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Heritage Education and Non-Formal Education Mediated by Mobile Learning

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ABSTRACT – Heritage Education and Non-Formal Education Mediated by Mobile Learning. Heritage education is currently an essential topic in debates on education and cultural heritage. Critically-based heritage education conceives its field not only as a commodity but also as a process, thus becoming a complex field since it provides multiple educational strategies. Therefore, establishing relationships between non-formal education and heritage education is of paramount importance. For this purpose, an application called *Passeio Cultural – Ponta Grossa* was developed for mobile devices, and the Delphi method was used to validate it. The results were essential to establish some limitations and to better adapt the app to the proposed theoretical bases.
Keywords: **Heritage Education. Non-Formal Education. Mobile Devices. Mobile Learning. Cultural Heritage.**

RESUMO – Educação Patrimonial e Educação não Formal Mediados por *Mobile Learning*. Atualmente a educação patrimonial é essencial nos debates em torno da educação e do patrimônio cultural. A educação patrimonial de base crítica concebe o campo não somente como produto, mas também como processo, tendo em vista dois eixos principais: diversidade cultural e participação da comunidade. Dessa maneira, é de suma importância estabelecer relações entre a educação não formal e educação patrimonial. Para tanto, foi desenvolvido o aplicativo para dispositivos móveis, denominado *Passeio Cultural – Ponta Grossa*, e para validá-lo foi utilizado o método Delphi. Os resultados foram fundamentais para estabelecer algumas limitações e para adequação do aplicativo às bases teóricas propostas.
Palavras-chave: **Educação Patrimonial. Educação Não Formal. Dispositivos Móveis. *Mobile Learning*. Patrimônio Cultural.**

Introduction

According to Scifoni (2015), heritage education has been a thing ever since the 19th century[1]. The term was brought to Brazil via England, being first employed in a seminar held in the city of Petrópolis, at the Imperial Museum, in 1983; its applications were then associated to a specific methodology whereby it could be used in monuments and museum environments for educational purposes.

Only in the last decade heritage education has begun receiving proper emphasis within academic production – no longer as a specific methodology, but as a field of work, reflection, and action. It is, however, far from being well-established. Some structural and practical aspects therein, such as the lack of training in the field, the perception of the field as a commodity, as well as some of its individualized practices, disclose limitations that are determinant of the reflexive shortcomings within the field.

Thus considered, heritage education is held hostage to ineffective pedagogical practices, lacking any substantial theoretical foundation. Therefore it is been described as a recent theoretical field, "[...] not consolidated, broad, diverse, and contradictory; not sufficiently well-founded; multidisciplinary and interdisciplinary by nature" (Scifoni, 2015, p. 195).[2] The need for theoretical and critical discussion derives from such a scenario (Scifoni, 2012).

The pioneering major publication in the field of heritage education in Brazilian Portuguese is the *Guia básico de educação patrimonial* ("Basic Guide to Heritage Education", by Horta; Grunberg; Monteiro, 1999). Despite its importance, the guide was, according to authors such as Tolentino (2016), controversially composed, especially in what concerns Paulo Freire, thereby formulating a fallacious concept of education with implications to the pedagogical practices of heritage education. According to the aforesaid author, the idea of cultural literacy reproduced therein is tightly connected to the imperative of teaching literacy to the Other in another cultural context – an idea inspired by Paulo Freire, though without proper scrutiny. In Tolentino's words (2016, p. 40-41), the guide, "[...] while asserting the need to culturally teach literacy to the Other, does not recognize this Other as a producer and protagonist of his or her own culture, and postulates one culture (ours) as superior to anybody else's."

Such a perspective results, so Tolentino (2016), in a conception of education as a transmission of knowledge, values, and hegemonic ideas. Contrary to what Paulo Freire (2004) proposed through his dialogical education, this scenario ends up reproducing an anti-dialogical perspective; that is, education here takes place as a banking matter, where the student is seen as a vessel wherein content and information must be deposited.

Another criticism by Tolentino (2016) concerns the guide's conception of heritage education as a specific methodology, neglecting the idea of educational practices as something to be guided by a

whole array of methodologies which take into account the specificities and particularities of each circumstance. The author highlights that the methodology proposed in the guide focuses more on standardized cultural objects than on the subjects of educational practices.

The guide offers, then, a one-sided vision (Scifoni, 2015), the outcome of a field conceived as a commodity. In other words, reflections on educational practices are taken as mere transmissions of information and content built within various institutions – be them formal and/or informal, public and/or private –, so as to be executed from the top down in the format of booklets, games, informative pamphlets without addressing local demands. This context, so Demarchi (2016), is bound to lead to ineffective and non-continuous educational practices lacking an up-to-date and robust theoretical foundation. In the discussion that follows, we explore a critical epistemological basis for heritage education, which deems its field as a process – not a mere commodity.

To a new epistemological perspective on heritage education

The notion of heritage education as a specific methodology, with pedagogical practices that reproduce a set of isolated actions conceived as products, has gradually been overcome. That is to say: the field extends beyond actions of "diffusion" or "promotion" of cultural heritage, thereby focusing essentially on constant constructions of relationships between the community and local demands.

According to Scifoni (2015), the epistemological foundation for heritage education should be critical and conceived as a process rather than a commodity. In this critical perspective, we can reflect on the basis of heritage education side by side with the ideas of Paulo Freire (2004) regarding dialogical education.

A field grounded in such a critical epistemological basis should be conceived through practices aiming at humanization, at the process of reflecting the surrounding world so as to transform it. This, however, does not solely involve raising awareness about culture – since the mere spreading of awareness, so Demarchi (2016), constitutes symbolic violence once it presupposes reality to be absent from the individual. This process of awareness-raising should rather give place to critical participation – that is, to a perspective of culture as "mediation", in Paulo Freire's words (2004).

