

A Work Project, presented as part of the requirements for the Award of a Master's in
International Management from the Nova School of Business and Economics

HOW CAN NUCLIO ENTER THE EXECUTIVE EDUCATION TRAINING SEGMENT?

DEVELOPMENT OF A SUSTAINABLE FINANCIAL PLAN FOR NUCLIO TO DIVERSIFY REVENUE STREAMS AND REDUCE DEPENDENCY ON EUROPEAN FUNDING

MARIANA DOS SANTOS SILVA

Work project carried out under the supervision of:

José Miguel Pita

10/01/2025

Abstract

NUCLIO's mission is to promote structural changes in the educational system, but its heavy reliance on EU funds threatens its financial sustainability. This project proposes transitioning NUCLIO into a hybrid organization by diversifying its revenue streams. The focus is on restructuring its Training Center BU and expanding its course portfolio, introducing executive and international courses to create sustainable income. By implementing these initiatives, the financial potential impact will contribute to reducing dependency on external funding and enhancing the financial self-sufficiency of the Training Center, and consequently of NUCLIO.

Keywords

NGO, Educational Development, Education Community Impact, Certification, Training, Courses, Personal Development, Career Development, Innovative Teaching Methodologies, Mentoring, Digital Innovation, STEM, Professors, Professional Training Market, Revenue's Streams Diversification, European Union Funds, External Financing Dependency, Benchmark, Market Overview, Market Sizing, Marketing Mix, Pricing Strategy, Implementation Plan, Seasonal Optimization, Promotion, Partnerships, Financial Sustainability, Financial Forecasts, Educational Systemic Change, Pedagogic Digital Innovation, High-value training, Cash-flow Projections, Break-even, Scenario Analysis

This work used infrastructure and resources funded by Fundação para a Ciência e a Tecnologia (UID/ECO/00124/2013, UID/ECO/00124/2019 and Social Sciences DataLab, Project 22209), POR Lisboa (LISBOA-01-0145-FEDER-007722 and Social Sciences DataLab, Project 22209) and POR Norte (Social Sciences DataLab, Project 2220

Abbreviations

NUCLIO - Núcleo Interativo de Astronomia e Inovação em Educação

SDG – Sustainable development Goals

CCPFC – Conselho Científico-Pedagógico da Formação Contínua

BU – Business Unit

CFA – Centro de Formação Acreditada

ACD – Ações de Curta Duração

OF – Oficinas de Formação

FQ – Física e Química

CAGR – Compounded Annual Growth Rate

EU – European Union

NGO – Non-Governmental Organization

FTE – Full-time Employee

CFAE – Centro de Formação das Associações de Escolas

PALOP – Países Africanos de Língua Oficial Portuguesa

UCP – Universidade Católica Portuguesa

INA – Instituto Nacional de Administração

ANDAEP – Associação Nacional de Diretores de Agrupamentos e Escolas Públicas

AEEP – Associação de Estabelecimentos de Ensino Particular

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1. Executive Summary

The project conducts an extensive analysis of NUCLIO's current outlook, using it as the starting point for subsequent recommendations, aiming to help NUCLIO fulfill its educational mission while operating in a more financially sustainable way.

The first main objective is to understand how NUCLIO conducts its operations, analyzing its revenue and cost drivers, as well as its strengths and weaknesses. The analysis revealed the critical issue: NUCLIO heavily depends on European Funds, with this funding source accounting for over 95% of its total revenue.

The following stages of the work evaluate different possible paths in solving the main issue. Each has an extensive strategic implementation plan, that aims to balance the financial purpose of its existence while helping NUCLIO to continuously fulfill its main mission. To evaluate whether these initiatives improve NUCLIO's outlook, a comprehensive financial analysis has been conducted, for each product and in aggregate. This approach allows the identification of the most valuable asset to NUCLIO, and the understanding of the market conditions required to reach the proposed goals, which was done through a scenario analysis. In doing so, NUCLIO's pilot "executives" is identified as being the most valuable asset to NUCLIO, due to its capability of generating substantial income, that can support the remaining initiatives in downturns.

These initiatives are expected to reduce the Training Center BU dependence on European funds by 78%. Additionally, in an optimistic scenario where executive courses see great market adhesion and NUCLIO increases its offering, the organization will be able to operate the Training Center BU independently from European funds, even when considering the delivery of a portion of free courses.

2. Context – What is NUCLIO and how does it operate?

2.1 Value Created by NUCLIO

NUCLIO (Núcleo Interativo de Astronomia e Inovação em Educação) is an NGO founded in Portugal in 2001, by the initiative of a group of astronomers who shared a belief in the transformative power of astronomy to leverage societal change.

Over the years, NUCLIO's mission evolved from engaging the public in astronomy dissemination activities to promoting educational innovation close to professors and the general community, particularly through teacher training and the development of new inclusive learning experiences. In 2021, the organization decided to pursue and emphasize its growing commitment to education. Currently, NUCLIO employs a team of scientists and trainers to address systemic issues in education. Through this interdisciplinary approach, NUCLIO's mission combines its scientific foundations with a strong commitment to educational system advancement.

NUCLIO's mission is of great relevance to addressing persevering challenges within the education system in Portugal. Sustainable development has as cornerstone quality education, yet systemic barriers delay its realization in Portugal, perpetuating inequities in access and quality. Despite progress in reducing dropout rates and improving higher education enrolment, socioeconomic disparities remain a significant challenge. According to recent research, students from disadvantaged backgrounds in Portugal consistently perform worse on standardized assessments, with rural and low-income communities facing limited access to qualified teachers and resources (OECD, 2021)

Furthermore, the pre-existing gap in accessibility to quality education was exposed and aggravated during the COVID-19 pandemic, as many rural and low-income students lacked access to technology devices for online learning (PORDATA, 2021), highlighting the urgent need for changes and inclusive education solutions. Moreover, the typical Portuguese classroom

very often relies on traditional pedagogical methods centered on rote memorization, limiting students' ability to develop critical thinking and problem-solving skills essential for modern workforce demand trends (World Economic Forum, 2020).

Portuguese professors face difficulties introducing in the classroom environment STEM methodologies, primary drivers of society development and economic prosperity. Several disciplines hold the critical potential to apply interdisciplinary and STEM literacy, one good example is the discipline of astronomy, however, educational institutions often lack the required teacher training and resources for effective implementation (Bailey et al., 2020).

The four pillars of NUCLIO's mission are:

1. **Empowering Educators:** NUCLIO provides professional development programs, equipping teachers with the skills to adopt innovative and interdisciplinary approaches to teaching.
2. **Enhancing STEM literacy:** The organization prioritizes diversity and accessibility, ensuring that its initiatives reach marginalized and underrepresented communities.
3. **Fostering Digital Transformation in Education:** narrowing the digital divide and ensuring technology serves as an enabler of education development.
4. **Promoting Global Collaboration:** NUCLIO builds networks of educators, researchers, and students to share knowledge and resources on a global scale.

Ultimately, NUCLIO's vision aligns with global education priorities, such as the United Nations SDG 4: Quality Education.

The organization currently employs 9 individuals (2 in part-time), distributed by four functional areas: Communication & Dissemination, Accounting & Financial Management, Outreach, Training, Innovation & Development, and Systems Management & IT, working on a flexible rotational project assignment dynamic. The number of beneficiaries is never constant

and dependent on the activities programmed throughout the year to the professors, students, or general community.

The subsequent chapter will explore NUCLIO's offer for better capacitation of the educational and general community, which will be accomplished by analyzing NUCLIO's existing portfolio of services.

2.2 Current Portfolio of Services & Initiatives

NUCLIO's diverse activities can be categorized into two primary areas: Social Initiatives and Business Units.

Social Initiatives are dedicated to fostering meaningful educational and social impacts, primarily supported through funding obtained via European Union-approved proposals:

- The **Innovation in Education** is an initiative in which NUCLIO develops, coordinates, and participates as a partner in several national and international education projects across diverse areas of intervention. Some current projects are DEMO (Design your Own Multimedia learning Environment is an initiative for STEM teachers) and EXPLORE (an initiative designed to engage students in space exploration experiences aligned with STEM curriculum requirements).
- The **Scientific Dissemination is NUCLIO's mission** to be involved in science communication, particularly in Astronomy and Astrophysics. The organization conducts workshops, lectures for the public, science cafés, and solar and night sky observation sessions. It promotes scientific research in classrooms, engaging students in asteroid discovery, exoplanet searching, and combating light pollution, among other topics. Since its inception, NUCLIO has maintained the Astronomer's Portal, a science communication website that provides quality information in Portuguese.

- In the **Astronomy for Development** initiative NUCLIO coordinates the Portuguese Language Office of Astronomy for Development (PLoad), an initiative of the International Astronomical Union (IAU). This initiative brings together partners from Portuguese-speaking countries with the goal of using Astronomy as a vehicle to promote development.
- The **International Programs** initiative established partnerships with foreign educational institutions and collaborative teaching projects for educators worldwide, integrating interdisciplinary experiences such as international schools and global astronomy conferences. NUCLIO participates as a partner in three main types of offerings: conferences, summer schools, and assemblies (see Appendix 1). The major projects are: **GTTP** (NUCLIO actively participates, helping to develop training strategies to enhance teaching skills. Through a network of Galileo Ambassadors and Teachers, GTTP provides resources and support, promoting innovative astronomy teaching worldwide), **Astronomy education adventure in the Canary Islands** (annual summer event where the program aims to equip teachers to engage students in science through astronomy, with hands-on research), and **COSPAR** (International Scientific Assembly, offers educators tools to inspire students' interest in science and technology).

Conversely, **Business Units**, while yet also benefiting from EU financial support, have revenue-generating potential:

- NUCLIO's **Training Centre BU** is currently an accredited training centre entity recognized by the CCPFC, offering accredited training to regular professors in areas such as STEM.
- **Change Makers** is a collaborative initiative with InovLabs that fosters creativity and innovation in schools and the community. It provides students, teachers, and citizens with workshops, training, and the opportunity to develop projects using advanced technologies, such as 3D printers, laser cutters, CNC machines, and web studios, all

with the support of professionals from various scientific and educational fields. It seeks to empower individuals across all age groups, promoting skills for better employment and advancing education. Schools can reserve space for classes, and workshops are open to the community.

2.3 Impact Diagnostic

NUCLIO's impact was assessed using the **Logic Model**, a framework that maps relationships between resources, activities, outputs, outcomes, and long-term impacts. This method, as defined by the W.K. Kellogg Foundation (2004), provides a systematic and visual representation of how an organization mobilizes resources to achieve meaningful change.

To further refine this assessment, the traditional Logic Model was customized by incorporating the internal process dimension inspired by Kaplan and Norton's Balanced Scorecard (1992). This addition offers a holistic view of NUCLIO's operations, emphasizing how internal processes ensure the delivery of quality outcomes aligned with its mission, as represented in figure 1.

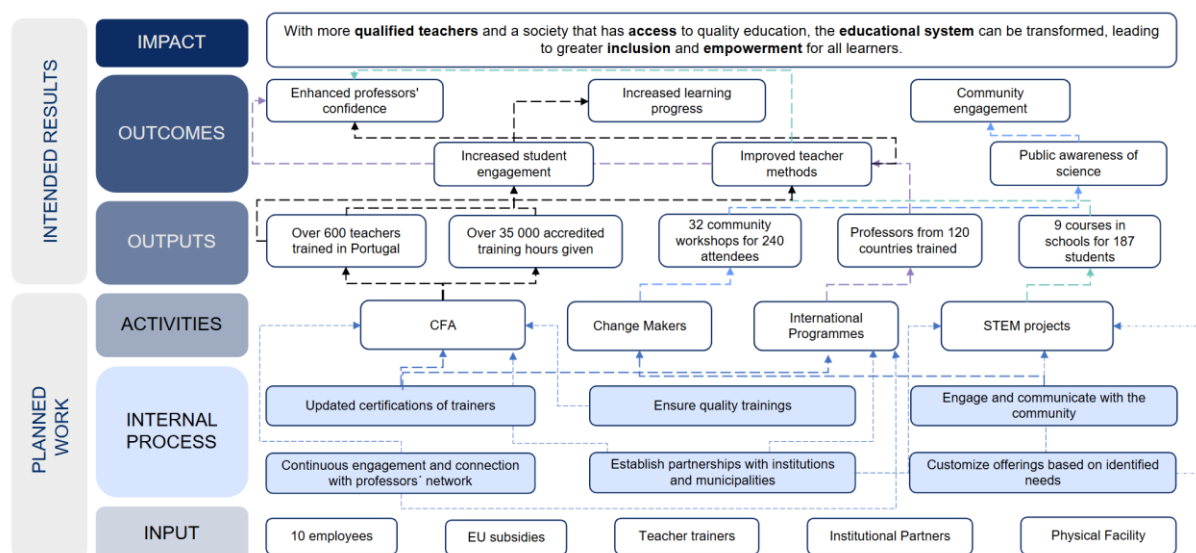


Figure 1 - Impact Diagnosis

Following a bottom-up analysis approach, the framework highlights the dependency on European Funds to maintain the base operational inputs such as the regular employees, external

trainers, and physical facility monthly rent payments. Furthermore, the organizational impact, from the aggregate activities developed, is the direct qualifications development of 600 teachers and the increase of STEM methodologies awareness close to 427 students and the general community in the last 6 years.

