RESEARCH | PESQUISA

Mobile application for the educational praxis of nurses in the Family Health Strategy: ideation and prototyping[a]

Aplicativo móvel para a práxis educativa de enfermeiros da Estratégia Saúde da Família: ideação e prototipagem

Aplicación móvil para la praxis educativa de enfermeros en la Estrategia de Salud Familiar: ideación y creación de protótipos

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ABSTRACT

Objective: To describe the process of ideation and prototyping of a mobile application supporting the educational praxis of nurses from the Family Health Strategy. **Method:** Methodological study and participatory research with a qualitative approach, conducted in four steps, according to a model adapted from Participatory Design: Step 1 – Exploration of the context; Step 2 – Ideation; Step 3 – Prototyping; Step 4 – Usability Testing. The study involved 26 nurses of a health district in Manaus, AM, Brazil. Data was collected between April 2018 and March 2019, using the World Café method and a usability test form. Data were submitted to thematic and categorical content analysis and descriptive statistics. **Results:** The FracTeam® APS prototype was produced, presented by Wireframe for a briefing on the current status. As a strategic and unconventional technology, it brought together multiple functionalities and thematic areas in alignment with the needs of the nurse user. **Conclusion and implications for practice:** The process enabled a collaborative experience to support the intellectual needs of education and work according to the collective intelligence of workers. Ideation and prototyping based on participatory processes will affect the development of technologies for nursing and health.

Keywords: Health Education; Community Health Nursing; Inventions; Mobile Applications; Nursing Informatics.

RESUMO

Objetivo: Descrever o processo de ideação e prototipagem de um aplicativo para dispositivo móvel de apoio à práxis educativa de enfermeiros da Estratégia Saúde Da Família. **Método:** Estudo metodológico com interface participativa e abordagem qualitativa, operacionalizado em quatro **fases**, segundo modelo adaptado do *Design* Participativo: Fase 1 – Exploração do contexto; Fase 2 – Ideação; Fase 3 – Prototipação; Fase 4 – Teste de usabilidade. Envolveu 26 enfermeiros de um distrito de saúde de Manaus, AM, Brasil. Dados coletados entre abril de 2018 e março de 2019, por meio da técnica *World Café* e formulário de teste de usabilidade, submetidos à análise de conteúdo categorial temática e estatística descritiva. **Resultados:** Foi produzido o protótipo *FracTeam*® APS, apresentado por *Wireframe* para briefing do estado atual. Como tecnologia estratégica e não convencional aglutinou funcionalidades e áreas temáticas múltiplas em alinhamento com necessidades do usuário enfermeiro. **Conclusão e implicações para a prática:** O processo possibilitou o exercício da experiência colaborativa em prol das necessidades intelectuais de educação e trabalho a partir da inteligência coletiva dos trabalhadores. A ideação e a prototipagem com processos participativos repercutirão no desenvolvimento de tecnologias para a Enfermagem e a saúde.

Palavras-chave: Educação em Saúde; Enfermagem em Saúde Comunitária; Invenções; Aplicativos Móveis; Informática em Enfermagem.

RESUMEN

Objetivo: Describir el proceso de ideación y creación de prototipos de una aplicación para dispositivos móviles que apoye la praxis educativa de enfermeros de la Estrategia de Salud Familiar. **Método:** Estudio metodológico con interfaz participativa y enfoque cualitativo, llevado a cabo en cuatro **fases**, según el modelo adaptado del Diseño Participativo: Fase 1 – Exploración del Contexto; Fase 2 – Ideación; Fase 3 - Creación de Prototipo; Fase 4 – Prueba de Usabilidad. Participaron 26 enfermeros de Manaos, Amazonas, Brasil. Datos recogidos entre abril/2018 y marzo/2019, a través de la técnica del *World Café* y formulario de prueba de usabilidad, sometidos a un análisis de contenido categórico temático y estadística descriptiva. **Resultados**: El prototipo *FracTeam*® APS fue producido, presentado por Wireframe para *briefing* del estado actual. Como tecnología estratégica y no convencional, reunió múltiples funcionalidades y áreas temáticas en alineamiento con las necesidades del usuario enfermero. **Conclusión e implicaciones para la práctica**: El proceso posibilitó el ejercicio de la experiencia colaborativa a favor de necesidades intelectuales de educación y trabajo a partir de la inteligencia colectiva de los trabajadores. Ideación y creación de prototipos con procesos participativos impactará en el desarrollo de tecnologías para la práctica de la Enfermería y la salud.