Pedagogical practices as "mediation" aim for an inquiring perspective so as to raise an 'intentional awareness' of the world. In other words, education is all about individuals and their overarching relationships; it is the way one takes decisions autonomously and cultivates oneself as a person while consciously drawing up one's history, transforming one's surrounding reality.

This way, the individual turns out to consider spatiality, objects, and monuments as one's cultural constructs. Hence, pedagogical practices in heritage education should associate cultural assets with

daily practices or other instances of the individual's life. Debates on the preservation and recognition of cultural assets should be seen as a social practice, taking into account human beings as major protagonists in actions related to their sense of belonging and the preservation of their cultural assets.

Departing from the critical perspective on heritage education, Florêncio (2014, p. 24) conceives cultural heritage as a "living document." Such a viewpoint deems educational practices through multiple educational strategies which are not only associated with formal education but also in consonance with non-formal and informal education.

The author claims that interactions can be strengthened not only through contact between schools and public spaces (such as squares, parks, and historical buildings) but also by other instances of individuals' lives open to interpretation, articulated through daily practices and identity marks, among others (Florêncio, 2014). In this sense, pedagogical practices aim for the collective and democratic construction of knowledge. After all, the community's participation in the processes of formulation, implementation, and execution of cultural heritage should be ensured in all aspects (Tolentino, 2012).

In addition to the intentional awareness of the world, where individuals are the protagonists of their interactions with the world, critical heritage education must highlight the unequal nature of cultural heritage. According to Miceli (2007), in the collection of Pierre Bourdieu's articles published in Brazil as *A Economia das Trocas Simbólicas*, there is a hegemonic appropriation that is organized by culturally relevant distinctions. This way, it attributes values and produces marks of distinctions, making them more or less pertinent, consequently, more or less recognized.

The full quote (Miceli, 2007, p. 109) states that

> […] at a certain stage of a given field […], the search for themes, techniques, and styles [are] endowed with *value* in its specific economy – for they are capable of culturally allowing the existence of the groups that produce them, properly attributing cultural marks of distinction (an expertise, a manner, a style), recognized by the field as culturally relevant and, therefore, susceptible to being perceived and acknowledged as such, based on the cultural taxonomies available at a certain stage of this given field.

Cultural capital fosters hegemonic appropriation, allowing certain groups to control information and formations, inasmuch as they aim for uneven control over spaces. Thus, specific cultural heritages enable one group's privileged access to the production and distinction of cultural assets at the expense of another's, building hierarchical boundaries between both.

In this sense, Canclini (1994) reveals that the hierarchy of cultural values has defined the popular as inferior, reinforcing the subordination of the lower classes and their memories. In the same vein,

Demarchi (2016) highlights that, in Brazil, cultural heritage is rooted in the privilege of certain historical narratives over others, conditioned by a series of impositions. Canclini (1994, p. 97) argues that "[...] the dominant sectors not only define which goods are superior and deserving of conservation, but also own the economic and intellectual means, besides the work hours and leisure time necessary to impart greater quality and refinement to these goods."

Interests in the preservation of a building or cultural event generate conflicts and undergo negotiations among different social agents, since they are involved in their own attributions and criteria while exercising their task of protecting assets – even when the heritage remains the same, the way one regards it does not. Dropa (2016) takes as an example an "old building," which, from an economic and real estate point of view, may be a nuisance. On the other hand, once we take into account artistic and historical criteria, it may be a reference in terms of aesthetics and technical execution.

In the same vein, Scifoni (2015) highlights the hegemonic and selective nature, particularly in the State's appropriation in education and in heritage itself, unveiling the existence of a Caucasian representation with a Eurocentric focus. In the author's words (Scifoni, 2015, p. 200):

> The trajectory of heritage policies in Brazil places us before a patrimonial ensemble seemingly cohesive and uniform: these are estates, mansions, and sugar mills that produced the country's economic wealth; military fortifications and strongholds that ensured the possession of the territory under the Portuguese colonization; churches and chapels that bespeak the role of Catholicism in the nation's construction; town halls and jails representing the power and control of a political elite over the social sphere.

The expansion of European colonialism, according to Quijano (2005), naturalizes the relations of domination between Europeans and non-Europeans through Eurocentrism. This process became an effective and enduring instrument of universal social domination, implying "[...] a new way to legitimize the already long-settled ideas and practices of hierarchical relationships of superiority/inferiority between rulers and the ruled" (Quijano, 2005, p. 118).

Such a perspective treats heritage as something autonomous, implying a view of cultural heritage independent of the processes it stems from – and it does so with the purpose of concealing certain historical actors and the relationships of conflict and domination, steering the seemingly neutral cultural asset in service of hegemonic purposes. Due to this neutrality, so the author, therefrom comes a "[...] biased view of who we are, as some are not represented there as much as the others" (Scifoni, 2012, p. 34).

In this way, pedagogical practices on heritage education, with no proper intricate and critical theoretical reflection, can reinforce hegemonic domination mechanisms produced by an anti-dialogical debate – one where the individual is absent or alienated from his or

her own reality. As a result of this debate, so Scifoni (2012, p. 37), there arise "[...] conflicts, tensions, and often a negative image of heritage and preservation agencies, along with the population's lack of awareness of the values attributed to a given cultural heritage".

For pedagogical practices on critical heritage education, it is essential that we base our reflections upon collective and democratic formations, engaging citizens in the challenge of contemplating the protection of assets related to their memory – and all its manifestations –through a continuous dialogue among cultural and social agents. According to Dropa (2016), pedagogical practices in heritage education should not solely focus on a given property after it has been recognized as heritage. It should rather be part of the recognition, inventory, and preservation process.

Florêncio (2014, p. 20) analyzes that pedagogical practices "[...] should be faced as a fundamental resource for the appreciation of cultural diversity and the strengthening of local identities, through the use of multiple strategies and learning situations collectively constructed." Similarly, Scifoni (2015, p. 202) emphasizes that "[...] rethinking heritage education within the new pedagogy requires us breaking with the traditional ways of transmitting culture based on the celebration of what has been configured as barbarism".