2.4 Financial Overview

To have a good understanding of NUCLIO's current financial situation, a thorough financial analysis was conducted. This allowed understanding of NUCLIO's strengths and weaknesses, which enabled selecting the areas in which the focus would be devoted. To conduct this analysis the financial statements, provided by the partner, were analysed. The first approach was to breakdown both NUCLIO's revenue and cost structure. Data regarding revenues and costs from the "Relatório e Contas" past 6 years was used, to understand the sources of revenues and costs, as NUCLIO tries to create the most impact in society.

This time range was chosen, as not only it allows to work with more complete data, but also it allows understanding of the organization's financial trends before, during and after the COVID-19 pandemic, enabling a more complete overview of NUCLIO's financials.

Revenues

Currently, NUCLIO gets its revenues from three distinct sources: European Funds, to subsidize the projects (95%); Donations, that derive from the NUCLIO Trust (1%); Other, in which NUCLIO includes Associates Membership Fees and sporadic revenues it is able to generate. (4%).

At first glance, the main conclusion is NUCLIO's heavy dependence on funds coming from the EU. In fact, throughout the years, these funds have always accounted for at least 90% of NUCLIO's entire revenue stream and have been the main driving force behind the organization's 10.65% CAGR since 2018, from 445 205€ to 699 453€. Another stand out point is that in 2023 NUCLIO was able to return to the revenue seen in the pre pandemic years,

showing resilience and adaptability to the circumstances, and the capability to reinvent and bounce back from less thriving years.

However, there are two downsides worth noticing. Securing European funds is a very time consuming and lengthy process, from which follows that NUCLIO, having to allocate resources to these proposals, is then left without valuable human capital than could be utilised to generate further impact and fulfil their mission. This issue becomes more relevant considering their slim workforce. Also, as the process of coming up with ideas for projects, writing proposals, having them approved and finally receiving the money is quite long, sometimes NUCLIO ends up not being able to implement the projects, which harms both their mission and their financial sustainability.

The second major issue in depending on the EU so much is that it harms the financial sustainability. In fact, NUCLIO, has seen increases in its cost structure (to be analysed in next section), mainly due to growing the workforce. This increase in costs is currently being supported solely by these funds, which also make feasible NUCLIO's other initiatives. This way, in the extreme scenario in which NUCLIO is not able to secure them, it would not be able to conduct their operations. This potential issue emphasizes the importance of the project, whose goal is to propose NUCLIO with different revenue streams, consolidating the financial sustainability.

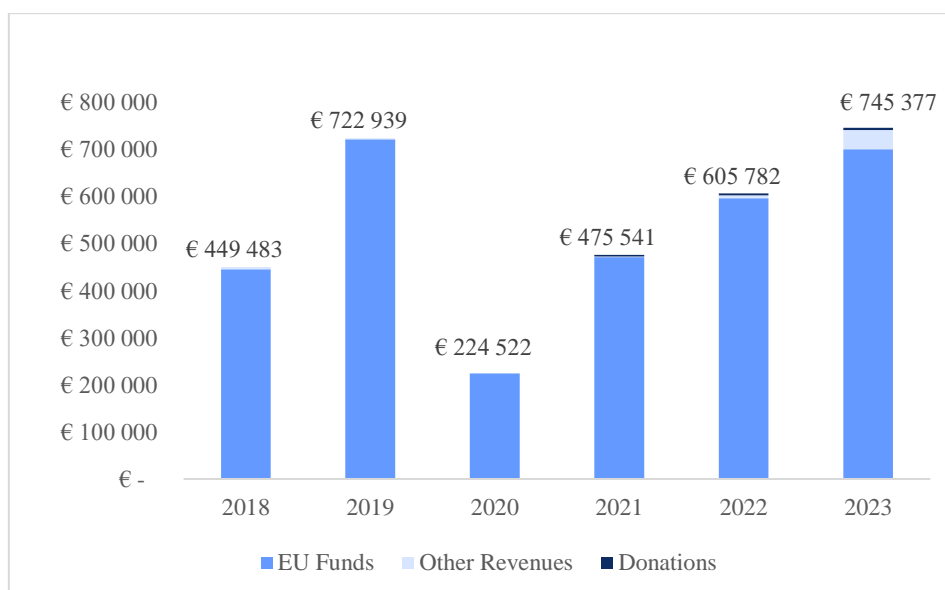


Figure 2- Revenue Distribution (2018-2023)

Costs

Costs can be broken down into four main categories: Personnel Costs, Subsidies (to partners in EU funded projects); Travel, Food and Stay; Other Costs, such as costs related to Materials and Maintenance. As a whole, costs increased from 442 372€ in 2018 to 710 126€ in 2023, at a 9.93% CAGR.

Delving deep into NUCLIO's expenses with its collaborators, the first conclusion is that NUCLIO nearly doubled costs in this caption, from 204 374€ in 2018 to 383 124€ in 2023, at CAGR of 13.4%, justified by the number of full-time employees (FTE) of NUCLIO having increased from 7 in 2018 to 10 in 2023.

It is important to notice that these costs are independent of NUCLIO's projects. This way, even if NUCLIO stops being able of asking for funds, personnel costs still exist, yielding another reason to pursue different sources of revenue.

Subsidies, on the other hand, are composed of the payments NUCLIO must make to its partners, whether they are in the EU funded projects, or the teachers that work with them in the training programs. This caption is correlated with the ability to fund projects, that is, if there

are no projects, there will be less partners to pay. 2023 was the year in which NUCLIO paid more subsidies to partners (202 050€), which can serve as an indicator of its efforts to continuing to implement new projects and fulfilling their mission.

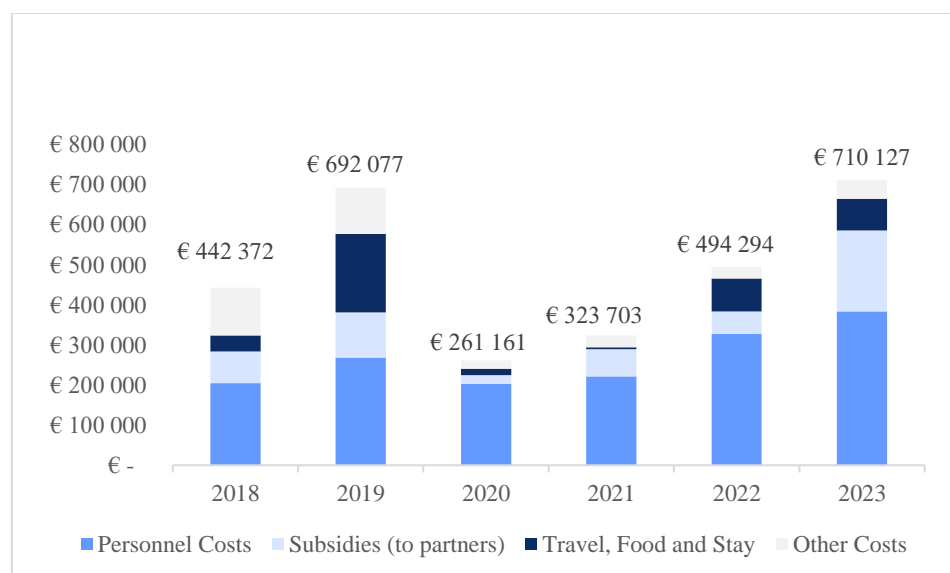


Figure 3 - Cost Breakdown (2018 - 2023)

Net Income Analysis

Having analysed both the revenue and cost structure, it is important to combine them to provide valuable insights to continue the financial overview of the organization. One standout aspect is that, due to being an ONG, NUCLIO does not pay the corporate tax rate. Also, it does not have any outstanding loan or interest-bearing means of debt.

Looking deeper into the result (figure 4), NUCLIO has positive periods, supported by European Funds. The major outlier is 2020, understandable due to the pandemic's impact with few fundable projects. This exemplifies the behaviour of results should NUCLIO not be able to secure funds.

In general, NUCLIO has improved its performance, growing from 5 0123€ in 2018 to 24 638€ in 2023, at a CAGR of 37.5%. This shows the resilience in recovering from years of uncertainty and the capability of reinventing and keep innovating to secure new projects.

Notwithstanding, later years saw decreases in Net Income, from 141 969€ in 2021 to 24 639€. This trend is justified by the fact that, in this period, costs have largely outgrown revenues, by nearly two times (48.11% vs 25.20%). This way, the decrease is not due to decreasing revenues, but simply to a much larger increase in costs. Looking into NUCLIO’s “Relatório e Contas”, an explanation is found. In fact, NUCLIO realizes both revenues and costs at the time they receive the funds. Therefore, the Net Income will be somewhat a volatile measure, since it is expected that it will be quite large in years where NUCLIO secures funding, but does not implement the projects, and, on the contrary, it will be quite low in years in which NUCLIO implements the projects with funds previously secured.

With this in mind, our goal of exploring alternative revenue sources becomes even more relevant, to ensure NUCLIO can stabilize its returns.

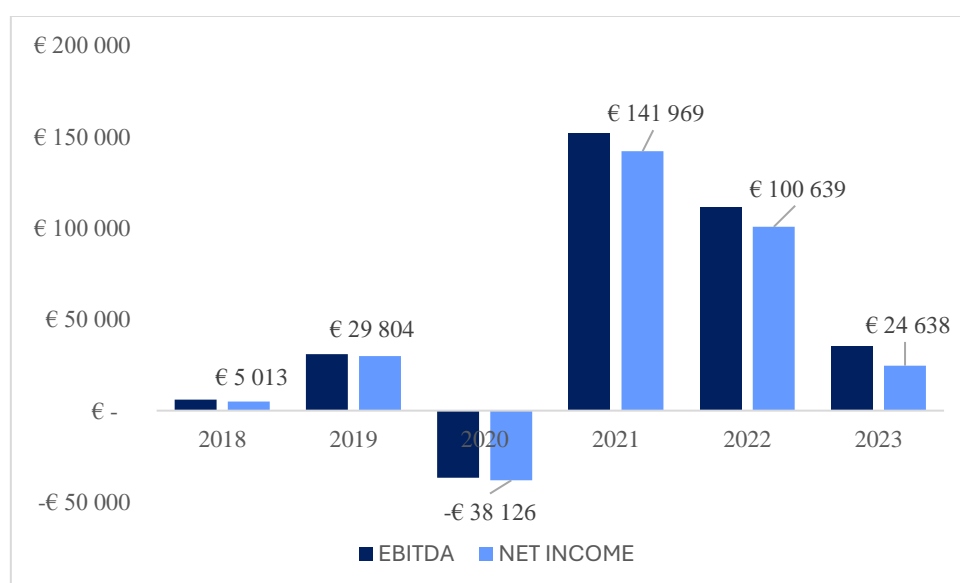


Figure 4- Net Income (2018 - 2023)

Liquidity

Simply put, “liquidity means the company’s ability to pay its obligations as they come” in the short term (Oleva Savchuck, 2014). It is therefore fundamental to evaluate NUCLIO’s liquidity to provide a complete financial overview.

First, an understanding of what current assets and liabilities are is needed. Current assets “are assets that a company intends to convert into cash within one fiscal year”. These are considered the most liquid assets, meaning that the company can more easily convert them into cash. On the contrary, current liabilities are debts that the company has to settle within one year.

Having this in mind, some common liquidity ratios were analyzed and compared against some benchmark numbers. The ratios are as follows: Current Ratio and Cash Ratio. The current ratio is the ratio between all current assets and all current liabilities. The rule of thumb is that, if the ratio is above 1, then the company is liquid, but the contrary shows negative signs. The cash ratio measures the ability of NUCLIO to pay off its liabilities using only its cash position.

According to the Corporate Finance Institute, although there is not a singular measure, 0.5 is seen as the general benchmark. It is worth noticing that the ratio heavily depends on the industry a company operates, so these are mere benchmarks to follow. One note is that, although it is common to also assess the Quick Ratio $((\text{Current Assets} - \text{Inventories}) / \text{Current Liabilities})$, as NUCLIO does not have a significant amount of inventories we understood that assessing this ratio would not provide any added value to the analysis.

NUCLIO’s liquidity ratios show that, although depending on the EU, it can easily meet the liabilities. The current ratio has been well above the recommended threshold (figure 5), while the cash position has historically been very strong (see Appendix 2). Both the main assets and liabilities are the funds NUCLIO is yet to receive or pay. However, as the projects are implemented only when the money is received, there is no danger from having high deferrals.

When ignoring these asset classes, NUCLIO is left without substantial liabilities, which, backed by solid cash reserves, lead to a comfortable liquidity position. Notwithstanding, as personnel costs grow, the need to emancipate from European funds grows, so as not to drain the cash position.

