

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

**NUCLIO SOCIAL IMPACT FIELD LAB,
TRANSFORMING CHANGE MAKERS FOR SUSTAINABLE IMPACT – WHAT ARE
THE FINANCIAL IMPLICATIONS RESULTING FROM THE VALUE
PROPOSITION AND HOW CRITICAL ARE SUBSIDIES IN ENSURING FINANCIAL
SUSTAINABILITY?**

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Abstract

Change Makers, a NUCLIO's project with a maker space in São Domingos de Rana, aims to empower the community through educational innovation. Previously reliant on European funding, it now seeks financial sustainability. This thesis analyzes the financial support and subsidies required to secure financial viability, given the defined value proposition. The final objective is to position Change Makers as a sustainable project for innovation, learning, and community engagement, while acknowledging its financial limitations and the need for financial support.

Keywords

Social Impact, Innovation in Education, Empowering the Community, Raising Citizens' Voice, Financial Analysis, Financial Sustainability, Revenue Streams, Cost Drivers, Scenarios, Cash Flows, Need for Subsidies.

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Abbreviations

CAGR: Compound Annual Growth Rate

CCPFC: Scientific-Pedagogical Council for Continuing Education

CNC Machine: Computer Numerical Control Machine

COGS: Cost of Goods Sold

EBITDA: Earnings before Interest, Taxes, Depreciation and Amortization

GGTP: Galileo Teacher Training Program

IAU: International Astronomical Union

IRC: Imposto sobre Rendimento Coletivo/ Tax on Collective Revenue

IUC: Imposto Único de Circulação / Vehicle Circulation Tax

IPSS: Instituição Particular de Solidariedade Social / Non-Profit Entities

ISV: Imposto sobre Veículos / Vehicle Tax

NUCLIO: Núcleo Interativo de Astronomia e Inovação em Educação

NGO: Non-Governmental Organization

NPO: Non- Profit Organization

OECD: Organization for Economic Cooperation and Development

PhD: Doctor of Philosophy

PLOAD: Portuguese Language Office of Astronomy for Development

STEAM: Science, Technology, Engineering, Arts and Mathematics

STEM: Science, Technology, Engineering, Mathematics

VAT: Value-added Tax

YoY: Year-on-Year

3D: Three Dimensional

Table of Contents

- 1. EXECUTIVE SUMMARY..... 5**
- 2. INTRODUCTION..... 6**
 - 2.1. NUCLIO’s Overview..... 6**
 - 2.2. Scope Definition..... 9**
 - 2.3. Change Makers Concept Introduction..... 10**
- 3. FINANCIAL ANALYSIS..... 13**
 - 3.1. Change Makers’ Financial Aspects..... 13**
 - 3.2. Change Makers’ Cash Flows Over Time 19**
 - 3.3. The Vital Need for Subsidies 24**
- 4. FINAL RECOMMENDATIONS AND CONCLUSION 30**
- 5. BIBLIOGRAPHY 34**
- 6. APPENDIXES 38**

1. EXECUTIVE SUMMARY

This impact lab project presents a comprehensive analysis and strategic recommendations for Change Makers, a NUCLIO project focused on educational innovation and community empowerment. The main objective is to transform Change Makers to achieve sustainable impact following the recent end of its European funding.

The analysis begins with NUCLIO's context, narrowing down the scope to identify Change Makers as the focus of this study. Change Makers is revealed as a project that presents significant opportunities for improvement, currently underperforming with an inefficient use of resources, not reaching its full potential.

Following an assessment of the market landscape and relevant benchmarks, presenting key opportunities, and a value proposition that can better position Change Makers given their three different offerings, each aligned with a specific target segment and Change Makers' mission pillars, a financial analysis is presented, focusing on examining Change Makers' projected cash flows over time, demonstrating that Change Makers cannot achieve financial sustainability independently, and highlighting its critical need for subsidies.

In conclusion, this thesis provides an analysis for Change Makers' evolution and sustainability, balancing social impact with financial viability. The primary goal is to provide innovative educational experiences and maker space access to communities, while securing sustainable operations through a combination of earned revenue and subsidies.

2. INTRODUCTION

2.1. NUCLIO's Overview

NUCLIO is a non-profit organization (NPO) and non-governmental organization (NGO) for development, composed by a group of scientists, researchers, teachers, and trainers, specialized in different scientific areas as well as in areas of educational psychology and science teaching.

NUCLIO – Núcleo Interativo de Astronomia – was founded in 2001 by a group of astronomers, astrophysicists and amateur astronomers who had the dream of changing the world through Astronomy. The team started to carry out numerous astronomy events, such as science cafes, sky observations, lectures at schools, research projects with students and teacher training. This path naturally led NUCLIO to the world of education and made them understand the power it has in building a better future for all. It was for this reason that, in 2021, NUCLIO changed its name to NUCLIO – Núcleo Interativo de Astronomia e Inovação em Educação – to clarify the importance that education had gained in their activities. Currently, the organization aims to become a reference in providing holistic and engaging educational experiences, with a strong purpose of serving the community. Hence, the organization's mission is to bring innovation and development in education to all parts of the world, specially in Portugal, and to promote diversity and inclusion. The organization believes that education is the most powerful tool that humans have to offer people a responsible, tolerant, and informed way of life.

NUCLIO's mission translates into four areas of intervention which include:

- **Teacher Training:** NUCLIO is a training entity accredited by CCPFC - Scientific-Pedagogical Council for Continuing Education, offering accredited training to teachers across the country. NUCLIO coordinates the Galileo Teacher Training Program (GTTP), a worldwide teacher training network born in the International Year of Astronomy (2009), which remains as a legacy of this initiative. Since 2009, GTTP has trained more

than 70,000 teachers in about 120 countries. Current relevant projects in this area also include Synapses, GeoAcademy and Otters.

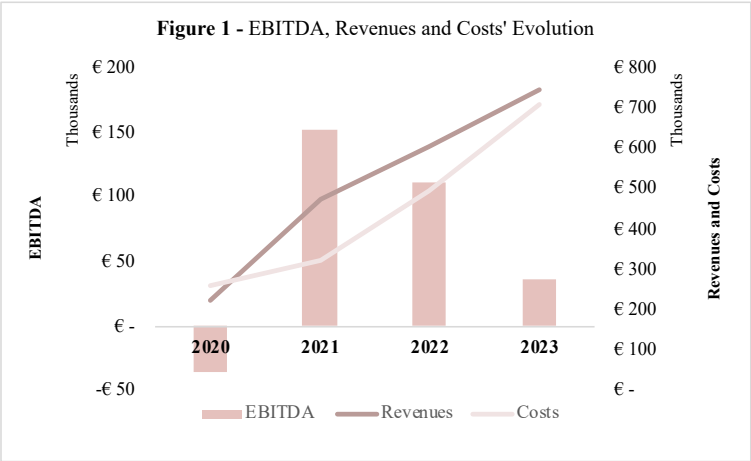
- **Astronomy for Development:** NUCLIO coordinates the Portuguese Language Office of Astronomy for Development (PLOAD), an initiative of the International Astronomical Union (IAU), which brings together partners from Portuguese-speaking countries, and aims to use Astronomy as a vehicle for promoting development.
- **Scientific Outreach:** NUCLIO also intervenes in scientific outreach, with special emphasis on Astronomy and Astrophysics, conducting workshops and lectures for the general public, science cafes, and observation sessions of the sun and night sky. It also promotes scientific research in the classroom, involving students in the discovery of asteroids, search for extrasolar planets, fight against light pollution, among other topics. It has also maintained, since its inception, the Astronomer's Portal (Portal do Astrónomo), a scientific outreach site with quality information in Portuguese.
- **Innovation in Education:** NUCLIO develops and actively participates in significant national and international projects in the field of education, with strong connections to schools, teachers, and students. NUCLIO is also involved in coordinating and/or participating in initiatives related to education, development, and outreach. The main projects included in this area are Change Makers and EXPLORE.

Financial Situation

Regarding the current financial situation, and after analyzing the income statements ¹ for the last four years (Appendix 1), we can verify that in 2023 NUCLIO presented an EBITDA of 35,240€, corresponding to a decreasing tendency when compared with the values of 111,478€

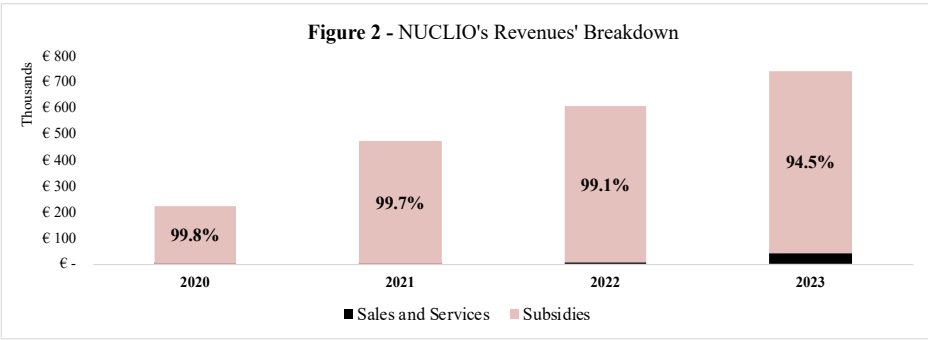
¹ The organization's results before taxes coincides with the net result of the period. According to the codes of IRC (Tax on Collective Revenue), VAT (Value-added Tax), IMI (Municipal Property Tax), IUC (Single Circulation Tax), and ISV (Vehicle Tax), the exemption of these taxes is foreseen for non-profit entities (IPSS and other legally equated entities).

and 151,828€, in 2022 and 2021, respectively (Figure 1). This decrease is explained by total costs increasing at a higher rate than total revenues, with total revenues presenting a compounded annual growth rate (CAGR) of 25%, and total costs presenting a CAGR of 48%. From 2020 to 2021 there had been a significant improvement on EBITDA mainly due to a high increase in subsidies, donations, and legacies for exploration.



