

# Work-linked training and the development of soft skills: the case of renewable energy vocational training trainees

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**Abstract.** The transition to renewable energy requires qualified professionals with technical skills and soft skills. This study investigates the impact of work-linked training on the development of soft skills in renewable energy vocational training trainees. As part of this research, we used an online questionnaire created using Google Forms to collect quantitative data. The aim of the questionnaire was to identify the factors that promote or inhibit the development of these skills among renewable energy vocational training trainees. The results of the questionnaire were analyzed in order to determine the impact of work-linked training on the development of soft skills, focusing on several aspects, namely the effectiveness of the support provided to trainees in the workplace, the resources made available to trainees in the workplace, the work-linked training program, the teaching methods used by the trainers and the trainees' perception of the usefulness of this training method. The results of this study will contribute to questioning the effectiveness of work-linked training in developing the soft skills of renewable energy trainees.

**Index Terms**— Work-linked training, Soft skills, Vocational training, Renewable energy, Internships

## 1 Introduction

The study of the subject of development of non-technical skills called "Soft Skills" is of major importance, given that companies are more and more demanding given the technological, socio-economic, environmental, and climatic changes that the world has been undergoing lately. These transformations have created new needs in the world of work. To meet these requirements, the training of labor and professionals is essential to meet the needs of the national and international economy.

To achieve this, companies are looking for professionals with both technical and non-technical "soft skills". These skills have become essential in the professional world, including in the renewable energy sector. They are considered to be behavioural and social skills that

complement technical skills and enable professional effectiveness and professional fulfilment in the workplace. According to LeBoterf G. (1995) [1], a qualified professional is one who can combine a combination of knowledge, know-how and interpersonal skills into a set of skills for action, meaning the mobilization of all these skills in a given context and a specific professional situation. A review of the literature reveals the existence of studies on the definition of skills in general, on the evolution of this concept, and on the development of technical skills and soft skills in general. Few studies have looked at soft skills in relation to work-linked training, as a training method that combines theory and practice in the development of non-technical skills and more specifically among renewable energy trainees in vocational training establishments.

In Morocco, the vocational training system has undergone a series of reforms in conjunction with the education system since 1999, marked by the the national charter for education and training [2]. The national vocational training strategy on the horizon 2021 [3] aims to offset for the qualitative and quantitative shortfall in trainees and has emphasized the need for and importance of incorporating key "soft skills" into the vocational training program, to enhance human capital and promote employability. The office of vocational training and work promotion has joined this approach by introducing the "SOFT SKILLS" module in the training system. This is how the OFPPT signed, in 2016, a partnership agreement with USAID (United States Agency for International Development) for the construction of career centers and support for the OVTWP in the evaluation of curricula and training methods, in order to respond to the issue of employability and openness to the labor market.

Despite these efforts, the unemployment rate among graduates of vocational training establishments is relatively high, 20.5% according to the MEI's national survey assessing the integration and progress of higher education graduates carried out in 2018. [4],

However, the problem of our paper revolves around the following question: to what extent does work-linked training have an impact on the development of soft skills among renewable energy trainees in Moroccan vocational training establishments? What are the dimensions and factors at play that promote or inhibit the development of these skills in the context of work-linked training?

The aim of our study is to compare the perceptions of young trainees in renewable energy vocational training establishments regarding the impact of work-linked training on the development of their soft skills. Over the last few decades, studies have been carried out on the development of soft skills, but few of these have included the dimension of vocational training and renewable energy as a field and population of study. In this context, our research will aim to fill this gap. During this research, our main concern is to demonstrate the factors that influence the development of soft skills in different contexts, based on trainees' perceptions of several dimensions, via a quantitative study based on a questionnaire.

Our work begins with a summary giving a general overview of the study, followed by an introduction covering the general context and the objective of the study envisaged. Then, is followed by a description of the methodology adopted and the target population, including data collection, interpretation and discussion of the main results obtained from this survey. Finally, concluding with a perspective.