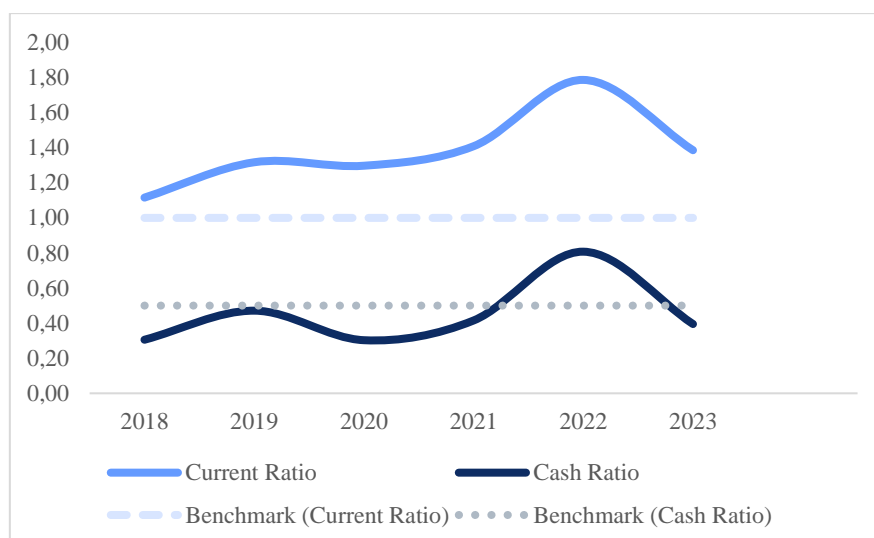


Figure 5- Liquidity Assessment

2.5 Problem and Scope Definition

NUCLIO's primary challenge is its heavy reliance on European Union subsidies as its sole funding source, which classifies it as financially unsustainable due to the absence of internally generated revenue or diversified funding streams. This classification is grounded in the principle that a sustainable NGO must have diversified income streams to mitigate risks associated with external funding dependencies, ensuring both the continuity of social initiatives and the availability of structural resources necessary for long-term operations (Mikeladze, 2021). To address this challenge, the thesis research question will be: **What sustainable financial strategies can NUCLIO implement to diversify its revenue streams, and reduce dependency on European Union funding?**

To address this issue, NGOs increasingly turn to service sales as a viable solution to funding challenges, enabling these organizations to stabilize their finances and maintain autonomy, allowing for long term strategic planning (Salamon, 1997). However, transitioning to a revenue-driven model introduces risks and challenges, including the potential for "mission drift," where revenue-generation goals could overshadow the NGO's social objectives (Eikenberry & Kluver, 2004; Dees & Anderson, 2003) and often internal tensions may arise, as

stakeholders and staff might perceive revenue-oriented activities as conflicting with the NGO's mission (Young, 2006).

One potential solution lies in adopting hybrid organizational models, which blend commercial stream diversification and social objectives. These models would allow to separate profit-driven activities from their mission-oriented operations, reducing the risk of mission drift while maintaining financial sustainability (Battilana et al., 2012).

Building on the hybrid organizational model concept, this thesis will formalize the selection and establishment of a specific business unit (BU) within NUCLIO, targeting services with high potential for both social and financial impact. Given NUCLIO's lack of prior experience in service monetization, this initiative will focus on designing and implementing the organization's first structured revenue-generating strategy. Keeping this primary objective in focus, the list below outlines the potential business units to intervention:

1. Training Center BU
2. Change Makers BU
3. Education Consulting (new BU under consideration, proposed by NUCLIO)

Acknowledging the importance of focusing the efforts for maximum impact, the decision was made to strategically prioritize which business unit to intervene in. To do this, a specific criterion was developed to guide the selection, focusing on identifying the BU intervention that would deliver the greatest overall benefits for NUCLIO. As NUCLIO is a social enterprise, two main criteria were established to provide a structured approach to guide the selection process: Social Impact and Financial Impact.

1. **Social Impact:** Given the broad and complex nature of this criterion, Social Impact was defined in terms of the number of individuals (teachers and students) that NUCLIO

could reach through the proposed initiatives. Both short-term and long-term effects were considered, along with the feasibility of scaling the impact over time.

2. **Financial Impact:** Recognizing the importance of financial sustainability, this criterion addressed NUCLIO's primary challenge—ensuring its ability to generate sufficient revenue. Although NUCLIO's main objective is not profit generation, the organization must prioritize initiatives that contribute to its financial viability. This, in turn, enables the funding of additional projects with a greater focus on Social Impact, rather than solely on Financial Impact.

Below is the rationale for their placement, in figure 6:

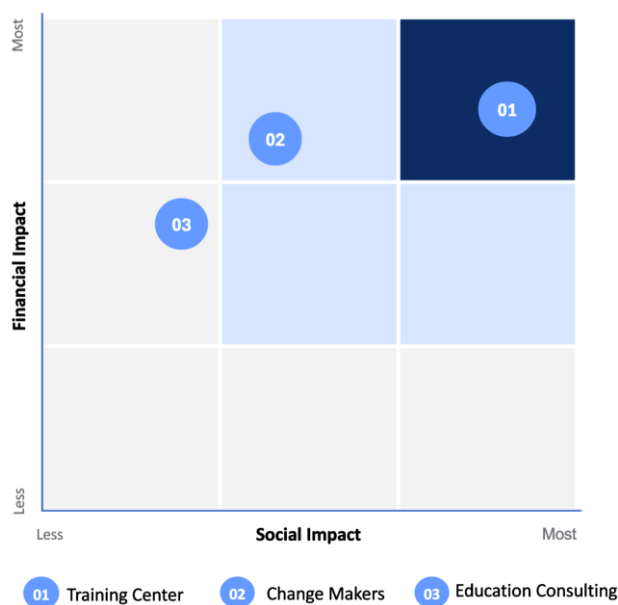


Figure 6 - Impact Matrix

The **Training Center** was identified as the initiative with the highest combined social and financial impact. Its social reach is unparalleled, as it trains teachers who, in turn, impact numerous students, creating a cascading effect. This impact is sustained year-round, and online courses further enhance scalability by making the program accessible to remote areas. Financially, CFA has significant monetization potential within the training center BU. While

currently EU-funded, the program could transition to a self-sustaining model by introducing paid training options in CFA or by diversifying its offer beyond. This would allow NUCLIO to reinvest resources into other initiatives, maximizing both its financial returns and broader social objectives.

The **Change Makers** initiative delivers significant local social impact by equipping individuals across various age groups with skills for employability and education. However, its reliance on a physical facility in Cascais limits scalability and restricts awareness to the local community. The program's in-person engagement model is effective for fostering connections but makes broader expansion challenging. Financially, the initiative depends on European Social Fund co-funding, with limited revenue from workshop bookings, which are insufficient to cover operational costs. Consequently, while impactful, the program struggles with financial sustainability.

The **Education Consulting** initiative proposes a systemic approach, partnering with schools and universities to transform educational practices. While it holds promise for meaningful long-term impact, it is still at a conceptual stage and would require extensive human resources to implement. Its financial viability is equally uncertain, as establishing a client base and achieving profitability would demand significant upfront investment. This places it in the lower-left quadrant, reflecting moderate social impact and limited financial sustainability in a medium-term.

The evaluation highlights the Training Centre as the most strategic initiative for NUCLIO, offering both substantial social impact and the potential for financial self-sufficiency. That way, it is important to understand what is involved behind the Training Centre operations and current offer to provide accurate recommendations for possible service monetization and diversification. For that, we explore this business unit more deeply in the next chapter.

3. Diagnosis – How is the training centre currently characterized?

An analysis was conducted to understand the current structure, processes, and overall environment behind the “CFA” business unit. This analysis covered the definition of the current value proposition of this service, together with an analysis of current capabilities, financials, market segmentation followed, and, ultimately, an analysis of external communication and brand perception.

3.1 Current Value Proposition

The current value proposition was analyzed by addressing common factors that are considered in this regard, namely the benefit the product/service provides, for whom it aims to provide this benefit, how this it is being delivered, who is the target buyer, what is the problem the product/service aims to solve and what distinguishes it from competitors.

This business unit’s **benefit** is the ability to teach and impact the world through their capacitation in key areas. NUCLIO’s courses can be divided into two main segments, being those subject skills, where science-specific topics are grouped, such as “Building science materials”, “Sustainability” or “Best practices in science teaching”, and teaching skills, covering general topics that can be applied to all disciplines taught, including “Digital transition”, “Sonification of learning”, and “Innovative and inclusive teaching methods”. NUCLIO’s approach emphasizes both subject-specific knowledge and pedagogical methodologies, with the current offer being focused on the combination of those 2 aspects simultaneously.

Regarding **whom** that benefit will impact, the analysis identified five main stakeholders. The improvement in teachers' skills naturally benefits the teachers, as they can better perform their lessons. However, this improvement of skills holds as stakeholders a diverse range of entities. Students are directly impacted by those changes in teaching processes. As per rankings, recognition, and others, schools also benefit from the improvement. In Portugal, schools do not

have a lot of autonomy, and, with the money coming namely from municipalities, those are also considered stakeholders. The government is impacted by both the educational system and the capabilities of students (future workers).

Regarding **how** that benefit is delivered, an analysis of NUCLIO's offering was performed.

	“Ação de curta duração”	Courses	“Oficina de formação”
Duration Requirement	3 to 6 hours	12 to 25 hours >12h	50 hours 12h – 50h
Method	Lesson/workshop	Lessons/Workshops	Lesson & classroom intervention
Format Requirement	E-Learning or face-to-face	E-Learning or face-to-face Face-to-Face, E-Learning or B-Learning	B-Learning or face-to-face >1/3 Face-to-Face
Number of participants Recommendation /Requirement	23	23 <30 Recommendation	21* 5 - 20 Requirement

Figure 7 - Product Mix and Characteristics

NUCLIO's offer, following current legislative guidance, is composed of 3 different categories of training courses, being those “Ações de curta duração” (ACD), “courses”, or “Oficinas de formação” (OF). Each of these categories encompasses different durations, methods, formats, and numbers of participants, with some having legislative requirements and limitations.

The analysis of the table shows that, by having different durations ranging from 3 to 50 hours, costs will naturally follow this increase as trainers' cost per hour is the main driver of costs. Thus, "OF" might be more expensive for the NGO. Regarding format, if the choice is to go for an online setting, either to reduce dislocation costs or increase demand, "ACD" or "courses" are preferable, allowing a 100% online teaching format. "ACD" does not have a maximum number of participants established and, together with "courses", share the highest average number of clients per session in the last 4 years.

Regarding the current **target buyer** of the NGO's offering, both professors and municipalities were identified based on previous sales. Professors are the main target of the training courses, justifying their importance as target buyers. Currently, the persona for this service consists of a professor located in Lisbon (because of the presence of face-to-face lessons) and, based on the current environment surrounding the educational system in Portugal, a middle-aged to older person.

However, there is also another segment purchasing those services – municipalities. Municipalities have access to school associations' training centers, but due to the lack of a certain offer, they might outsource those services to an external training center, such as NUCLIO. That is what happened with "Câmara Municipal de Cascais", curiously, not purchasing this service for teachers in the municipality, but rather for school workers, due to them being the municipalities employees.

The **problem** that the CFA aims to solve is that, in Portugal, for a professor to move up in his/her career, among other things, two need to happen: Evaluation - Professors are evaluated regarding their teaching ability. To move up, there is the need to obtain a minimum of "Good" in the evaluation criteria (Lei do Estatuto da Carreira Docente, 2012). The usage of the skills taught in NUCLIO's training might indirectly help in this segment, and, in some cases, the certification given directly helps; Training – More directly, professors need to obtain a

minimum duration of teaching modules during their presence in each career level. Those career levels range from 1st to 10th with a mandatory 25 hours of training modules in the 5th level and, for the rest, 50 hours (Lei do Estatuto da Carreira Docente, 2012). It is important to note that at least half of the hours spent in training need to be related to the discipline the professor teaches and not to pedagogical/general topics.

NUCLIO distinguishes itself from other training centers through its focus on astronomy, being one of the most important centers in this subject, as well as the importance given to the psychology of education, diversity, and innovation in the teaching system. The main advantage comes not from having those topics separately but by integrating them and offering sessions that emphasize the usage of those “soft skills” in the teaching of science or astronomy, the “hard skill”.

So, CFA is highly dependent on the accredited courses which professors are required to take, with the center being accredited, trainers being accredited and even training modules being accredited. However, how is this accreditation process conducted? The following chapter delves into the details of how this accreditation process is conducted.

Accreditation process

The accreditation process ensures that the center, its trainers, and the training courses meet rigorous standards set by the Conselho Científico-Pedagógico da Formação Contínua (CCPFC) - an entity capacitated by the Ministry of Education to ensure quality in this matter (Regime Jurídico da Formação continua de Professores, 2014). With this market being intensely legislated, accreditation is necessary to operate and provide accredited training courses that tackle the professor’s training module requirement.

Accreditation for trainers is a lifelong credential, enabling them to maintain their certified status as educators and trainers indefinitely. This allows NUCLIO to retain an

experienced pool of trainers who bring continuity and depth to the training programs. In Portugal, there are 41 174 trainers (CCPFC, 2024) accredited by the CCPFC.

