Improving Greek-Roma Education Through an Inclusive Digital Learning Hub

Authors
Liam Laidlaw
Zhyan Noble
Peter Story
Ava Waddell

Advisors
Melissa Butler
Robert Kinicki

Sponsor

Roma Educational Vocational Maintainable Assistance (REVMA)

Worcester Polytechnic Institute

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1. Introduction

The European Fundamental Rights Agency reported that, on average, 68% of Roma students are early leavers from education and training (Rutigliano, 2020). Within various European schools, Roma students are struggling to further their education due to both direct and indirect forms of discrimination embedded within these educational institutions. The three substantial forms of discrimination Roma students face include segregation, poverty-driven absenteeism, and peer-victimization/bullying (Rutigliano, 2020). These systemic and social barriers create an environment that pushes Roma students toward disengagement and early school leaving.

This inadequacy of equitable access to education for Roma students across Europe has particularly impacted the Greek Roma population, which has the lowest rate of Roma student attendance in early childhood education, approximately 28%, as opposed to nine other Roma-populated European countries, where rates of attendance range from 32% to 95% (Kavasakalis et al. 2023). Furthermore, there is a high dropout rate amongst Roma students in Greece. The root causes of this dropout rate are prompted by the organization of the educational system, Roma culture, and prejudice towards Roma (Papachristou, 2023). Roma education attendance and equity deficiencies in Greece are likely a byproduct of deep structural deficiencies that marginalize already underserved communities.

As the Greek educational system lacks other forms of support, like inadequate teacher training due to cultural ignorance, the cultural gap between Roma students and the Greek educational system continues to persist. Many educators receive limited preparation for teaching

in multicultural classrooms, which can severely hinder their ability to support Roma students given their fraught history of discrimination in education (Georgiadis & Zisimos, 2012). Expanding culturally responsive digital educational materials can therefore help to support educators as ready-made resources can provide accessible strategies in promoting inclusive classroom environments.

Digitally inclusive educational materials serve as a promising medium for promoting inclusive education for the Roma. These digital tools aim to provide educators with the necessary resources, lesson plans, and strategies to cultivate an inclusive learning environment. The contents of such resources vary depending on their intended purpose; for example, a Roma-specific lesson plan may include a list of required materials, desired outcomes, and activity instructions while taking into consideration the cultural discrimination faced by Roma students. Alternatively, REVMA staff seeking to produce a pedagogical article may choose to present it in essay format with background, recommendations, and references sections.

This project's sponsor, Roma Educational Vocational Maintainable Assistance (REVMA), is an active advocate for Roma educational reform in Greece. In 2025, a team of WPI undergraduate students completed an IQP project designed to act as a digital repository for inclusive educational resources, including teacher training, lesson plans, and Roma advocacy articles. The goal of this project is to strengthen educator support within the REVMA hub while advancing intercultural education through the development of education materials focusing on intercultural education. Our team will accomplish this goal by addressing the following objectives:

1. Understand the educator's perspectives around teaching Roma students and gauge their familiarity with digitized education platforms.

2. Evaluate the current cultural responsiveness, accessibility, and usability of the REVMA Hub and its existing resources.

3. Develop culturally responsive digital resources and implement usability improvements to address identified gaps.

4. Evaluate the effectiveness of implemented improvements through educator feedback and usability testing.

2. Background

In this chapter, the team examines the challenges faced by the Roma people, Greek educators, and the Greek Educational System. The first section focuses on the history of discrimination and exclusion of the Roma people, involving social isolation and barriers to educational access. Following this, we then discuss Roma student dropout rates and their significance to the staggering disparity in Roma education rates. We then highlight the challenges faced by Greek educators, paying particular attention to the importance of multicultural teacher training and the cultural divide that often exists between Roma students and educators. Lastly, we discuss areas of improvement within the Greek educational system, both emphasizing the need for multicultural education practices and culturally inclusive education through online professional learning communities.

2.1. The Historical Discrimination of the Roma People

The Roma, an ethnic group that migrated from India, have faced centuries of social exclusion and systemic oppression in Europe. When the Romani first relocated to Europe, Europeans labeled them as "pilgrims", "nomads", and "travelers" (Dimitrova, 2021). This perception marked the beginning of widespread Romani exclusion and discrimination within the region due to cultural differences. Many Europeans perpetuated negative stereotypes about the Romani, describing them as "cunning thieves, ill-mannered, godless, and physically unappealing" (Dimitrova, 2021). These harmful stereotypes reinforced their social isolation and exclusion from cities. Discrimination persisted for centuries in multiple countries, including the persecution and killing of Romani in Lindau and Spain, enslavement in Wallachia and Moldavia, and mass genocide during World War II (Dimitrova, 2021). After the war, many Europeans

denied Roma full citizenship and recognition as a distinct cultural group (Dimitrova, 2021).

These historical injustices continue to affect Romani people and their communities today.

Despite recent efforts to include individuals of Roma descent in society, there is still

discrimination towards the Roma, which ultimately affects their quality of life. Across

southeastern Europe, 25% of Roma people live in shacks, and 55% of Roma homes lack a

sewage system (Renzi, 2010). Employment discrimination is widespread, with only 38% of

working-age Roma in paid employment and nearly two-thirds reporting refusal of work because

of their ethnicity (Renzi, 2010). The limited access to stable housing and lack of employment

produces a cycle of poverty within the Roma community that is extremely difficult to escape.

Across most European countries, Roma individuals face disproportionately high poverty rates. In

Greece specifically, the at-risk poverty rate of Roma communities is 96% (Rutigliano, 2020).

Furthermore, these social disadvantages extend to Roma children, who are twice as likely to be

at-risk of poverty compared to non-Roma children (Rutigliano, 2020).