Departing from this debate, there stand out two essential axes that permeate the entire reflective process of pedagogical practices on critical heritage education. One must consider these axes as a whole, as they are not the only concerns related to reflections on heritage education. Nevertheless, their importance for the contemporary debate on the topic is here acknowledged.

The first axis relates to the community's participation in the process of collective and democratic construction of knowledge; it takes into account the community and its citizens as producers of knowledge. Consequently, it is crucial for the actors – the community and its citizens – to actively participate in the formulation, implementation, and execution of decisions regarding cultural heritage. When we talk about community participation, it involves not only the decision-making process regarding heritage but also in the ongoing pedagogical project itself.

As a result, it is essential for the actors – e.g. the community and its citizens – to actively participate in the formulating, implementing, and decision-making process regarding cultural heritage. Once we bring about the topic of communal participation, we do not only refer to the decision-making process on the heritage itself, but also to the ongoing pedagogical project.

The second axis relates to cultural diversity. This perspective reflects on and mobilizes various collectively constructed pedagogical strategies to strengthen local cultural diversity. Even so, according to Florêncio (2015), pedagogical practices in heritage education should not be thought of solely for a specific context but rather through the

local cultural references that citizens come to understand and reflect upon regarding the world and its cultural diversity.

Pedagogical practices in heritage education aim for the collective and democratic construction of knowledge. In other words, they should ensure community participation in the processes of formulation, implementation, and execution around cultural heritage in all its diversity (Tolentino, 2012).

Here we arrive at the following definition, as formulated by Florêncio (2014, p. 19).

> Formal and non-formal educational processes whose focus lies on Cultural Heritage, socially appropriated as a resource for the socio-historical understanding of cultural references in all their manifestations, [aim to] contribute to their recognition, appreciation, and preservation. It also points out that democratic-based educational processes should allow for the collective and democratic construction of knowledge via continuous dialogue among cultural and social agents and the active participation of communities that hold and produce the given cultural references, [and] where diverse notions of cultural heritage coexist.

Florêncio (2012) raises the question that heritage education should approximate society and public sectors, making use of instruments such as listening and observation, "which should allow for the acceptance and integration of local singularities, identities, and diversities" (Florêncio, 2012, p. 26). Tolentino (2012, p. 51), on the other hand, highlights, regarding the double axis here proposed, that heritage education "[…] must take into account the fact that educational processes are supposed to be ground upon a democratic basis, whereby they prioritize the collective construction of knowledge and effective participation of diverse social actors who own and produce the given cultural references".

Thus having exposed a theoretical discussion on the topic of heritage education, we now turn to the debate and reflection on the field in non-formal education mediated by learning through mobile devices or mobile learning *(m-learning).*

Heritage education, Non-formal Education and Mobile Learning

The increasing use of technological resources has challenged the traditional pedagogical paradigm with models such as e-learning (electronic learning) and b-learning (blended learning). Whereas the former relates to online teaching from home and at the workplace, the latter is associated with hybrid teaching with different learning possibilities, blending distance learning resources and the classroom environment.

Regarding the use of mobile devices, their uncomplicated use and optimization, besides the fact they keep becoming increasingly smaller and more advanced in terms of multiplicity of functions and services, provide several educational possibilities in diverse contexts.

Following the concept of mobile learning (m-learning), they alter the spatial-temporal relationships of individuals, thereby facilitating communication. Consequently, they bring about significant changes in the teaching-learning process, as well as in the roles of teachers and students. Formerly, m-learning was associated with a stage of learning anywhere and anytime, and to the idea of ubiquitous mobile[3].However, according to Moura (2012), the evolution of the definition of m-learning has been changing alongside the development of mobile devices themselves. Thus, its definition is broadened so as to involve the user and the context, and, with it, short-term learning, "[...] providing information in a specific context and for a specific purpose" (Moura, 2012, p. 128). Another crucial point in this ever-changing movement is the misguided restriction of m-learning to a mere extension of e-learning. Mobile devices, with proper mediation, could provide positive experiences in the context of blended learning (b-learning) and face-to-face learning as well.

Whatever technological learning model should be employed, caution must be exercised in asserting that technological resources result in improvements in the teaching-learning process (Wardenski; Espíndola; Struchiner; Giannella, 2012). According to Valente (2014), Wireless Mobile Technologies (WMT) may provide conditions that can influence learning, thus establishing m-learning as a new way of imparting knowledge. But, accordingly, m-learning can be limited neither to the use of WMT for learning anywhere and anytime, nor to the learning mediated by the use of mobile devices, as certain a technocentric view of learning emphasizes. This context is closely tied to technological determinism[4] and technological instrumentalism[5].

To avoid a technocentric view of learning in mediations using m-learning, it is proposed to emphasize the pedagogical and social aspects that tend to use mobile devices as a means to create, enrich, and integrate, regardless of the learning model (e-learning or b-learning), developing "[...] a more complex view, fathoming learning as a sociocultural construction of knowledge that involves the student, technology, and the context" (Valente, 2014, p. 45).

It is of paramount importance in education that the means for the development of capacities and skills be provided, as well as the conditions for changing the homogenizing aspect in scientific and technological innovation, considering those interested in social change. According to Feenberg (2010, p. 106), "[t]he most fundamental thing for the democratization of technology is to find new ways of privileging these excluded values and realizing them in new technical arrangements".

The potential of m-learning – once we favor pedagogical and social aspects – lies on its capacity to change individuals' relationships with space and time through mobility, reducing distances, bringing the subject closer to everyday life, facilitating information sharing, and creating-integrating diverse learning possibilities in multiple contexts.

In this way, learning through m-learning encompasses a variety of contexts beyond traditional places (classrooms, laboratories, homes and so on). M-learning facilitates communication and information sharing, besides reducing distance, bringing the subject closer to everyday life, and promoting new conditions for implementing and enabling pedagogical projects in the contexts of non-formal education.[6] Through it, information is discovered rather than taught, and the intentionality of action becomes of paramount importance for non-formal education (Gohn, 2006).