For the CFA itself, accreditation is granted for a limited period of three years. Every three years, NUCLIO's programs, methodologies, and operational procedures undergo a thorough review to verify adherence to CCPFC standards. This re-accreditation process ensures that NUCLIO maintains its educational practices, and includes a comprehensive assessment of the CFA's curriculum, qualifications, and organizational effectiveness.

Moreover, accreditation provides NUCLIO with a competitive advantage, distinguishing it from non-accredited centers, and allowing it to compete in the specific market for accredited teacher training. There are 318 accredited centers, but this number includes universities and other non-relevant centers for this project. Ninety of those accredited centers are from school associations, providing free training courses for professors.

The programs also share the necessity of being accredited to be recognized as an official course for career progression purposes. This accreditation also lasts for 3 years and, currently, there are 11 145 accredited courses in Portugal.

This information is summarized in the following graph (figure 8):

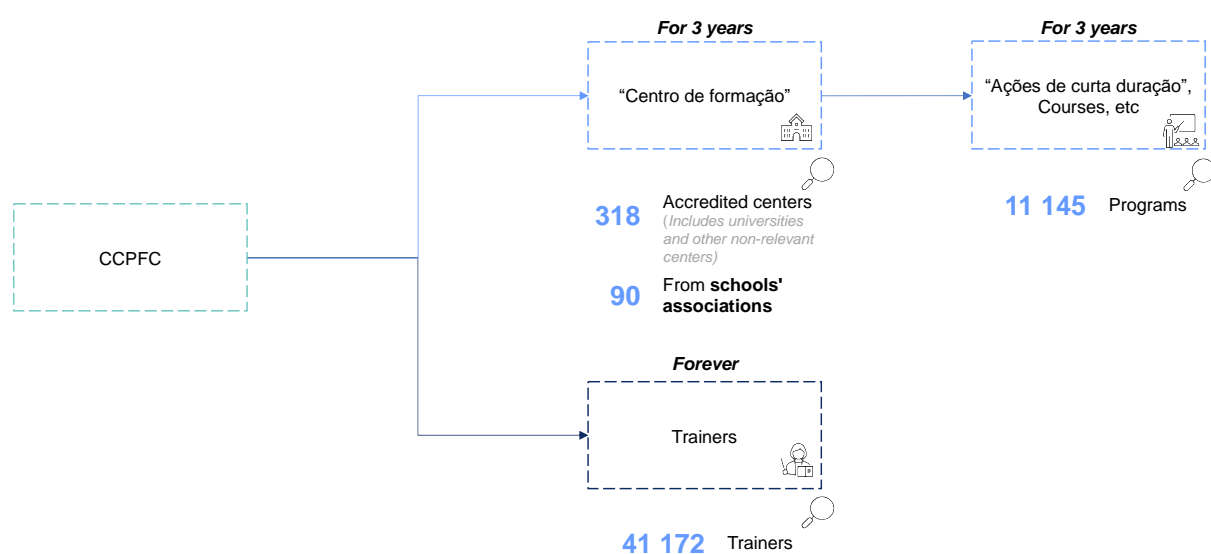


Figure 8 - Accreditation Process and Values

How has this been materialized at NUCLIO?

NUCLIO's resources and capabilities, in this regard, are characterized by the number of trainers that can be used to provide the service, and which service those trainers are capable of providing, meaning which subjects are they qualified to teach through training services. NUCLIO has eight in-house trainers and five possible "outsourced" ones. Those five compose a network of trainers that NUCLIO possesses who do not continuously provide their service, rather, they provide it only occasionally, depending on the course's subject.

The trainers' capabilities regarding which areas they are accredited to provide training were registered, providing us with the following information (Figure 9):

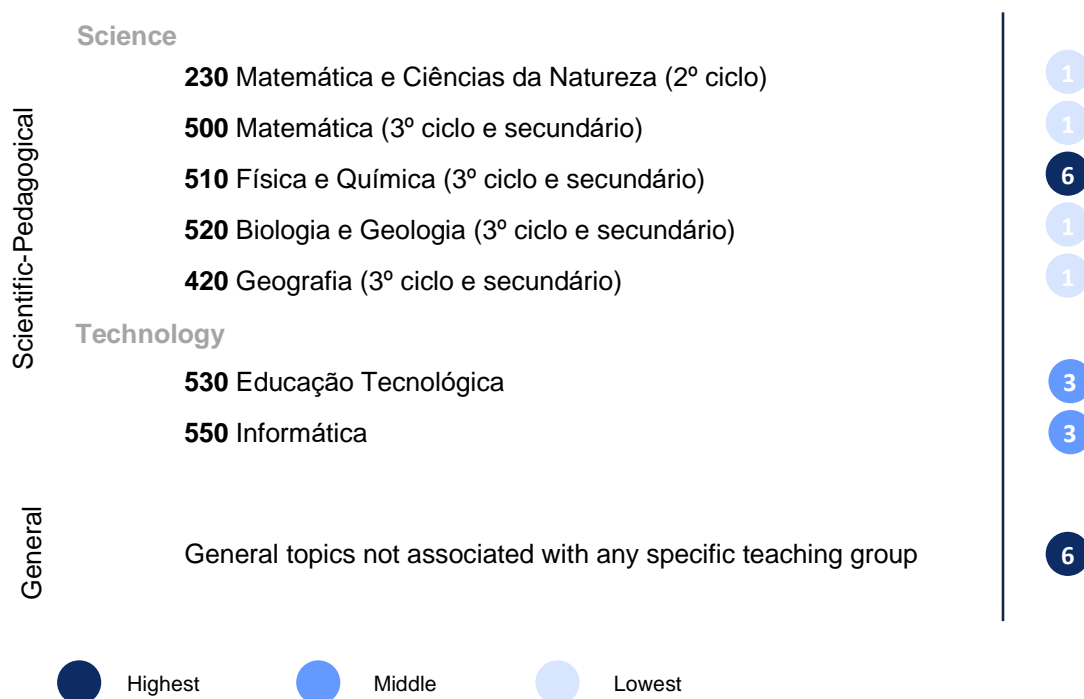


Figure 9 - NUCLIO's trainers' capabilities

Training capabilities, because of legislation that separates subject-specific teaching from general educational teaching, are analyzed between a "scientific-pedagogical" group and a "general" group.

There is a clear indication of the prioritization of areas inside NUCLIO. There are six capable trainers to provide training related to “Física e Química (3.º Ciclo e Secundário)”, 3 in “Educação Tecnológica” and 3 in “Informática”, with 6 being able to provide training in general educational related topics. The distribution of professors reflects a targeted approach, with resources allocated based on the strategic importance for NUCLIO. This allocation supports NUCLIO’s mission to enhance science and technology education (and, sometimes, not necessarily separated) while also addressing cross-disciplinary teaching skills, providing an offer for the demand of both subject-specific and general teaching modules.

Service output

NUCLIO’s trainers currently have 15 488 disposable working hours in a year (assuming 8 hours a day, 22 days per month and 11 working months) which are allocated between administrative work (50%), CFA (15%), and other projects (35%). Based on that, there are 2322 hours allocated to CFA, which include both preparation and teaching hours.

An analysis was conducted to understand the outputs of NUCLIO’s activity. To understand outputs, we looked at the courses offered. Historically, there have been 31 certified courses, the majority being “Oficinas de Formação” (48%) and, due to this preferred format, in a face-to-face setting. More than 70% of those courses were held within a maximum of 15km from NUCLIO headquarters, due to both a higher demand locally (more brand awareness) and lower costs (less dislocation costs).

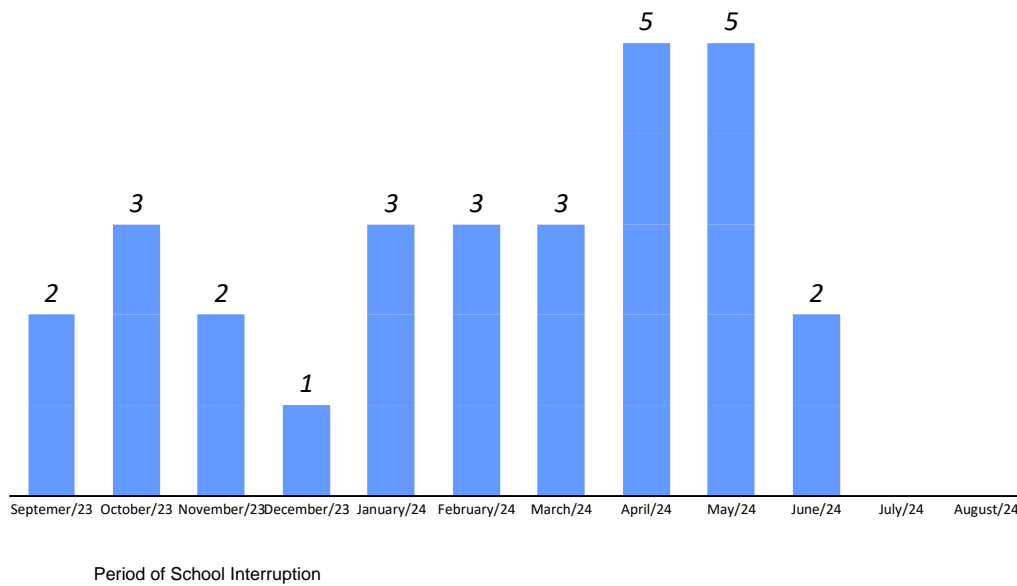


Figure 10 - Courses seasonal distribution

Regarding the distribution of courses throughout the year, the ongoing courses align with the class periods in the annual academic calendar. Periods with few or no courses registered correspond to school breaks, creating a certain seasonality effect.

3.2 Financial Analysis

To thoroughly evaluate how NUCLIO's current BU can be restructured to help achieve the desired financial sustainability, an assessment of each unit as an independent business was conducted.

To achieve the goal, and similarly to what was done with the whole overview of NUCLIO, a financial statement analysis was done, to understand both the revenue and cost structure, and to understand whether it is currently profitable, and, also, its potential as a sustainable revenue source.

As NUCLIO does not currently possess statements of just this BU, a questionnaire was done, which then was asked to be filled out by NUCLIO's employees, which yielded the desired data to be able to work on. The questionnaire consisted of trying to obtain information of the following nature: **(1)** Topic of training; **(2)** Format of the training (On-Line, B-Learning,

Presential); **(3)** Nr of hours preparing the sessions; **(4)** Nr of hours of lecturing; **(5)** Nr of hours of individual support; **(6)** Cost per hour per trainer; **(7)** Cost of traveling and stay

The first result, and the most obvious, is that the CFA is not financially sustainable. This happens because NUCLIO does not monetize these training courses, and funds them through EU subsidies. From this, it can follow that there is potential to make this BU sustainable by starting to monetize the courses, if there is a willingness to pay. Therefore, the belief that can become CFA a sustainable, not necessarily profitable BU, exists.

Regarding its cost structure, the first thing that can be pointed out is that, over the past few years, NUCLIO has spent 70 289 € (see Appendix 3), which, compared to the 1990397.82€ raised over the homologous period, is not a huge share. The amount spent across the years was largest in the year COVID hit (26 448€), since due to the training being online, NUCLIO gave more training hours, thus having higher costs. Also, in the past three years, there has been a tendency to increase costs, as more courses and training hours have been given. In the past year, NUCLIO spent 23 813 € with the CFA.

Of the total amount spent, the highest share is, as expected, with the trainers' compensation, which makes up 95% of the total amount spent over the years. From this follows the difficulty to reduce the cost structure since if more courses are given, costs will increase, as more hours will be needed by the professors. Also, reducing the current wages is not a viable solution, as in Portugal there has been a lot of revindication by the professors due to the salaries. NUCLIO should aim to provide the best conditions it can, to convince better talent, which may attract more clients to the courses.

One interesting point of this cost structure is that there aren't many fixed costs, mainly those with rent. This means that, on the one hand, NUCLIO does not have tied-up resources that will be consumed even in the case of no formations, such as rents. On the other hand,

increasing the scale of programs will increase the cost structure in the same proportion, as personnel costs constitute the vast majority of total costs.

Another interesting metric to study is how much does it cost, on average, NUCLIO to give certified training to a professor. Here, despite having that the average trend has been increasing in the last 3 years, it is important to notice that different types of courses will be of different value to NUCLIO. Courses that require a higher trainer to teacher ratio will be most expensive to conduct, while those in which NUCLIO can more easily scale may prove to be more valuable.

All in all, CFA is a BU in which NUCLIO can set to achieve financial sustainability, by seeking to fund its operations through monetizing courses. To do this, professors must be willing to pay for these courses, a topic which will be attended to in the further stages of the work.

3.3 Market Segmentation

NUCLIO's market segmentation for the "Centro de Formação" is based on three primary dimensions: demographic, geographic, and behavioral. This approach allows NUCLIO to develop and deliver training programs that align closely with the needs of distinct educator segments, enhancing program relevance and participant engagement.