Palabras clave: Educación en Salud; Enfermería en Salud Comunitaria; Invenciones; Aplicaciones Móviles; Informática de Enfermería.

INTRODUCTION

Technological innovation is defined as the process of conceiving or aggregating new functionalities or characteristics of a product or of a production method.[1] Innovation is also understood as a new mentality, triggered by contextual changes and that allows new, useful, creative and unexpected links, generating a solution/adaptation to a problem and adding value, whether in the scientific, academic or practical fields.

Until the past decade, Nursing expressed an incipient scientific activity of innovation and technological development, with fragile performance in the generation of inventions.[2] The demarcation and historical development of the technological dimension in nursing took place from the first half of the twentieth century in the professional practice in public health and were structured in different periods of construction, expressed in the following phases: 1- understanding of times of political-social oscillation and production quality; 2- the phase of nursing inventions and adaptations; and 3- the development of projects that enabled registrations and patents from the expansion of undergraduate and graduate courses.[3]

In Nursing, innovations create improvements in quality, cost-effectiveness or efficiency.[4] In this regard, it is noteworthy that the area has evolved in the constitution of knowledge networks for the construction of products derived from its praxis and with this has been achieving a significant impact on the quality of care and improvement of the population's health. Such investment is aimed at increasing innovation in healthcare, adapting to the needs of users as a whole, and in solving structural and global problems of humanity.[2,5-7]

A typology of innovations in Nursing encompasses eight types, according to the expected impacts and the application contexts: 1) creating models of care provision – or treatment; 2) transforming processes to improve care provision – or treatment; 3) developing patient care interventions; 4) advanced research and translation methods; 5) facilitating communication and collaborations; 6) taking advantage of technology and data; 7) enabling function transitions; and 8) developing the teaching of methods.[4]

Considering the amplitude of Nursing work scenarios in Brazil, it is believed that technologies should be developed for specific contexts and demands, based on the knowledge of real work experiences. An important election focuses on the qualification of Nursing work in the Family Health Strategy (FHS), due to the important space that the role of Nurses occupies in it. In addition, the organizational and substitutive character of the FHS is in line with the traditional model of primary care, as a strategy for producing an impact on the health system, expanding accessibility to the health system and increasing prevention and health promotion actions.[8]

Considering the need to increase information and communication technologies in support of nurses in FHS[9] teams, the educational praxis of nurses in the FHS is assumed as the target activity for the development of a mobile application (App) technology.

Although etymologically the term praxis has the approximate meaning of practice, this manuscript takes on its broadest, polysemic and procedural meaning. The one based on dialectics, on reflection, translated into the movement of action beyond conduct, permeated by the search for theoretical knowledge and its application in reality. The praxis in which man builds and knows himself, promoting the transformation of himself and the world around him. At first, the term praxis is chosen to designate the human and social activity manifested in the relationship between theory and practice.[10] Thus, the specific form of praxis to be addressed, is the educational praxis concretized in individual and collective manifestations of nurses who work in the Family Health Strategy (FHS).

Thinking about innovation for the educational praxis of FHS nurses means, among other aspects, producing instruments beyond industrialized physical products. It permeates the assumption of the participatory process for the co-creative and co-productive thinking of the health care services worker, strategically in favor of the construction of concepts and methods of technological development, guided by the exchange, the multiplicity of views, the collective intelligence and the learning.

Currently the vast majority of mobile applications used in different fields are not presented in scientific articles and still few are produced in connection with academic studies. Hence, the most effective method of locating this type of technological product is by direct search in virtual stores for Android and iOS (Play Store and Apple Store), so when performing a search for mobile apps related to the educational praxis of nurses in the FHS, in these virtual stores, only a national production was found at the time of the study, the Rede Humaniza SUS Móvel (RHS), a social network of people involved in the humanization processes of management and care in SUS (the Unified Health System, UHS). In the other applications available, the purposes of training, body and aesthetics, nutrition, and diet therapy are predominant from the user's perspective. For the worker stands out the training alternatives in the distance mode and/or TV play with little or almost no interactivity.

