

E-Pescados: Financial Education using an application that helps the economic dynamics of fishing communities

Abstract: In this paper, we present a discussion of the results of the pedagogical strategies resulting from the master's research entitled *Financial Education in High School from the point of view of a fisherman teacher from Salinas da Margarida, Bahia*. The methodology used was participant-based, applied, qualitative research. The data was collected through the accounts and experiences of the fishermen students in the classes of elective component I — *Financial Education Network: Fishing Dreams*, recorded in the tide diaries and, as an analysis procedure, content analysis was used. The aim of this paper is to present pedagogical strategies for teaching Financial Education in High School, based on the economic dynamics of the fishing communities in the municipality of Salinas da Margarida, Bahia.

Keywords: Fishing Community. Financial Education. E-Pescados. Application.

E-Pescados: Educación Financiera con el uso de aplicaciones que ayudan en la dinámica económica de las comunidades pesqueiras

Resumen: En este trabajo, presentamos una discusión de los resultados de las estrategias pedagógicas, resultantes de la investigación de maestría titulada *Educación Financiera en la Enseñanza Media desde el punto de vista de un profesor pescador de Salinas da Margarida, Bahia*. La metodología utilizada fue la investigación participativa, aplicada y cualitativa. Los datos fueron recolectados a través de los relatos y experiencias de los alumnos pescadores, en las clases del componente electivo I — *Red de Educación Financiera: Pescando Sueños*, registrados en los diarios de marea y, como procedimiento de análisis, se utilizó el análisis de contenido. El objetivo de este trabajo es presentar estrategias pedagógicas para la enseñanza de la Educación Financiera en la enseñanza media, a partir de la dinámica económica de las comunidades de pescadores del municipio de Salinas da Margarida, Bahía.



Palabras clave: Comunidad Pesquera. Educación Financiera. E-Pescados. Aplicación.

E-Pescados: Educação Financeira com o uso de aplicativo que auxilia nas dinâmicas econômicas das comunidades pesqueiras



Resumo: Neste trabalho, apresentamos a discussão dos resultados das estratégias pedagógicas, decorrente da pesquisa de mestrado intitulada *Educação Financeira no Ensino Médio sob o olhar de um professor pescador de Salinas da Margarida Bahia*. Como metodologia, utilizou-se a pesquisa participante, aplicada, de natureza qualitativa. Os dados foram coletados por meio dos relatos e vivências dos alunos pescadores nas aulas da componente eletiva I — *Rede de Educação Financeira: Pescando Sonho*, registrados nos diários da maré e, como procedimento de análise, utilizou-se a análise de conteúdo. O objetivo deste trabalho é apresentar estratégias pedagógicas para o ensino de Educação Financeira no Ensino Médio, a partir das dinâmicas econômicas das comunidades de pescadores do município de Salinas da Margarida, Bahia.

Palavras-chave: Comunidade de Pescadores. Educação Financeira. E-Pescados. Aplicativo.

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Article

1 Introduction

Salinas da Margarida has excellent natural beauty, a variety of delicacies, religious, cultural and artistic events, but without a doubt, the simple, welcoming and hospitable people are its greatest asset.

The city's first name comes from salt, which is responsible for giving food its flavor. In the city, salt is at the heart of the people, who suffer but resist, who find their daily sustenance in the tide, regardless of whether it's sunny or rainy, since that's where their food comes from.

The fishermen and shellfish gatherers leave at dawn to work, without having a time to return, they come back without having a time to rest, they rest while continuing their work and so another stage begins: treating the fish, scalding and collecting the shellfish, as well as going into the woods to gather firewood. This town bears the mark of strong women, women warriors, women heads of families who support their homes.

According to Sulzart *et al.* (2021, p. 32), “everyone in Salinas da Margarida is enveloped by the sea, even the air of the town, humid and full of saltiness, dictates life and health”. Salt has always been the hallmark of the people of Salinas da Margarida; it gives them flavor, meaning and the strength to continue carrying out their age-old activity of resistance and subsistence.

It is clear that the routine in Salinas da Margarida has its essence in the sea, because everything comes from it or converges towards it. Most of the human activities carried out in the municipality are centered on the sea, the beach and the mangrove swamp, because it is from these spaces that most families derive their livelihoods. The sea is also sacred territory for maintaining the religiosity of the people of Salina, as well as for moments of meetings and farewells. It is therefore a space of resistance, ancestry and tradition.

With this in mind, Skovsmose (2001) argues that the curriculum for high school students belonging to fishing communities in Salinas da Margarida/Ba should include content that can make connections between reality and school, giving meaning and significance to practices.