Legend: NUCLIO's EBITDA has been showing a decreasing tendency since 2021, with costs increasing at a higher rate than revenues.

By analyzing the income statements of the last four years (Appendix 1), it was also possible to conclude that NUCLIO's revenues have been increasing over the years, and come mainly from subsidies, donations, and legacies for exploration, being the most substantial ones the European Union funds.



Legend: NUCLIO's Revenues coming from sales and services are very low and not substantial when compared with subsidies, donations, and legacies for exploration.

In the figure above we can see that in 2020, approximately 99.8% of total revenues were referring to subsidies, and in 2021 and 2022, this value remained relatively constant. In 2023, this value decreased to 94.5%. However, these values remain very low and are not significant, with NUCLIO's revenues remaining heavily reliant on subsidies.

2.2. Scope Definition

The four NUCLIO's areas of intervention presented in the section above include a current total number of 19 active projects and 9 ongoing initiatives (Appendix 2), some of them financed by European funds.

Currently, NUCLIO is more focused on projects that will be concluded this year or that require more effort to achieve their goals, all of them involving Teacher Training and Innovation in Education. This impact lab project will specifically focus on the Innovation in Education area.

In the Innovation in Education area, the current main projects include the following:

- *EXPLORE, the Expeditionary Program for Learning Opportunities in Analog Space Exploration*, which is an initiative designed to engage students in space exploration experiences while aligning with their STEAM (Science, Technology, Engineering, Arts and Mathematics) curriculum requirements. This Erasmus+ funded project invites students to participate in activities that simulate moon or mars environments, providing hands-on experiences of international space missions;
- *SoundScapes, Sonification Environments for STEAM Learning*, which proposes an innovative STEAM approach with an emphasis on Arts, where students design and use a sonification environment, converting numeric data related to school curricula into sound. This approach aims to increase student engagement and motivation while promoting an inclusive environment, as they learn, through exploring the hearing sense (especially relevant for the visually impaired), to communicate and connect with each other through the universal language that is music;

- **Change Makers:** A space for creation, learning and innovation where imagination is the limit. Change Makers offers students, citizens, and creatives the opportunity to develop projects working with cutting-edge technologies (3D printers, Laser Cutter, CNC Machine, among others) and have the dedicated monitoring of professionals with expertise in several scientific and educational fields.

In contrast to EXPLORE and SoundScapes, Change Makers is not currently funded by the European Union. Moreover, Change Makers has been characterized as a project with substantial untapped potential, with a current inefficient use of resources, despite its current low performance. This project has been underperforming but it has significant room for improvement, and for this reason, it is the focus of our impact project lab.

2.3. Change Makers Concept Introduction

Change Makers, founded in 2021, is an innovative educational initiative that empowers students, teachers, and community members to develop critical skills for a sustainable future and engage with cutting-edge technologies (Change Makers n.d.). Regarding Change Makers' mission, it is a project that aims to:

- Innovate in Education by involving schools and promoting key skills for a more educated, competent and sustainable future;
- Empower the Community offering training to all age groups, promoting skills, innovative thinking and a better profile to thrive in life;
- Raise Citizens' Voice by supporting the creation of innovative solutions that may benefit the community and that have the potential to make a difference.

The current Change Makers team dedicated to this mission is a small team of three people:

- **Coordinator of Change Makers:** graduated in Biology, completed a Master's in the same area, and a Postgraduate degree in Educational Psychology. She is currently pursuing a

PhD in this field and is also a certified trainer by the CCPFC. Her main goal is to involve the whole community in sharing knowledge and making learning an accessible path for everyone who wants it;

- Member 1 of Change Makers: graduated in Physics, completed a Master's in Cognitive Science and another in Anthropology. He is a researcher in Biophysics and Social Psychology and has extensive experience working with students and a strong desire to enhance education. His main interests and responsibilities within Change Makers are related to vector drawing, electronics, and programming;
- Member 2 of Change Makers: graduated and completed a Master's in Energy and Environment Engineering. He is primarily responsible for the maker space's equipment and materials, and is more focused on 3D modeling, printing and laser cutting.

Change Makers comprises a maker space in São Domingos de Rana, Cascais, with the following equipment:

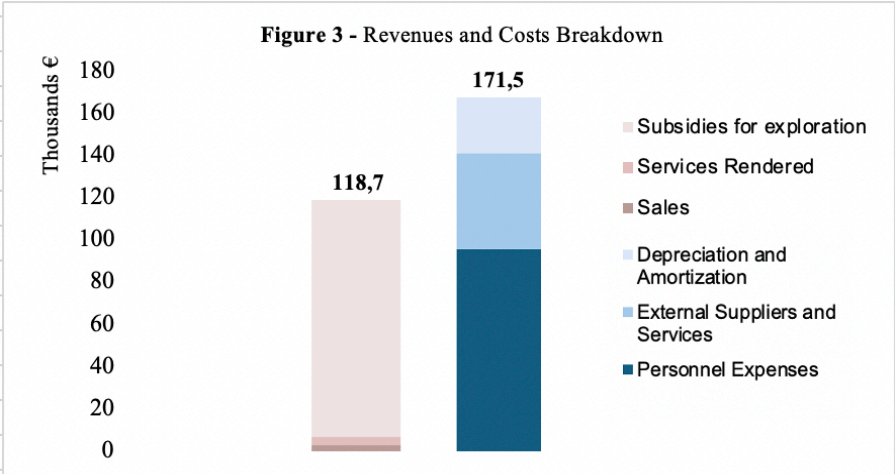
- 3D Printers: allow the transformation of any 3D digital design into real objects;
- Laser Cutting and Engraving Machine: digital manufacturing machine that works through wear, allowing the creation of physical pieces through vector drawing;
- CNC machine: digital manufacturing machine that works through mechanical wear;
- Vinyl Plotter: allows transforming vector drawings into vinyl stickers;
- Mechanical welding machine: allows joining metal pieces;
- Electronic soldering station: for soldering cables and forming electrical circuits;
- Webstudio: includes a computer, microphone, screen, lights and a chroma key backdrop, for creating videos, podcasts, filming (currently it is not being used).

The Change Makers' project was financed by European funds from 2021 to 2023, which allowed the organization to offer some free workshops for the community and for public schools, leading to high levels of participation and engagement especially in schools. However,

and since then, only two workshops were held for free, specifically for staff conducting extracurricular activities, subsidized by the Cascais City Council. Besides these two workshops, no more workshops were held for the community. One summer course for children and young people was offered but did not happen due to a lack of participants (likely because of late promotion and a high price). There were no more attempts to offer paid workshops to the community so far.

Change Makers’ Financial Performance

After an analysis of Change Makers’ financial statement for 2023 (Appendix 3), which demonstrates the accumulated total revenues and costs since the project was founded in 2021, total revenues of 118,731 € and total costs of 171,450 € were concluded, resulting in a negative balance of -52,719 € at the end of this year.



Legend: Change Makers’ total accumulated revenues by the end of 2023 are mainly operating subsidies, with sales and services rendered constituting only 5.7% of total revenue. Total accumulated expenses are mainly constituted by personnel expenses.

The figure above illustrates the accumulated revenues and costs breakdown for Change Makers by the end of 2023. Total revenues are divided into sales, services rendered and subsidies. Sales and services represent approximately 5.7% of total revenue, while subsidies constitute the remaining and substantial part of it (94.3%). Regarding the total costs, personnel costs constitute the largest expense category (57.3%) (Appendix 3). The resulting net loss at the end

of the year 2023 is attributed to the fact that the last tranches of project funding for that year had not been yet received, as they were only received in 2024.

As of 31 August 2024, the total recorded costs are 177,170€ and total revenue is 187,570€, which results in an overall positive balance of 10,401€ for the project at that date (Appendix 4). From this analysis it is possible to conclude that, similarly to NUCLIO, the Change Makers project is heavily reliant on subsidies, particularly from European Union funds, and that the total project's revenues only exceed total costs due to that. However, from 2024 onwards Change Makers is no longer expected to receive European funding, and hence diversifying revenue sources and seeking other sources of financial support becomes essential.

The next chapter will focus on analyzing the financial implications resulting from a developed value proposition, the need for subsidies will be evaluated, and final recommendations will be presented.

3. FINANCIAL ANALYSIS

A comprehensive financial analysis of Change Makers' is essential to assess its financial viability. While school workshops, community workshops, and equipment access and usage constitute the main revenue streams to consider, it is important to highlight that subsidies play a vital role in ensuring Change Makers' operational stability and financial sustainability.