This study is justified, as it contributes technologically to the health work process in the FHS based on the protagonism of professionals in the development of an emerging instrument of social practice in the production of health.

The relevance of the study is given by two horizons, the first scientific-immediate, systematizing contributions to the critical-creative praxis in the FHS; and the second scientific-mediate, for creating possibilities for the expansion of new/other participatory studies on work, technological innovation, health education and citizenship in the northern region of the country.

Considering the relevance of increasing technological innovation for the work of Nursing in their different needs and contexts of action, the objective of the study is to describe the process of ideation and prototyping of an application for mobile devices to mediate the educational praxis of nurses in the family health strategy.

METHOD

This is a methodological study with a participatory interface and a qualitative approach, operationalized in four phases: Phase 1 – Initial exploration of the work – in this study, the context of educational work in the FHS. Phase 2 – Discovery Process – Ideation. Phase 3 – Prototyping. Phase 4 – Usability test, model adapted from Participatory Design (PD) for empowerment and digital inclusion.[11,12] Participatory Design emerged more than half a century ago and originated in Scandinavian territory between the 1970s and 1980s, being used with the aim of "training workers and promoting democracy in the workplace"[12]. The main basis of this methodology is to involve users in the development process, that is, different from design models that are thought "for" someone, PD treats design "with" the user. Among the advantages of PD, there is the engagement of users in the design processes and the greater acceptance of the product, since they also feel responsible for the results. The 4 Phases were carried out from June 2018 to May 2019.

In Phase 1, the researcher met with the workers for a first approach and familiarization with the problem, presenting ideas and establishing priorities. Participated 26 nurses from the Family Health Strategy of the Distrito de Saúde Leste – DISAL (Eastern Health District, in free translation), one of the five Districts linked to the Secretaria Municipal de Saúde – SEMSA (Municipal Health Secretariat, in free translation), in Manaus, AM, Brazil. The following inclusion criteria were used: be in SEMSA's effective staff; have a minimum performance time of 02 years in the same FHS Unit; be in full activity during the data collection period. Awareness and invitation to participants took place through telephone contact followed by visits to DISAL's FHS Unit.

For the production of data, the World Café group technique was used, which seeks to promote the discovery and participatory construction of joint solutions to collective problems, through the meeting of people around meaningful and strategic conversations.[13]

Two meetings were held at different times (World Café 1 and 2), in a private space, reserved for the activity. The technique was coordinated by the host-researcher. In these spaces of encounter and dialogue, conversations favor exploring meanings for the multiple contexts of life and work.[13] The guiding question of the two meetings was: What can Family Health Strategy teams create to enhance health education practices? Supporting materials were provided, such as paper towels and pens for notes and free registration of ideas. The participants of the World Café meetings were distributed in groups of four per table, with one of them having the role of table host. The dialogues were organized in rounds of 15 minutes, so that all participants circulated at the tables and progressively exchanged ideas with each other. The return to the initial tables took place in the last round, when there was a synthesis of the discoveries and preparation for sharing in plenary, an opportunity to express collective knowledge. On average, the duration of the meetings was 03 hours. In order to contribute to logistics, records, frequency control and other aspects of infrastructure, the research had properly trained research assistants and the meetings were filmed and photographed.

The data obtained were transcribed, organized and processed using the Atlas.ti8 software (Qualitative Research and Solutions) version 8.3.20/2019, including the content of tablecloths and videos. It is a CAQDAS (Computer Assisted Qualitative Data Analysis Software) used in qualitative investigations in several areas and different theoretical and methodological approaches.[14] The data analysis of the two meetings was categorical-thematic.

In Phase 2, researcher, developer and workers interactively idealized the requirements for the technological invention. Participated 12 nurses (among the 26 nurses who participated in Phase 1). In this Phase, World Café 3 was held. At the first moment, the researcher presented the synthesis of World Café 1 and 2, the categories that emerged from the analysis, with emphasis on the indicative category of technology creation, and the geometric figure of a dodecagon, representative of the Conceptual Framework for Educational Practice of Nurses of the FHS, built from the synthesis of Phase 1, and represented in the form of a fractal. In the second moment, the developer presented some technological options available on the market. Finally, in the third moment, the researcher launched the guiding question of the discussion: based on the synthesis of cafés 1 and 2 and the options presented, what technology can enhance the educational praxis in health in the FHS and what should it contain?