Demographic

Scientific Field: NUCLIO categorizes its participants based on their scientific discipline, targeting teachers within fields such as physics, chemistry, and mathematics. This subject-based segmentation allows NUCLIO to provide highly relevant content tailored to the specific pedagogical and content challenges faced by teachers in these disciplines and develop subject-specific training according to the legislation.

Teaching Level: NUCLIO differentiates its offerings based on the educational level at which participants teach. This level-based segmentation is essential, as it enables NUCLIO to design courses that are appropriate and relevant to the cognitive needs of different age groups.

Applying these two, we get, for example, that a physics professor teaching at the secondary level might require more advanced training in experimental techniques, whereas primary school teachers may need resources for introducing fundamental concepts.

Geographic

Location: NUCLIO's segmentation strategy also considers geographic factors. This serves to understand in which format the course should be developed, with e-learning being the option for courses with the furthest professors enrolled and b-learning and face-to-face being the options for local clients.

Segmentation regarding municipalities, when selling services directly to them, is currently only constituted of its location. This distinction happens for two main reasons: An extremely low number of sales to municipalities (one); and dislocation costs playing a major role in the matter of the location of customers.

Behavioral

NUCLIO further segments its market based on behavioral factors, specifically the history of participants in previous courses. For educators who have previously attended NUCLIO's programs, the organization employs a targeted communication strategy. This approach fosters a sense of community among returning participants, encouraging sustained engagement and loyalty.

Conclusion

By tailoring its offerings across demographic, geographic, and behavioral dimensions, the organization ensures its training programs are both impactful and inclusive. This approach

not only enhances the learning experience for educators but also supports NUCLIO's broader goals of promoting innovation, equity, and excellence in education.

3.4 Communication & Branding

Communication

The promotion of NUCLIO's accredited teacher training programs involves a multifaceted approach. When these training sessions are integrated into specific projects, project coordinators establish direct contact with schools and teachers to foster participation. In cases where open recruitment is needed, social media campaigns and newsletter invitations are utilized to attract potential participants. All available training opportunities are also listed on the NUCLIO website and featured in a detailed catalogue, distributed in print at events and available online.

Additionally, word-of-mouth plays a vital role, since teachers who participate in workshops or training often share their experiences with colleagues, fostering organic awareness. Monitoring and feedback are gathered post-promotion through registration numbers and surveys, helping NUCLIO refine its offerings and better understand teacher interests and needs.

Despite the organization having a dedicated page on its website for teacher training programs, that includes detailed explanations about the training content, target audience, and methodological information, social media platforms such as Instagram and Facebook, lack clear access points or easily understandable summaries of these offerings. For instance, there are no dedicated highlights on Instagram that summarize the training opportunities, requiring users to spend time exploring the account to find relevant information about the programs. This can create barriers for potential participants seeking easy access to training details.

Branding

NUCLIO's brand reflects its years of experience and solid reputation, particularly internationally, where it is known for innovative contributions through numerous partnerships and projects in science education. However, its recognition in Portugal is still developing.

While NUCLIO has formed strong partnerships with certain Portuguese schools and teachers, it aims to strengthen connections with other local organizations, government bodies, and the Ministry of Education. One reason for this could be the organization's roots in astronomy and space sciences, which initially defined its mission in Portugal. Over time, NUCLIO expanded its scope to include broader scientific education and innovation, but this shift is still gaining traction locally. NUCLIO has seen increased visibility in the Lisbon and central Portugal regions, working to establish collaborations with the local governments of Cascais and Oeiras. Yet its recognition within Portugal remains limited.

NUCLIO's long-term goal is to be known not only as an accredited provider of teacher training but also as an institution dedicated to inclusive and innovative education. By training teachers and engaging in educational projects, they aim to empower students to become informed and engaged citizens. Improving its digital presence, particularly the website, could help clarify NUCLIO's mission for new audiences. The site's focus on astronomy may give the impression of a narrow specialization, whereas emphasizing its broader work in science education and innovation could make its full range of initiatives clearer, supporting its goal of reaching a wider audience and strengthening its national reputation.

3.5 SWOT Analysis and Strategic Insights

3.5.1 SWOT Analysis

The Training Center BU positioning in the educational sector can be assessed through its strengths, weaknesses, opportunities, and threats, offering insights into its current capabilities and areas for improvement. The SWOT analysis, an effective strategic planning tool, allows organizations to sustain a continuous flow of information, facilitating planning and

responses to dynamic environmental factors (BENZAGHTA et al. 2021), and providing an understanding of organizations' competitive advantages, vulnerabilities, potential growth areas, and external challenges.

Strengths

CFA is a well-established service renowned for its strong reputation in STEM education, built on a foundation of trust, by addressing audience needs through tailored training. Its commitment to excellence is further bolstered by strategic international partnerships that establish and maintain extensive global networks. Additionally, the organization's highly skilled team brings extensive expertise and wide-ranging know-how, ensuring the delivery of impactful, relevant, and forward-thinking training programs.

Weaknesses

Despite its strengths, the Training Center faces vulnerabilities such as total reliance on EU funding to support training. Its small team size imposes limitations on scalability and reduces its potential for broader impact. Additionally, NUCLIO's limited recognition within Portugal restricts its ability to expand its reach and influence in the domestic market.

Opportunities

Several emerging trends present opportunities for NUCLIO's growth. The increased national government and European community investment in professional development and international education experiences support can drive demand for training services. The unfreezing of teaching careers in Portugal signals a heightened need for teacher training programs. Moreover, different audiences have requested NUCLIO numerous tailored trainings in other segments, besides the teachers impacted by the CFA offer, non-teaching staff, and school leadership members also looking for solutions to the lack of available training.

Threats

NUCLIO faces significant external challenges. The aging teacher demographic reduces the need for mandatory training, potentially shrinking its target market. A decline in the number of public schools in Portugal further narrows its primary market. Additionally, lower household income levels in Portugal may affect educators' ability to self-finance training programs.

3.5.2 Strategic Insights

Looking at NUCLIO CFA's current operation, key insights have emerged in which the proposed strategies for future development of the Training Center were based. NUCLIO's strengths, including its capabilities regarding teacher training and commitment to educational innovation, co-exist with critical challenges, particularly its reliance on European funding and limited domestic visibility.

The analysis highlighted the need for diversification in revenue streams to enhance financial sustainability. To address these challenges, we propose three hypotheses that will be evaluated, together with 2 other that were considered not worthy of exploring due to their positioning in the created decision matrix (see Appendix 4).

1. Current offer: Focus on monetizing the accredited teacher training courses. Reasoning – NUCLIO offers a differentiated specialized service that is creating value for professors that is, currently, not monetized.

2. New service: Create a new course that caters to a more attractive market segment in Portugal – executive positions in schools. Reasoning – The accredited courses market is not particularly attractive, due to the free options. Thus, it will be hard to rely on the revenues brought by the new monetized offer. That way, NUCLIO should focus on a more attractive segment of this market, courses for school executives.

3. New market: Based on CFA's capabilities, create a local course for international professors – a summer school for professors in Portugal. Reasoning – NUCLIO has some know-how on the creation of those courses that, as being targeted at international professors, show a higher

potential revenue creation. Not only that, but this also tackles the seasonality factor in NUCLIO's offer.

However, 2 other hypotheses were disregarded mainly due to their lower perceived impact and feasibility: **(1)** an expansion to the PALOP, due to its cultural proximity to Portugal, mainly in its official language, disregarded due to a low financial impact as disposable revenue in the PALOP countries is reduced (Statista, 2024), and **(2)** the creation of non-teaching staff formative courses, disregarded due to this service being very different from the currently offered, which would greatly impact NUCLIO's structure.

This approach positions NUCLIO to gradually reduce its reliance on European funding, fostering greater financial sustainability. The critical question, however, is whether these strategies should be implemented and, if so, how they can be effectively executed. These considerations are comprehensively examined in the subsequent chapters

5. Executive courses - How can NUCLIO enter the executive education training segment?

5.1 Opportunity

5.1.1 Strategic Opportunity: Pilot Course for the Executive Segment

The remarkable opportunity to diversify revenue streams identified involves the importance of leveraging NUCLIO's core competencies and services to expand its training offer to a new related audience (Christensen and Raynor, 2003), recognized as a low-risk diversification strategy (Ansoff H., 1957). Under analysis is the Training Center service expansion to the executive education training segment. This segment targets schools' leadership teams and the maximum decision-making authority within the education community.

5.1.2 Alignment with the Organization

Mission Consistency & Social Impact

NUCLIO is a mission-oriented organization, therefore, it is fundamental to analyze if the objective is aligned with the considered segment diversification opportunity. To illustrate, if the main purpose is educational reform, offering training courses targeting school principals supports systemic education quality improvement, maintaining mission consistency.

By strategically addressing school principals (decision-makers), in place of exclusively targeting professors (executors), top-level stakeholders will be well-equipped, acting as drivers of change, developing a large-scale systemic ripple effect in the dissemination of teaching methodologies, innovative practices, and training policies implementation (Fullan, 2001 and Darling-Hammond et al., 2017).

Internal Capabilities

NUCLIO has 2 in-house trainers with certification to address several systemic pedagogic innovation spheres: digital methodologies, community engagement, and D&I). Furthermore, there are available classroom physical spaces for presential lecturing in the change-makers facilities rented by NUCLIO, located in Cascais.

Financial Impact

The launch of a pilot course for the executive education training segment is expected to deliver exclusive, high-quality service and recognition to the participants, justifying premium pricing (Priceva, 2023), consisting of a potentially relevant new revenue stream to the training center.

Additionally, school principals have a systemic responsibility, if they recognize the value of NUCLIO's offer after firsthand experience, they have a singular position to advocate for teachers' enrolment in CFA courses to extract systemic benefits, describing an interesting cross-selling opportunity (Feedough, 2023).

The expected positive cash inflow will potentially support other branches of the Training Center, ultimately contributing to reducing reliance on European Funding.

5.1.3 Market Trends

The market demand trends reinforce the international momentum supporting the executive training segment launch. Firstly, the demand for the sector of executive education is growing, especially in the spheres of leadership, innovation development, and capacity to adapt (Peter Hirst, 2020 and IEDP, 2023). Secondly, there is a strong emphasis on continuous training investment in digital methodologies that cater to the evolving needs of professionals (European Business Review, 2023).

Moreover, high-performing school systems emphasize that effective leadership significantly improves educational outcomes, with strong leadership being associated with a 20% increase in student achievement, thereby promoting investment in training for these professionals (McKinsey & Co., 2023). The OECD further supports this view, emphasizing that leadership development is a core priority in high-performing education systems globally (OECD, 2022).

With these trends pointing to a growing demand for school leadership training, particularly through innovative and digital solutions, the executive education pilot course is well-positioned to meet market needs, suggesting strong potential for success.

5.2 Market Overview

5.2.1 Market landscape

The Portuguese market is mainly composed of school leadership professionals from 2 types of organizations: private schools and public schools. As elaborated below, these institutions operate under diverse leadership roles frameworks, varying in the composition and scale of the principal's leadership support team. The Decree-Law No. 137/2012 (Diário da República, 2012), states that each public-school group or non-grouped school leadership team is composed of 1 principal, 1 vice-principal, and 3 assistants to the principal, and the main spheres of their leadership are finance, administration, and pedagogy. The election for the leadership roles states is done every 5 years and requires the elements to have a curriculum in leadership previous positions.

In contrast, private institutions do not adhere to a rigid organizational structure and can operate with greater flexibility. In the data analysis of the organizational structure adopted by 50 private institutions, it was found that the leadership roles most commonly present in nearly every institution include a principal, a financial officer/administrator, and a pedagogical coordinator for each educational cycle, ranging from kindergarten to high school.

5.2.1.1 Major Challenges Faced by School Leaders

Nations with highly developed school systems face difficulties in keeping up with trends because school leaders often lack sufficient training to introduce innovative pedagogical changes, which becomes a barrier to helping teachers adopt disruptive strategies (McKinsey, 2017). Furthermore, technology remains a skill not mastered by many principals, limiting their

ability to implement methodologies that foster student progress. This gap between technology's potential and actual results highlights the need to create training offerings to equip principals for change integration in their schools (Education Week, 2021).

The challenges and obstacles identified by principals in their daily responsibilities are numerous, with particular emphasis on the need to implement innovative pedagogical methodologies, especially in the digital sphere, as confirmed by the principals interviewed (see Appendix 5 and 6).

5.2.1.2 Target Costumers

To estimate the target customers of the executive segment course we will define the total number of principals and other professionals involved in the decision-making process in private and public schools in Portugal.

Firstly, in the public school's scenario, leadership teams oversee a total of 805 grouped and non-grouped schools (DGEEC, 2024). According to the legal framework, each leadership team consists of an average of 5 members (Diário da República, 2012), which results in an estimated total of 4,025 leadership professionals in public schools.