3.1. Change Makers' Financial Aspects

An in-depth analysis of the main revenue streams and cost drivers is crucial, providing insights into whether Change Makers' can achieve financial sustainability independently or if it will require subsidies to maintain operations. The revenue streams and cost drivers will be analyzed for the three product offerings: school workshops, community workshops and equipment usage. It is important to mention that equipment usage' financials do not account for the required

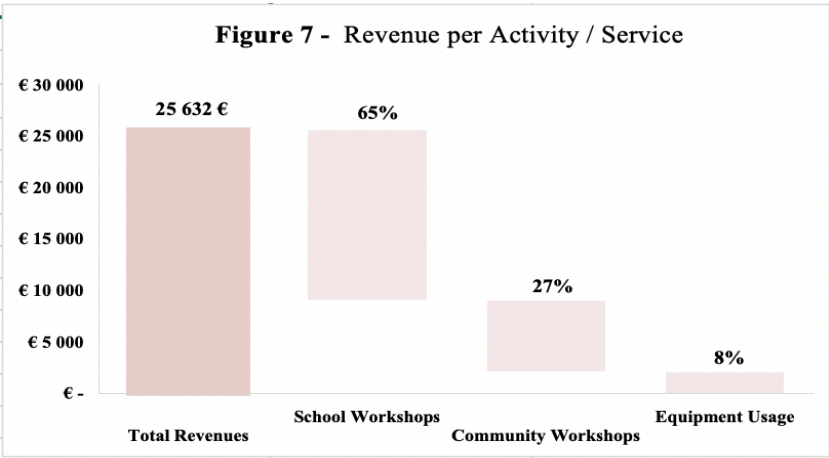
materials, since these are assumed to be brought by the users, focusing solely on the revenues coming from the usage of the machines itself.

Revenue Streams

The price for school workshops is 11€ per participant for every workshop. As for the community workshops, the Electronics and Programming workshops, *Introduction to 3D Modeling and Printing*, and *Engraving and Laser Cutting for Crafts* workshops have a price of 8€, while the *Create your LED Lamp* workshop is priced at 16€. It is very important to note that, to simplify the calculations and to reach a more accurate estimate of annual revenues, a weighted average price for community workshops was considered, in which the price for each workshop was weighted and multiplied by its planned distribution (translating the number of times each workshop is conducted in a year relative to the others, in which this distribution reflects the interest on each workshop assessed with a survey). Hence, a weight of 15% was assigned to the *Create your LED Lamp* workshop (priced at 16€), and 85% to the others (priced at 8€), resulting in a weighted average price per participant for community workshops of 9.20€, which reflects the mix of higher and lower-priced workshops. Lastly, for the equipment usage, it is assumed for calculations' simplification that machines are equally used throughout the year. Given the equipment usage prices defined, for calculating community workshops' annual revenues, a weighted average price per hourly usage of 5.25€ was concluded.

It is important to highlight that each school workshop is conducted for one class, corresponding to an average of 21 students (OECD 2024), and each community workshop has an assumed number of 15 participants, corresponding to the maximum optimal capacity per community workshop, allowing for personalized attention and hands-on engagement. Considering a maximum capacity scenario with the total number of school workshops, community workshops, and equipment usage hours that can be sold per year (72 school workshops, 50 community workshops and 400 hours for equipment usage), the figure below illustrates total annual revenue

when the full capacity is achieved, with the percentage of revenue that each activity/service represents.



Legend: School workshops represent the primary revenue stream, accounting for 65%, followed by community workshops (27%), while equipment usage only generates 8% of total revenue.

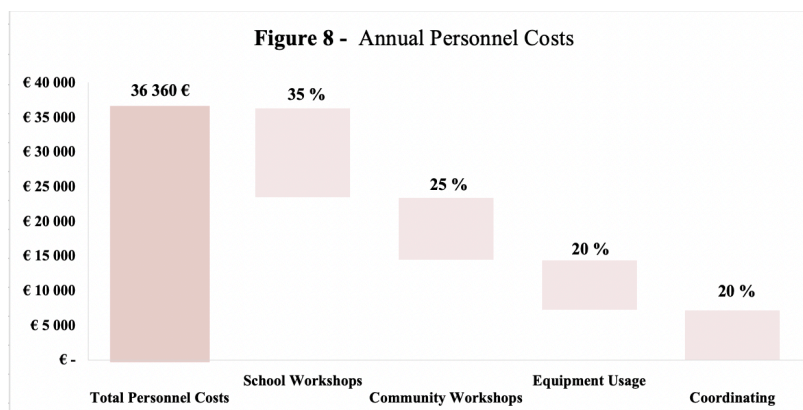
Main Costs

In respect to the main cost drivers, the analysis is focused on personnel costs (salaries and benefits), COGS mainly “raw materials” (corresponding to the supplies and resources needed for the workshops), marketing costs and maintenance costs. Since the Change Makers’ physical maker space is offered by the Parish Council of São Domingos de Rana, Change Makers does not have to pay any rent neither cover any utility costs (electricity, water, internet). As this support is expected to continue, these operational expenses will not be considered in Change Makers’ financials for the next years, with Change Makers’ being exempted from paying these costs.

In the next paragraphs, a detailed analysis of the previously mentioned costs will be provided. Personnel costs constitute the largest expense category. For the maximum capacity scenario, a total of 1010 operational hours result annually. These operational hours have a cost of 18€/h per staff member. Given the staff requirements, the total personnel costs for school workshops are 12,960€ per year (corresponding to 360 annual hours), for community workshops total

annual personnel costs amount to 9,000€ (250 annual hours) and equipment usage requires 7,200€ annually (400 annual hours).

Additionally, with an assigned cost of 36€/h, the personnel costs for the Change Makers' coordinator amount to 7,200€ annually, resulting in total annual personnel costs of 36,360€. The figure below shows annual personnel costs and the percentage of personnel costs allocated to each activity.



Legend: School workshops represent the highest personnel cost at 35%, followed by community workshops, and Equipment Usage and Coordinating account for 20 % of personnel costs each.

Concerning COGS, these vary between activities, with school workshops encompassing raw materials and transportation costs, whereas community workshops only include raw materials. Equipment usage does not incur any COGS (as the users are assumed to bring their own materials). Raw materials vary between each workshop. According to Change Makers, the raw materials' costs for school workshops, for an estimated number of 21 participants, are the following:

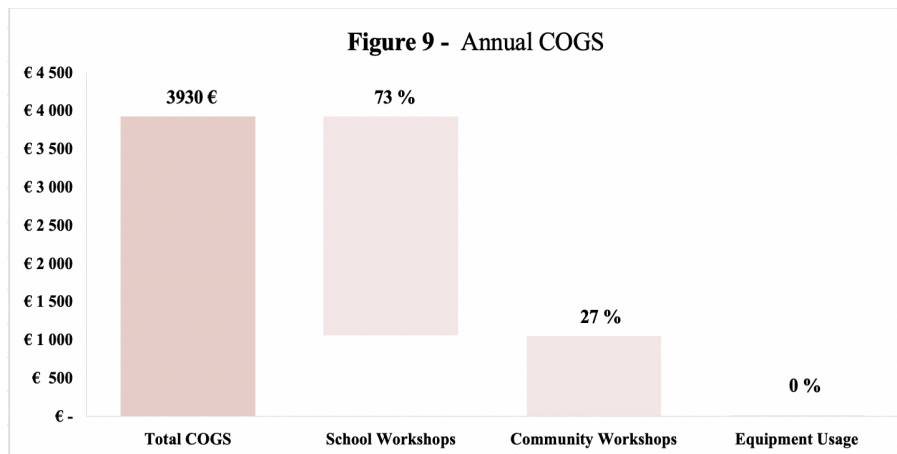
- Electronics and Programming workshops do not have any relevant raw material costs associated, as only an existing soldering station, electronic kits and computers are used;
- *Introduction to 3D Modeling and Printing* workshop has an estimated raw material cost of 7€ per workshop (corresponding to 3D printer filament);

- Creative Engineering workshops (*Painting Robots* and *Electric Car*) have an estimated raw material cost of 64€ per workshop.

Assuming that these 3 workshop categories are conducted approximately with the same planned distribution throughout the year (the same amount of times per year) and given the raw material cost per workshop for each workshop category, an average raw material cost of 24€ per school workshop is concluded. Additionally, the average transportation cost per school workshop is 16€, resulting from an average of 0,40€/km and 40 km of average round-trip distance to the schools. Hence, total COGS per school workshop amount to 40€ (Appendix 5).

Regarding the community workshops, the offer excludes Creative Engineering workshops and includes two additional workshops: *Engraving and Laser Cutting for Crafts* and *Create your LED Lamp*. With the raw material cost per workshop adjusted for 15 participants, for each of the workshops included in the community workshops' offering, an average COGS of 21€ per community workshop is considered (Appendix 6). To reach this value, a weighted average was computed by considering the planned distribution of community workshops, with this assumed distribution translating the interest in each of the workshops assessed with the survey.

Total COGS per year will vary depending on the number of workshops conducted, and for the maximum capacity scenario annual COGS for school workshops amount to 2,880€, while annual COGS for community workshops amount to 1,050€, resulting in total annual COGS of 3,930€ when full capacity is reached, as shown in the figure below.