2 Wanderings and fishing: The unfolding of the research

This text¹ is a continuation of the research work presented under the title *O Entrelaçamento da maré no currículo: Dinâmicas econômicas e culturais das comunidades de pescadores de Salinas da Margarida, Bahia* (The interweaving of the tide in the curriculum: Economic and cultural dynamics of the fishing communities of Salinas da Margarida, Bahia), which was approved by the Research Ethics Committee (CEP) of the State University of Bahia (UNEB), with CEP Consubstantiated Opinion n. 5.181.225, under CAAE: 53613421.5.0000.0057, on December 21, 2021. In order to present the results, we will focus on pedagogical strategies IV and V.

This is a qualitative study using participant methodology. The data collection instrument used was the students' and teacher's records in the tide diaries. As “the essential focus of these studies lies in the desire to get to know the community, its characteristic features, its people, its problems [...]” (Trivinos, 2012, p. 111), the tide diaries allowed us to get to know the impressions, feelings and realities of the fishing communities in more depth, through the eyes and narration of the students themselves and the teacher, who reported on their experiences in

¹ This paper is part of the master's thesis defended in the Postgraduate Program in Management and Technologies Applied to Education at the State University of Bahia, organized in *multipaper* format, written by the first author and supervised by the second author.

this environment based on the reflections proposed in the classroom.

The tide diaries mentioned are the notebooks used by the students during PE classes and by the teacher during the course of the research (Zabalza, 2014). The research was carried out at the Juracy Magalhães State College, in the city of Salinas da Margarida/Ba, during the classes of elective subject *I — Rede de Educação Financeira: Pescando Sonhos* (I — Financial Education Network: Fishing for Dreams), in three classes of the first year of the New Secondary Education (NEM). The students selected are fishermen and shellfish gatherers, the children of fishermen and shellfish gatherers or those who carry out some activity related to artisanal fishing. Data collection took place during the first semester of the 2022 school year, evaluating the implementation and adherence to the elective curricular component in the various activities proposed. In order to maintain the secrecy and confidentiality of the research subjects, the names of fish, crustaceans or molluscs present in the Salinas da Margarida region were adopted.

In the first week of school in February, students were given the opportunity to get to know the elective subjects offered by the school, so that they could choose later. The school offered six electives, and each student could choose only two of them to complete the necessary workload. During the selection process, students showed great interest in Financial Education, as it was the most popular subject and the first to close enrollment. It is worth noting that 120 places were available, distributed over the school's three shifts.

In order to present pedagogical strategies for teaching Financial Education in High School based on the economic dynamics of the fishing communities in the municipality of Salinas da Margarida, we have developed five strategies which we describe below:

1. Pedagogical Strategy I — Socio-economic profile and class survey activity.
2. Pedagogical Strategy II — First concepts of Financial Education.
3. Pedagogical Strategy III — Rescue, appreciation and economic dynamics of the fishing communities of Salinas da Margarida, Bahia.
4. Pedagogical Strategy IV — Organization, planning and financial reserve.
5. Pedagogical Strategy V — Creation of a prototype application: E-Pescados.

3 Pedagogical Strategy IV — Organization, planning and financial reserve

In order to work on the importance of planning, saving and reserving, we reflected on two situations experienced by the students: the first was in September 2019 and dealt with the appearance of oil slicks on the beaches of all the Northeastern states, plus Espírito Santo and Rio de Janeiro. One of the biggest environmental disasters ever recorded in Brazil, with more than 1,000 communities affected, from which, according to the Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis (Brazilian Institute for the Environment and Renewable Natural Resources — Ibama), more than 5,000 tons of oil had been removed by the beginning of 2020.

The oil spill was felt most acutely by the various fishing communities, whose routines and dynamics were affected. As a result, the sale of fish was compromised, as the population was afraid to consume the products because of the dangers caused by contact with the oil. The Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis (Ibama) also said in a statement that, according to the health authorities, improper handling of crude oil could cause risks to human health and the environment. In addition, direct contact with the oil could cause great harm to animals and plants, while it could cause irritation to the skin and eyes.

In this context, the fishermen were prevented from selling their products because they had no one to sell them to, which ended up restricting their fishing activity to their own consumption, even if they exposed themselves to the risk of contamination because of the need to survive. This reality has caused many social, environmental, emotional and economic problems in these communities, whose only source of income is artisanal fishing.

The second episode reflected on and discussed in class was the Covid-19 pandemic, which emerged in China in 2019, but in Brazil the first case of infection occurred in February 2020, hitting everyone unexpectedly and spreading rapidly. Even with little time to recover from the problems caused by the oil stains on the beaches, fishing communities have already had to go through exposure to the virus, social isolation, financial difficulties and precarious health care.

With the coronavirus, the recommendation of social isolation and the health barriers imposed in many municipalities, there has been a limitation in the marketing of fish and in the food production chain. These events have had a direct impact on fishermen's finances, as they have been unable to sell their products and have had to consume more fish from the region, due to the difficulty of acquiring other foods.