2.2. Educational Exclusion of Roma Children

Longstanding discrimination toward the Roma population has reinforced structural and

cultural barriers that limit the accessibility of equitable education for Roma children.

Specifically, interactions among family attitudes, classroom experiences, and socio-economic

conditions influence Roma participation in early childhood education. As is evident in Figure 1,

professors at the University of Patras, Greece, found that only 28% of Roma children participate

in early childhood education in Greece (EL), as compared to 84% of the general population

(Kavasakalis et al, 2023). This statistic is particularly jarring when placed in comparison to other

European countries. For instance, both Spain and Hungary have achieved Roma children's early

childhood education participation of 95% and 91%, respectively. It should be noted that Spain

has a similar percentage of Roma population to Greece, approximately 1.5% of the general

population as compared to Greece's 2.47% of the general population (European Commission,

2024). Thus, Spain's significantly higher percentage of early childhood school participation

should not be attributed to a notably smaller number of Roma children within their educational

system. While Roma children's participation is generally low across Europe (~30-50%),

Greece's overall participation is the lowest of all the countries, demonstrating the severity of the

educational divide in Greece today.
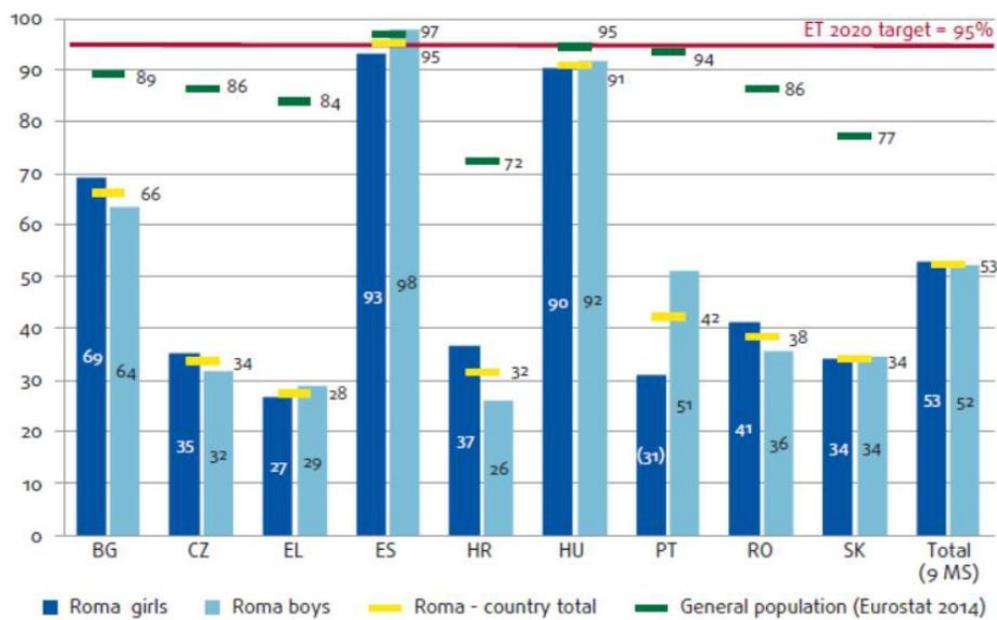
Figure 2.1 Children participation in early childhood education (in 9 European Union Member States), (Kavasakalis et al, 2023)

The same study found that poverty-driven alienation is related to low attendance and

absenteeism among Roma children within school, as well as the cultural belief within the Roma

community that formal education is not beneficial or translatable to economic prosperity

(Kavasakalis et al, 2023). These factors both link to the ongoing segregation that Roma children

endure, as they are often placed in special-education classes within schools and thus receive high

levels of isolation from their non-Roma peers. Specifically, special-educational programs often

offer a lower quality of education than those received in standard education (Gal & Ryder, 2025). Both the pace and content difficulty are reduced, meaning that many Roma students are simply not offered the same access to a standard level of education. In turn, this falsely perpetuates the idea that the Roma population is not as intelligent as their non-Roma counterparts, due to systemically enforced classroom segregation.

Additionally, the low level of education among Roma parents "often results in insufficient support for their children's learning and lowers their expectations for their children's education" (Kavasakalis et al, 2023). In essence, this creates an ongoing cycle whereby negative and alienating experiences within formal education continuously force Roma families to endure. This reduces the likelihood of continuing education and decreases the prioritization of education for their own children. Thus, the educational system inhibits Roma families' ability to escape poverty as the Roma population remains comparatively uneducated or undereducated and, therefore, unable to advance economically. For many Roma parents, the narrative that education is a continuation of historical segregation and discrimination practices is persistent and aligns with many of their own experiences.

2.3. Addressing Roma Dropout

High dropout rates among Roma students are detrimental to the Roma educational divide. A qualitative analysis published by Maria Papachristou in the European Journal of Educational Studies (2023) uncovered the driving factors in the dropout of Roma students through semi-structured interviews with ten principals of schools with a significant population of Roma students. Results from the research revealed that the causes of Roma dropout originate from three main sources:

1. The education system (lack of accommodation, distance to school, etc.)

2. Roma culture and lifestyle conflicting with Greek educational norms and expectations

3. Cultural anti-Roma sentiments (Papachristou, 2023, p. 282).

These causes do not fully explain the Roma dropout rate on their own; rather, the Greek education system's failure to accommodate the nomadic lifestyle of the Roma clarifies their effect on the quality and quantity of Roma education. For example, some research suggests that a major driving factor in Roma absenteeism is the lack of consistent transportation to and from school (Papachristou, 2023; Novak, 2019). The nomadic nature of Roma culture leads many Roma people to live in settlements rather than established permanent residences. These settlements are often inaccessible to Greek transportation systems (Papachristou, 2023). Moreover, due to high poverty rates amongst the Roma, many do not have access to alternative forms of transportation to school (Papachristou, 2023). This lack of consistent transportation acts as a massive obstacle for Roma students who would potentially otherwise attend school under traditional circumstances. While addressing low Roma attendance rates in schools is a critical first step, providing them with a higher quality education requires the Greek education system to actively foster cultural awareness among educators to ensure the inclusion of Roma students in the classroom.