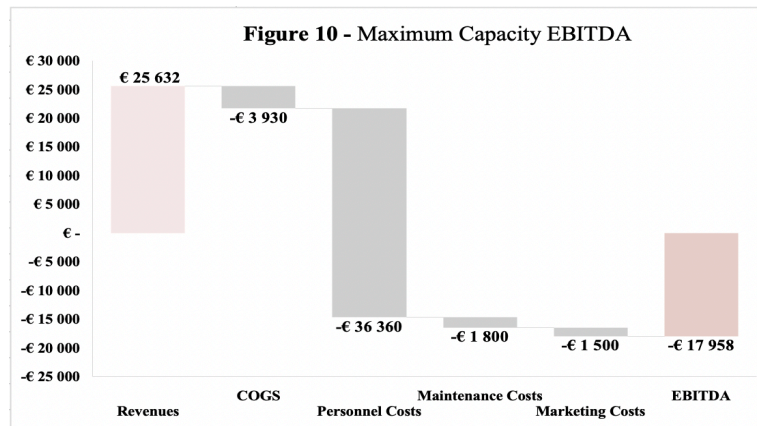


Legend: The activity with highest annual COGS is school workshops, representing 73% of total COGS, while community workshops represent 27%.

There are other relevant fixed costs to consider beyond the personnel costs, especially the maintenance costs and the marketing costs. Maintenance costs constitute the expenses incurred to keep the equipment in good operating conditions, and according to the Change Makers' financial records, these amount to 300€ for the 3D printers annually (100€ for each of the three 3D printers), 700€ for the CNC machine and for the Laser Cutter, and 100€ for the Vinyl Plotter, resulting in estimated total maintenance costs of 1,800€ annually.

Concerning marketing costs, these predominantly consist of online ads and brochures. Based on the Change Makers' costs in previous years for Meta platforms ads (considering that an ad for a post has an approximate cost of 20€ for Change Makers), 1,000€ in annual estimated costs are expected for online ads, with brochures accounting for 500€ annually, resulting in total estimated marketing costs of 1,500€ per year.

The comprehensive analysis of the revenue streams and main costs detailed above results in a profit and loss statement for Change Makers under the maximum capacity scenario (Appendix 7). The resulting EBITDA and its breakdown are shown in the figure below.



Legend: Change Makers' EBITDA in the maximum capacity scenario amounts to -17,958 €, with Personnel Costs as the main contributor for this negative value.

Therefore, it is possible to conclude that, even in a maximum capacity scenario, Change Makers would not achieve financial sustainability independently, highlighting the critical need for subsidies to maintain operations.

The next section will present Change Makers' cash flows over time across three different scenarios. This analysis is particularly relevant to conclude the minimum levels of financial support required.

3.2. Change Makers' Cash Flows Over Time

To estimate values for Change Makers' cash flows over time, the main cash inflows and cash outflows were analyzed. Cash inflows correspond to the revenues coming from school workshops, community workshops and equipment usage, while the analyzed costs: COGS, personnel costs, maintenance costs and marketing costs, constitute the main cash outflows.

For a period of 5 years, a scenario analysis was conducted. Scenario analysis involves the construction, in addition to the baseline, of two more scenarios based on optimistic and pessimistic forecasts (Andros et al. 2021, 242). These scenarios are created not to choose the most preferable from the scenarios and determine the effectiveness of the project by it, but to simultaneously consider all scenarios (Andros et al. 2021, 242). Within the three different

scenarios (an optimistic scenario, a baseline scenario, and a pessimistic scenario), different levels of achieved capacity in 5 years' time were assumed, and different yearly growth rates (YoY rates) for the workshops conducted and equipment usages were defined from the first year to the fifth year. Assumed numbers of workshops conducted and usages for the first year (implementation year) were also considered in each scenario.

Optimistic Scenario

The optimistic scenario constitutes a forward-looking projection that outlines a favorable outcome based on specific assumptions about the future (Fiveable n.d.).

In the optimistic scenario, 95% of Change Makers' maximum capacity is assumed to be achieved in the 5th year, corresponding to 68 school workshops, 48 community workshops and 380 hours of equipment usage annually. The values assumed for the implementation year (year 1), are defined as being approximately 63% of the year 5' values: 43 school workshops, 30 community workshops and 238 annual usages.

For the school workshops, it is important to understand the drivers behind these numbers, mainly regarding the number of schools implied. Assuming each school has on average 2 classes per grade level, and that when a school shows interest in the Change Makers' school workshops this interest is extended for an average of 2 grade levels, one school is implied behind a number of 4 school workshops. As a result, for this scenario, we are assuming that 11 schools are reached in the first year, and that in the fifth year this number amounts to 17 schools.

In this case, the YoY rate translates the growth in the number of school workshops conducted (which implies a certain number of schools reached annually), as well as the growth in community workshops conducted and equipment usages, with an assumed value of 20% for the second year, stabilizing at 10% for the third, fourth and fifth years, until reaching the fifth year'

final values. The associated CAGR from year 1 to year 5, which measures the average annual growth over this period, is 12%.

Given these assumptions for the optimistic scenario, resulting net cash flow values (calculated with the difference between total cash inflows and total cash outflows) were concluded for each year: -26,744 € in year 1, -24,161 € in year 2, -22,611 € in year 3, -20,906 € in year 4 and -19,043 € in year 5 (Appendix 8).

Baseline Scenario

The baseline scenario constitutes a more conservative scenario and represents the most likely or expected outcome. For this scenario, regarding school and community workshops, it is assumed that in 5 years' time 70% of the Change Makers' maximum capacity is achieved: 50 school workshops, corresponding to approximately 13 schools, and 35 community workshops conducted. As for the equipment usages achieved in the fifth year, an alternative approach was used to project a realistic number of usages for this baseline scenario: FabLab Lisboa's equipment usage data was analyzed, given its similar target audience and community focus, serving as a reasonable proxy for Change Makers' estimated demand.

In 2023, FabLab Lisboa recorded 493 total users accessing their space for equipment usage. Total users generated a total of 800 entries/usages throughout the year, since some users accessed the space multiple times, giving an average of approximately 1.6 usages per user annually. It is important to note that during this year, FabLab Lisboa had 75 open days (days destined for this equipment usage), resulting in an average of 6.57 users and 10.67 usages per day (FabLab Lisboa, interview, October 16, 2024). For Change Makers' projections, three adjustment factors were considered: the target population difference, a downward adjustment for the fact that Change Makers' equipment usage is not free as it is in FabLab Lisboa, and an upward adjustment accounting for the competitive landscape difference between municipalities. For the FabLab Lisboa's target population, 256,656 people aged 20-54 years

old in the municipality of Lisbon were considered (INE 2021). With a Change Makers' target population for this segment of 170,585, as described in chapter 3.3. *Target Market Segmentation*, it is possible to conclude that it constitutes 66.4% of FabLab Lisboa's target population. As for the second adjustment, as Change Makers' prices (as defined in chapter 4.1.3. *Equipment Access and Usage*) contrast with the FabLab Lisboa's free access, a downward adjustment of 40% was considered. This adjustment addresses price sensitivity, recognizing that the existence of costs often deters potential users who might have engaged with a free service, as it requires them to deliberate further on their willingness to pay (Cziehso, Schaefers and Kukar-Kinney 2019, 231; Shampanier, Mazar and Ariely 2007). However, the third adjustment partially offsets this downward adjustment. While Lisbon municipality has some Fab Labs that compete for the same target audience, as previously analyzed in chapter 3.2, Change Makers is the only one in the Cascais and Oeiras' municipalities, with a market exclusivity, hence an upward adjustment of 10% is considered.

By applying these adjustments to FabLab Lisboa's daily metrics (6.57 users and 10.67 entries/usages per day), Change Makers can expect approximately 2.9 users and 4.69 usages per day. Knowing that planned weekly activities would include one day for equipment access and usage, as described in 4.2. *Operational Capacity Planning* and that 50 days would be considered annually, Change Makers' values result in a total of 145 users and 235 one hour-usages assumed for the fifth year in this baseline scenario (with users assumed to maintain a similar pattern of 1.6 usages per user annually).

At the end of the first year, school workshops, community workshops and equipment usages are assumed to constitute 70% of the fifth-year values, amounting to 35 school workshops (with 9 schools reached), 24 community workshops and 162 equipment' usages. It is important to mention that the decision to consider this 70 % (7% higher than in the optimistic scenario) is justified by the fact that in this baseline scenario we are already being more conservative by

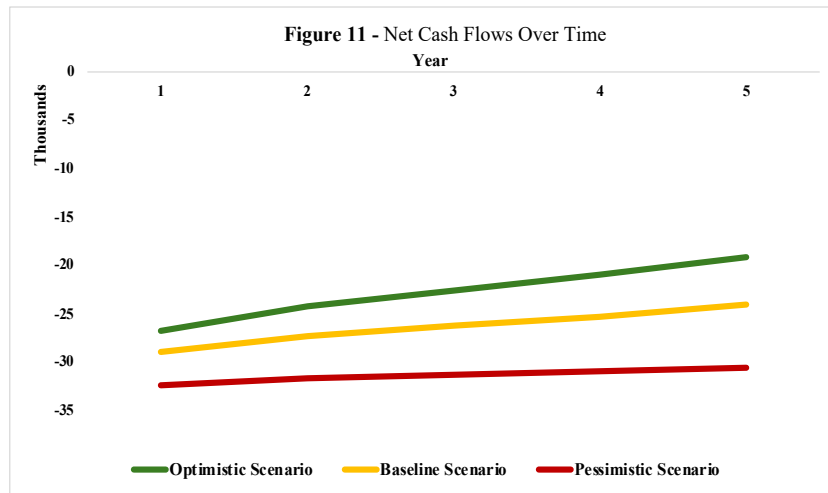
considering a lower percentage of the maximum capacity reached in the fifth year, hence the values assumed for the first year become realistically closer to the fifth-year values.