## **2 Methodology:**

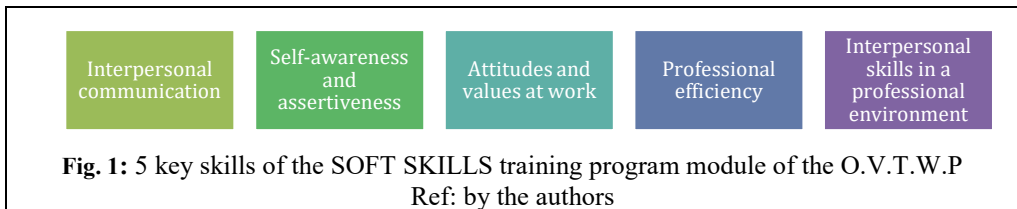
To answer our research question, we have chosen to opt for a quantitative study, which was carried out from February to April 2023 on a population that varied according to age but had the same level of education and belonged to a vocational training establishment. This quantitative study was performed using an online questionnaire designed on the google forms electronic platformed for data collection, written in French using a computer with a Windows 2018 operating system. Participation in the survey was voluntary, and the questionnaire

contains a preamble explaining the purpose of the study, which sets out the state of knowledge on the subject; and this questionnaire will be in an academic setting. However, we have diversified the types of questions (short answer questions, checkbox questions, multiple choice questions ...).

To increase the response rate and participation in this questionnaire, the link was sent via e-mail and WhatsApp educational groups to the trainees in the renewable energy sector, and more specifically to the photovoltaic systems installer training course at the specialized institute of Applied Technology under the Office of Vocational Training and Work Promotion of Morocco.

Participation in the survey is voluntary and anonymous, and the questionnaire is introduced by collecting demographic data on the trainees (gender, age). The second part of the questionnaire assesses their general level of satisfaction with the soft skills module and their expectations of it. Next, the trainees' perception of the teaching approaches used in class to develop soft skills by the trainers. The third part looks at the conditions for developing soft skills in work-linked training, the trainees' perception of the quality of the support and tutoring and the resources mobilized by the host company and the original vocational training establishment.

The soft skills module is one of the cross-disciplinary training modules used to complement technical skills. This module covers 60 hours of training and is subdivided into 5 training sequences relating to 5 key skills as follows (figure1):



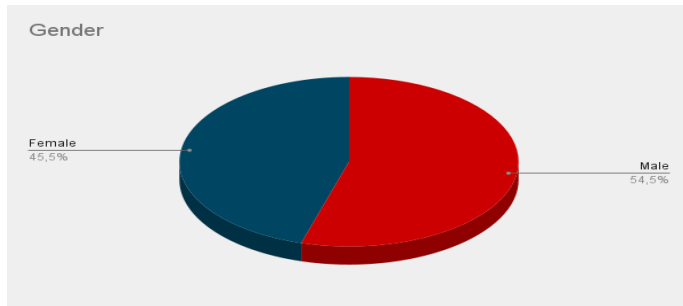
### 3 Collecting and analyzing data:

To achieve our research objective, we used a questionnaire consisting of 5 elements. It should be noted that the study sample was made up of trainees from the Ouarzazate Institute of Applied Technology, part from Draa Tafilalt Regional Directorate, OVTWP, Morocco. The trainees covered by the study are following a qualifying training course in the field of renewable energies, which lasts 295 hours and leads to the award of a certificate of qualifying training in the installation of photovoltaic systems. After completing the course, the young person can carry out all the work required for the installation, commissioning, and maintenance of photovoltaic systems. They will be able to work for a service provider in the renewable energy sector or set up their own business. The training is alternated, combining classroom lessons with work experience in a professional environment.

The main objective of using the questionnaire as a data collection tool is to obtain trainees' perceptions of the range of elements or factors that can influence the development of soft skills in sandwich courses. The questionnaire enabled us to collect data on the demographic characteristics of the study sample.