2.4. Teacher Training in Multicultural Education

A fundamental cause of negative Roma experiences in education is that many teachers are simply not prepared to teach students who are a byproduct of such complex multiculturalism and social injustice. In essence, "research on teachers' perceptions indicates that teachers have very little knowledge about their students, since they spend little time in getting to know them" (Georgiadis & Zisimos, 2012). Hence, students from minority groups experience a sense of

rejection due to their already negative culturally induced perception of education. Georgiadis & Zisimos argue that schools must adequately train teachers in multicultural environments in critical pedagogy, which questions and analyzes school practices and policies while "teaching consciously for social change, social empowerment and activism" (Georgiadis & Zisimos, 2012). As this is certainly a substantial challenge for many early childhood schoolteachers, it is imperative to note that without significant change at the educator-level, the implications of discrimination against Roma children will continue to permeate into adulthood and continue the ongoing cycles of poverty and under-education.

Considering the need for significant change in teacher preparedness, there have been several attempts at extensive educational reforms that aim to increase Roma inclusion in schools. However, these initiatives are short-term solutions that fail to produce sustained improvements in Roma education participation. Notably, in interviews with primary school principals and teachers, researchers found that many school administrators utilize the Roma's cultural perception of education as an excuse for relaxed standards of attendance and participation (Tourtouras et al, 2016). An excerpt from one interview illustrates this practice; "The second teacher added that Roma students cannot keep up with the curriculum and some of them face 'obvious' learning difficulties, thus medicalizing social issues…when some of the students cannot follow the pace of the curriculum, teachers either loosen up a little bit from the program or they reduce the amount or/and the quality of what they teach" (Tourtouras et al, 2016). Scholars and international organizations have also criticized Greece for its lack of participation in UN-led efforts to increase the quality of life for Roma across Europe. Particularly, the Decade of Roma Inclusion represented an unprecedented effort led by 12 European governments, as well as the United Nations, to improve the education, employment, health, and housing standards of

Roma populations. Despite having some of the worst inclusion rates for each, Greece did not join the initiative at its initial launch (United Nations, 2007). This lack of investment in the Roma people's development translates directly into the school environment, as teachers feel less inclined to prioritize inclusivity when their government continues to perpetuate harmful stereotypes.

A specified focus on teacher training in multicultural education is a relatively new, yet necessary aspect of educational pedagogy. Yasemin Acar-Citci defines multicultural education as "a medium to eliminate the inequities that students face regarding race, ethnic origin, gender, social class, language, sexual orientation, and abilities" (Acar-Ciftci, 2019). Through research, she identified three main approaches to multicultural education (see Figure 2), which are necessary to consider in respect to the educational environment's particular cultural makeup.

3 Main Approaches to Multicultural Education

Conservative Multiculturalism

Argues that school structures and educational practices are only representative of the dominant or majority culture.

Liberal Multiculturalism

Respects cultural and ethnic differences, while prioritizing the preservation of cultural traditions within school curricula.

Critical Multiculturalism

Questions the current socio-political context of the curriculum from the perspective of significant social inequities and the incompatibility of certain cultures
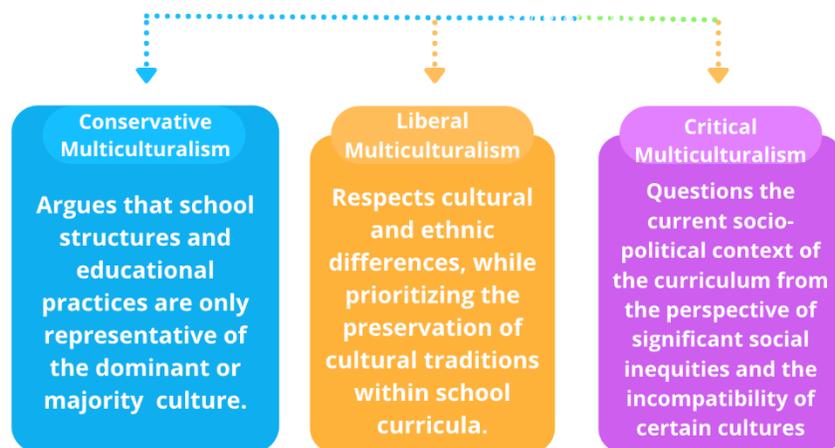
Figure 2.2: Image Showing Definitions of Three Main Approaches to Multicultural Education

While each framework presents its own complexities, they are particularly relevant to the education of Roma children in Greece.

Roma students occupy a marginalized cultural position within Greek society, face limited recognition of their cultural traditions in formal curricula, and continue to experience deep-rooted social inequities. Applying a critical multicultural lens highlights how structural discrimination drives many of the disparities observed in Roma education. However, as Acar-Ciftci notes, even when multicultural practices are present in classrooms, teachers often fragment them subconsciously, as they lack a unified or collective framework within the broader educational field. This absence of cohesion limits the transformative potential of multicultural education and underscores the need for systematic, well-structured teacher training initiatives.