The technological possibilities of the second moment illustrated the process of defining the invention and its prototyping, and about this, it is important to describe them, since each brings with it (in separate functionalities), the users' desire to have them gathered in a single technology option in favor of praxis. *Believ* is a group platform; *Timerepublik* an application that allows the exchange and sharing of professional experiences and skills; *Slack* allows group interaction by sending and receiving texts, images, video voices; and *Medium* is a *News* application, which allows the exchange of scientific and/or journalistic content and/or materials.

In Phase 3, the researcher and the developer, based on the requirements discussed and presented at World Café 3, developed an application prototype. The flows were hosted on the Marvel platform with the respective *Wireframes*. It is a primitive version, which consists of a schematic and/or diagrammed representation of the structures and divisions of a technological project based on the user's experience.[15]

In Phase 4, the researcher and workers, at a meeting scheduled and held at a DISAL health unit, tested the application prototype. Eight nurses participated (among the 26 nurses who participated in Phases 1 and 2). The nurses were submitted to the usability test through intuitive digital simulation of the prototype. When submitted to the prototype simulation, workers were observed and filled out the Usability Test Form on *GoogleForms* with two sections containing 18 objective and one subjective questions. Usability is a term referring to a range of methods that assess user interaction with product and system interfaces. This study assumes the UX (User Experience) process, which treats the design process based on the users' influence beyond the functional and final characteristics, but in the progress until the

final version of the invention.[15,16] The analysis of the test data was quantitative, based on descriptive statistics.

The study received institutional approval from SEMSA, was submitted to Plataforma Brasil and obtained an opinion substantiated by the Ethics in Research Committee of the Universidade do Estado do Amazonas (UEA) under CAAE 796719170.0000.5016 and opinion No. 2,376,273 on November 10, 2017. The Free and Informed Consent Term and the Authorization Term for the Use of Image and Voice, supported by the ethical principles of Resolutions 466/2012, 510/2016 and 580/2018 of the Conselho Nacional de Saúde – CNS (National Health Council, in free translation), that govern research with human beings, social sciences and strategic interest with the Unified Health System (UHS).

RESULTS

Regarding Phase 1 (World Café 1 and 2), the significant conversations revealed five categories; among these, the one that pointed to the technological perspective was the category: praxis creator of technologies for educational work in the FHS, constituted from three discursive sets: creation of spaces for exchange, sharing and dialogue; use of information and communication technologies in educational praxis; university presence in the permanent education of the FHS worker (Figure 1). In this category, discursive content brings together technological tracks with functionalities that point to technologies available on the market, products with fragmented interfaces that can be combined into a single mobile technology. In this study, Phases 2, 3 and 4 are highlighted.

Regarding Phase 2, the discussion that took place among workers (World Café 3), prompted the process of defining the requirements for the invention. It was verified that the requirements were based on the daily needs of workers, with a view to enhancing educational practices. It became clear that one of the professionals' needs was to organize praxis around the thematic areas, according to guidelines from the Ministry of Health: women's health, children's health, health of the elderly, etc. It was also found that they wished to interact with team members as well as with other DISAL teams, to share experiences, doubts and suggestions. It was based on these workers' ideas that they proceeded to the next Phase.

Regarding Phase 3, the process was made operational by the developer from the elaboration of *Wireframes*, a method to create a prototype used in interface design that suggests the structure of a website, web, app, among others; a similar illustration of the layout that includes the fundamental elements of a technology/invention.

The prototype was named *FracTeam*® APS, in which *Frac* represents fractal, *Team*, FHS team, APS, "Atenção Primária à Saúde (Primary Health Care). It is a strategic and unconventional technology that combines functionality from multiple applications into a single product. The main objective of the *Wireframe* is to be the main tool for aligning the need and expectation of the end user of the invention. In a preliminary way, the presentation of the *Wireframe* to the user, promotes a critical/constructive analysis to the finished product development, providing the measurement and/or briefing of the current state, with a view to the sufficiency/approval and success of the product (Figure 2).
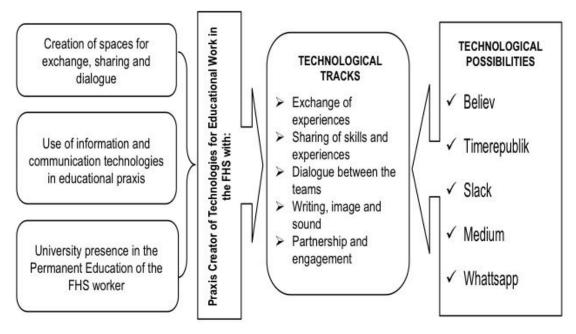