This type of learning dynamics of the non-formal education is not restricted to acquiring skills and abilities through memorization and reproduction of content. It rather involves the use of new perceptions and sensitivities for the sharing of information, in a constant process of formation, where daily interactions develop a state of permanent learning. Its outcome is an open, non-linear, and mutable learning (Kenski, 2003).

Learning contexts in non-formal education, according to Gohn (2006), are set outside the school, in spaces that pertain to people's daily lives, and let itself be defined as spaces of collective actions, where learning occurs through the experience exchange. In this scenario, once we problematize non-formal contexts as spaces of collective daily experiences, we can think of them pedagogically, transforming, for example, once historically neutral buildings into valuable spaces for reflection.

In this context, m-learning is able to provide a holistic view of cultural heritage, since it embeds it in a certain sociocultural, economic, historical, and geographical network, allowing for optimal understanding and interpretation (Ott; Pozzi, 2011). Hence, the non-formal space, mediated by m-learning in heritage education, aims to strengthen the bonds of belonging as a reflection of cultural construction, where the individuals (deeming themselves as producers of history) are able to transform reality. Pedagogical practices should stem from participatory and democratic actions – prioritizing excluded values, considering those interested in social change – in order not to result in a 'bank education' or an anti-dialogical approach (following Freire's wording, cf. 2004), a mere reproducer of technocentric thoughts.

With this aim of bringing together non-formal education and heritage education through m-learning in view, an application (app) called *Passeio cultural – Ponta Grossa* ("Cultural Sightseeing – city of Ponta Grossa") has been developed; its goal is integrating discussions that stem from the very theories exposed in this article.

Presenting the app *Passeio Cultural – Ponta Grossa*

The application *Passeio cultural – Ponta Grossa* reproduces audiovisual information – historical photos of buildings and audio narratives on their history – as the user approaches historical buildings of material and immaterial heritage, with no need for an internet con-

nection. Each time a user passes by a given building, the audiovisual information will be different.

The pedagogical, interactive, and conceptual construction aspects of the app are outcomes of the aforementioned theoretical discussions. Initially, the buildings[7] represented in the app are those that were in the inventory process[8] – they had already undergone a voting process by the local cultural council and been removed from the inventory process and, consequently, from the landmarking process.

Such a selection was thoughtfully designed and took into account the discussions on the two proposed axes concerning cultural diversity and the community participation process, as well as in alignment with Dropa's (2016) statement which suggests: pedagogical practices in heritage education should not focus solely on a good after being recognized as heritage through the landmarking process.

Many of the buildings excluded from the inventory process have either been or are already destroyed, as they were rejected in the negotiation process carried out by municipal agents of interest. In case there is a hegemonic process behind State-related processes (Canclini, 1994) such as landmarking, the very fact that we use the proposed selection already counts as a valuation of local cultural diversity, helping to revive the cultural stories of social agents rejected by the hegemonic negotiation process.

It is important to highlight some aspects that relate to hegemonic discourses and the non-neutrality of landmarked heritages in order to reflect on existing conflicts involving different criteria for selection and value attribution concerning cultural assets. In the case of Ponta Grossa, these "culturally pertinent distinctions" (Miceli, 2007) linked to cultural capitals can be evidenced by the following example.

According to city documents, the movie theater Cine Teatro Ópera, located on Quinze de Novembro street, is a landmark. Both the building and the street have been historically visited by the upper class. In contrast, there is the example of Cine Império, a movie theater attended by the working-class that offers low-cost tickets for sessions known as "Pão duro" (tight budget). At its peak, the theater's departing crowds filled the street, requiring police assistance to control its traffic. Cine Império was inventoried in 2001, removed in 2005, and after a fire ceased to exist.

The app aims to integrate processes of valorization, recognition, and preservation, emphasizing local cultural diversity, recovering histories, and showing users that the buildings – e.g. the ones sorted out – currently lack any form of legal protection. Some of them, in fact, no longer exist.

Another aspect of the app that stemmed from theoretical discussions consists in its informing the users that landmarking is not the only process able to protect cultural goods. Users can also participate in decision-making, for instance, by filing inventories for buildings with which they have some form of identity connection – it is an

open process that any citizen, not only the building owner, is able to set out (Tolentino, 2012).

Another key point in the theoretical debate previous to the app's development lead us to the relevance of community participation as an important axis for heritage education; not as a mere endpoint in the decision-making process regarding heritage, but also throughout the pedagogical practice. In this way, the app allows users to submit personal stories and narratives concerning the buildings, so enabling them to share personal information based on their experiences therewith. This aspect is crucial since user collaboration is essential for learning in m-learning and heritage education.

In addition to collaboration among users, collaboration within learning contexts represented by historical buildings is important for m-learning. The audiovisual information reproduced in the app integrates the stories of the buildings with other narratives, such as events, gatherings, occurrences, and curiosities that took place in the surrounding buildings or different regions and streets of the city.

Another remarkable aspect is connectivity. According to a survey conducted by the Regional Center for Studies on the Development of the Information Society (Cetic, 2019), the so-called the *Survey on the Use of Information and Communication Technologies within Brazilian Households*, 71% of households had internet access. In a specific segment concerning the poorest households with an income of one minimum wage, this percentage dropped to 55% (Cetic, 2019). In the Southern region – where the app was developed – 21% of the population has access to mobile data.

Due to the Brazilian state of affairs and to enhance its mobility, the app was designed to operate without requiring an internet connection. This decision considers that access to mobile data – 3G and 4G – is considerably low in face of the figures provided by Cetic (2019).

The Delphi Method

New practices and social relationships bring increasingly complex discussions to the field of education, both in formal, non-formal, and informal education. Such changes must be matched with renewed strategies, methods, and evaluation parameters for educational research. Strategies such as Delphi, which facilitate dialogue among experts, are, according to Marques and Freitas (2018, p. 410), "potentially more comprehensive and inclusive".