2.5. The Cultural Divide Between Roma Students and Greek Educators

There is a strong cultural divide between Roma children and their Greek educators. As Section 2.2 describes, teachers often lack the necessary cultural understanding and training to properly address Roma students in the classroom (Papachristou, 2023). This cultural significance likely arises from the pervasive anti-Roma sentiment that many Greeks carry. A relatively low portion of the Greek population is occupied by Roma likely perpetuates, alongside a bilateral resistance to their cultural assimilation that both Greeks and Roma display. Since Roma find themselves in such a minority, awareness surrounding Roma culture and/or educational issues is not given priority by non-Roma educators, administrators, or state officials, leading to a perpetuation of the Greek-Roma disconnect. These issues are pervasive within Greek Roma education and further demonstrates the need for intercultural educational materials. While Section 2.2 identified several proposed strategies to improve Roma education in Greece,

improving the cultural awareness of non-Roma educators must be a priority within Greek inclusive education solutions.

2.6.   Best Practices for Multicultural Education

Along with teacher training, incorporating culturally responsive teaching materials into the curriculum is essential for improving educational outcomes for Roma students. This requires teachers to move beyond a strictly "Eurocentric" or "mainstream" framework and instead integrate the lived experiences, values, and traditions of ethnically diverse students into their curricula (Lambrev, 2025). The first step in building culturally responsive teaching materials is understanding the students and their culture. When teachers take the time to recognize the students' home environments, it fosters trust with both the parents and students. This results in the parents encouraging schooling and students wanting to come to class (Lambrev, 2025). While learning about the students and parents' cultural background, it is also important to recognize the subsections within each community. By comprehending that within cultures there are different subgroups that require different needs, teachers should avoid treating one cultural group as a monolith (Lambrev, 2025).

Additionally, a culturally responsive curriculum design must move beyond superficial representation and instead incorporate deeper perspectives and omitted history (Meléndez-Luces & Couto-Cantero, 2021). Instead of limiting the curriculum to cultural food and festivals, educators should incorporate materials written by and about ethnically diverse people while including materials that discuss neglected historical events (Meléndez-Luces & Couto-Cantero, 2021). When students see their identities and histories meaningfully reflected in the curriculum, they develop a stronger connection between their lived experiences and classroom learning.

Moreover, teachers should recognize students' diverse learning styles. If students are struggling with comprehension or reading, then the teachers need to adjust certain materials and tasks for those students. In communities with strong oral traditions or communication patterns, it might be beneficial to incorporate oral activities, like speaking games or roleplaying (Lambrev, 2025). Finally, intercultural education requires challenging institutional norms that perpetuate injustice and inequality. These educational materials should acknowledge the impact of poverty, racism, and discrimination on people in society (Lambrev, 2025). Furthermore, materials should challenge stereotypes and harmful rhetoric and strive to erase the students' own existing stereotypes and biases toward ethnic minorities. If these concepts are difficult for students to comprehend, then teachers can incorporate more humanistic techniques to help develop empathy (Meléndez-Luces & Couto-Cantero, 2021). Integrating these various techniques into intercultural education can lead to increased motivation and classroom participation, improved attendance, higher academic achievement, and enhanced social skills (Meléndez-Luces & Couto-Cantero, 2021). When teachers implement these techniques intentionally, they can help educators create safe and long-term social change within educational institutions.

2.7. Culturally Inclusive Education Through Online Professional-Learning Communities

While there are existing well-researched practices and techniques regarding inclusive teaching, educators also benefit from dedicated spaces to discuss, develop, and adapt these practices to their specific use case. Online Professional Learning Communities (OPLCs) provide teachers with such a space, fostering discussion while simultaneously enabling the distribution of materials and resources between otherwise disconnected educators. Researchers conducting a 2023 survey at the University of Hong Kong found that teachers involved in various OPLCs

noted a significant improvement in their inclusive teaching practices and strategies (Jin, 2023).

Educators noted an improvement in their reflective ability through the reception of constructive

criticism, particularly for novice teachers looking to learn from more experienced peers.

Moreover, two studies cited indicate that participation in an OPLC improved classroom

management practices (Bernard et. al, 2018; Xie, 2023). While these practices and improvements

do not directly reference Roma education in particular, the efficacy of their proposed adaptation

to the Greek-Roma classroom are promising, nonetheless.

3. Methods

The goal of this project is to strengthen the existing REVMA Hub by developing culturally responsive digital teaching resources and improving the platform's accessibility and usability to better support REVMA AMKE in its mission to address educational disparities within the Thessaloniki Roma community.

To achieve this goal, our team has identified the following four objectives:

1) Understand the educator's perspectives around teaching Roma students and gauge their familiarity with digitized education platforms.

2) Evaluate the current cultural responsiveness, accessibility, and usability of the REVMA Hub and its existing resources.

3) Develop culturally responsive digital resources and implement usability improvements to address identified gaps.

4) Evaluate the effectiveness of implemented improvements through educator feedback and usability testing.

3.1. Objective 1: Understand Educator Perspectives on Roma Students and Digital Education Platforms

The first objective identified by the team is to assess the digital proficiency and needs of Greek educators who teach Roma students. This objective is a prerequisite to achieving our project goal, as a lack of a solid grasp of the nature of interactions between Roma students and their non-Roma educators would hinder the effectiveness of our research. Moreover, assessing the digital proficiency of educators is multifaceted and will involve both an assessment of the teacher's comfort with digital educational tools and the nature of their past experiences with such

resources. Acquiring this understanding prior to the deployment of any resources or modifications to the REVMA Hub is crucial to ensuring maximal utility and accessibility for its users.