Figure 1. Synthesis of the constituent elements of the category Praxis Creator of Technologies for Educational Work in the FHS.
Source: the authors

The prototype *FracTeam*® App is a digital tool designed from the political perspective of the FHS workers' cognition and the desire for the provision of "public corporative" technology that favors dialogue, exchange and sharing of knowledge and experiences around educational work in health. It has compatibility with smartphones and tablets that operate with iOS and Android
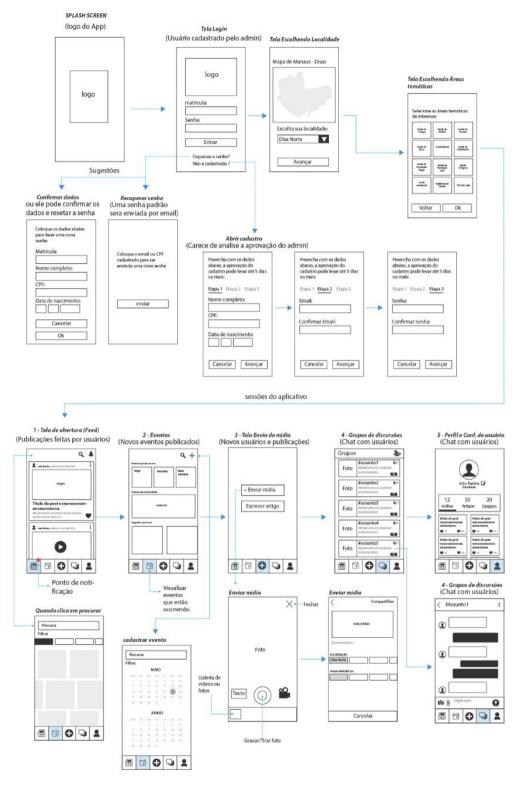

Figure 2. Prototyping - *Wireframes* of the App *FracTeam*® APS prototype.
Source: The authors

technology, and to download, the user will need to be linked to the health service and have access to the internet.

The initial screen of the prototype requires functional registration to allow the nurse to perform the access with a password created on the first access, from the previously registered functional database, as it is a corporate technology applied to the functional environment, and therefore, with access restricted to servers in the research scenario. The second screen shows the choice of the Health District, in this case the East, with the possibility of expanding to the other districts (North, South and West), in a possible design of application/integration to the entire Health care network. The following screens contemplate the thematic areas (Figure 3).

When selecting the thematic area, the worker accesses all the functionalities of the prototype in each thematic area and can create events and groups, send and receive content, videos, images; interact with other users and establish hybrid arrangements of communication, formation and information.

Regarding Phase 4, the workers who participated are between 31 and 57 years old, 88.9% use Smartphones with Android operating system and 11.1% iOS. When asked about the time of use, 44.4% reported accessing at any time of the day and 55.6% only at night. Regarding social networks 44.4% have more than four social networks installed on their cell phones, 33.3%, two, and 22.2%, only one. When asked about internet access in the Health District, 66.7% access it frequently and 33.3% sometimes.

Regarding the experience with the *FracTeam®* App prototype, 55.5% considered it totally adequate, 33.3% adequate and 11.1%

partially adequate. When asked about the speed of the prototype's actions, 55.6% considered it fast and 44.4% moderate. Regarding the difficulties to navigate, create and send content, 66.7% did not report any difficulties and 33.3% had partial difficulties.

As for the appropriate, pleasant and expected functions in the prototype, 100% of the subjects considered it totally satisfactory. When asked about suggestions and observations about the prototype, users reported:

> *The application generally fulfills expectations* (Nurse 1. Verbal information).