The fishermen were held hostage by the government, which, belatedly and after many struggles and negotiations, included the artisanal fishing category in the list of professions entitled to the Emergency Aid benefit; at first R\$ 600.00, then varying according to the criteria established by the Federal Government, as well as campaigns for donations of basic food baskets, personal hygiene products and masks, for example.

From this perspective, we discussed the need to organize one's financial life by developing a financial plan that is in line with each student's reality, exercising the habit of saving, even if it's a small amount at first, but which is the beginning of creating a financial reserve that can, in the future, enable achievements and help in any emergency.

Based on the reflections made in the previous activities, issues related to the practice of fishermen and shellfish gatherers that involve the management of resources were addressed in the classroom. The students pointed out the difficulties of making a financial plan that includes the amounts invested, expenses and profits. In boat fishing, which takes place on the high seas in the Salinas region, fishermen are classified as *moço* or *mestre*. During the fishing activity, the young man is responsible for assisting the master, helping with various tasks, including: guiding the canoe, casting and harvesting the nets, transporting the fish and organizing the fishing gear. The master, on the other hand, is the most experienced fisherman or the owner of the canoe. He is the one who analyzes the winds, the tide, the phases of the moon, the best time to sail, sets the course, the place to cast the nets, the time to harvest and leave (Diegues, 2004). Generally, most fishing activities are carried out with just two fishermen dividing the tasks between them.

When they get back from fishing, the fishermen separate what they have caught, so that one part is for sale and the other is divided between them. They are usually divided into three similar shares: one for the owner of the canoe and one for each fisherman. When it comes to control, most of the fishermen write down their receipts on a piece of paper or in a notebook and, at the end of the fishing period, this amount is divided between those involved. The division usually takes place as follows.

If he is also the owner of the canoe and net, one of the fishermen will get 75% of the total, and the young man will only get 25% of all the value of the fish sold. On the other hand, fishermen, especially shellfish gatherers, who work on the sea coast, usually manage their

finances individually from what they produce every day.

Table 1: Distribution of fishing values

Partition	Value %
Fisherman 1 (Master)	25%
Fisherman 2 (young man)	25%
Part of the Canoe	25%
Part of the net	25%
Total	100%

Source: Own elaboration (2022)

The students told us that, while fishing, they sometimes didn't manage to keep track of what they earned, because they didn't used to write down their expenses. As a result, all the money they earned was considered profit and expenses, without taking into account that they had to set aside a sum for the maintenance of the boat, net and other expenses. Some students reported that they had already spent a period of time not carrying out their activities because they were unable to do the necessary work on the canoe, net or engine, as no funds had been set aside for this purpose, thus compromising the livelihood of everyone in the family.

The families are linked to the fishermen's associations, which play an important role in the communities. It is through these associations that the fishermen apply for insurance and other benefits from the Instituto Nacional de Seguro Social (National Social Security Institute - INSS). Each village has one or more fishermen's associations: The 34 — Associação dos Produtores Rurais e Pescadores de Encarnaç o de Salinas; The 89 - Associação de Pescadores e Aquicultores de Salinas da Margarida; The 117 — Associação dos Pescadores e Marisqueiras de Cairu de Salinas; The 97 — Associação dos Pescadores e Marisqueiras de Conceiç o de Salinas; The 99 — Associação de Pescadores e Marisqueiros Cavalo Marinho; The 109 — Associação de pescadores/as Artesanais e Quilombolas de Conceiç o de Salinas; The 228 — Associação de Pescadores Força da Verdade Salinas; Associação de Moradores, Pescadores e Marisqueiras da Barra do Paraguaçu, and Z 13 — Col nia de pesca de Salinas da Margarida.

The closed season is established and monitored by IBAMA and refers to the period necessary for reproduction, with the aim of preserving the species. In Salinas da Margarida, fishermen apply for shrimp closed season insurance twice a year. According to Normative Instruction no. 14 (2004), its first article states that:

Prohibit, on an annual basis, fishing for pink shrimp (*Farfantepenaeus subtilis* and *Farfantepenaeus brasiliensis*), seven-barb shrimp (*Xiphopenaeus kroyeri*) and white shrimp (*Litopenaeus schmitti*), with any fishing gear, in the areas and periods listed below:

II — in the area between the border of the Municipalities of Mata de S o Jo o and Camaçari in the State of Bahia and the border of the States of Bahia and Esp rito Santo, during the periods from April 1 to May 15 and from September 15 to October 31 (Brazil, 2004).

Another situation exposed in the PE class was that, during the shrimp reproduction period, known as the *closed season*, fishermen are prevented from carrying out their professional activity and apply to the National Institute of Social Security (INSS) for aid, which corresponds to two minimum wages, for the shrimp reproduction period, which lasts 45 days

in the first and second half of the year (Brasil, 2004).