This methodological tool has significant potential in the educational field since it "[…] allows harnessing the potential of different areas of expertise in the search for solutions, forecasts, or characterization of complex and multidimensional problems – such as are most educational issues" (Marques; Freitas, 2018, p. 411).

According to Roque (1998), the Delphi method was developed to increase the accuracy of parameters yet unknown – it deduces, refines, and generates a certain result based on the opinions of a group

of experts. Although, such a method aims not only to deduce a simple answer, but to obtain high-level opinions by means of debates, with the goal of seeking consensus on a specific theme as it is presented to experts from different areas of knowledge.

The process of applying the Delphi method consists of distinct stages called rounds. Those rounds are carried out to analyze trends, opinions, and justifications of the experts. However, it does not consist in a vote count or even in a presentation of quantitative data. The initial responses are systematized, analyzed, and compiled – only then new questionnaires are formulated for another round of responses. This way, experts can refine, defend, or alter their answers (Marques; Freitas, 2018).

Besides the questionnaire rounds, Rozados (2015) emphasizes that the Delphi method has three fundamental characteristics: anonymity, interaction, and controlled feedback. Anonymity, accordingly, has three positive points. First: it prevents a research participant from being influenced by the reputation of another, or from opposing directly against other research participants. Second: it allows a change of mind during the research. Third: it enables participants to defend arguments, even when a certain idea is misconceived.

The questionnaires are conducted anonymously, as emphasized by Marques and Freitas (2018). This characteristic is accordingly crucial for overcoming barriers associated with face-to-face communication, such as persuasion, changing viewpoints, the expression of contrary and polemical opinions, and so forth.

We have seen how interaction and controlled feedback emerge from the questionnaire rounds. How, by interacting with the questionnaires multiple times, experts can modify their opinions. In essence, as stated by Marques and Freitas (2018), the Delphi method, through anonymous dialogue over multiple rounds, reflects a rich construction as it incorporates viewpoints from various experts, seeks consensus, and builds bridges.

Once the experts get involved in crafting the initial questionnaire in the first round of responses, they are able to share their opinions among themselves. These first round responses are then analyzed and used to build up a second round; thus, the significant points raised by the experts undergo scrutiny from their peers.

The app underwent analysis by experts – Cultural Experts (CE) and Technological Experts (TE) – using the Delphi method, aiming to gather opinions on its functionality and usability, as well as its role as a tool for learning heritage education. For the analysis of qualitative and quantitative data, content analysis was employed and involved the creation of categories and the grouping items based upon the responses.

The first group of experts (TE) comprised six individuals: professors associated with the Universidade Tecnológica Federal do Paraná, Ponta Grossa campus, holding master's or doctoral degrees in areas such as System Analysis and Development, Computer Science, Data

Processing, and Information Systems. The second group of experts (CE) consisted of six individuals affiliated with the Fundação Municipal de Cultura, holding managerial positions within or in relation to the city's cultural council.

The cultural questionnaire was designed to inquire about general aspects of heritage education incorporated into the application. These parameters aim to assess the application with higher-quality results, covering a wide range of areas. In order to organize the questions in the cultural questionnaire, some key concepts of great importance to the research, selected from the theoretical framework, were systematized so that the questions could be formulated more accurately.

The CEs assessed aspects related to the subcategory of cultural heritage, which were systematized through theoretical concepts related to cultural recognition and diversity, appreciation of local heritage, community learning, and bonds of belonging. Based on responses from the open-ended inquiry, we formulated the second round of the questionnaire. This round was developed in the light of the interpretation of results structured under the information category.

In the technological questionnaire, experts addressed questions raised during prior contact, focusing on mobile devices as a learning tool (m-learning), app functionalities, and usability.

App Limitations

Based on the considerations and questions raised by the experts, and as a result of the methodology used, we must make some observations regarding the app limitations. Such discussions may eventually serve as a starting point for some changes in the app's characteristics. From the analysis of content derived from the Delphi methodology, the limitations were categorized as follows: 1. color changes, 2. access to information, 3. information on immaterial heritage, and 4. changes concerning audio.

Category number 1 – regarding color changes[9] –, relates to the potential confusion of users with the colors variations. The app does not clearly indicate, through a color scale, the equivalent caption to each color. TE 3 emphasizes: "In my opinion, the colors should have been designed solely for the purpose of location (something like 'which points have I not visited yet')". TE 4 also raises the question, "Should the colors indicate whether I have passed by a particular location or not?".

It is manifest that all individuals have the right to access their city; however, in today's society such an inclusion is suppressed, overshadowed by the prioritization of the right to private property and profit margins (Harvey, 2008). Such a configuration contributes to urban segregation and the exclusion of socially vulnerable individuals from the city centers, for example.

From this discussion arises category number 2 – access to information. It pertains to the need to add functionalities that make it easier for users to overcome the aforementioned limitations. The potential solution to these issues leads to the idea of 'gamifying' the app. As explained, puzzle games and memory games will be developed and made available in future updates, so as to incorporate information on immaterial heritage into the app once the user completes certain challenges.

Category number 3 – information on immaterial cultural heritage – resulted from discussions raised by the Cultural Experts (CE) and was chosen due to the lack of information regarding immaterial cultural heritage. It consists of a way to enrich the information available in the software. CE4 argues: "I'm afraid there is a lack of more popular expressions of immaterial cultural heritage, suggesting that they also must be taken into account, in observance of the law for safeguarding intangible assets, as places (in the sense of immateriality), expressions, and knowledge".

Category number 4 – changes concerning audio –, was raised due to the app's functionality. It reproduced information after the user moved 25 meters away from a given property, so that he or she needed to return to receive further information. As a solution, it was suggested the possibility for the user to choose to play all the audios, accessing all information at once. We recall the statement from TE4, who suggested that the app could have a "further information" button which played the rest of the audios.