#### 3-1 Gender:

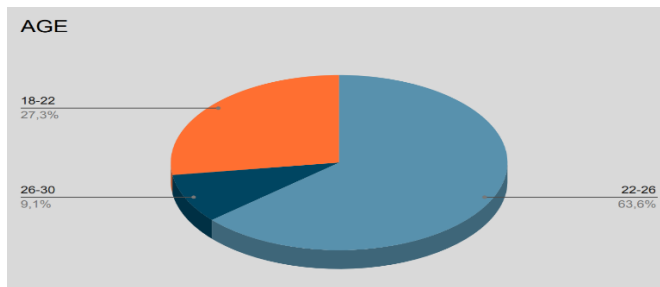
Our survey reached 54.5% of men and 45.5% of women, which means that our target population is composed of a relative majority of men (figure2).



**Fig. 2 :** Surveyed by gender Ref: by the authors.

### 3-2 Age:

Regarding the age bracket relative to our target population, it is divided into 3 intervals: 63% of the study sample is in an age bracket between 22 and 26 years old, 27% between 18 and 22 years old and a minority 9.1% between 26-30 years old.

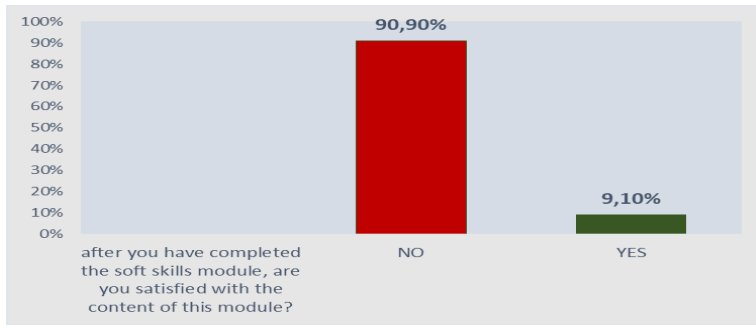


**Fig. 3:** Surveyed by age group Ref: by the authors.

After the demographic characteristics the data collected is divided into 4 elements: the satisfaction of trainees in relation to their expectations vis-à-vis the content of the soft skills module, the quality of supervision and tutoring in the middle of the internship, the perception of trainee resources mobilized by the training establishment and the host company to ensure the effectiveness of the work-study program in the development of non-technical skills, namely communication, problem solving, time management...Finally, the perception of the trainees of the pedagogy of learning and development of soft skills in the classroom and in the middle of the internship.

### 3-3 Satisfaction of trainees with the soft skills module:

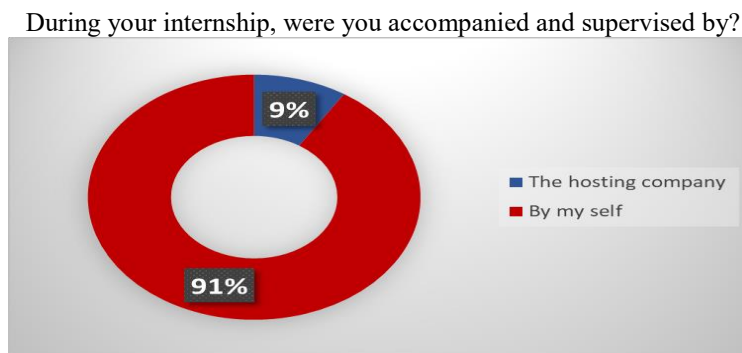
Graph 4 shows that 90.90% of respondents are not satisfied with the content of the soft skills module.



**Fig. 4 :** Surveyed by satisfaction with soft skills module Ref: by the authors

### 3-4 The quality of supervision and tutoring in the internship environment:

The graph below (figure5) shows that 91% of the target population is not supervised during the internship period, they are left to their own devices, and 9% of respondents are accompanied by the company.