Regarding the YoY rates, the ramp-up speed for school workshops (with an implied number of schools reached) and community workshops conducted, as well as estimated equipment usages, will be lower than in the optimistic scenario, with an assumed growth rate of 15% for the second year, and 8% from the third to the fifth year. In this scenario, the resulting CAGR is 10%. The baseline scenario's resulting net cash flows for the five years will then be the following: -28,879 €, -27,262 €, -26,270 €, -25,199 € and -24,073 € (Appendix 9).

Pessimistic Scenario

The pessimistic scenario considers that in 5 years' time only 40% of the Change Makers' maximum capacity is achieved: 29 school workshops (representing approximately 7 schools reached), 20 community workshops and 160 equipment' usages per year. The first year' values are assumed to represent 80% of the fifth-year values: 23 school workshops (corresponding to approximately 6 schools reached), 16 community workshops and 126 usages annually. Once again, it is possible to note that as the scenarios become more conservative and pessimistic, the assumed values reached in the fifth year become lower, and the first-year values become closer to fifth year values. Workshops conducted and equipment usages are assumed to growth at a lower rate than in the previous scenarios, with an YoY rate of 10% in the second year, stabilizing at 5% in the remaining years. The associated CAGR for this scenario is approximately 6%. In this pessimistic scenario, the net cash flows reached for the first, second, third, fourth and fifth years are -32,410 €, -31,684 €, -31,286 €, -30,867 € and -30,536 €, respectively (Appendix 10).

The figure below shows Change Makers' net cash flows over time across the three different scenarios.



Legend: Although the optimistic scenario shows the steepest upward trajectory, all cash flows remain consistently negative across the three scenarios, with values ranging from -33,000 € to -19,000 €.

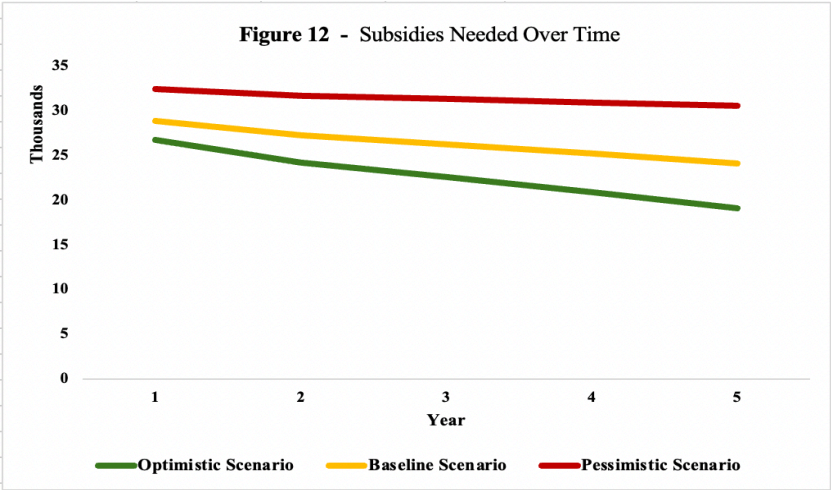
Lastly, it is important to note that Change Makers’ values correspond to a very low market penetration, primarily due to its limited maximum capacity.

To calculate the market penetration rates over the 5-years period for the three scenarios, the following methodology was applied: for the school workshops’ segment, the number of schools reached was divided by the number of potential schools. Regarding the community workshops, the number of participants reached was divided by the total target market size for the General Community interested in Lifelong learning, and for the equipment usage, total estimated Change Makers’ users were divided by the target market size for the maker community. To estimate total users, the number of usages was divided by the average of 1.6 usages per user (based on the data from FabLab Lisboa). The resulting market penetration rates are presented in Appendix 11, with very low values ranging from approximately 0% to 1.8% across the three scenarios.

3.3. The Vital Need for Subsidies

This section will focus on assessing Change Makers’ need for subsidies. Indeed, as stated at the end of section 5.1., even under its maximum capacity scenario Change Makers would not achieve financial sustainability on their own. With the scenario analysis performed in the

previous subchapter, the Change Makers’ urgent and vital need for subsidies is confirmed, as the annual net cash flow values are consistently negative across all the three different scenarios. Therefore, the need for subsidies in the different scenarios presented will be analyzed. The objective is to adopt a realistic perspective on Change Makers’ dependency on subsidies and to provide an accurate estimation of the financial support required.



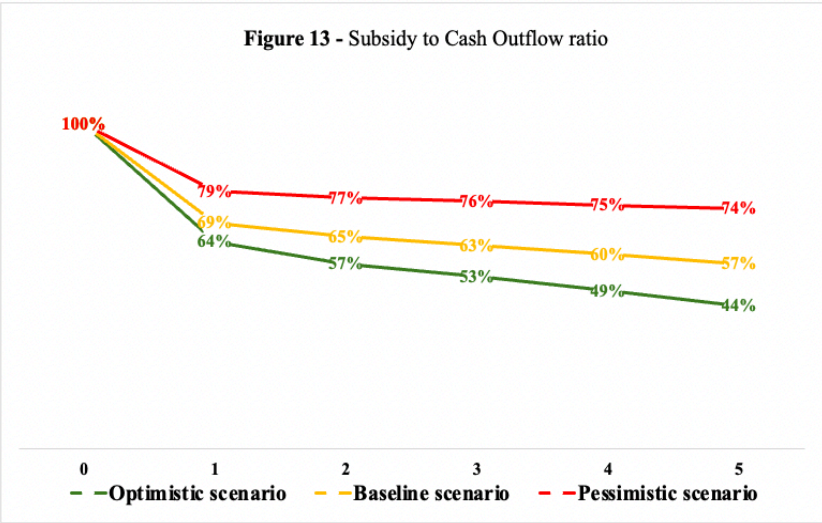
Legend: The need for subsidies decreases over time in each scenario, with values ranging from 19,000€ to 33,000 € (symmetric of the cash flows trend shown in the previous figure).

As a general initial analysis and based on the figure 12, it is possible to see that the annual subsidy requirements across all scenarios range between 19,000 € and 33,000 €. In particular, the optimistic scenario shows a range of 19,000 € to 27,000 € over the years; the baseline scenario ranges from 24,000 € to 29,000 €; and the pessimistic scenario ranges between 30,000 € and 33,000 €. Note that these ranges correspond to the subsidies required in year 5 compared to year 1 within each scenario.

Thus, and as expected, the need for subsidies is higher in the pessimistic scenario, followed by the baseline scenario, and lower in the optimistic scenario (as these values reflect the symmetry of the cash flows associated with each scenario presented in the previous section). Finally, it is also possible to observe that all the 3 scenarios show an improvement over the 5-year timeline, with the level of subsidies required decreasing over time in each scenario.

Change Makers' Subsidies Dependency

To analyze the dependency of Change Makers on subsidies, a subsidy to cash outflow ratio was calculated to determine the minimum percentage of cash outflows that needs to be covered by subsidies. This metric is particularly relevant for assessing the financial sustainability of Change Makers, as its non-profit nature and community-focused mission make it highly reliant on external financial support. The figure below shows the subsidy to cash outflow ratio for the three different scenarios over time.



Legend: Subsidy to Cash Outflow ratio is decreasing over time for each scenario, with the baseline scenario reaching in year 5 a ratio of 57%.

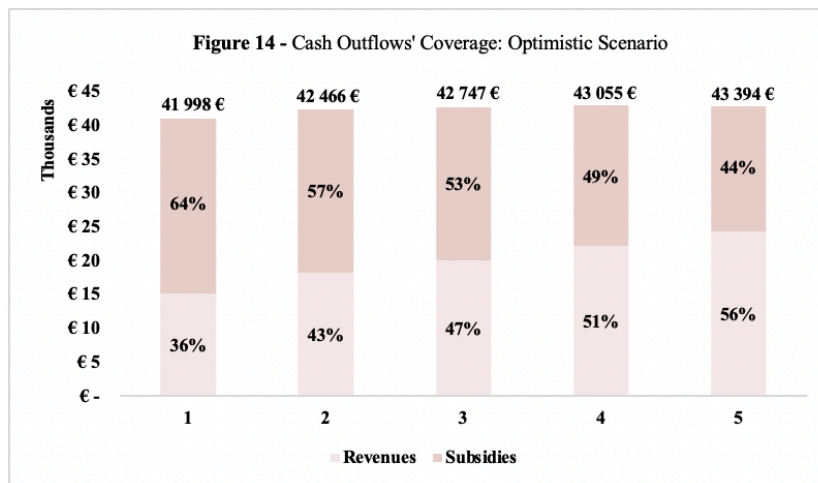
Note that the starting point of the graph reflects the current situation of Change Makers, in which it is basically entirely funded by subsidies. As it is possible to observe from the graph, across all three scenarios, Change Makers is expected to reduce its dependency on subsidies by lowering the percentage of cash outflows covered through such support:

- In the optimistic scenario, the reliance on subsidies to cover cash outflows decreases to 64% in year 1, reaching a value of 44% in year 5.
- In the baseline scenario, the dependency on subsidies to cover cash outflows would be 69% in year 1, reducing progressively to 57% until year 5.