App Correspondence with Non-formal Education

In what concerns the questionnaire, we addressed aspects of heritage education and mobile devices to correlate some knowledge already present in the results obtained from the Delphi method while the app was been formulated. With these results, the discussion will focus on m-learning along with some aspects of non-formal space. In order to do so, we will employ the six-fold questioning to define the non-formal space, following Gohn's model (2006), for the context of heritage education mediated by m-learning.

As an answer to "who educates?" (Gohn, 2006), the author proposed: those with whom we integrate or interact. Thus, we can highlight within the results the responses in which the experts agreed when asked about the creation of new learning spaces, integrating knowledge among users and the stories of the buildings themselves.

It is important to remark that the app is open for the users to participate and record their own audio content. In this way, the app brings an essential characteristic in m-learning: it provides forms of interaction and cooperation with other people and institutions, aiming to strengthen the learning process. There, it creates and integrates learning possibilities in multiple contexts – in our case, in the context of the buildings and their stories. This does not occur in isolation,

though; the results show that the experts agreed when asked that the app is able to integrate the stories.

This question is also relevant for heritage education since, as formerly proposed, one of the axes for the field is the process of community participation – be it in the formulation, implementation, and execution of educational practices, as well as in continuous educational practice. This perspective is adamant to the process of collective and democratic construction of knowledge where the community and its citizens act as producers of their own knowledge.

The second question reads: "where does education takes place?" (Gohn, 2006). According to the author, non-formal education takes place in contexts outside the school, amid people's daily lives. Heritage education practices as "mediation" (Freire, 2004) are more positive when we relate other instances of people's lives to learning, taking into account their environs, objects, and monuments as a reflection of their cultural building.

We can associate cultural goods in everyday practices by means of the concept of mobility. According to the results, the app facilitates the creation of new spaces for learning. These aspects may be reflected in an integrated and interdisciplinary pedagogical planning that involves students and the community as active participants in the construction of a sense of belonging.

As an answer to the third question – "how does one educate?" (Gohn, 2006) –, the author claims that a non-formal education is crucially depended on intentionality, and the partaking in it must be elective. These environments must be built collectively, following the dynamics and guidelines of a given group.

The results to the questionnaire show that the app provides users autonomy to construct their knowledge – it allows them to plan when and how they will use the app, create routes, and visit historical buildings, for example. The app also allows for optional participation, enabling users to choose the best time or day, despite the discussed limitations. In terms of city access, users can properly plan their actions before using it.

The fourth question relates to "purpose/objective" (Gohn, 2006). Accordingly, it is about developing habits, attitudes, and behaviors, thereby enabling access to world knowledge collectively built and based on social justice, besides strengthening the exercise of citizenship. In heritage education, this process is linked to the recognition and valorization of cultural heritage, so that gradually, individuals develop a sense of belonging to exercise their citizenship around cultural heritage.

Regarding the app results, the CEs emphasize the importance of valuing and recognizing historical heritage provided to the user. These two aspects are important in the initial stages of knowledge building, though they should not be restrained to them, as this involves a more permanent and systematic process (Tolentino, 2012), such as the recognition of cultural diversity.

The fifth question is related to the "core attributes of each field" (Gohn, 2006). The construction of citizenship is accordingly of utmost importance, since it encompasses subjective aspects of groups for the development of bonds of belonging. In its relation with contemporary heritage education, citizenship becomes not only a set of practices or attributes of the individual – neither is it about the rights and duties regulated by the state, nor even about the struggle for them.

For Castelfranchi and Fernandes (2015), citizenship goes beyond focusing on the relationship between people and their rulers; it is about the connections between individuals and their environs. Feenberg (2017) points out that the political action of citizenship is not simply reflected in the right to speak one's mind but rather in what he calls "political agency". The concept is thus based on knowledge and power, defined by the legitimate right and the power to influence in the political field.

Through such political engagement may decisions go beyond the technical spheres; the group negotiations around heritage starts to be based on subjective aspects. This is because the underlying aspects are of paramount importance for the protection of cultural assets. Heritage education then becomes a field that aims at participatory pedagogical practices, involving the individual in the process of protecting goods and the memory of these goods, significantly anchoring itself in non-formal education.

The last question pertains to the "expected results in each field" (Gohn, 2006). Non-formal education teaches individuals to interpret the world, thus developing the ability to (re)construct worldviews. This way, it is crucial for the individuals to value themselves and other groups, recognizing each and every one as equals and rejecting culturally established prejudices.

Within the perspective of non-formal education, cultural diversity is of paramount importance as the individual comes to recognize the history of those groups that have been neglected by a dominant hegemonic negotiation system – a system that disposes of economic and intellectual means in a way that rejects the idea of neutral cultural heritage.

As the app shows, buildings that were not "accepted" by the hegemonic system and, despite some resistance, were annexed to the inventory process, ended up being no longer protected, and some no longer exist. In the questionnaire, the Cultural Experts (CE) agreed that the app integrate people into their cultural diversity. However, an increase in information, especially related to immaterial heritage, is necessary to more comprehensively address cultural diversity.

Final Remarks

This paper aimed to establish a relationship between heritage education, non-formal education, and m-learning. M-learning unfolds through an app designed for mobile devices and serves as a me-

diating path between heritage education and non-formal education, with a focus on historical buildings.

Therefore, heritage education is conceptualized as a process rather than just a commodity. Two fundamental axes, though not the exclusive ones, were singled out – they concern the reflective framing of pedagogical practices around heritage education with a critical epistemological basis – and as such served as the basis for the app's design.

The first axis relates to the participation of the community and its citizens in the process of collective and democratic knowledge building, whereby they are the main goal of the knowledge production and of its understanding. Thus, it is crucial for these agents to actively participate in the formulation, implementation, and execution of discussions on cultural heritage.

Furthermore, community participation is crucial if we want to reject a technocentric view of knowledge, allowing the use of m-learning to emphasize pedagogical and social aspects in creating, enriching, and integrating formal, non-formal, and informal education. This way, it may develop a more comprehensive understanding which involves students, technology, and the context.