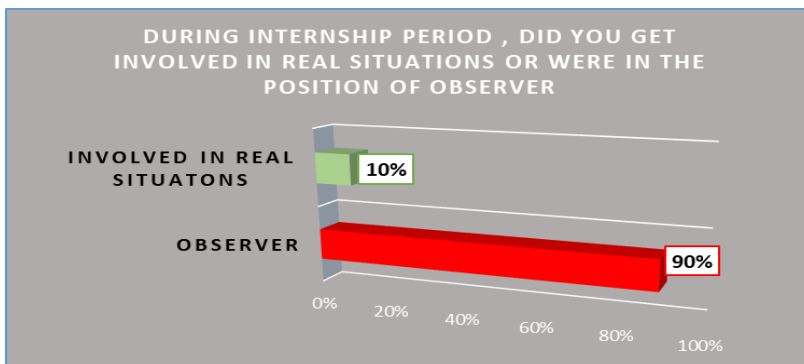


**Fig. 5 :** Surveyed according to supervision and tutoring in the workplace Ref: by the authors

### 3-5 Searching for an internship opportunity:

100% of the respondents declared the fact that, it is they themselves who are invested in the search for an internship, the training establishment has not mobilized its resources to place the trainees in the professional internship environment.

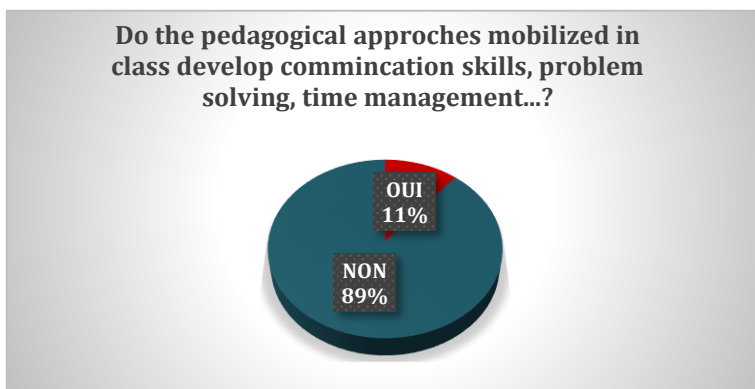
Figure 6 shows that the majority of the 90% of trainees stated they did not feel involved in real-life work situations in their training environment, but rather were in the position of observers.



**Fig. 6 :** Surveyed according to the activity of the trainees during the internship within the company Ref: by the authors

### 3-6 Quality of classroom pedagogy for the development of soft skills:

In addition, around 89% of learners find that the pedagogical approaches used by the trainer in the classroom do not allow for the real development of soft skills such as communication, problem-solving, time management etc. 11% of learners find that the pedagogy of soft skills in the classroom is effective.



**Fig. 7 :** Surveyed according to the quality of soft skills teaching in the classroom Ref: by the authors

## 4 Results:

Analysis of the results revealed a remarkable trend towards trainee dissatisfaction with the pedagogy of soft skills teaching. Participating learners wanted a more practical and dynamic approach, enabling them to apply and emphasize the skills they had acquired directly to real-life business scenarios and situations. Many trainees noted that traditional, even lecture-based teaching methods, which focused mainly on theoretical presentations, definitions, and classroom exercises, did not fully develop, and apply their soft skills. They expressed the need for more concrete activities, such as role-playing, and group projects

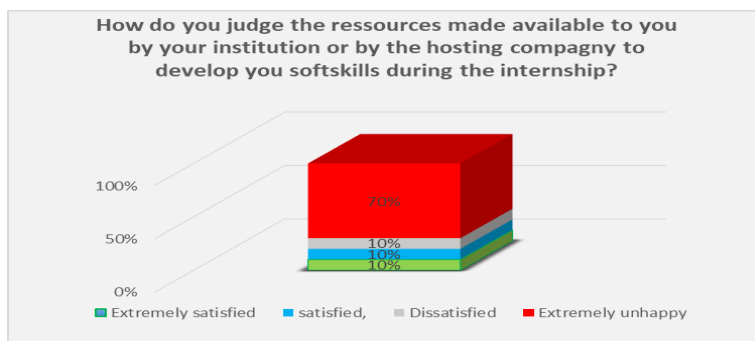
related to their renewable energy professions. This requires the contextualization of soft skills teaching, and the innovation of new teaching methods to match the needs of trainees and companies in terms of qualification in renewable energy professions.