3.1.1. Surveys for Educators

Due to the seven-week time restriction of this project, and the known time constraints faced by educators, the team has chosen to utilize a survey to achieve this objective. The proposed questions for this survey can be found in Appendix A. The survey will consist of 11 questions, take approximately 10 minutes to complete, and will explore how the Roma fit into the Greek education system, what education-related pitfalls, and to gauge the digital proficiency of educators. This survey will be synthesized using Qualtrics to allow for automated data summarization and modeling and will be sent to educators via email. Educators will be sourced with help from our sponsor REVMA, and through local onsite project coordinators.

3.2. Objective 2: Evaluate the Current Cultural Responsiveness, Accessibility, and Usability of the REVMA Hub and Its Existing Resources

To assess the quality of cultural responsiveness educational materials that currently exist on the Hub, the team will conduct document reviews using a standardized assessment tool. Document reviews are a form of examining previous materials to assess the positive and negative features of resources in a standardized format, identifying common trends and issues (Sikrat & Osman, 2024). The format that the team will be conducting document reviews is educational content audits.

Educational content audits focus on the qualitative review of content on educational websites like the REVMA Hub in a standardized structure. Educational content audits work through inventorying each piece of content, to categorize purpose going forward (YaleSites, n.d.). The team will be utilizing Yale's educational content audit tools to conduct document reviews of the REVMA Hub.

The team will use Yale's industry-accepted tool to assess the educational materials of the Hub via four categories – readability, usefulness, accuracy, and inclusivity. Yale's categories were chosen because it is a commonly known, industry-accepted tool, that aligns well with the team's objective of assessing cultural responsiveness and accessibility. Through Yale's content auditing tools, the team will answer each category on its quality from a scale of 1 – 5, from strongly disagree to strongly agree. The team will categorize the content in question into three categories - merge, improve and retire – based on the audit's score. This document review process, derived from an industry-accepted tool created by Yale, creates a standardized guide on what types of content needs to be added or improved upon.

It is important for the team to utilize standardized testing tools because of the reliability and validity that come with the assessments of testing tools. Research shows that structured documentation and accounting results in more efficient, accurate, and higher quality results (Ebbers, 2022). These advantages that come with standardization are important for the team's document reviews to create high quality educational content, while improving upon previously uploaded content. Furthermore, the standardization of the audit's verdicts shows what content should either be merged or removed entirely from the REVMA Hub. Quantifiable information from document reviews identifies key items missing from the REVMA Hub's educational content regarding cultural responsiveness and accessibility.

If time permits, the team will utilize the think-aloud protocol to assess the usability of the REVMA Hub and its resources. The think-aloud protocol is a standardized form of qualitative research in ethnographic and anthropological observations that focuses on the study of decision-making. When applied, the participant of the technique will interact with a tool or resource while constantly verbalizing their thoughts (Guss, 2018). The team will administer the think-aloud protocol through one-on-one sessions with Greek educators. These 20-minute, one-on-one sessions will happen immediately after the team's interviews and involve providing each participant with resources posted in the REVMA Hub and prompting them to complete navigation-centered tasks assigned by the team.

The team will request participants at the beginning of the think-aloud to verbalize thoughts when completing the navigation-based tasks. The team will record all verbalized thoughts formed by the participants both through Microsoft Word's audio transcription and hand-written field notes. The team will aim to conduct the think-aloud protocol after internal document review, during the end of interviews conducted in Objective 1.

The think-aloud protocol effectively aligns with the team's objectives due to its flexibility and form of feedback. The team's main priority when conducting the protocol is attaining feedback that allows the assessment of the REVMA Hub's usability for Greek teachers. This protocol, unlike interviews, specializes in unveiling participants' unfiltered thoughts when navigating the REVMA Hub and similar resources if time permits.

Additionally, the team utilizes the flexibility of think-alouds to pivot from the interview time with teachers to REVMA contacts if time at the project center does not permit. Because the team will conduct interviews alongside think-alouds, having each method untwined results in an unrealistic expectation of what is to be completed in a singular WPI academic term. In the

scenario that there is not enough time to conduct think-alouds with teachers or REVMA staff, the team plans to sideline this method to prioritize in-person methods like interviews. While not ideal, in this scenario the team plans on researching common User Interface and User Experience practices while at the project site and incorporate it into the REVMA Hub. This is not ideal because Greek educators are not a common audience when UI and UX studies are conducted, making it an unoptimized solution to think-alouds. The team's think-aloud structure is explained in more detail in Appendix B.

3.3. Objective 3: Develop culturally responsive digital resources and implement improvements to address identified deficiencies in the REVMA Hub

The team will utilize findings from educator interviews, surveys and document reviews to identify recurring themes related to shortcomings of the existing REVMA Hub. The team will analyze data from surveys, interviews and document analysis through a thematic lens to identify patterns on the representation of Roma students based on educator perspectives and written texts. Specifically, we will focus on the accessibility of materials, quality of educational content and significant usability challenges within the platform A comparison of qualitative data from multiple forms of research is necessary before engaging in the restructuring and creation of new materials within the REVMA Hub. In turn, we will use quantitative data obtained from an analysis of proportions of certain types of material within the REVMA Hub (for instance, number of articles as compared to number of lesson plans) as well as survey ratings, to effectively prioritize deficiencies based on severity and prevalence. Through this synthesis, we can establish a clear distinction between surface-level concerns versus structural shortcomings within the website.

Based on the above analysis, we will then develop culturally responsive digital educational materials in alignment with principles of intercultural education, specifically focusing on addressing the deficiencies established by data synthesis. During the development process, we will create materials in a digital format to expand upon the existing content within the REVMA Hub through further conversation with our sponsors to identify their preferred areas of priority, supplemented by our synthesized data and input from educator participants. We aim to focus directly on creating structured lesson plans, classroom activities, and interactive games to further expand the current REVMA resource archive. These forms of educational content are more accessible in a classroom environment as compared to research articles and reports, which currently dominate the Hub. By grounding the development of these materials in both intercultural education pedagogy and the acquired data from our research, we aim to produce resources that better support educators within a multicultural environment and improve the educational value of the REVMA Hub.