Generally, the average time it takes for fishermen to receive the aid is sixty days, which means that most people end up having a hard time during this period, without being able to fish, because by the time the amount is debited from their account, fishing is already free. During this phase, many fishermen who don't have a financial reserve or other fishing gear go through delicate situations, having to look for other sources of income to support their families.

From the discussions, based on the information provided by the students, we built some tables to improve control of the fishery. The aim of the following tables was to draw the fishermen's attention, by recording all the income and expenditure, and make them realize what is really investment, expenditure and, finally, profit.

Table 2: Fishing entries

Date	Fishing gear	Fishermen	Fishing location	Quantity (Kg)	Value Sold R\$
Total					

Source: Own elaboration (2022)

This fishing control table was built jointly with the students and, based on classroom discussions, put into practice by the students themselves and their families.

In addition to the financial control table, a table was also made of the possible expenses incurred in fishing.

Table 3: Fishing expenses

Items	Date	Value R\$
Food		
Clothing		
Diesel oil		
Canoe maintenance		
Net maintenance		
Buying a net		
Fishing gear		
Other		
Total:		

Source: Own elaboration (2022)

In this activity, we related EF notions to the fisherman's routine, and we noticed the students' engagement throughout the process. We discussed financial planning, personal and family budgets, investing in fishing gear, pricing fish, among other things. On this occasion,

the students used mechanisms to help them manage and organize their resources.

According to Santo et al. (2022), useful technological tools for EF classes include software such as the Central Bank's Citizen's Calculator, Excel or Google Spreadsheets and financial management and organization apps such as: *Organizze, Money Lover, Mobills, Toshl, My Budget, Guiabolso, My Savings and Daily Budget*. These apps are available on the PlayStore and other platforms and can help to train autonomous individuals who are the protagonists of their own knowledge, as advocated by the BNCC (Brasil, 2018).

For the following activity, we based ourselves on the skill EM13MAT203, which guides:

Plan and execute actions involving the creation and use of applications, games (digital or not), spreadsheets for controlling family budgets, simulators for calculating compound interest, among others, to apply mathematical concepts and make decisions. (Brasil, 2018, p. 534)

The task consisted of exploring these technological tools, starting with the software, manipulating spreadsheets and the citizen's calculator, interest situations and, finally, the apps. The students were divided into groups of five, then an app was drawn for each team; afterwards, the students developed a tutorial explaining the app they were responsible for.

To build the tutorial, the students downloaded the app, researched it, created a fictitious account and ran the simulation. The tutorial was organized as a video lasting no more than five minutes, containing the app's features, step-by-step instructions on how to use it and its advantages and disadvantages. In the end, the tutorials were presented in class and made available to other students at the school.

4 Pedagogical Strategy V — Creating the application prototype: *E-Pescados* — Phase I

Digital technologies are increasingly present in people's daily lives, especially among teenagers and young people, who use them creatively and skillfully. In recent years, there has been a significant increase in access to these means of information and communication. From this perspective, the BNCC states that:

[...] As a result of the advance and multiplication of information and communication technologies and the growing access to them through the greater availability of computers, cell phones, tablets and the like, students are dynamically inserted into this culture, not just as consumers. Young people have become increasingly engaged as protagonists of digital culture, getting directly involved in new forms of multimedia and multimodal interaction and social networking, which take place in an increasingly agile way. (Brasil, 2018, p. 61).

It is well known that young people find it easy to handle new digital technologies, and it is important that the school can use these skills to involve them in the proposed activities, encouraging student protagonism and the autonomy needed to build knowledge. It is also necessary that the use of these technologies is done with reflection and criticality to avoid excesses, both in interaction and in the consumption of equipment.

In this respect, in understanding the importance of new technologies, Ferreira (2014) states that:

These new technologies have had a major impact on education, creating new ways of learning, disseminating knowledge and, above all, new relationships between teacher and student. Today, there is great concern about school improvement, expressed above all in the learning results of its students. Being informed is one of the key factors in this context. Therefore, schools cannot remain oblivious to the process of technological development or risk getting lost in the midst of this whole process of educational restructuring (Ferreira, 2014, p. 15).

Given the above, we can see how beneficial the use of new technologies can be for students' learning, given that various skills and abilities can be explored by sharing knowledge. Digital technologies allow access to a range of content and tools that can contribute to meaningful student learning. For this to happen, the educator must consciously mediate in the process of developing knowledge. In this vein, Boff (2005) states that:

We are creative when we go beyond conventional formulas and invent surprising ways of expressing ourselves [...]; when we establish new connections, introduce subtle differences, identify potential in reality and propose consistent innovations and alternatives (Boff, 2005, p. 9).