In parallel, the number of private schools was determined to be 2,646 (DGEEC, 2024). Based on the research conducted, it was established that each private school typically includes two core leadership roles, along with one pedagogical coordinator per level of education, which varies depending on the school's academic offering. The incidence rates for pedagogical coordinators were defined as the percentage of private schools offering the following academic levels: kindergarten (65%), first cycle of basic education (45%), second cycle of basic education (30%), third cycle of basic education (25%), and high school (17.5%) (DGEEC, 2024). The total number of professionals working in private schools is estimated at 10,121. In total, the

combined number of leadership professionals in both public and private schools in Portugal is estimated at 14,146.

5.2.1.3 Target Financial Capacity and Support

When analyzing the financial capacity of school leaders, we focus on principals as an example. Their salaries suggest a higher willingness to pay for professional development compared to the average Portuguese workforce. The average gross national salary is €1,640 (INE, 2024), while a public school principal's gross income significantly exceeds this, averaging €3,408. This includes a base salary of €2,658, which corresponds to the 7th career level of teachers (SPN, 2024), the typical position held by professors transitioning into principal roles. Additionally, principals receive leadership remuneration ranging from €600 to €750, as stated in Article 54 of Decree-Law No. 137/2012 (Diário da República, 2012).

In contrast, private school principals earn an average of €3,250 (Glassdoor, 2024), but principal salaries may vary a lot depending on the institution's size and prestige. In conclusion, public school principals earn about **107% more** than the national average, while private school principals earn around **98% more**, highlighting their stronger financial capacity for investing in professional development.

Further financial support for training is available under Ordinance No. 229/2015 (Diário da República, 2015), financial support is available to promote the continuous development of professional skills and qualifications, particularly in the digital domain. This funding is designed to encourage training programs where at least 80% of the curriculum focuses on digital tools and methodologies. Eligible candidates include both public school staff and private school staff, categorized as Workers in Public Functions under Portuguese regulations. Each eligible applicant can receive up to €750 annually to cover the cost of training programs. The courses must align with the ordinance's guidelines and be offered by DGERT-certified training centers,

ensuring compliance with quality standards. The interviews conducted (see Appendix 5 and 6) confirm that this financial incentive will increase demand for professional development programs among school leaders across both the public and private sectors.

5.2.2 Benchmark Analysis

To support the study of the target audience for this course and establish a foundation for defining its market value, we conducted a benchmark analysis to examine similar or substitute offerings in the market. The market for continuous training solutions targeting school executive leaders can be categorized into two main types: courses offering academic degrees and courses certified by DGERT. Both types represent competitors to NUCLIO, as holding an academic degree is not a mandatory requirement for executive roles in educational institutions. Courses with regular certification may present a viable alternative to academic degree programs, particularly if their training methodologies demonstrate comparable quality. These alternatives often require lower financial investment, fewer hours of commitment, and lighter evaluation criteria, making them attractive to prospective participants.

For the purposes of this analysis, both categories of services were examined. Within each category, we prioritized courses that incorporate a strong emphasis on pedagogical innovation. This program serves as a benchmark for high-quality executive courses targeting educational professionals, highlighting a structured and cost-effective approach to promoting pedagogical innovation. The Post-Graduation in Pedagogical Innovation and Educational Change offered by Católica Porto is a relevant benchmark for executive courses aimed at educational professionals. It is designed to address the needs of educators and school leaders interested in integrating innovative pedagogical practices and managing educational transformation. The program spans 150 hours, structured with four-hour sessions held twice a week, providing a balance between rigorous training and accessibility for working professionals. Tuition is €1,998, equating to approximately €15 per training hour, and the course admits up to 30

participants per cohort. The curriculum emphasizes the application of theoretical knowledge to real-world challenges in education, focusing particularly on the integration of digital strategies and tools.

» The Master's in Educational Innovation at Portucalense University (UPT) in Porto, Portugal, spans two years and consists of 400 instructional hours, with a focus on multimedia and technology in education. Designed for working professionals, it offers evening in-person classes with 30 slots available per intake. Tuition is €8,763, equating to approximately €21.91 per hour.

» The Scholar Executive Leadership course by Incurso Training Center, certified by DGERT, offers 20 hours of in-person training, focusing primarily on pedagogic innovation. Conducted once per academic year, it accommodates 30 participants for €780 (€32 per hour). The course features invited speakers from some of the most prestigious private schools, who share insights into systemic changes they have implemented and the measurable results achieved.

» The School Directors' Update Course offered by the National Institute of Administration (INA) is a Blended Learning program that spans 103 hours of training. The course is priced at €1,230, which amounts to approximately €11.95 per hour. It combines both online learning and in-person sessions. Designed specifically for directors, deputy directors, and assistant directors of grouped schools and non-grouped schools. This training is tailored to educational leaders who are responsible for managing and leading schools in the evolving educational landscape of the 21st century. The course covers a range of essential topics, including school modernization, legislation in education, autonomy instruments for schools, human resource management, public accounting applied to schools, and evaluation strategies. However, even being included, pedagogic innovation is not the center of the discussed themes, the main focus is administration tasks.

In summary, the cluster card representing the market benchmark has an average of 35 hours, and the average tuition price is 17,8€ per hour, with a medium number of 30 participants.

5.2.3 Market Size

To estimate the market size, we begin by considering the leadership professional in both public and private schools. In public schools, leadership teams are elected every five years (Diário da República, 2012), with training demand assumed to occur once per period. Assuming the same rotation for private schools, we calculate the number of leadership positions requiring training annually. By dividing the total number of leadership positions by five, we estimate that 805 individuals in public schools and 2,024 in private schools require training every year.

The target market identified is national. However, if the training format includes in-person classes, it is more appropriate to consider proximity to NUCLIO's physical facility in Cascais, with a 50 km radius established as the criterion. Therefore, if the leadership team's members reside in the regions where they work, the regions considered are Greater Lisbon, Oeste e Vale do Tejo and the Setúbal Peninsula. In the case of private schools, 40.2% of them are located in the target regions (DGEEC, 2024) (814 schools), while for public schools, this figure is 27.6% (DGEEC, 2024) (222 schools), representing a total market size of 1,036 professionals as potential customers annually. In conclusion, based on the current market offer cluster card, the market value is estimated at €645,428.

5.3 Go-to-market Plan

5.3.1 Broad Objective

Considering the market analysis within the educational sector, the key needs of the target customers have become evident. The primary course features identified, as confirmed by the interviews conducted with principals (see Appendix 7), include an innovative pedagogical approach with a strong emphasis on digital methodologies, practical and hands-on learning

experiences, and broad systemic transformation. Additionally, there is a clear need for mentoring services to assist in the implementation of tailored strategies for each institution. To further support these needs, it is essential to create offers that align with available funding options to help offset the costs of professional development.

The offerings from market competitors have yet to provide a comprehensive solution that fully addresses all the identified needs and requirements (figure 16).

Key services	NÚCLIO	UCP	UPT	Incurso	INA
Digital Pedagogic Innovation Training	✓	✓	✓	✓	✓
Systemic Transformation Approach	✓	✓	✗	✓	✗
Project Based-learning	✓	✗	✓	✗	✗
Mentoring Sessions	✓	✗	✗	✗	✗

Figure 16 - Executive Courses Benchmark

5.3.2 Marketing Mix (5P's)/ Recommendations

5.3.2.1 Product

This executive course represents the first structured program specifically tailored for school leaders, aiming to equip them with advanced tools and strategies to foster pedagogic innovation within their institutions (figure 17). The program offers a DGERT-certified curriculum with a strong emphasis on digital transformation, community engagement, and inclusive education practices. The course is grounded in five key components, each carefully designed to maximize impact and applicability:

1. Content and Methodology

The course is organized into three thematic areas: Digital Innovation Methodologies (20 hours, 80%): Focused on integrating technology into teaching practices, highlighting innovative tools and strategies to enhance learning outcomes; Community Engagement (2.5 hours, 10%): Exploring cutting-edge methods to build strong partnerships with local communities and

stakeholders, fostering a shared commitment to educational excellence; Diversity and Inclusivity Approaches (2.5 hours, 10%): Addressing educational strategies to create inclusive learning environments that respect and celebrate diversity, ensuring equity in education.

2. Invited Speakers

A distinguishing feature of this program is the inclusion of experienced school principals as guest speakers. These practitioners will present successful case studies from their schools, illustrating how innovative practices have been effectively implemented and the measurable outcomes achieved. These real-world examples provide invaluable insights and inspiration for participants.

3. Project-Based Learning

The course adopts a project-based learning model to ensure the practical application of the concepts covered. Participants are grouped, preferably by their institutional affiliations, to collaboratively design and develop a project tailored to their school's specific needs. Under the guidance of expert trainers, these projects are refined and prepared for implementation.

4. Certification

The course is DGERT-certified, ensuring compliance with national standards for professional training in education. This certification adds credibility and value to the skills and competencies gained through the program, making it a recognized benchmark for educational leadership excellence.

5. Mentoring for Implementation

A premium feature of the course is the provision of mentoring support to facilitate the implementation of the developed projects. Participants will benefit from two online mentoring sessions, offering strategic advice and troubleshooting to adapt and integrate their projects effectively into their school environments.



Figure 17 - Key Figures of Executive Pilot Course

5.3.2.2 Pricing Structure

The pricing model for the course is designed to balance cost-efficiency with premium value. For individual enrollment, the course is offered in two formats: Training Only for €600, and Training with Mentoring for €650. For group enrollment, which requires a minimum of three participants from the same institution, the cost is €560 per participant for the Training Only option, and €600 per participant for the Training with Mentoring option. Additionally, an Early Bird Discount of 5% is available for participants who enroll at least three months before the course start date, making the program even more affordable. This pricing strategy is structured to cater to various needs, whether participants are looking for immediate training or sustained support through mentoring. The group discount is particularly valuable for institutions looking to engage multiple participants, fostering collaboration and encouraging systemic transformation at the institutional level.

5.3.2.3 People - Team and Stakeholders

The success of the course relies heavily on the expertise of its project team. This team consists of a project coordinator responsible for driving sales and overseeing the course's strategic growth, two certified trainers in pedagogic innovation, and a marketing technician. Furthermore, guest speakers from both public and private schools will be invited to share their real-world insights, particularly those who have successfully implemented innovative projects. These guest speakers will offer valuable perspectives that enhance the learning experience for participants.

5.3.2.4 Place - Market Reach and Distribution:

The course will be delivered in a presential (in-person) format at NUCLIO's physical facility, while mentoring sessions will be conducted online. Furthermore, the course will be promoted through multiple channels to ensure broad visibility and engagement. These channels include a professional LinkedIn profile, targeted email marketing campaigns, and partnerships with relevant educational organizations, such as ANDAEP and AEEP. The websites of these partner organizations will also serve as platforms for promotion, directing interested individuals back to the NUCLIO website for more information and registration.

5.3.2.5 Promotion

The promotional strategy for the course will include a variety of tactics aimed at engaging the target audience effectively. Optimized content will be featured on the course website to ensure it is informative and user-friendly, encouraging potential participants to learn more about the program. Additionally, the available government funding solution will be highlighted alongside the course to foster demand and make the program more accessible to interested individuals. Active and engaging social media profiles will be maintained to reach school leaders and educators. Email newsletters will also be sent out, specifically targeting school leaders and education professionals. Strategic partnerships with educational institutions and professional organizations will help to expand the course's visibility by tapping into established networks. Additionally, testimonials from past participants, as well as insights from guest speakers who have successfully implemented innovative educational projects, will be used to build trust and credibility, further attracting new enrollers.

5.4 Implementation Plan

The implementation plan is structured into five key phases to ensure a systematic and organized approach (figure 18). These phases include:

In the **planning phase** for project implementation, it is critical to address essential areas to ensure a strong foundation for success. The process begins with establishing a robust team structure, acquiring necessary certifications, designing a comprehensive program, developing a targeted marketing strategy, and inviting prominent guest speakers. The internal team setup consists of four core members: a project coordinator, two trainers certified by CCPFC in pedagogic innovation, and a marketing technician. These trainers specialize in areas such as digital innovation, diversity and inclusion, and community engagement, while the marketing technician oversees the development of an effective marketing plan. Additionally, obtaining DGERT certification is a priority, as it ensures eligibility for government funding. This process, costing approximately €500 and taking three months to complete, establishes credibility and compliance. The training program development focuses on creating sessions that are both structured and flexible to meet diverse participant needs. The program's core topics are carefully designed to align with course objectives and adapt to the preferences of educators. Concurrently, the marketing plan is developed with an emphasis on digital campaigns. Website optimization ensures the course page is user-friendly, SEO-optimized, and highlights unique features such as DGERT certification, mentoring opportunities, and guest speakers. Social media engagement through a professional LinkedIn profile and personalized email marketing campaigns further amplifies the course's reach. To enrich the program's content, a curated list of guest speakers is prepared. These speakers, representing both public and private schools, are selected based on their relevance to pedagogic innovation, professional prestige, and proximity to NUCLIO's facilities. Invitations are extended, and agreements are finalized to ensure their valuable participation.

The **promotion phase** focuses on implementing a strategic approach to market entry. Collaborations with key principals' associations, such as ANDAEP (Associação Nacional de Diretores de Agrupamentos e Escolas Públicas) and AEEP (Associação de Estabelecimentos

de Ensino Particular), leverage their credibility and networks to promote the course. Early bird discounts and group enrollment incentives further encourage participation. Attendance at relevant educational conferences and events ensures direct engagement with potential participants and stakeholders.