3.3.1. Database Implementation

As the website currently stands, resource uploads are manually input by REVMA staff and added to the website. This creates several problems. Firstly, storing resource data directly in WordPress couples that data with the site feature within which it resides. This coupling limits the use of this data in any capacity outside of the REVMA Hub and even within other website components. In addition, the use of the flat file storage complicates the implementation of a proper automated uploading mechanism for teacher's use on the site. If the team were to implement such a feature under the current storage solution, it would be inherently proprietary, and the team would have to create it from scratch. Finally, the current site's list of resources is immutable from a global perspective. This is a particularly problematic aspect of the current

storage solution if a large subset of resources all require the same change, REVMA staff must manually apply that alteration, one-by-one, point-and-click-style editing inside WordPress, which is an incredibly inefficient workflow for REVMA Staff. The implementation of a proper database system for the REVMA Hub would address these issues.

Databases are the ground truth for an organization's data; this means that developers assume that the data within the application database is more valid than mirrored data from any other source within that organization. Typically, applications access databases through the internet using standard TCP/IP protocols meaning that the storage of data is independent of any application that a database serves. Moreover, modern databases use a Database Management System (DBMS) that enforces rules about the data that it stores, ensuring consistency and data integrity. Lastly, developers interact with a typical relational database using a query language such as SQL which allows for dynamic filtering, grouping, and fine-grained selection of data for retrieval, removal, alteration, etc. Consequently, developers may handle alterations to database content programmatically, allowing for the streamlined implementation of an automated upload feature, resources filtering, resource categorization, and advanced searching/pattern matching. The team plans to synthesize a comprehensive technical implementation plan for such a database with REVMA upon our arrival in Thessaloniki. Such a document will establish strategies for the selection of a technology stack, data migration, and user acceptance testing for the proposed database.

Given that this objective hinges upon the results of Objectives 1 and 2, the team cannot yet completely determine the exact scope and implications of the technical methodology. We have instead left this section to be flexible and will strengthen it through on-site research and further conversation with our sponsors. While our current output remains speculative, we are

assured that we will ground our development in extensive and well-analyzed research and data synthesis.

3.4. Objective 4: Evaluate the Effectiveness of Site Improvements and Educational Resources

The final objective is to evaluate our project's overall success by gathering the REVMA staff and teacher's feedback on the website and the intercultural education materials. A survey is the primary research method for this objective. Even if implementation of revisions extends beyond the project's timeline, the evaluative data collected provides a foundation for future projects and long-term impact. The survey will measure the effectiveness of the implemented site improvements and newly developed features. Additionally, the team seeks to determine if the educational materials they create are instructionally effective and developmentally appropriate, intercultural education materials.

Although the team initially considered focus groups for the website evaluation, many educators have limited availability and may not be able to participate in multiple interviews or group sessions. Therefore, the team selected a survey as the most appropriate research method since it allows participants to provide meaningful feedback at their convenience. Collecting comprehensive input on what teachers and students find helpful, challenging, or enjoyable will enable the team to thoroughly assess progress toward the project goal.

3.4.1. Website Improvement Survey

To evaluate the improvements to the original website design, the team will administer a survey to educators and REVMA staff who will be using the site. The team will create the survey

using Qualtrics, a platform provided by Worcester Polytechnic Institute that offers online surveys and data collection (see Appendix C). Section one of this survey will have topics surrounding ease of accessibility, organization, aesthetics, and search capabilities. This survey will incorporate the System Usability Scale (SUS) survey tool to measure the subjective usability of the website (Kortum, 2014). This method contains ten standardized questions with a five-point Likert Scale ranging from "Strongly Disagree" to "Strongly Agree" for each question. The team will combine individual responses into a single score ranging from 0 to 100 using the standardized System Usability Scale (SUS) scoring methodology. This overall score is then compared to an established acceptability scaling method that determines if the product is "acceptable", "marginally acceptable", or "unacceptable" (Kortum, 2014).

Participation will be anonymous and voluntary; however, this survey will incorporate additional demographic questions such as age, percentage of Roma students in school, gender, and the percentage of Roma students within the teacher's specific classroom. This information will allow the team to examine which age groups find the website helpful or difficult to navigate. Collecting demographic information will also allow the team to examine similarities and differences in how various groups of teachers interact with and evaluate the website. These comparisons may reveal patterns in usability, accessibility, and overall experiences. The team will provide the survey in English and Greek. After a final review, the team will collaborate with project translators and additional translation resources to ensure that the survey is easy to understand and in turn maximizes participation rates. To contextualize the importance of this initiative, the survey will begin with an introduction passage discussing our team, overall project goal, and the purpose of the survey within the broader scope of the project. After drafting the survey, the team will send it to the REVMA employees for review. This will allow the team to

gather preliminary feedback on clarity and efficiency before distributing the survey. After the REVMA staff examines the survey, the team can refine or edit questions based on the feedback received. The team will distribute the finalized surveys to REVMA's partner schools through a QR code. The use of a QR code can also help involve teachers in other affiliated schools/programs to broaden participation. The survey will also include a statement requesting that participants complete the survey only once to avoid double entries.