The *E-Pescados* app aims to publicize and boost the local economy, making it possible to market fish in the municipality and the region, as well as providing greater fundraising among fishermen. It came about as a result of a classroom discussion about the reality of fishermen in the first-year NEM class at the Juracy Magalhães State College in Salinas da Margarida, BA, in 2022. The students reported that one of the difficulties they experienced was getting their fish to market: “a lot of suffering, because you only profit, you only make money if you manage to sell the fish” (Ostra, 2022).

They also say that lately they have noticed a reduction in the amount of fish they catch: “it's a very dignified profession, but it's very tiring, and often the fishermen don't get any fish to sell” (Pescada, 2022). As a result, the fish they catch “will serve as food for their own family or for sale” (Bagre, 2022).

Most of what is taken for sale is passed on more cheaply to middlemen and sometimes the products are stored at home for long periods without anyone to sell them to, which leads to losses in the value of the product due to the need to leave refrigeration equipment on for longer, increasing electricity consumption.

Fishermen usually sell what they catch on the beach, when they get home from fishing or at their own homes, advertising their catch on social networks, *WhatsApp* being the most used for this purpose. This dissemination ends up being limited, because only those closest to the fisherman, who have the fisherman's contact details, have access to the information.

Sales to middlemen (traders) are always at wholesale prices, much cheaper than for the people in the community, who buy for their own consumption at retail prices, but in smaller quantities. Most of the products from Salinas da Margarida are sold in Salvador, on the island of Itaparica, in Nazaré, Santo Antônio de Jesus and Bom Jesus dos Pobres.

Bearing in mind the issue presented and the activities carried out in the classroom, and observing Freire (1996, p. 19), when he says that “the more you reflect on reality, on your concrete situation, the more you emerge, fully aware, committed, ready to intervene in reality to change it”, the students themselves, in order to improve the situation presented, suggested the creation of an app that could help fishermen in the dissemination and marketing of fish,

since “apps were a very cool way that brought ease to financial organization” (Student Sororoca, 2022).

The *e-Pescados* app can contribute to the local community's economy, as it aims to publicize fish in the municipality of Salinas da Margarida and the region, helping fishermen to market their products. In addition to “promoting student empowerment through the appropriation of technological tools that provide personalization and active student engagement.” (Santo et al., 2022, p. 172)

In this context, we observed that the use of digital technologies in EF classes favored the students' assiduous participation throughout the process, as it encouraged them to search for solutions that could intervene and improve the difficult reality faced by fishing communities.

4.1 Objectives of the *E-Pescados* application

- To publicize the products caught by fishermen and shellfish gatherers in the municipality and the region;
- To help market the fish;
- Boost the local and regional economy;
- Decentralize the sale of fish in the municipality and region.

4.2 Methodology for creating the application prototype

Through discussions in the classroom, it was possible to create a working group to build the app, with students, teachers and the management of the Juracy Magalhães State School. After creating the group, a meeting was held to discuss what an app and a prototype are, the importance of technology, the viability of the app, how to develop an app and/or prototype and how we would like it to work. This moment provided interaction with various disciplines, exercising interdisciplinarity.

The Biology teacher helped explain the fishing environment and marine species, especially those found in this region. The Art teacher helped with the visual design of the app and the logo. The sociology teacher reflected on the relationship between work and employment. The Math teacher helped with the pricing of the fish, adding value and taking into account time, effort and investment. Finally, the Geography teacher helped by explaining the territory and helping to map the marketing points using geolocation concepts.

Secondly, we described what we wanted the app to have. Among the aspects discussed were the name of the app; the logo; the colors of the logo and the app; the layout of the app and the prototype with the interfaces; the use of Google Maps to geolocate the places where fish is sold; the registration form and photographs of the places where fish is sold; payment methods (pix, cash, credit or debit card) and search filters (proximity, cheapest and/or by type of fish). To this end, we discussed how *Uber*, *OLX* and *Facebook* would use these filters.

We then organized a committee for general planning and some teams were given specific tasks. The tasks were divided as follows:

- Team 1 — Project coordination and organization;
- Team 2 — Field research and mapping of fish sales sites;
- Team 3 — Construction of the map of Salinas da Margarida with the geolocation points of the fish sales sites on Google Maps;

- Team 4 — Construction of the visual part of the app (artwork and logo);
- Team 5 — Organizing the app's functionalities (Layout and Interfaces).

The groups then got together and started work. The team responsible for the visual part of the app built and made available two logo templates for the app, which the others could choose from.



Figure 1: Logo templates (Authors' archive, 2022)

In order to use programming in the classroom, it is not essential to be a programmer, it is enough to have the will and desire to create and learn, as there are materials and tools available for free on the internet that help teenagers and young people to create different games and apps in a practical and easy way (Garofalo, 2018).