The **pilot stage** of the course plays a pivotal role in validating its effectiveness. It begins with implementing pilot training sessions to assess the program’s alignment with objectives and participant needs. Following this, mentoring sessions provide personalized guidance to participants, helping them apply the acquired knowledge to real-world scenarios. Feedback collection through structured surveys, focus group discussions, and interviews ensures a comprehensive evaluation of participant experiences and outcomes.

Impact measurement and service adaptation follow the pilot phase. Participant feedback is analyzed to identify strengths and areas for improvement, ensuring the program’s objectives are met. Based on this analysis, necessary adaptations are made to enhance content, delivery, and overall effectiveness.

Finally, the **service integration and scale-up planning phase** focuses on broadening the client base and optimizing operations. Expanding the potential target audience involves analyzing market trends and developing tailored strategies to attract new clients. Additionally, hiring a commercial manager becomes essential to drive sales, manage client relationships, and oversee strategic business development. This role ensures effective communication between marketing, sales, and service delivery teams, fostering growth and sustainability.

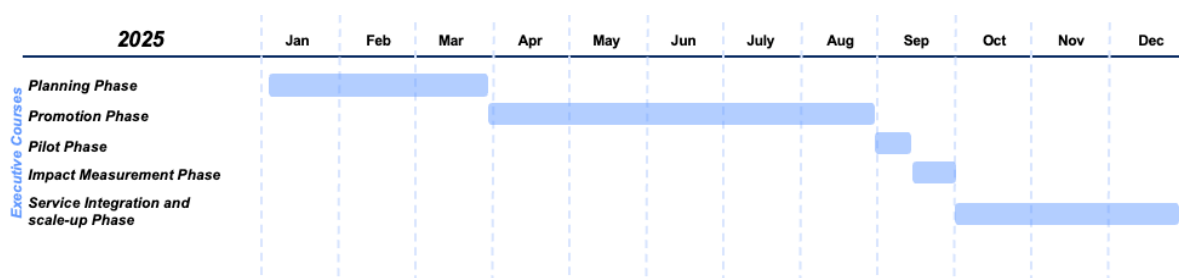


Figure 18 – Implementation Plan Executive Courses

8. Final Recommendations and Conclusions

Following the three previous chapters with the in-depth research and analysis of the potential sustainability of the Training Centre's offer restructuring and expansion to new segments, the closing chapter will compile our aggregated curricular offer, and implementation plan, together with the main recommendations and conclusions to our thesis project.

Final recommendations

A vast array of recommendations and changes that we believe attain significant value to the Training Centre were made throughout the project, ultimately leading to the financial sustainability of the business unit and reduction of the overall preponderance of European Funds to NUCLIO.

As a starting point, a comprehensive academic training offer calendar of the Training Centre BU (Figure 26) was reorganized, gathering suggestions of course dates to professors, principals, and international segments, to guarantee that seasonality of revenues, with higher course incidence from October to May, no longer occurs and that resources allocation is efficient, no longer over allocation of human resources during concentrated seasons of the year.

Ultimately this maximization of resources allowed us to increase the number of courses delivered and people impacted, generating not only a higher revenue potential but also a higher social impact.

Secondly, we designed tailored premium features for every course segment to increase the aggregate value of the training offer and propel the monetization of the courses, consisting of mentoring support for the implementation in practice.

Moreover, aligning training offerings with available funding is essential to boost demand, equally important is the dissemination of funding information on the course website. For Erasmus+ KA1 funding, training programs and funding details must be announced a year in advance to meet EU application deadlines.

We also recommended a B-learning lecturing format for the training courses to maintain the human experience and network opportunities existing in the presence format while facilitating the mobility and time management of the classes of occupied professionals targeted by the research indicated to be target groups' preferences.

We also firmly believe that a multi-channel marketing strategy and partnerships with target groups' associations work as an extraordinary promotion channel, together with the investment in a new optimized website with payment methods featured, would benefit immensely the awareness and consumers buying journey more user-friendly for the training center.

Finally, to guarantee a smooth implementation process a fusion of every individual segment implementation plan was elaborated (see Appendix 8 and 9) to obtain alignment in the team priorities and different segment phases synergies, to guarantee optimization of resources and cope with the proposed offer for the academic year's 2025/2026.

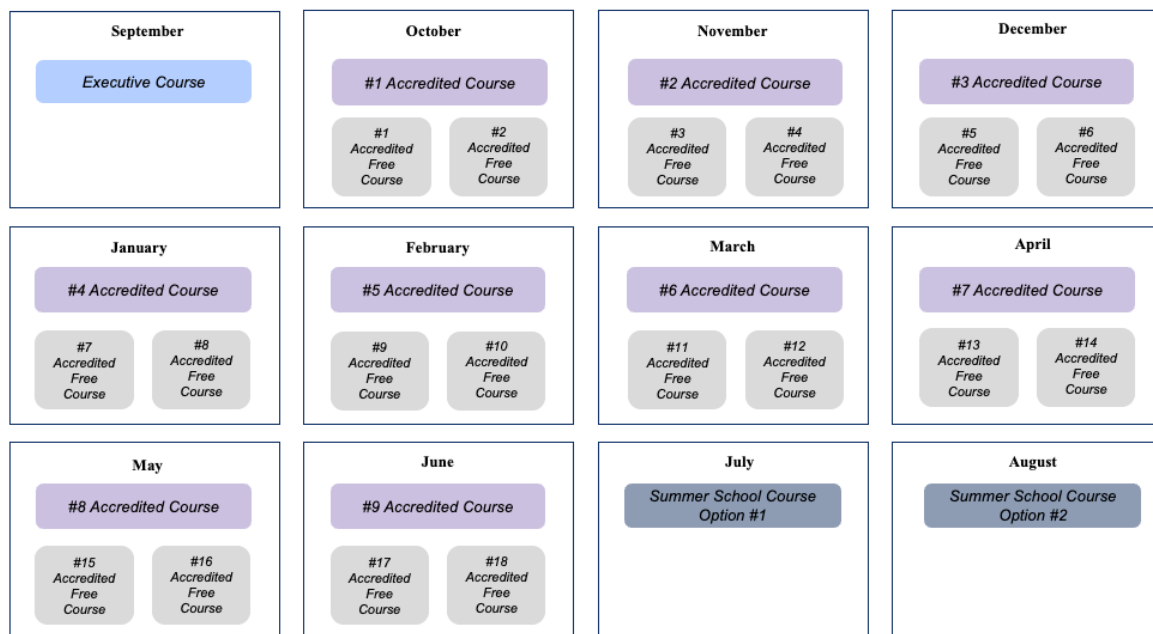


Figure 26 – Training Center BU Calendar

Conclusions

Building on the points discussed, the transition towards a hybrid organizational model emerges as the solution to NUCLIO's challenge of reducing dependency on EU funding. The proposed diversification of revenue streams for the Training Center BU demonstrates significant potential to achieve greater sustainability and long-term stability.

In alignment with this strategy, CFA introduced a hybrid model combining premium paid courses with free courses, ensuring accessibility while supporting financial sustainability. The executive pilot course presents the strongest potential, if operating above 83% capacity allows NUCLIO to cover costs and offset losses from other services. The possibility to expand to 2 annual executive courses could fully fund free offerings, achieving financial self-sufficiency. While international summer schools offer potential at over 88% capacity, their uncertain demand may warrant discontinuation if they fail to align with financial objectives.

In conclusion, in 2030, in the base case, the Training Centre is expected to reduce its dependency on EU subsidies to 28%. Moreover, in the more optimistic scenario, leveraged by the potential success of the pilot courses, this BU is expected to become 100% independent from external funding, and even generate surplus profits.

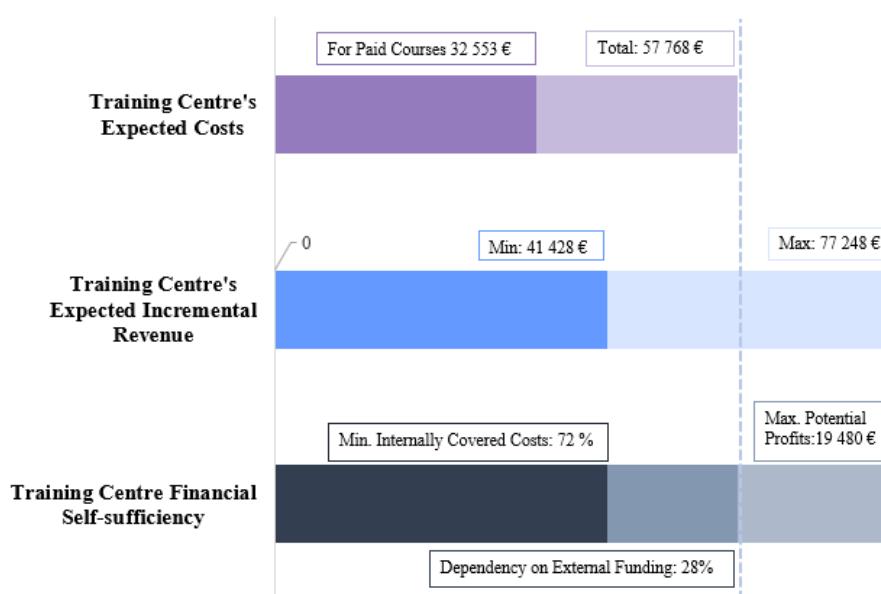


Figure 27 – Training Center BU Potential Financial Impact

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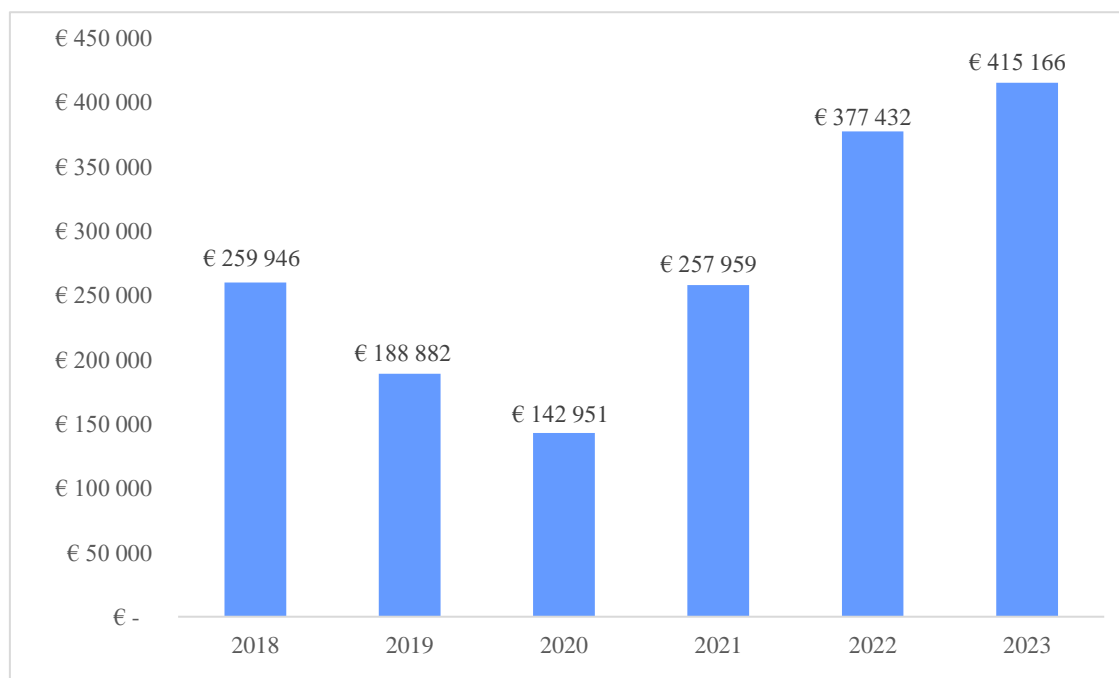
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10. Appendix

