content using a little bit of positive emotion, thus teaching and encouraging them to be creative by designing and manufacturing simple items that are useful and environmentally sustainable. Because such initiatives have the potential to attract students to join the green talent pool.

Moreover, a functional role should be given to actors such as company owners, the university, and scientists, through improving the coordination process between research centers and companies, and creating effective incentives for the private sector to invest in research and development.

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