So we started building the app prototype using some websites that the students were already familiar with. After a few attempts, the students responsible chose the website <https://www.figma.com> to create the prototype, as they claimed it was a free environment with more options and easier access.

The prototype was designed and built by the students using the school's physical space and technological equipment, under the guidance of the research teacher and management supervision. Below are images of the application's registration screen.

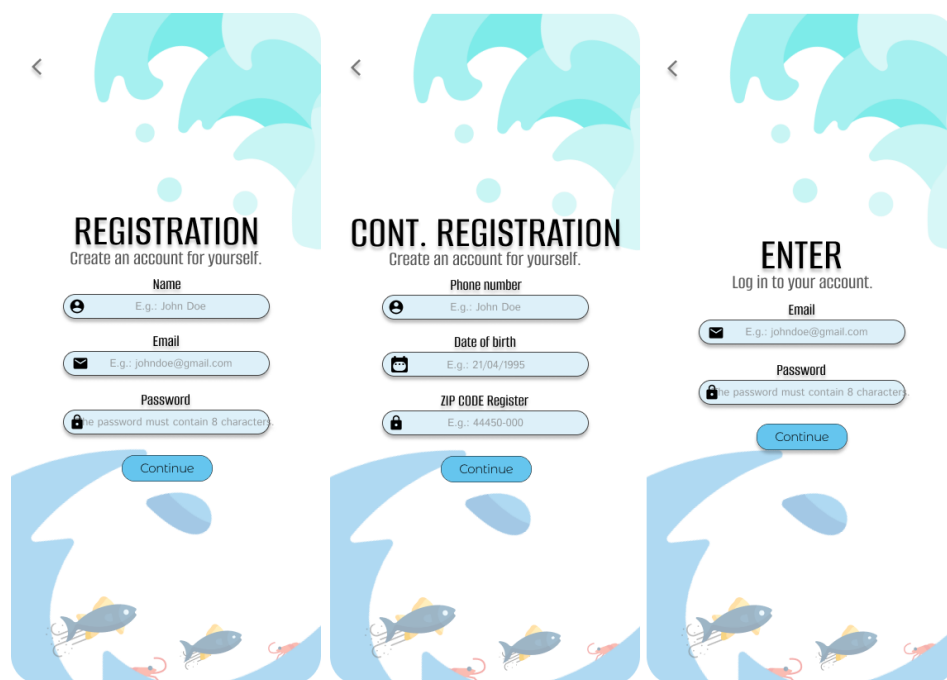


Figure 2: Registration screens in the application prototype (Authors' archive, 2022)

The initial screens are for creating an access account with a password and registering the details of fishermen and shellfish gatherers. After logging in, fishermen and shellfish gatherers can register the products they sell with the appropriate values. These products will be

advertised on the app in the town of Salinas da Margarida and the surrounding region.

There is also an area for fishermen to register and negotiate their sales, and another area for customers to find the fish they want, quickly, nearby and with the possibility of comparing the price and quality of the product.

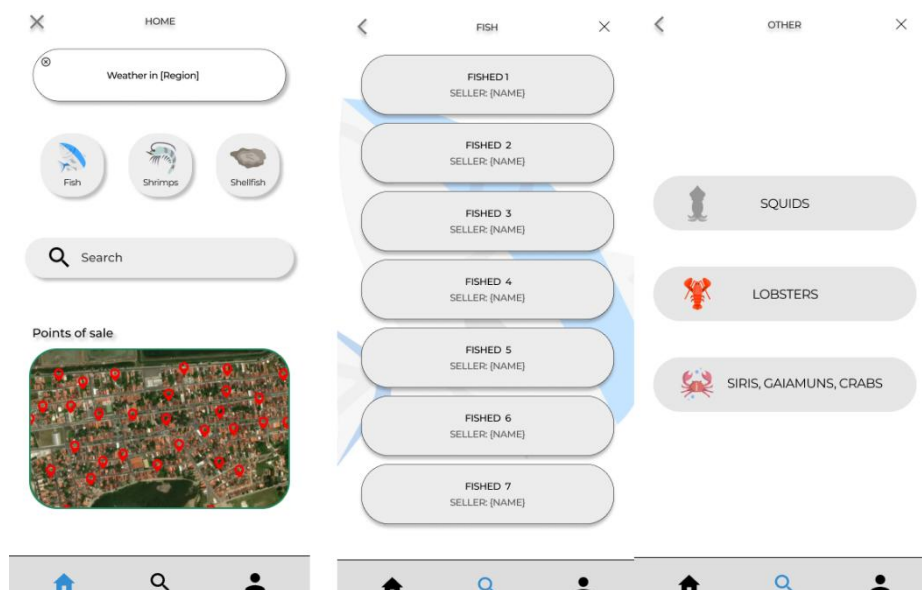


Figure 3: Initial screens of the application prototype (Authors' archive, 2022)

For the home screen, at the top of the app, an area has been suggested with information on the climate, temperature, tide times and curiosities of the region. Next, there is the option to click on the drawing with the most popular fish in the area, and it is also possible to search with the name of the fish directly in the search magnifying glass or in the other option.