A survey is a particularly effective method for assessing improvements to the REVMA Hub because they can generate measurable data regarding user preferences, perceptions, and experiences. Online surveys offer significant advantages, including cost-effectiveness and the ability to collect data efficiently within a short period of time (Nayak, 2019). These benefits are especially relevant given that the project's target audience consists of educators, who often have limited availability within their schedules. An online survey provides the teacher with more flexibility to complete the questionnaire at their convenience while still contributing essential information and data. To ensure responses are collected within the project timeline, the team will give participants a deadline of one week after survey distribution (See Table 1). Furthermore, online surveys encourage reduced interviewer bias and create a lower level of social desirability bias. When respondents are answering questions through an online survey, they are more likely to give honest and critical answers since they are not face to face with a researcher (Nayak, 2019).

3.4.2. Surveying Educators About Resources

Another important aspect of this objective is evaluating the quality and effectiveness of the intercultural education materials developed by the team for direct classroom implementation.

Section two of this survey is for educators, and it will ask questions about ease of use, complexity, and overall understanding. This section of the survey will also use the system usability scale tool to measure the subjective usability of the education materials the team created. Similar to the previous section, the second part of the survey also includes the ten standardized questions with a five-point Likert Scale. The team will again convert individual responses to a final score that will determine if the product is acceptable or unacceptable. The team will create, translate, and review the survey questions for clarity and cultural sensitivity by the REVMA sponsors. This section of the survey will also include demographic questions about Roma identifying students and students' gender. With this information, the team can observe potential relationships between classroom ethnicity and gender composition and overall experiences with the intercultural education materials created. In turn, this will provide insights into which intercultural education materials are most effective for specific demographic groups, and which may require further adaptation or refinement. The target audience and the recruitment process will remain the same.

Online surveys will also be useful for capturing and analyzing data related to classroom dynamics and reviewing intercultural education materials. Along with the other benefits mentioned previously, surveys using online platforms can be highly efficient in organizing, storing, and visualizing data (Nayak, 2019). Through the Qualtrics program, the team will be able to compare responses across different schools, grade levels, and teacher demographics. This will help identify patterns regarding where the intercultural education materials were most effective and where additional modifications or more interactive approaches may be necessary. By analyzing survey responses from teachers across diverse school contexts, the team will gain a deeper comprehension of how students respond to the materials and the unique needs of each

school, and in turn be able to edit or adjust the materials for further improvement. Overall, the data gathered from the survey about the different schools and how students reacted to certain materials, will support informed decisions demonstrating that the project effectively fulfills its goal of providing impactful and inclusive intercultural education resources for all participating schools.

In conclusion, the team seeks to evaluate and strengthen both the REVMA Hub, and the intercultural education materials developed. By completing the proposed objectives, the team aims to provide an efficient platform that meaningfully promotes intercultural education in multiple school settings. The primary beneficiaries of this work include the Roma students, educators, and the REVMA organization. The team hopes the students involved learn about the importance of education and interculturalism, that the teachers have access to structured and organized materials, and the REVMA organization will benefit from the updated website. The team hopes the work continued in this project will lay the groundwork for future projects focusing on educational impact and community within the Thessaloniki Roma community.

Table 1. Project Timeline

	March	April	May		1st priority
Month	March	April	May		
Date	14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30	1 2 3 4 5 6 7		2nd priority
Day of Week	S S M T W T F S S M T W T F S S M T W T F	S S M T W T F S S M T W T F S S M T W T F S S M T W T F S S M T W T F	S S M T W T		3rd priority
Week #	Week 1 · Week 2 · Week 3	Week 4 · Week 5 · Week 6 · Week 7	Week 8		
Meeting with Sponsors					
Send out Prelim. Survey					
Document Review					
Interview Educators					
Update Website					
Prelim. Survey Analysis					
Rough Draft of Project Report					
Send Out Eval. Survey					
Eval. Survey Analysis					
Final Draft of Project Report					

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Appendix A: Survey For Educators

We are a group of students from Worcester Polytechnic Institute, Massachusetts, USA and are working on a collaborative project with REVMA-AMKE to create digital teaching resources for the REVMA Hub to support REVMA in its mission to address educational disparities within the Thessaloniki Roma Community. The purpose of this survey is to Understand Educator Perspectives on Roma Students and Digital Education Platforms. The survey consists of 11 questions and should take about 10 minutes to complete. Your participation is completely voluntary, and you may withdraw at any time. Please remember that your answers will remain anonymous. No names or identifying information will appear on the questionnaires or in any of the project reports or publications. Your participation is greatly appreciated. Should you have any questions or concerns, we can be reached at gr-revma-D26@wpi.edu or through our advisors Melissa Butler mbutler@wpi.edu and Robert Kinicki (rek@wpi.edu). For more information about this research or about the rights of research participants, please contact irb@wpi.edu

What is your gender?

☐ Male

☐ Female

☐ Non-binary / third gender

☐ Prefer not to say

What grade level do you teach?

○ Pre-primary

○ Primary

○ Lower Secondary

○ Upper Secondary

○ Other (please specify):

How would you best describe your ethnicity?

Are you comfortable using technology in the classroom (virtual classrooms, collaboration tools, etc.)? If so, do you feel that it provides a notable benefit to student's learning? If not, what would have to change about digital education to ease your concerns?

Which digital tools or platforms (e.g., interactive boards, e-learning apps) do you currently use most frequently in your classroom (if none please write N/A), and what specific educational goals do they help you achieve?

Have you ever modified a lesson or activity to better suit a specific group of students? If so, please describe the nature of the assignment and your thought process behind these modifications.

In your experience, are there specific types of classroom activities where you notice Roma students are most engaged versus where they tend to withdraw or struggle?

How often do your current curriculum materials reflect Roma history, language, or culture?

○ Sometimes

○ Often

○ Rarely

○ Never

Do your Roma students have reliable access to digital devices or the internet at home? If not, how does this "digital gap" affect their ability to complete assignments compared to their peers?