Concerning the 2nd element, the quality of supervision and tutoring in the internship environment, several trainees expressed their satisfaction with the lack of supervision, whether from the host establishment or the host company. Trainees pointed out that they felt in a passive position of observer, with less effective involvement in activities, tasks, and work situations within the company. Some mentioned a proven lack of supervision on the part of their tutors, which curtailed the practical application of technical and non-technical skills in various professional contexts.

This outcome demonstrates the vital importance of quality supervision during work placements. It is essential that host establishments and partner companies acknowledge their contribution to the development of trainees' skills and provide adequate supervision throughout the internship period.

As for the perception of the trainees of the resources mobilized by the training institution and host company to ensure the effectiveness of the alternation in developing non-technical skills such as communication, problem-solving and time management, this study reveals negative and dissatisfied perceptions of the resources mobilized by training institutions and host companies, with the majority attesting that the resources provided did not meet expectations and were considered inadequate. Trainees expressed frustration at the lack of equipment and tools for communication and coordination between the home institution and the host company, given that the internship lasts one month. This unfavorable and negative perception of the resources mobilized underscores the importance of rethinking and questioning the efforts made by training establishments and host companies to support the development of skills, and more specifically soft skills.

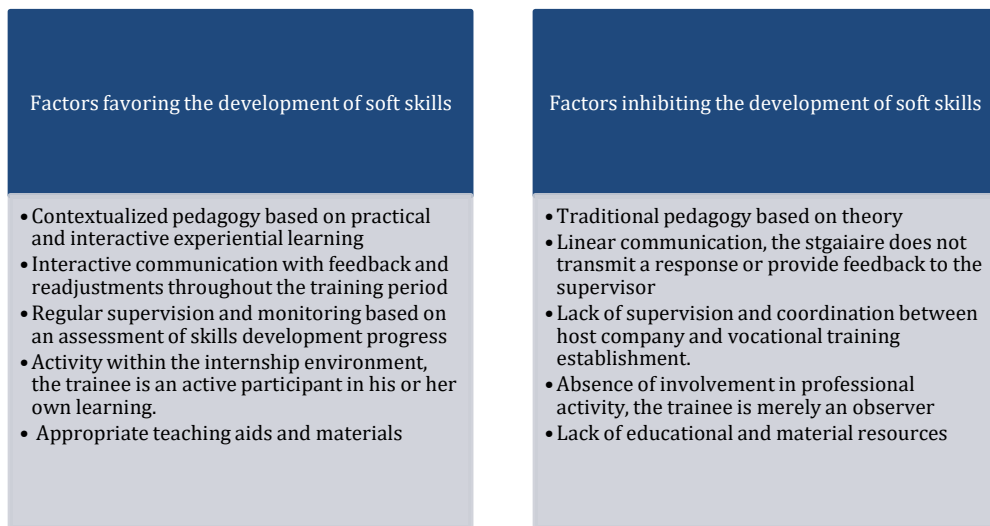
Finally, at the end of the questionnaire, trainees were asked about the practices implemented by the company to instill in trainees the importance of rationalizing energy consumption and protecting the environment, bearing in mind that trainees in the renewable energy sector are required to master job-related technical skills, soft skills, and green skills. According to the trainees surveyed, 80% of them stated that they had never received any practical or hands-on training in energy-saving and environmental protection practices during their internship with their host company.