On the home screen, a map of Salinas da Margarida will be available with the geolocation points of the places where fish is sold. In this way, those interested in tidal products will be able to find the nearest points of sale and compare prices and products. The app will then direct the interested party to the fisherman responsible for the fish to finalize the purchase.

Creation of a *beta-tester* phase — Once the app has been created, a *beta-tester* phase will be required, which will be used to define the moment when the app is getting ready to be released to the general public and will be under analysis for possible changes, before being released widely. It therefore consists of the following actions:

- Test the application with a small group of fishermen, through the associations;
- Analyze information on possible errors, collecting and transforming information into data for adjustments and improvements to the application;
- Suggest options to be added or removed from the application.

In this phase, the students will register and train the fishermen at the associations' headquarters, with the partnership and support of the members and the municipal government, creating a network of collaboration and cooperation between school, family, community and government.

4.3 Development of the *e-Pescados* application — Phase II

The proposed project is in line with Law No. 11.959/2009, which establishes the

National Policy for the Sustainable Development of Aquaculture and Fisheries, supporting initiatives that value fishermen and shellfish gatherers in the exercise of their trade, as well as promoting actions that help to strengthen the production chain of capture and marketing, assisting in the disposal of fish, with technological innovation, instruction and training, developing activities that facilitate the dissemination and disposal of seafood products, without the intervention of intermediaries in the marketing of fish.

In this sense, approximately R\$5,000 was budgeted annually for the development and maintenance of the *E-Pescado* application, with a minimum of three months required for its creation. Due to the limited deadlines for completing this research and thinking about the feasibility of making the app available to the community free of charge and with self-management, it was not possible to develop it.

In this sense, we see the need to seek partnerships with higher education institutions that offer courses in systems development for the creation of the app and the qualification of fishermen, in order to facilitate handling and maintenance, as well as creating support networks with the various sectors: public, private or ONGs (Non-governmental Organizations) that can make this app an accessible tool for fishing communities to publicize and market their products.

5 Evaluation of the Financial Education subject

We learned about financial habits, investments, financial planning and so on. Habits and financial planning were the ones that struck me the most, and the ones that helped me the most in the dynamics of controlling my resources. This helped me to save my savings and spend only what was necessary. The apps were a great way of making it easier to organize my finances (Sororoca, 2022).

I've learned several things about the financial side, things that can harm me and others that can help me. From the presentations I learned about apps that help me manage my money and also from the teacher's tips, I learned that I should save my money thinking about the future and for some difficult situation that may come up or also to invest without accumulating debts (Camarão, 2022).

Throughout this course, I learned that it's no use having money and not knowing how to manage it. Being financially stable isn't just about having piles of money, it's about knowing how to invest so that your source of profit doesn't run out and you end up with no money to spare (Lagosta, 2022).

The importance of management, regardless of how much money I have, if I really know how to manage my money, that will determine whether it multiplies or decreases. I also learned that I should be patient and always think when it comes to consuming (Sacaraúna, 2022).

At the beginning of the first unit, we were introduced to what Financial Education is and how each person invests their money. The main focus was on talking about goals, planning, budgets and dreams. Learning to better understand the opportunities that life offers and which ones are possible to achieve (Maçambê, 2022).

We learned about planning and I learned that planning requires objectives, goals. With planning, you can achieve some of the objectives and goals you've been pursuing for some time. Good planning starts with organizing everything that needs to be done. It's important to plan and invest (Arraia, 2022).

I learned that to start an investment you have to make plans, financial plans, choose what you're going to invest in, see if it's really worth it (Chumbinho, 2022).

I learned how to have a financial life even with the little I earn by writing down my expenses,

saving more money, knowing how to search in stores for products with lower prices, always creating an emergency reserve so that if one day I need it, an unforeseen event arises that always complicates our financial life such as health problems, home conditions and so on. As well as setting my goals and organizing my plans with resources, knowing how to manage the little I earn (Pititinga, 2022).

We learned to manage, save and invest what we received, these main points were worked on through books, videos and apps that helped us to have a different view of what financial education is (Pescada, 2022).

I learned to manage my own money, save and spend less, only on things that are necessary (Machadinho, 2022).