The second axis relates to cultural diversity and aims to employ different pedagogical strategies collectively constructed (first axis) to strengthen local cultural diversity. Although, one should not limit pedagogical practices to a single context. Rather, through the acknowledgment of their local cultural references, citizens come to understand and reflect on the world in all its diversity.

Moreover, it is crucial to develop capacities and skills, especially for those interested in social change, with the purpose of altering the homogenizing aspect also inherent to technology. Hence, the second axis (cultural diversity) should not be restricted solely to heritage education; it is fundamental for technology to find new ways to privilege excluded values and ground them in novel technical arrangements (Feenberg, 2010).

These two axes are not linear – they interconnect throughout the process of implementation and execution of discussions about pedagogical practices. Another crucial point here is the relationship between the contexts and agents of education. Non-formal education should not be conceived at the expense of formal education. Their relation should rather be characterized by contribution and collaboration – not replacement. Pedagogical practices should not be restricted to a specific educational context, as this might limit participation and learning. Establishing connections between formal and non-formal education is essential for a broader, inclusive, and dialogical educational process.

The virtual sightseeing was developed with the aim of overcoming economic, spatial, and time constraints. Such sightseeing reproduces historical information and images of the buildings. This mode of reproduction not only facilitates user access to information but also

bring together formal, non-formal, and informal education. This connection, along with the two aforementioned axes (community participation and cultural diversity), is of utmost importance for heritage education as a process, not just a commodity.

Notes

1 The following article is a selection from the dissertation *Educação patrimonial por meio da mobile learning na educação não formal: aplicativo passeio cultural – Ponta Grossa* ("Heritage education through mobile learning in non-formal education: application Passeio Cultural - Ponta Grossa", In: SCHEID, 2021) under the advising of Eloiza Aparecida Silva Avila de Matos and the coadvising of Julio Cesar Botega do Carmo, approved on September 30, 2021.

2 Hitherto, all translation from Brazilian Portuguese are the authors' own.

3 As McGreal highlights (2005, p. 3), "[…] [it] allows for the delivery of learning to anyone, anywhere, at any time using ubiquitous mobile device".

4 Technological determinism, being technologically autonomous, as Feenberg (2010) points out, does not imply that technology is self-creating, but rather that there is freedom in the decision-making process of individuals regarding technology. Such a perspective on technology is autonomous since it reproduces its own laws, which are followed in an optimistic and progressive manner. According to the author, "[...] the determinists believe that technology is not controlled by humans; it conversely controls humans; that is, it shapes society according to the demands of efficiency and progress" (Feenberg, 2010, p. 59).

5 Feenberg (2010) claims that this is the modern view of technology, taken as a tool or instrument for people to satisfy their needs. This perspective relates to the "liberal faith in progress" (Feenberg, 2010). As it does not incorporate values, it is neutral, even though it is humanly controlled, in terms of its use and appropriation of technological artifacts.

6 According to Gohn (2006), educational contexts encompass formal, non-formal, and informal education. In essence, formal education is that which takes place in schools, with a predefined content. Informal education is what individuals learn through the process of socialization, such as amidst family, friends, neighbors, clubs, etc. It is also laden with "[...] values and cultures of belonging and inherited feelings" (Gohn, 2006, p. 28). Non-formal education is characterized by a collective nature; learning occurs through the exchange of experiences, above all in spaces of collective action. The intentionality behind actions is crucial for non-formal education; as is "[...] the act of participating, learning, transmitting, or exchanging knowledge" (Gohn, 2006, p. 29).

7 This data collection took place at the collection made available by the Fundação Municipal de Cultura (Municipal Culture Foundation), singling out buildings pertaining to the inventory from 2001, the year when the Municipal Culture Foundation began receiving requests, up to the present moment. Nevertheless, the selected buildings are those that have already been removed from the inventory.

8 This consists in an legally-binding instrument for the protection of cultural heritage, although much milder than other legal devices such as landmarking; even so, it is an alternative for safeguarding cultural heritage. This process of identification and registration allows, through research, that a survey of various specificities and

characteristics of a particular asset be made, which includes its historical and architectural nature, among other aspects.

[9] The color changes every time the users pass by a specific building, allowing them to see when they have already visited a location. Historical information updates each time the users pass through a point.

References

CANCLINI, Néstor García. Patrimônio cultural e a construção imaginária do nacional. **Revista do Patrimônio Histórico e Artístico Nacional**, Brasília, Instituto do Patrimônio Histórico e Artístico Nacional, n. 23, p. 95-115, 1994.

CASTELFRANCHI, Yurij; FERNANDES, Victor. Teoria crítica da tecnologia e cidadania tecnocientífica: resistência, "insistência" e hacking. **Revista de Filosofia Aurora**, Curitiba, PUCPR, v. 27, n. 40, p. 167-196, 2015.

CETIC. Centro Regional de Estudos para o Desenvolvimento da Sociedade da Informação. **TIC Domicílios**: 2019. CETIC: São Paulo, 2019. Disponível em https://cetic.br/pt/tics/domicilios/2019/domicilios/. Acesso em: 15 mar. 2020.

DEMARCHI, João Lorandi. Perspectivas para atuação em educação patrimonial. **Revista CPC**, São Paulo, n. 22, p. 267-291, 2016.

DROPA, Marcia Maria. **A narrativa dos idosos**: análise a partir de Walter Benjamin – uma contribuição para a educação patrimonial de Ponta Prossa – PR. 2016. 267 f. Tese (Doutorado em Educação) – Universidade Estadual de Ponta Grossa, Ponta Grossa, 2016.