> *I am extremely satisfied, it is a tool that is easy to handle and understand, very similar to other existing applications on the market, I believe it will be of great benefit to expand dialogues, discussions and knowledge to professionals working in Primary Care, this means greater access and better quality of service to users* (Nurse 2. Verbal information).

> *It is innovative, but I think it should present content in parallel to that of the Ministry of Health* (Nurse 3. Verbal information).

> *I believe that this application will provide positive feedback as a permanent education and alignment of conduct and guidance to network professionals* (Nurse 4. Verbal information).

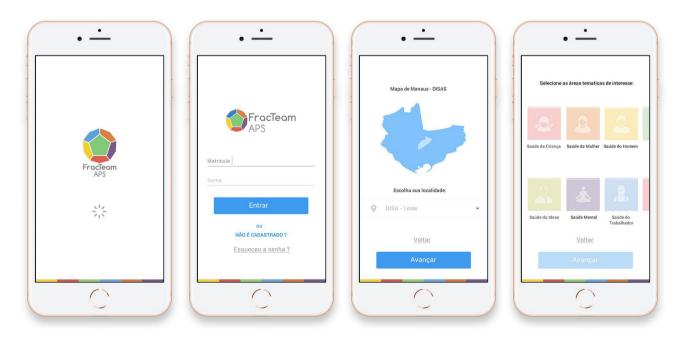> *Inclusion of CID10 and CIAP2 tables* (Nurse 5. Verbal information).

Figure 3. Home Screen, Functional Access, DISAL and Thematic Areas of Interest - Prototype of the *FracTeam®* APS App.
Source: the authors

DISCUSSION

The use of the World Café technique with the workers participating in this study promoted the meeting of nurses, and through meaningful and strategic conversations, they sought to reflect and discuss the context in which they work and carry out the educational praxis as well as discussed and pointed out requirements for the technological alternative in order to enhance it.

The technique allows conversations to favor the discovery and participatory construction of solutions to collective problems. It is a technique that brings back deep memories of two fundamental beliefs about human life: we want to talk together about the things that are important to us; as we talk, we become able to access a greater wisdom than that which is found only in the collective.[13]

The application of the Participatory Design (PD) model, unlike the User-Centered Design (UCD) model, favored co-production, as workers had an active voice in discussing problems, developing ideas and indications for technology design.[15] In this model, opportunities for collective expression are favored, in addition to traditional and more common usability tests.

With the joint action between researcher, developer and workers in the process, a high participatory intensity was achieved in the methodological study developed.[17] The high intensity is made possible with co-creation. In the participatory development of instruments-technologies, interaction-dialogue is promoted, and conversations enable the identification of both content and aspects of appearance, essential requirements for prototyping.

From the talks, emerged the technological tracks that arose in the requirements for the development of the application type prototype. Application development has become more and more frequent nowadays. Computerized processes are tools that improve and simplify nurses' actions, whether in the field of management, care or teaching, thus being related to the work process of this professional.[18] Therefore, the use of scientific evidence and user involvement (in this study, FHS workers), supports the way it was developed, the purpose and use for which the *FracTeam*® App prototype is intended[19].

The results indicated that the workers' needs could be met through a technological resource. When invited to think about a technology to enhance educational praxis, ideas were generated to support the work done. Ideating implies generating, inaugurating, inventing. It is characterized by the linking of ideas for the conception/formation of an intent[20] or a technique for innovation and advancement of knowledge around a situation that allows the breaking of the *status quo*. Conceiving, designing and developing technological resources to support work through digital interfaces translates into a growing challenge, which requires a scientific, participatory and inclusive method by researchers, designers and developers. In this sense, the idealized and prototyped technological innovation is inscribed in a very timely manner, by combining the modern and relevant, with the appropriate conceptual foundation for the current practice and the instruments necessary for the implementation of the praxis.[20]

The prototype produced with workers is inscribed as technological innovation, self-education technology and networked education, with the potential to transform educational praxis based on the encounter between the "world of work" and the "world of the user" and the intersection between "teaching health" and "practicing health" in the reality of the FHS territories.[11,12,15]

The *FracTeam*® App is an alternative to make tangible problems and support the educational praxis of nurses in the Family Health Strategy. It is a prototype of communication, information (and training) technology, which contemplates aspects from the users' experience and their technological needs. There is a forecast of the use of the App in the study scenario, not only in the district and health units studied, but throughout the Health Department of the Municipality of Manaus, after the final stages of the study. In addition, the intention is to advance participation in the moderation component and in the forms of management participation within the App, in addition to the possibility of making it free to all teams in Manaus and of the most different FHS scenarios in the country.