**Fig. 8** : Surveyed according to the perception of resources mobilized by the training establishment and host company... Ref: by the authors

## 5 Discussion :

Following the content analysis, our results show and confirm the factors inhibiting the development of soft skills in the dual training mode for trainees in renewable energy vocational training. We have tried to represent these factors as follows:

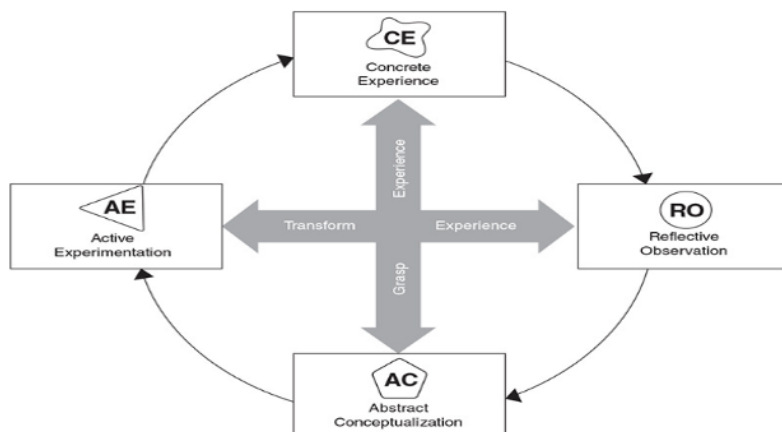


**Fig. 9** : Factors that promote or inhibit the development of soft skills in work-study training. Ref: by the authors

The results of this study confirm and enrich the findings of the literature review previously carried out. Indeed, the literature review had already highlighted the concerns associated with soft skills pedagogy, highlighting the need for an interactive, hands-on approach to foster the development of these skills in learners. Our outcomes reinforce this conclusion, showing that trainees also share this demand and express dissatisfaction with soft skills teaching pedagogy. In addition, previous studies have highlighted the crucial role of the alternance mode as an innovative way of combining theory and practice, based essentially on the careful supervision of young people in training establishments and on the job. The results of this study confirm these concerns, highlighting the absence of tutoring and of a clear commitment on the part of each party responsible for the sandwich course, both on the part of the host establishment. Broadly speaking, the results of the study confirm the conclusions of the literature review, bringing out the specific concerns expressed by trainees. These results underline the importance of making significant improvements in pedagogy while basing itself on experiential learning, which is a pedagogical approach that focuses on the acquisition of knowledge and skills through actual, real-life experience in a well-defined, well-prepared context.

Experiential learning, or John Dewey's Learning by Doing {6}, is action-based learning created on learning by doing and experimentation. It enables the learner to take charge of his or her own learning and to appropriate the mechanisms for developing skills in real-life conditions and contexts.





**Fig. 10** Kolb's classic model of Experiential Learning (2014).

Experiential learning describes a continuum of activities that includes classroom exercises that resemble "real life" and involve learning by doing beyond the classroom in a more specific context. For example, experiential learning in the classroom might include simulations, role-playing or debates. Beyond the classroom, experiential learning can include internships, peer learning and so on.

## 6 Conclusion:

This study on work-study training in renewable energy and the development of soft skills highlighted several significant concerns. Trainees revealed their dissatisfaction with soft skills pedagogy, pointing to the need for a contextualized, hands-on approach. In addition, the lack of adequate supervision, on the part of both the host establishment and the host company, marginalized trainees to the role of observers rather than actors taking ownership of their learning. The resources mobilized by the training establishment and host company were judged to be minimal, falling short of the trainees' expectations in terms of developing soft skills and even technical competencies linked to the trade.

The results of this study are of considerable use to decision-makers in vocational training policy. This exploratory study has enabled us to draw up an inventory of the operationalization of work-study training in vocational training in terms of developing soft skills, which will enable us to question communication and coordination practices and the resources mobilized by stakeholders. To overcome these constraints, several measures are proposed: firstly, the appropriate planning and implementation of any dual training scheme by identifying the specific skills needs in the renewable energy field and assessing the soft skills sought by companies in the sector and the possible opportunities for professional integration. Secondly, to set up a training program for supervisors in the techniques of coaching, guidance, and tutoring. Thirdly, to improve the resources made available to stakeholders. In addition, internal and external communication mechanisms need to be strengthened to enhance the effectiveness of work-study programs in developing trainees' skills.

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