The subject was assessed at the end of the teaching unit, when the students were able to express themselves in written or oral form. We noticed significant progress in their knowledge of EF topics. Initially, we talked about what EF was, and most of the students thought that this subject would only deal with the subject of money; however, over the course of the lessons, they expanded their knowledge and noticed that the subject goes beyond talking about money, as the student shows us when he describes what we reflected on at the beginning of the lessons: “We were introduced to what Financial Education is and how everyone invests their money. The main focus was to talk about goals, planning, budgets and dreams” (Student Maçambê, 2022).

Starting by talking and encouraging students to dream makes all the difference. They begin to believe that it is possible to make dreams come true, by creating objectives with well-defined and achievable goals. We then realized that the elective subject made it possible to “learn more about the opportunities that life offers and which ones are possible to achieve” (Student Maçambê, 2022), “as well as defining my goals and organizing my plans with resources, knowing how to manage the little I earn” (Student Pititinga, 2022). It also contributed to the planning of the students' life projects, after all “good planning starts with organizing everything that needs to be done, it's important to plan and invest” (Student Arraia, 2022).

Planning is the key to a healthy financial life. Thus, we worked with the students on the need to create good habits so that financial planning can take place efficiently, since “habits and financial planning were the ones that marked me the most and the ones that helped me the most in the dynamics of controlling my resources” (Student Sororoça, 2022).

We then discussed how to manage resources, especially financial resources, using various strategies and tools. The students explained this by saying: “I learned that it's no use having money and not knowing how to manage it” (Student Lagosta, 2022); “the importance of management, regardless of the amount of money I have” (Student Sacaraúna, 2022) and “I learned how to manage my own money, save and spend less, only on things that are necessary” (Student Machadinho, 2022).

We can see that the students have managed to assimilate the knowledge and importance of managing their resources, planning their spending and avoiding taking on unnecessary debt. This is how student Pititinga (2022) put it: “I learned how to have a financial life even with the little I earn by writing down my expenses, saving more money, knowing how to search in stores for products with lower prices [...]”.

We reflected on how the media interferes in decision-making, encouraging impulse consumption without assessing the real need, as well as highlighting the importance of a personal and/or family budget in managing resources, writing down all expenses and

researching the price of products in order to find the best cost-benefit ratio. “I also learned that I should be patient and always think when it comes to consuming” (Student Sacaraúna, 2022).

We also worked on the themes of saving, building a financial reserve and investing, with a focus on the future: “I learned that I should save my money thinking about the future and for some difficult situation that may come up or also to invest without accumulating debt” (Student Camarão, 2022) and “always create an emergency reserve so that if one day I need it, something unforeseen comes up that always complicates our financial life such as health problems, house conditions and so on” (Student Pititinga, 2022).

Finally, we talked about investments: “I learned that in order to start an investment you have to make plans, financial plans, choose what you're going to invest in, see if it's really worth making that investment” (Student Chumbinho, 2022). We then reflected on various types of investments, starting with investments in the fishing gear that each of them used, after understanding the basics of the main types of investments available today, both in fixed and variable income, in both fixed and variable income, as well as working on entrepreneurship, especially sustainable entrepreneurship.

6 Final considerations

The aim of this paper was to present pedagogical strategies for teaching Financial Education in High School based on the economic dynamics of the fishing communities in the municipality of Salinas da Margarida, Bahia.

Pedagogical strategies IV and V, built and applied in EF classes, were related to the use of digital information and communication technologies in the planning and organization of resources. These technologies proved to be important learning tools, as the students showed great interest and involvement when using them in the classroom for EF-related topics. Through the use of critical thinking, theoretical research, technological tools and experimentation, it was possible to think of viable alternatives to intervene in the reality experienced by the students; for example, creating mechanisms to help fishing communities market and advertise fish, as well as improving their knowledge of the financial world. This cross-fertilization of ideas, through the proposed activities, enabled the students to become more engaged in the learning process.

It is clear that much still needs to be done to achieve better results. In this way, the elective subject has made it possible to work closely with the community by tackling themes from the fishermen's experience, through, for example, actions, interdisciplinary projects, fairs, workshops, lectures and conversation circles, in order to encourage the participation and protagonism of the students. Financial Education (EF), linked to the reality of fishing communities, can add value in training young people and adults to organize, plan and manage resources in a conscious and balanced way, in preparation for the world of work and in building a life project.

Therefore, we observed that the use of digital technologies, such as applications and software, facilitates the understanding of the proposed content as it encourages the construction of new knowledge. Therefore, we believe that the classes in elective subject I - Financial Education Network: Fishing for Dreams were extremely important for the lives of the student fishermen from Salinas da Margarida, as they allowed them to discuss the local reality and propose solutions to improve the quality of life in the community, which contributed to the formation of autonomous, creative, decisive, active and protagonist subjects in the construction of knowledge.

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