Technological innovation affects the lives of its users, causes transformations in life (and work). It is not simply a matter of launching a "new product", but of involving human beings in the theoretical conception and technological development of this solution, proposing, testing, building and adjusting. However, it is necessary to add to the proposition of an innovative technology, the commitment and institutional support to implement the product in a next stage of the program.[21]

Health education and care management actions can be developed and strengthened by the use of technologies,[20] since the dissemination of information occurs with consistent scientific bases, but in an attractive way. It can contribute to the interactivity and technological inclusion of workers and to the knowledge necessary to reduce risks related to the health care of the population.

Also, in nursing education, the benefits and barriers of using mobile technology in clinical nursing teaching have been studied. Nursing teachers are challenged to co-design and evaluate mobile applications to support learning in professional practice, in addition to researching the results of such use, the best strategies for personalizing and integrating apps in the educational context.[22]

The current phase of the development of technological innovations in the field of Nursing informatics suggests the need to know and evaluate the decisions that integrate the development process and its political contexts. In the future, the area will shift its focus from the development of specific brands and devices applied to the clinic to emphasize the involvement and autonomy of the care user him/herself, in addition to maximizing the usability and interoperability between various devices and investments.[23]

In the case of technologies aimed at promoting and qualifying communication between professionals, the involvement of users can occur since the development stages. Even more specifically, in the case of the type of technology proposed in this study, there will be challenges for the future, including expanding its potential for interoperability, incorporating dialogue with other technological resources.

Prototyping gains relevance and reduces the possibility of an invention failing. The culture of empathic co-creation (or co-creative empathy) when exercised in the technological development process, generates an "empathic product", accelerates the speed of adaptation as well as the understanding of the importance of its use.[15]

The results highlighted that usability tests can indicate improvements in the devices developed or in prototyping as in this study, as well as indicating the acceptability and level of user satisfaction, aspects considered essential in usability studies.[24]

CONCLUSION AND IMPLICATIONS FOR PRACTICE

The process allows the exercise of collaborative experience in favor of intellectual needs for education and work based on collective intelligence. The ideation and prototyping based on participatory processes will have an impact on the development of technologies for the practice of Nursing and health. The FracTeam® App can foster the PHC nurse's learning process, self-education and critical sense, allowing, through the use of mobile devices based on praxis, the (re)direction of actions through contextual, collaborative knowledge, and collective experiences.

A technological resource can promote the acquisition of knowledge, (re)application of successful experiences, supporting the planning and care in the health care of FHS communities and territories with the potential to transform traditional mechanisms of education at work. The use and expansion of mobile applications in the health, nursing, and education work process require a conceptual framework based on fundamentals that underpin its development in a consistent way and coherent with the real. Every product must (or should) start from critical knowledge focused on life and the human being. Innovating from previously conceptualized knowledge is a condition for technological development.

It is considered as limitations of the study not listening to the managers, in order to obtain other perspectives on the challenges of the educational praxis of the FHS nurses, and the non-inclusion of the FHS nurses working in the other health districts of the municipality.

The potential for future studies is highlighted, in which the application is appreciated and evaluated by specialists as well as developed and tested with the nurses of the FHS. It is recommended that further research be carried out considering the point of view of other FHS professionals.

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AUTHOR'S CONTRIBUTIONS

Darlisom Sousa Ferreira: Study design. Acquisition; data analysis and interpretation of results; Writing and critical review of the manuscript; Approval of the final version of the article; Responsibility for all aspects of the content and the integrity of the published article.

Flávia Regina Souza Ramos: Study design. Acquisition; data analysis and interpretation of results; Writing and critical review of the manuscript; Approval of the final version of the article; Responsibility for all aspects of the content and the integrity of the published article.

Elizabeth Teixeira: Study design. Acquisition; data analysis and interpretation of results; Writing and critical review of the manuscript; Approval of the final version of the article; Responsibility for all aspects of the content and the integrity of the published article.

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