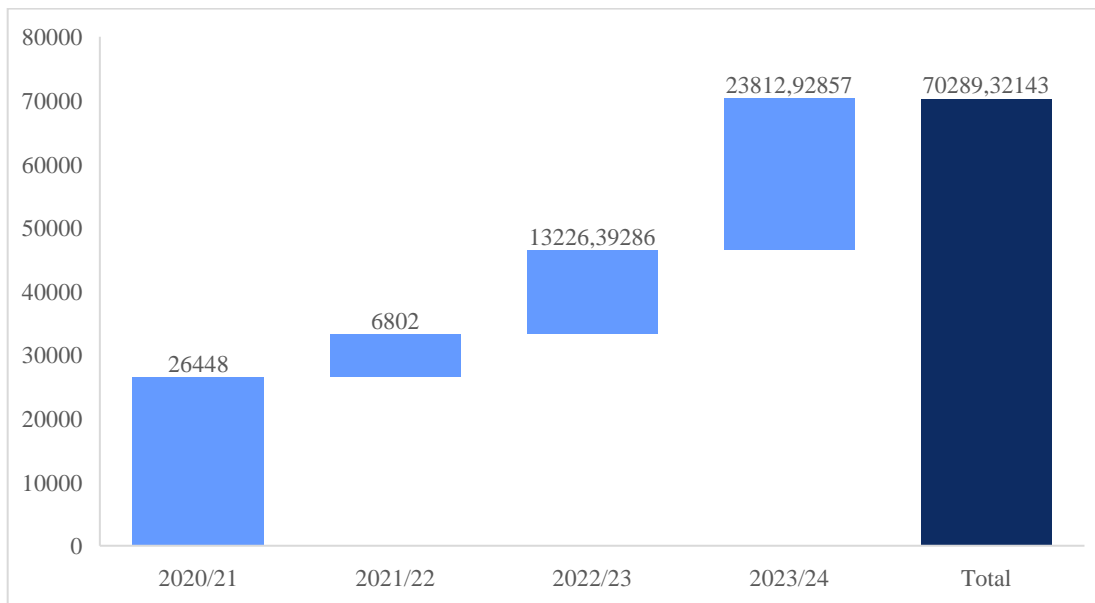
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APPENDIX 1 - INTERNATIONAL COURSES OFFERED THROUGH NUCLIO'S PARTNERSHIPS

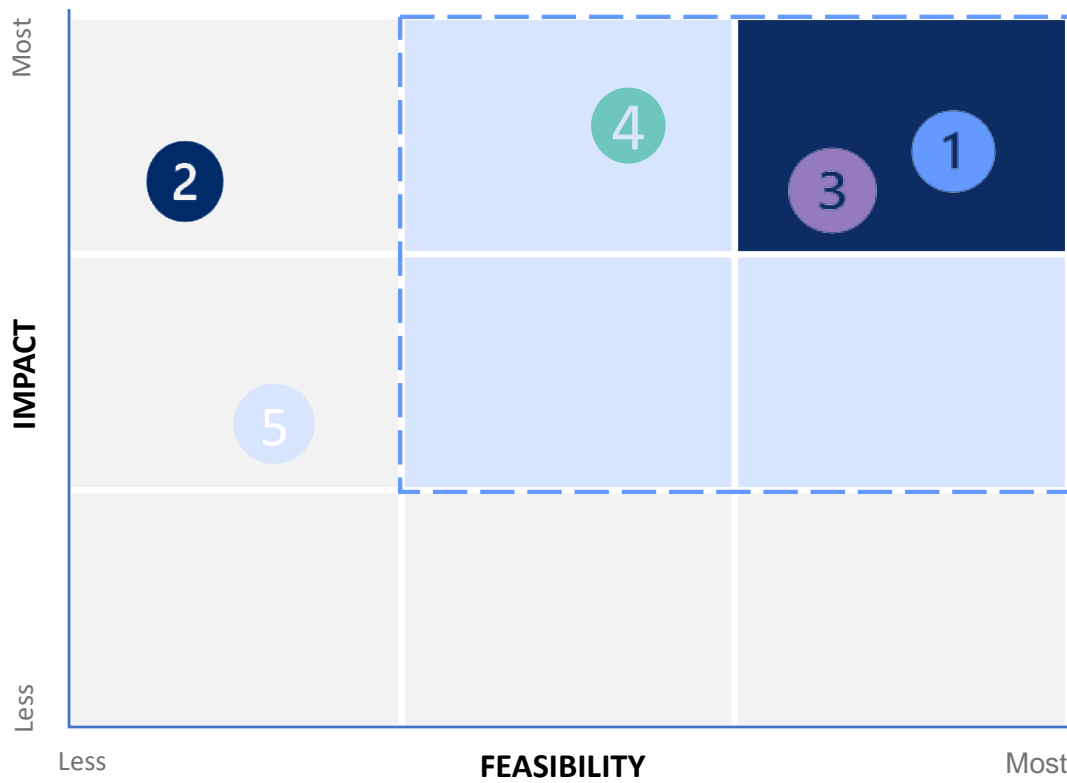
	“Conference”	“Summer School”	“Assembly”
Duration	4/5 days	5/6 days	8/9 days
Method	Workshops and presentations	Lectures, workshops and field trips	Lesson and scientific update
Format	Hybrid	Hybrid/Online	Face-to-face
Price	Not applicable	100€ (national) 400€ (international) 10€ (online)	Not applicable

APPENDIX 2 – CASH POSITION

APPENDIX 3 – CFA TOTAL COSTS



APPENDIX 4 – DECISION MATRIX



APPENDIX 5 – INTERVIEW 1 TO ASSESS EXECUTIVE SEGMENT CUSTOMER NEEDS

INTERVIEW GUIDE: CUSTOMER NEEDS ASSESSMENT (Public School Principal)

Question 1: Could you briefly describe the main characteristics of your school, such as the number of students and the levels of education offered?

Answer 1: *The school has 1400 students, from kindergarten to the 3rd cycle of basic education.*

Question 2: How is the structure of the leadership team in your school organized? For example, how many professionals are part of the team, and what roles do they occupy?

Answer 2: *Our leadership team has a total of 5 elements: 1 principal, 1 vice-principal, and 3 assistants to the principal.*

Question 3: In your opinion, what are the main challenges currently faced in the management of the school?

Answer 3: *Bureaucracy and lack of teaching and non-teaching staff. Difficulty in leading the implementation of innovative teaching methodologies.*

Question 4: In your opinion, which area of responsibility for a school administrator requires the highest priority in continuous training investment due to the constant need for updated knowledge and methodologies: financial management, pedagogical innovation, or administrative management? Please select the option you consider most relevant and justify your choice.

Answer 4: *The pedagogic innovation sphere requires regular skills update to better prepare the future leaders.*

Question 5: Which of the following components of pedagogical innovation do you consider having the greatest need for investment in continuous training for the professionals responsible for providing student education: digital innovation, diversity and inclusion (D&I), or community engagement?

Answer 5: *Digital Innovation or Community engagement.*

Question 6: What format do you prefer for training: presential or blended learning? What duration do you prefer for training: 25 hours or 50 hours?

Answer 6: *I have preference for 25hours Be-learning sessions.*

Question 7: If a certified training program focused on disseminating pedagogical innovation for the executive school segment at a systemic level were offered, what price range would you be willing to pay? Please select from the following options (€450-€550; €550-€650; €650-€750; €850-€950)

Answer 7: *I would be willing to pay below the 450€-550€ range.*

Question 8: If a certified training program focused on disseminating pedagogical innovation for the executive school segment at a systemic level were offered, and if through the *Cheque Formação +Digital* program this training was available free of charge, would you enrol?

Answer 8: *Certainly.*

APPENDIX 6 - INTERVIEW 2 TO ASSESS EXECUTIVE SEGMENT CUSTOMER NEEDS

INTERVIEW GUIDE: CUSTOMER NEEDS ASSESSMENT (Private School Principal)

Question 1: Could you briefly describe the main characteristics of your school, such as the number of students and the levels of education offered?

Answer 1: *Our institution has close to 400 students, from kindergarten to the 1st cycle of basic education.*

Question 2: How is the structure of the leadership team in your school organized? For example, how many professionals are part of the team, and what roles do they occupy?

Answer 2: *I am the principal, and within my team I have 1 financial officer and 2 pedagogic directors.*

Question 3: In your opinion, what are the main challenges currently faced in the management of the school?

Answer 3: *We follow the pedagogic movement modern school so for us the constant challenge is to improve teaching methodologies to meet student's needs.*

Question 4: In your opinion, which area of responsibility for a school administrator requires the highest priority in continuous training investment due to the constant need for updated knowledge and methodologies: financial management, pedagogical innovation, or administrative management? Please select the option you consider most relevant and justify your choice.

Answer 4: *As mentioned before our priority is pedagogic innovation*

Question 5: Which of the following components of pedagogical innovation do you consider having the greatest need for investment in continuous training for the professionals responsible for providing student education: digital innovation, diversity and inclusion (D&I), or community engagement?

Answer 5: *All are important, but the major portion of investment I would be willing to do is in the digital area.*

Question 6: What format do you prefer for training: presential or blended learning? What duration do you prefer for training: 25 hours or 50 hours?

Answer 6: *Presential lectures and with a duration of 25 hours.*

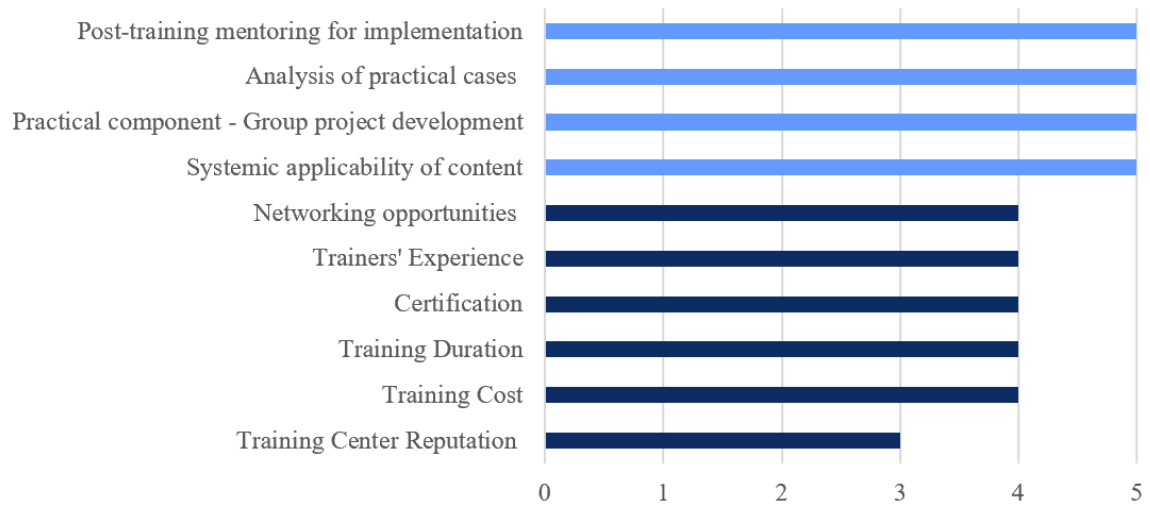
Question 7: If a certified training program focused on disseminating pedagogical innovation for the executive school segment at a systemic level were offered, what price range would you be willing to pay? Please select from the following options (€450-€550; €550-€650; €650-€750; €850-€950)

Answer 7: *Assuming a high quality training, the range between 550€ and 650€.*

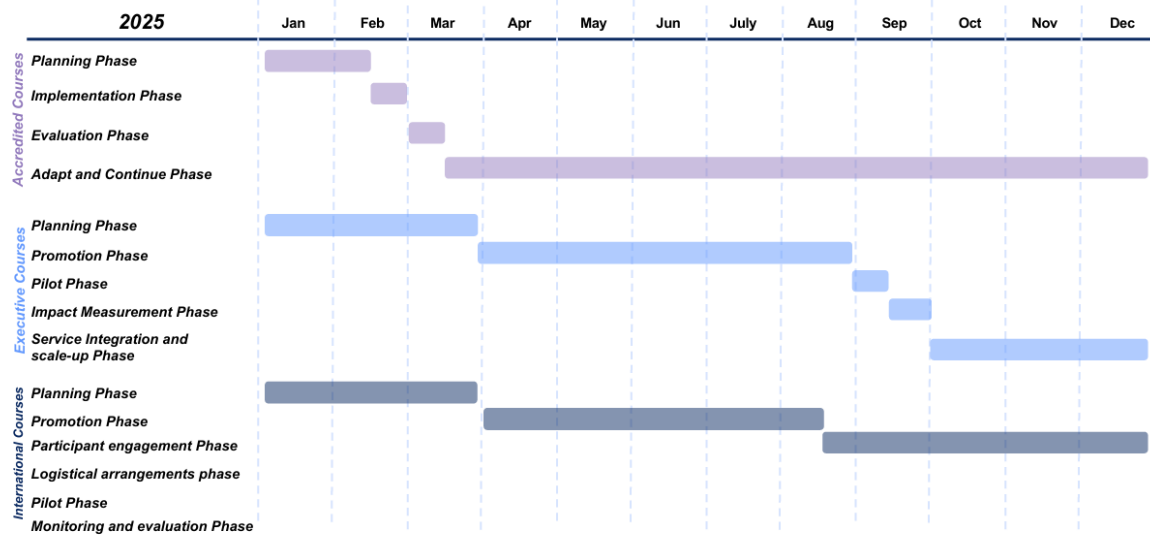
Question 8: If a certified training program focused on disseminating pedagogical innovation for the executive school segment at a systemic level were offered, and if through the *Cheque Formação +Digital* program this training was available free of charge, would you enrol?

Answer 8: *Yes, for sure.*

APPENDIX 7 – EXECUTIVE SEGMENT CUSTOMER NEEDS ASSESSMENT - COURSE FEATURES PREFERENCES



APPENDIX 8 – TRAINING CENTER IMPLEMENTATION PLAN



APPENDIX 9 – TRAINING CENTER IMPLEMENTATION PLAN