FEENBERG, Andrew. O que é a filosofia da tecnologia? In: NEDER, Ricardo (Org.). **Andrew Feenberg**: racionalização democrática, poder e tecnologia. (Ciclo de Conferências Andrew Feenberg. Volume 1. Número 3). Brasília: Observatório do Movimento pela Tecnologia Social na América Latina; Centro de Desenvolvimento Sustentável – CDS, 2010. (Série Cadernos Primeira Versão: CCTS – Construção Crítica da Tecnologia & Sustentabilidade).

FEENBERG, Andrew. Agency and Citizenship in a Technological Society. In: PITT, Joseph; SHEW, Ashley. **Spaces for the future**. New York: ImprintRoutledge, 2017. P. 10.

FLORÊNCIO, Sônia Regina Rampim. Educação Patrimonial: um processo de mediação. In: TOLENTINO, Átila Bezerra (Org.). **Educação patrimonial**: reflexões e práticas. João Pessoa: Superintendência do Iphan na Paraíba, 2012. P. 22-29. (Caderno Temático 2).

FLORÊNCIO, Sônia Regina Rampim. **Educação Patrimonial**: histórico, conceitos e processos. Brasília: Iphan; DAF; Cogedip; Ceduc, 2014.

FREIRE, Paulo. **Pedagogia do oprimido**. Rio de Janeiro: Paz e Terra, 2004.

GOHN, Maria da Glória. Educação não-formal, participação da sociedade civil e estruturas colegiadas nas escolas. **Ensaio: avaliação e políticas públicas em educação**, Rio de Janeiro, Fundação CESGRANRIO, v. 14, p. 27-38, 2006.

HARVEY, David. O direito à cidade. **Lutas Sociais**, São Paulo, n. 29, p. 73-89, 2008.

HORTA, Maria de Lourdes Parreiras; GRUNBERG, Evelina; MONTEIRO, Adriane Queiroz. **Guia básico de educação patrimonial**. Brasília: Iphan, 1999.

KENSKI, Vani Moreira. Aprendizagem mediada pela tecnologia. **Diálogo Educacional**, Curitiba, v. 4, n. 10, p. 1-10, 2003.

MARQUES, Joana Brás Varanda; FREITAS, Denise. Método DELPHI: caracterização e potencialidades na pesquisa em Educação. **Pro-Posições**, Campinas, Unicamp, v. 29, p. 389-415, 2018.

MCGREAL, Rory. **Mobile devices and the future of free education**. In: Athabasca University – Library & Scholarly Resources, Canada, 2005.

MICELI, Sergio. **Pierre Bourdieu**: a economia das trocas simbólicas. São Paulo: Perspectiva, 2007.

MOURA, Adelina. Mobile learning: tendências tecnológicas emergentes. In: CARVALHO, Ana Amélia Amorim (Org.). **Aprender na era digital**: jogos e mobile-learning. Santo Tirso: de Facto Editores, 2012. P. 127-147.

OTT, Michela; POZZI, Francesca. Towards a new era for Cultural Heritage Education: Discussing the role of ICT. **Computers in Human Behavior**, v. 27, n. 4, p. 1365-1371, 2011.

QUIJANO, Aníbal. Colonialidade do poder, eurocentrismo e América Latina. In: LANDER, Edgardo. **A colonialidade do saber**: etnocentrismo e ciências sociais. Perspectivas Latinoamericanas. Buenos Aires: Clacso, 2005. P. 107-126,

ROQUE, Ruth Ferreira. **Estudo comparativo de metodologias de desenvolvimento de sistemas de informação utilizando a técnica DELPHI**. 1998. Dissertação (Mestrado em Tecnologias da Informação) – Universidade Federal de Santa Catarina, Florianópolis, 1998.

ROZADOS, Helen Frota. O uso da técnica Delphi como alternativa metodológica para a área da Ciência da Informação. **Em Questão**, Porto Alegre, UFRGS, v. 21, n. 3, p. 64-86, 2015.

SCHEID, Guilherme. **Educação patrimonial por meio da mobile learning na educação não formal**: aplicativo passeio cultural – Ponta Grossa. 2021. 120 f. Dissertação (Mestrado em Ensino de Ciências e Tecnologia) – Universidade Tecnológica Federal do Paraná, Paraná, 2021.

SCIFONI, Simone. Educação e Patrimônio Cultural: reflexões sobre o tema. In: TOLENTINO, Átila Bezerra (Org.). **Educação Patrimonial reflexões e práticas**. João Pessoa: Superintendência do IPHAN na Paraíba, 2012. P. 30-37.

SCIFONI, Simone. Para Repensar a Educação Patrimonial. In: PINHEIRO, Adson (Org.). **Caderno do Patrimônio Cultural**. Fortaleza: Secretaria Municipal de Cultural, 2015.

TOLENTINO, Átila Bezerra (Org.). **Educação Patrimonial**: reflexões e práticas. João Pessoa: Superintendência do IPHAN na Paraíba, 2012.

TOLENTINO, Átila Bezerra. O que não é educação patrimonial: cinco falácias sobre seu conceito e sua prática. In: TOLENTINO, Átila Bezerra; BRAGA, Emanuel Oliveira. **Educação Patrimonial**: políticas, relações de poder e ações afirmativas. João Pessoa: IPHAN-PB; Casa do Patrimônico da Paraíba, 2016. P. 38-48. (Caderno Temático 5).

VALENTE, José Armando. Aprendizagem e Mobilidade: os dispositivos móveis criam novas formas de aprender. In: ALMEIDA, Maria Elizabeth Bianconcini de; ALVES, Dom Robson Medeiros; LEMOS, Silvana Donadio Vilela. **Web currículo**: aprendizagem, pesquisa e conhecimento com o uso de tecnologias digitais. Rio de Janeiro: Letra Capital, 2014. P. 20-38.

WARDENSKI, Rosilaine Fátima de; ESPÍNDOLA, Marina Bazzo de; STRUCHI-NER, Miriam; GIANNELLA, Taís Rabetti. Blended learning in biochemistry education: analysis of medical students' perceptions. **Biochemistry and Molecular Biology Education**, v. 40, n. 4, p. 222-228, 2012.

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