- In the pessimistic scenario, the dependency on subsidies to cover cash outflows decreases to 79% in year 1 and is expected to further decline to 74% until year 5.

This reduction in the dependency on subsidies should be analyzed within the broader context of what enables it, which is the increase in the proportion of cash outflows covered by Change Makers' revenues. Indeed, as previously stated, the project is not feasible without a minimum level of subsidies, and, as such, the combination of revenues and subsidies must, at least, cover the cash outflows for Change Makers to continue operations. It is important to note that as revenues grow at a higher rate than total cash outflows over the years, the dependency on subsidies will decrease.

Regarding the optimistic scenario, the figure below illustrates cash outflows coverage, showing the relationship between the level of revenues and subsidies over the 5-years period.

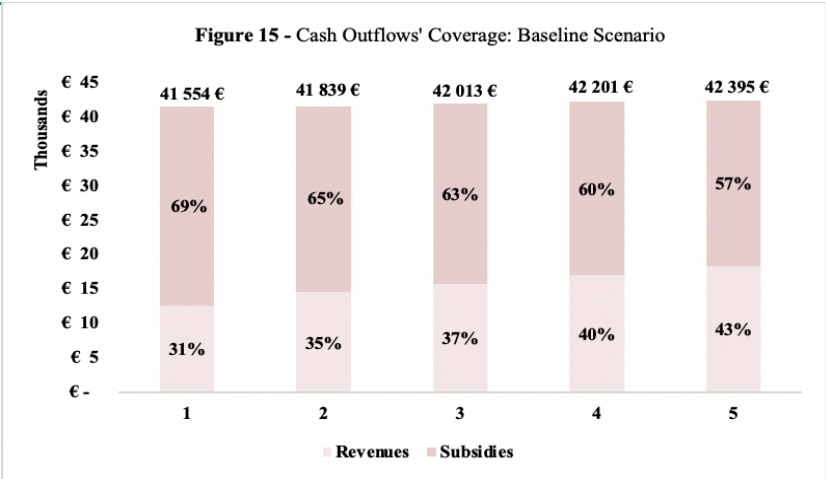


Legend: In the optimistic scenario, revenues are covering a higher percentage of Cash Outflow each years, reaching a proportion of 56% in year 5.

It is easy to observe this dynamic of cash outflows being supported by both a minimum level of subsidies and a certain level of revenues. In this scenario, in year 1, revenues would cover only 36% of cash outflows, but would progressively grow to cover more than a half (56%) of Change Makers' cash outflows in year 5. The figure demonstrates clearly how, over time,

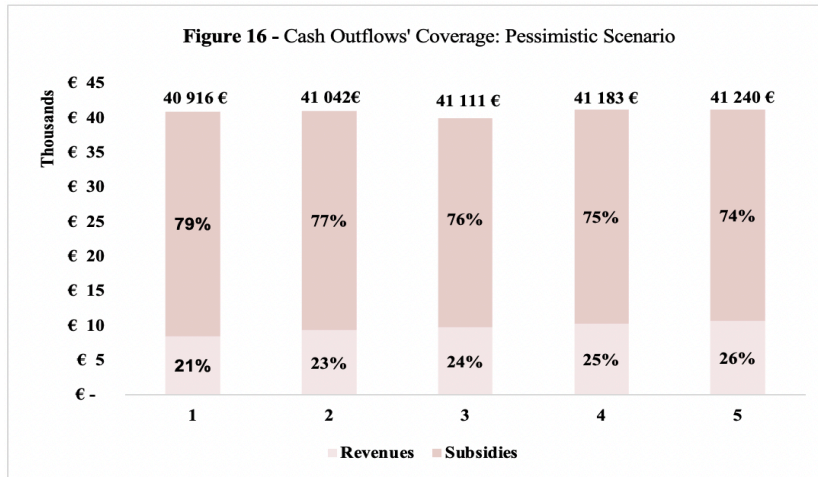
revenues increase at a faster rate than total cash outflows, covering each year a higher percentage of them.

Similarly, for the baseline scenario, in the figure below the same trends can be observed, with revenues covering 31% of total cash outflows in year 1 and increasing this coverage to 43% by year 5. While in this scenario revenues would not cover such a high percentage of cash outflows as in the previously presented scenario, they would still account for a significant proportion, constantly increasing over time.



Legend: Revenues in the baseline scenario are each year covering a higher percentage of Cash Outflows, with a proportion ranging from 31 % in year 1 to 43 % in year 5.

Finally, in the pessimistic scenario, the percentage of cash outflows covered by revenues, rises from 21% in year 1 to 26% in year 5. However, revenues would never cover more than 30% of cash outflows, indicating a higher and substantial dependence on subsidies. Additionally, it is important to note that while this dependency decreases over time, the improvement is far less pronounced when compared to the other two scenarios. Still, this scenario would represent a progress when compared to the current situation, where cash outflows are entirely supported by subsidies. The cash outflows coverage for this scenario can be seen in the figure below.



Legend: In the pessimistic scenario, revenues cover 21% of total cash outflows in year 1, slightly increasing over time and reaching a proportion of 26% in year 5.

In summary, the previous analysis demonstrates an expected improvement in self-sufficiency under all scenarios. Still, a significant proportion of subsidies - never less than 40%, even in the optimistic scenario - would be required to cover Change Makers' total cash outflows. Thus, while this analysis presents a hopeful outlook towards a more sustainable future, it also underscores Change Makers' critical and constant need for subsidies.

As a final regard, it is relevant to note that a potential source of funding for these subsidies would be the Cascais City Council, as this entity has demonstrated a consistent interest in supporting education-focused projects for the community (Câmara Municipal de Cascais 2023). In particular, the Cascais City Council has even funded other NUCLIO's initiatives in the past. Having this in mind, a meeting with the Cascais City Council Councilor (Councilor, meeting, November 22, 2024), responsible for Employment, Entrepreneurship and Youth, was conducted. The main objective of this meeting was to have an idea of how possible or realistic the required minimum level of subsidies would be. Thus, during the meeting, the estimated range of subsidies needed was presented to understand whether these amounts would be considered viable. The conclusion taken from the meeting was that there was a positive and open attitude on their side regarding a potential support for the project. Nonetheless, Change

Makers should further establish communication with the Cascais City Council to discuss the project more thoroughly.

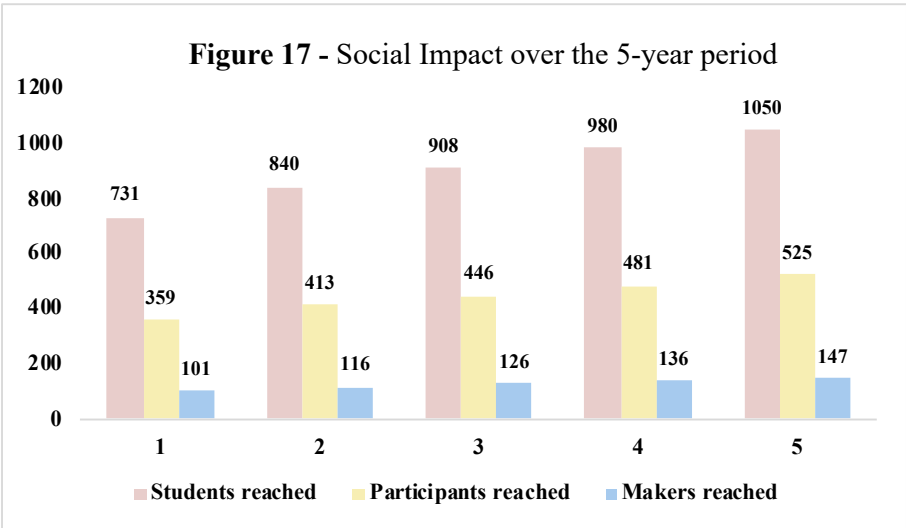
4. FINAL RECOMMENDATIONS AND CONCLUSION

Social Impact

The comprehensive financial analysis presented above, demonstrating a sustained need for subsidies, must be viewed through the lens of Change Makers’ fundamental purpose as a non-profit organization project. This persistent need should not be seen as a failure but rather as an inherent aspect of Change Makers’ social mission.

“The NPOs differs fundamentally from the POs because of the reason for existence and social mission. (...) Against to POs, the first aim of NPOs is not financial, it is about to realize the social requests, to accomplish social needs/goals and to pursue social public welfare” (Ayyildiz, Akmermer and Akyüz 2017, 181).