In your view, what are the "critical moments" (e.g., transition between grades, early marriage expectations) where Roma students are most at risk of dropping out of the Greek education system?

If you could co-design a new digital activity specifically to support Roma inclusion, what "cultural elements" or local Thessaloniki contexts would you want to see included to make it truly relevant?

Appendix B: Think-Aloud Protocol

Introduction:

When the interview section of one-on-one sessions ends, start out with this message:

The purpose of these think-alouds are to gauge the usability of the REVMA Hub. Throughout the think-aloud, the team will assign you with the completion of various tasks used to navigate the REVMA Hub. While completing each task, the team humbly requests that you verbalize your thoughts when participating in any action. Each task should take approximately 5 minutes. While there is no set deadline, it is encouraged to complete each task at your own pace. As you complete each task, the team will record field notes. If time permits, the team will provide an additional website and the same set of tasks to gauge.

Your participation is completely voluntary, and you may withdraw at any time. If there are any set of tasks that you are not comfortable with, or are not interested in performing you may choose to skip the task and proceed to the next task. Your participation with the think-aloud is greatly appreciated. Would you like to proceed with the think-aloud?

Section 1: REVMA Hub Task Completion

In this section, have each participant complete a set list of tasks designed to gauge the usability of the REVMA Hub. The order of tasks starts at Task 1 and ends at Task 4. This order will stay constant for each participant of the think-aloud.

Task 1: Access the supportive teaching section to watch the video about community centers. Then choose one of the community centers to learn about them.

Task 2: Please navigate to the training statistics and graphics section of the website that displays metrics about the Roma people.

Task 3: I would like you to navigate to the submitted resources in REVMA Hub and download it to your computer from the REVMA Hub.

Task 4: Lastly, I would like you to access the communication section of the website and draft a message to submit.

Section 2: Task Completion in Second Website

In this section, the team will hand the participant another website that focuses on the creation of educational resources. The team will assign the same tasks in the same order to the participant.

Appendix C: Evaluation Survey

WPI

We are a group of students from Worcester Polytechnic Institute, Massachusetts, USA and are working on a collaborative project with REVMA AMKE to create digital teaching resources for the REVMA Hub to support REVMA in its mission to address educational disparities within the Thessaloniki Roma Community. The purpose of this survey is to determine areas for improvement of the REVMA Hub and the efficiency of intercultural education materials our team created. The first part of this survey (Section 1) will be asking questions about your experience utilizing content within the existing REVMA Hub. Section 1 will take approximately 5 minutes to complete. The second part of the survey (Section 2) asks about utilizing intercultural education materials on the REVMA Hub within the classroom. Only teachers and educators will answer the second part of this survey. This will also take approximately 5 minutes to complete. Your participation is completely voluntary, and you may withdraw at any time. Please remember that your answers will remain anonymous. No names or identifying information will appear on the questionnaires or in any of the project reports or publications. Your participation is greatly appreciated. Should you have any questions or concerns, we can be reached at gr-revma-D26@wpi.edu or through our advisors Melissa Butler mbutler@wpi.edu and Robert Kinicki (rek@wpi.edu). For more information about this research or about the rights of research participants, please contact irb@wpi.edu.

What is your gender?

○ Male

○ Female

○ Non-binary / third gender

What is your age?

○ 18-24

○ 25-34

○ 35-44

○ 45-54

○ 55 and over

I am familiar with websites and feel confident navigating through most websites.

○ No web experience

○ Beginner

○ Intermediate

○ Experienced

Are you a teacher/educator?

○ Yes

○ No

→

Section 1:

WPI

Please respond to the following statements based on your experience using the REVMA Hub.

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
1a. I think that I would like to use this website frequently.	○	○	○	○	○
2a. I found this website unnecessarily complex.	○	○	○	○	○
3a. I thought this website was easy to use.	○	○	○	○	○
4a. I think that I would need the support of a technical person to be able to use this website.	○	○	○	○	○
5a. I found the various functions in the website were well integrated.	○	○	○	○	○
6a. I thought there was too much inconsistency on this website.	○	○	○	○	○
7a. I imagine that most people would learn to use this website very quickly.	○	○	○	○	○
8a. I found the website very awkward to use.	○	○	○	○	○
9a. I felt very confident using the website.	○	○	○	○	○
10a. I needed to learn a lot of things before I could get going with this website.	○	○	○	○	○

→

Note. If participants select "No" to the question "Are you a teacher/educator", they will be shown the questions above. Once these set of questions are completed the survey will end.

Section 2:

WPI

A majority of my students identify as Roma.

○ Yes

○ No

The school I work for is in a majority Roma area.

○ Yes

○ No

I have more female students than male students

○ Yes

○ No

Please respond to the following statements based on your experience using the REVMA intercultural education materials in your classroom.

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
1b. I think that I would like to use this product frequently.	○	○	○	○	○
2b. I found the product unnecessarily complex.	○	○	○	○	○
3b. I thought the product was easy to use.	○	○	○	○	○
4b. I think that I would need the support of a technical person to be able to use this product.	○	○	○	○	○
5b. I found the various functions in the product were well integrated.	○	○	○	○	○
6b. I thought there was too much inconsistency in this product.	○	○	○	○	○
7b. I imagine that most people would learn to use this product very quickly.	○	○	○	○	○
8b. I found the product very awkward to use.	○	○	○	○	○
9b. I felt very confident using the product.	○	○	○	○	○
10b. I needed to learn a lot of things before I could get going with this product	○	○	○	○	○

→

Note. If participants select "Yes" to the question "Are you a teacher/educator", they will be shown the questions above. Once the multiple choice and Likert scale questions within Section 2 are completed the survey will end.