By looking at the baseline scenario’s projected reach over the 5-year period, Change Makers’ social impact in terms of numbers can be concluded (Appendix 12). The figure below summarizes this impact for the three value propositions:



Legend: Students reached show the highest numbers with a value of 1050 for the fifth year, followed by community workshops’ participants.

The school workshops' total reach for the 5-year period of approximately 4,509 students fulfills Change Makers' mission of innovating in education, by gaining access to hands-on STEAM experiences and fostering key skills for a more educated and sustainable future. Through community workshops, Change Makers advances its goal of community empowerment, with a total of 2,224 participants over the 5 years being offered opportunities to develop practical skills and innovative thinking, contributing to lifelong learning. Lastly, by providing approximately 626 users/makers with equipment' access and usage, Change Makers enables citizens to raise their voices through tangible innovation, transforming creative ideas into solutions that may benefit the community. This impact demonstrates that subsidies are not only a necessity but a justified investment for Change Makers' social impact.

Recommendations

During this project, we have proposed several changes, suggestions, and recommendations that we believe would add significant value to the Change Makers project.

First, and as we have explained during the project, it is our recommendation that Change Makers charges for both community and school workshops, including those offered to private and public schools. While we acknowledge and respect Change Makers' objective of providing educational experiences in the most accessible way for everyone, the reality is that for the project to become more financially sustainable, it must consider implementing this change.

Secondly, as outlined in the value proposition chapter, we propose implementing a structured weekly schedule, which allocates specific days and times for each type of activity. We believe that this would enable Change Makers to maintain operational efficiency and avoid potential conflicts between different user groups. It is important to note that in formulating this suggestion, we considered insights from FabLab Lisboa, which detailed that such a system makes it easier for both the organization and its users to plan and organize their time effectively.

Moreover, we highly recommend that Change Makers enhances its website and social media platforms, more specifically, Facebook and Instagram. With these digital platforms containing specific sections dedicated to school workshops, community workshops, and equipment usage in the maker space, Change Makers can better and more clearly communicate its message and offerings to its different target segments.

Additionally, and regarding strategic differentiation, we recommend a focus on the offer of both school and community workshops. After the comprehensive analysis of the relevant benchmarks and with the value proposition developed, we conclude that workshops represent a unique offering in which Change Makers can differentiate itself the most. However, if there is a need for Change Makers to concentrate on a specific target segment, we suggest focusing on school workshops' target segment, the school community. This recommendation comes mainly from financial insights, as the analysis of the projected cash flows indicates that a very significant part of revenues would be generated from these workshops.

Lastly, as a final suggestion, we strongly recommend that Change Makers prioritize securing subsidies or other forms of financial support. As previously stated, we have already engaged with Cascais City Council, which is informed about the project and appeared open to it, and, as such, we recommend establishing contact with them. However, we also suggest seeking additional sources of support, as the project's success and sustainability depend on securing a minimum level of subsidies.

Conclusion

This thesis addressed the key question: "How can Change Makers adapt to improve its educational and community impact while ensuring financial sustainability?". The value proposition chapter examined in detail how should Change Makers be adapted, while the financial analysis chapter revealed that Change Makers requires subsidies to ensure financial sustainability, with insufficient revenue streams to cover total cash outflows.

The success of Change Makers' project will depend on its ability to secure subsidies and financial support, and on how it implements the recommendations developed throughout this project. By securing subsidies and following these recommendations, Change Makers can improve its educational and community impact and may become a standout project, empowering both the educational and general community especially in the Cascais and Oeiras areas.

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6. APPENDIXES

Appendix 1 – NUCLIO’s Income Statements for the Last 4 Years

Income Statement	2020	2021	2022	2023
Sales and Services provided	400	1290	5574	40841
Subsidies, donations and legacies for exploration	224122	474251	600207	704536
External Suppliers and Services	-58199	-102518	-166924	-327002
Personnel expenses	-202962	-221185	-327370	-383124
Other expenses and losses	-8	-10	-9	-10
EBITDA	-36648	151828	111478	35240
Depreciation and Amortization	-1479	-9859	-10839	-10602
EBIT	-38126	141969	100639	24638
EBT	-38126	141969	100639	24638
Net Income	-38126	141969	100639	24638

Appendix 2 – NUCLIO’s Active Projects and Ongoing Initiatives

geral@nuclio.org Subscribe to our Newsletter Contacts Privacy Policy




















NUCLIO Home About Us What we do News Media

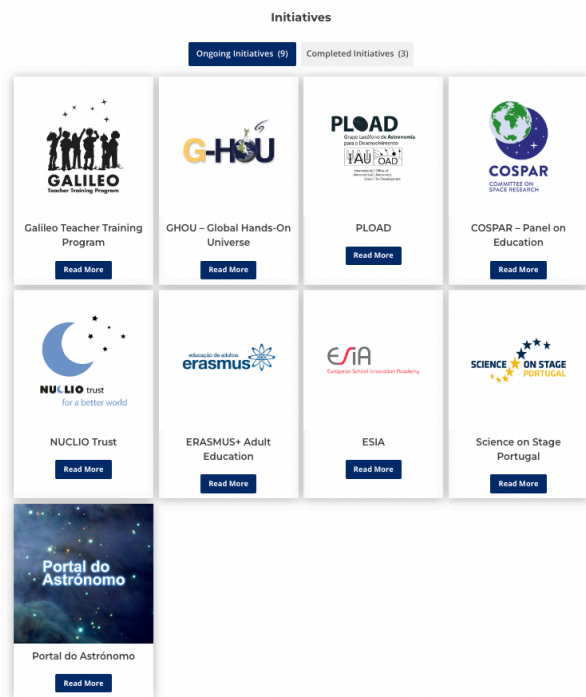
Projects

NUCLIO develops and actively participates in important national and international projects in the field of education, with strong connections with schools, teachers and students. NUCLIO is also involved in coordinating and/or participating in initiatives related to education, development, and outreach.

GET INVOLVED IN OUR ONGOING PROJECTS

Active Projects (19) Completed Projects (37)

 Change Makers Read More	 DOME Read More	 ASSESS Read More	 SoundScapes Read More
 EARN Read More	 Open Teach C-Hub Read More	 TD3C Read More	 EXPLORE Read More
 StAnD Read More	 GEO-Academy Read More	 Synapses Read More	 Bio-Streams Read More
 SLEAD Read More	 OTTERS Read More	 Discovery Space Read More	 AstronoMine Read More
 CIC-PoLIT Read More	 IASC - Asteroid Search Campaigns Read More	 Surrounded by Science Read More	



Appendix 3 - Change Makers' Financial Statement (Balancete) 2023

Balancete Change Makers 2023		
Sales	€	3 081
Services Rendered	€	3 720
Total Sales and Services Rendered	€	6 801
Subsidies for exploration	€	111 931
Total Revenues	€	118 731
Personnel Expenses	€	98 226
External Suppliers and Services	€	46 390
Depreciation and Amortization	€	26 835
Total Expenses	€	171 450
Net Balance	-€	52 719

Appendix 4 - Change Makers' Financial Statement (Balancete) as of August 31, 2024

Balancete Change Makers 2024 (as of August 31)		
Total Revenues	€	187 570
Total Expenses	€	177 170
Net Balance	€	10 401

Appendix 5 –Average COGS per School Workshop

School Workshops - COGS (RM costs and transportation costs)		
Electronics and Programming Workshops	€	-
Introduction to 3D Modeling and Printing Workshop	€	7
Creative Engineering Workshops	€	64
Average RM Cost per workshop *	€	24
Transportation Cost per workshop	€	16
Average COGS per workshop	€	40

**assuming the 3 workshop categories are conducted with the same planned distribution (the same amount of times per year)*

Appendix 6 – Weighted Average COGS per Community Workshop

Community Workshops - COGS (RM costs)		
Electronics and Programming Workshops	€	-
Introduction to 3D Modeling and Printing Workshop	€	5,25
Engraving and Laser Cutting for Crafts Workshop	€	7,50
Create your Led Lamp Workshop	€	115
Average COGS per workshop *	€	21

**assuming that each workshop planned distribution corresponds to the interest assessed with the survey*

Appendix 7 – Profit and Loss Statement under the Maximum Capacity Scenario

Profit and Loss Statement - Maximum Capacity Scenario		
Revenues	€	25 632
<i>School Workshops</i>	€	16 632
<i>Community Workshops</i>	€	6 900
<i>Equipment Usage</i>	€	2 100
COGS	€	3 930
<i>School Workshops</i>	€	2 880
<i>Community Workshops</i>	€	1 050
<i>Equipment Usage</i>	€	-
Gross Profit	€	21 702
Human Resources Costs	€	36 360
<i>School Workshops</i>	€	12 960
<i>Community Workshops</i>	€	9 000
<i>Equipment Usage</i>	€	7 200
<i>Coordinating</i>	€	7 200
Maintenance Costs	€	1 800
Marketing Costs	€	1 500
EBITDA	-€	17 958

Appendix 8 – Cash Flows Over Time: Optimistic Scenario

CASH FLOW							
OPTIMISTIC SCENARIO - 95% MAXIMUM CAPACITY							
	0	1	2	3	4	5	
CASH INFLOWS	€ -	€ 15 254	€ 18 305	€ 20 136	€ 22 149	€ 24 350	
<i>School Workshops</i>	€	€ 9 875	€ 11 850	€ 13 035	€ 14 339	€ 15 800	
Number of schools		11	13	14	16	17	
Number of workshops		43	51	56	62	68	
Average price per workshop (per participant)	€	€ 11,00	€ 11,00	€ 11,00	€ 11,00	€ 11,00	
<i>Community Workshops</i>	€	€ 4 130	€ 4 956	€ 5 451	€ 5 996	€ 6 555	
Number of workshops		30	36	40	43	48	
Average price per workshop (per participant)	€	€ 9,20	€ 9,20	€ 9,20	€ 9,20	€ 9,20	
<i>Equipment Usage</i>	€	€ 1 249	€ 1 499	€ 1 649	€ 1 814	€ 1 995	
Number of usages		238	286	314	346	380	
Average price per usage	€	€ 5,25	€ 5,25	€ 5,25	€ 5,25	€ 5,25	
CASH OUTFLOWS	€	€ 41 998	€ 42 466	€ 42 747	€ 43 055	€ 43 394	
Total COGS	€	€ 2 338	€ 2 806	€ 3 087	€ 3 395	€ 3 734	
<i>School Workshops</i>	€	€ 1 710	€ 2 052	€ 2 257	€ 2 483	€ 2 736	
Number of workshops		43	51	56	62	68	
Average COGS per workshop	€	€ 40,00	€ 40,00	€ 40,00	€ 40,00	€ 40,00	
<i>Community Workshops</i>	€	€ 628	€ 754	€ 830	€ 912	€ 998	
Number of workshops		30	36	40	43	48	
Average COGS per workshop	€	€ 21,00	€ 21,00	€ 21,00	€ 21,00	€ 21,00	
<i>Equipment Usage</i>	€	-	-	-	-	-	
Personnel Costs	€	€ 36 360	€ 36 360	€ 36 360	€ 36 360	€ 36 360	
Maintenance Costs	€	€ 1 800	€ 1 800	€ 1 800	€ 1 800	€ 1 800	
Marketing Costs	€	€ 1 500	€ 1 500	€ 1 500	€ 1 500	€ 1 500	
NET CASH FLOW	-€	€ 26 744	-€ 24 161	-€ 22 611	-€ 20 906	-€ 19 043	
Cumulative CF	€	-€	-€ 26 744	-€ 50 905	-€ 73 516	-€ 94 422	€ 113 466
YOY rates			20%	10%	10%	10%	

Appendix 9 - Cash Flows Over Time: Baseline Scenario

CASH FLOW							
BASELINE SCENARIO - 70% MAXIMUM CAPACITY							
	0	1	2	3	4	5	
CASH INFLOWS	€	€ 12 675	€ 14 577	€ 15 743	€ 17 002	€ 18 323	
<i>School Workshops</i>	€	€ 8 039	€ 9 245	€ 9 984	€ 10 783	€ 11 550	
Number of schools		9	10	11	12	13	
Number of workshops		35	40	43	47	50	
Average price per workshop (per participant)	€	€ 11,00	€ 11,00	€ 11,00	€ 11,00	€ 11,00	
<i>Community Workshops</i>	€	€ 3 786	€ 4 354	€ 4 702	€ 5 079	€ 5 539	
Number of workshops		24	28	30	32	35	
Average price per workshop (per participant)	€	€ 10,55	€ 10,55	€ 10,55	€ 10,55	€ 10,55	
<i>Equipment Usage</i>	€	€ 851	€ 978	€ 1 056	€ 1 141	€ 1 234	
Number of usages		162	186	201	217	235	
Average price per usage	€	€ 5,25	€ 5,25	€ 5,25	€ 5,25	€ 5,25	
CASH OUTFLOWS	€	€ 41 554	€ 41 839	€ 42 013	€ 42 201	€ 42 395	
Total COGS	€	€ 1 894	€ 2 179	€ 2 353	€ 2 541	€ 2 735	
<i>School Workshops</i>	€	€ 1 392	€ 1 601	€ 1 729	€ 1 867	€ 2 000	
Number of workshops		35	40	43	47	50	
Average COGS per workshop	€	€ 40,00	€ 40,00	€ 40,00	€ 40,00	€ 40,00	
<i>Community Workshops</i>	€	€ 502	€ 578	€ 624	€ 674	€ 735	
Number of workshops		24	28	30	32	35	
Average COGS per workshop	€	€ 21,00	€ 21,00	€ 21,00	€ 21,00	€ 21,00	
<i>Equipment Usage</i>	€	-	-	-	-	-	
Personnel Costs	€	€ 36 360	€ 36 360	€ 36 360	€ 36 360	€ 36 360	
Maintenance Costs	€	€ 1 800	€ 1 800	€ 1 800	€ 1 800	€ 1 800	
Marketing Costs	€	€ 1 500	€ 1 500	€ 1 500	€ 1 500	€ 1 500	
NET CASH FLOW	-€	€ 28 879	-€ 27 262	-€ 26 270	-€ 25 199	-€ 24 073	
Cumulative CF	€	-€	-€ 28 879	-€ 56 141	-€ 82 411	-€ 107 610	€ 131 682
YOY			15%	8%	8%	8%	

Appendix 10- Cash Flows Over Time: Pessimistic Scenario

CASH FLOW							
PESSIMISTIC SCENARIO - 40% MAXIMUM CAPACITY							
	0	1	2	3	4	5	
CASH INFLOWS	€	8 507 €	9 357 €	9 825 €	10 316 €	10 704 €	
School Workshops	€	5 313 €	5 844 €	6 137 €	6 443 €	6 699 €	
Number of schools		6	6	7	7	7	
Number of workshops		23	25	27	28	29	
Average price per workshop (per participant)	€	11,00 €	11,00 €	11,00 €	11,00 €	11,00 €	
Community Workshops	€	2 532 €	2 785 €	2 924 €	3 071 €	3 165 €	
Number of workshops		16	18	18	19	20	
Average price per workshop (per participant)	€	10,55 €	10,55 €	10,55 €	10,55 €	10,55 €	
Equipment Usage	€	662 €	728 €	764 €	802 €	840 €	
Number of usages		126	139	146	153	160	
Average price per usage	€	5,25 €	5,25 €	5,25 €	5,25 €	5,25 €	
CASH OUTFLOWS	€	40 916 €	41 042 €	41 111 €	41 183 €	41 240 €	
Total COGS	€	1 256 €	1 382 €	1 451 €	1 523 €	1 580 €	
School Workshops	€	920 €	1 012 €	1 063 €	1 116 €	1 160 €	
Number of workshops		23	25	27	28	29	
Average COGS per workshop	€	40,00 €	40,00 €	40,00 €	40,00 €	40,00 €	
Community Workshops	€	336 €	370 €	388 €	407 €	420 €	
Number of workshops		16	18	18	19	20	
Average COGS per workshop	€	21,00 €	21,00 €	21,00 €	21,00 €	21,00 €	
Equipment Usage	€	- €	- €	- €	- €	- €	
Personnel Costs	€	36 360 €	36 360 €	36 360 €	36 360 €	36 360 €	
Maintenance Costs	€	1 800 €	1 800 €	1 800 €	1 800 €	1 800 €	
Marketing Costs	€	1 500 €	1 500 €	1 500 €	1 500 €	1 500 €	
NET CASH FLOW	-€	32 410 -€	31 684 -€	31 286 -€	30 867 -€	30 536 -€	
Cumulative CF	€	-€	32 410 -€	64 094 -€	95 380 -€	126 247 -€	156 783
YOY			10%	5%	5%	5%	

Appendix 11– Market Penetration Rates for Change Makers

Market Penetration Rates					
	1	2	3	4	5 MP = N° Schools/Total Schools
School Community					
Optimistic Scenario	1,1%	1,3%	1,5%	1,6%	1,8% 972
Baseline Scenario	0,9%	1,0%	1,1%	1,2%	1,3% *Using 972 total potential schools, as per Chapter 3.3.
Pessimistic Scenario	0,6%	0,7%	0,7%	0,7%	0,7%
General Community					
Optimistic Scenario	0,1%	0,1%	0,2%	0,2%	0,2% 376 074
Baseline Scenario	0,1%	0,1%	0,1%	0,1%	0,1% *Using 376 074 total potential lifelearners, as per Chapter 3.3
Pessimistic Scenario	0,1%	0,1%	0,1%	0,1%	0,1%
Maker Community					
Optimistic Scenario	0,1%	0,1%	0,1%	0,1%	0,1% 170 585
Baseline Scenario	0,1%	0,1%	0,1%	0,1%	0,1% *Using 170 585 total potential individuals, as per Chapter 3.3
Pessimistic Scenario	0,0%	0,1%	0,1%	0,1%	0,1%

Appendix 12- Social Impact for the Baseline Scenario

SOCIAL IMPACT - BASELINE SCENARIO					
	1	2	3	4	5 TOTAL (over the 5-year period)
Number of school workshops	35	40	43	47	50 215
Students reached	731	840	908	980	1050 4509
Number of community workshops	24	28	30	32	35 148
Participants reached	359	413	446	481	525 2224
Makers reached*	101	116	126	136	147 626

*calculated by dividing the number of usages by the average usages of 1,6 per user annually