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Developing a Sustainable Online Platform for Language Learning across Europe

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Abstract: In this paper, we present a sustainable approach for addressing the language skills gap among EU citizens, which significantly hinders their mobility across the EU and their participation in education, in training, as well as in youth programmes. Our approach is based on the sustainable design of the OpenLang Network platform, which provides an open and collaborative online learning environment for language learners and teachers across Europe, and addresses the limitations of existing computer-assisted language learning approaches. The OpenLang Network platform is bringing together educators and Erasmus+ mobility participants to improve their language skills and cultural knowledge. To this end, the OpenLang Network platform offers a collection of multilingual Open Educational Resources and language learning services. The paper presents the results from the user evaluation of the platform, which has been conducted with members of its community of language teachers and learners. A mixed methods approach has been adopted in order to collect and analyse both qualitative and quantitative data from users about the sustainable design of the OpenLang Network platform, as well as to measure the user satisfaction levels of the platform's language learning services. According to the user evaluation results, the platform offers a sustainable online environment and a positive user experience for language learning. The user evaluation has also helped us identify a set of best practices and challenges associated with the long-term sustainability of an online language learning community.

Keywords: computer-assisted language learning; sustainable design; open educational resources; language learning services; OpenLang Network platform; Europe

1. Introduction

One of the fundamental principles of the European society is the freedom of movement for people within the European Union (EU) member states [1]. The Erasmus+ programme was launched in 1987 and since then, it has had over 12 million mobility participants [2]. Erasmus+ provides exclusive chances for students and staff in higher education and in schools, as well as for trainees, adult learners, young people, youth workers and sport staff, to study, train, work, or volunteer across the EU. Nevertheless, insufficient language skills continue to hinder people's participation in education, training and youth programmes within the EU. As communication through language plays a vital role in mutual understanding and comprehension, promoting and supporting sustainable language learning for Erasmus+ mobility participants is critical.

In this paper, we present the development of a sustainable online language learning platform. The motivation behind this work is to address the language skills gap across the EU, which comprises an essential step towards facilitating mobility and knowledge exchange between participants from all EU member states. The overall research objective of this work is to explore the use of sustainable design towards providing language learning services to different groups of stakeholders. In particular, we investigate the impact of

the sustainable design principles of openness, customisation, interoperability, mobility, community support, monitoring, storytelling, interactivity and gamification on the development of an online language learning environment and the resulting user experience. Our methodology is based on understanding the shortcomings of existing computer-assisted language learning approaches, followed by the sustainable design and development of an online platform that addresses these shortcomings. Additionally, our methodology includes the evaluation of the online platform that we have developed, using mixed methods to measure the satisfaction levels of end users from using the platform's language learning services, as well as to collect and analyse their views on the sustainability of the platform.

This work has been conducted in the context of the OpenLang Network, which is a research project supported by Erasmus+, aiming to address the language skills and cultural awareness requirements of Erasmus+ mobility participants and the training requirements of language teachers [3]. Specifically, the project aims to focus on the following groups of stakeholders:

- **Erasmus+ KA1 mobility participants,** such as Higher Education students and staff, vocational education and training participants, adult and school education staff, youth learners, youth workers and youth entrepreneurs, who require the enhancement of their language skills and cultural awareness.
- **Volunteer language teachers,** who assist Erasmus+ KA1 mobility participants by sharing their professional experience while receiving professional certified training on how to create, share and use language open educational resources (OERs) [4].

In the context of the OpenLang Network project, we have developed the OpenLang Network platform, the design of which has been based on a set of sustainable design principles. The OpenLang Network platform provides language learners and teachers with a range of services, such as a personal dashboard, a tandem language learning matching service, an interactive forum, a database of high-quality language OERs, as well as a responsive design that is accessible on various devices. The platform is a core output of the OpenLang Network project, aiming to establish a European language learning community [5]. In this paper, we present the sustainable principles that have driven the design of the platform, the language learning services that the platform offers to EU citizens, as well as the results from the user evaluation conducted with a representative user sample of the platform.

The remainder of this paper is organised as follows. Firstly, we discuss existing approaches and the latest developments in the research area of computer-assisted language learning. We then introduce the principles that have driven the sustainable design of the OpenLang Network platform. Subsequently, we present the language learning services that the platform offers to its community of language teachers and learners. We then present the results of the user evaluation of the platform and the feedback obtained from members of the platform's community. Finally, we distil the user feedback into a set of best practices and challenges associated with the continued sustainability of an online language learning community.

2. Related Work

The research area of computer-assisted language learning (CALL) is defined as "the search for a study of applications of the computer in language teaching and learning" [6]. This research area has undergone significant changes in the wake of recent technological developments related to the emergence of e-learning platforms and mobile apps. However, there are still certain shortcomings in the sustainability and effectiveness of the educational technologies used in the area of CALL [7]. Relevant systematic literature reviews reveal the need for technology-enhanced collaborative language learning [8] and gamified language learning [9], as well as for flexibility, continuity, timely feedback, personalisation, socialisation, self-evaluation, active participation and peer coaching in language learning [10].

A specific type of massive open online courses (MOOCs) called language MOOCs (LMOOCs) has emerged as "dedicated web-based online courses for second languages

with unrestricted access and potentially unlimited participation" [11]. Although LMOOCs are quite popular with language learners and teachers, they are often designed with a prescribed learning sequence in mind, without addressing the needs and preferences of individual learners [12]. Additionally, LMOOCs often lack interactivity between instructors and learners and between learners, as well as learner-centred formative assessments [12]. Mobile-assisted language learning (MALL) is also quite popular presently, with mobile apps such as Duolingo preferred by learners for their flexibility and their gamification elements [13–15]. However, these apps are often focused on English-speaking learners and do not offer sufficient learning materials in less popular languages [16,17].

In order to address the language skills gap of EU citizens, the EU is offering linguistic support to selected participants for studying, carrying out a traineeship, or volunteering abroad in the framework of long-term mobility activities through online linguistic support (OLS) [18]. OLS participants have the opportunity to assess their language competence and they may then follow an online language course to improve their language skills. However, this approach suffers from significant limitations, most notably a lack of openness, a lack of multilingual language learning resources, as well as a lack of opportunities for collaborative language learning.

3. Sustainable Design

The design of the OpenLang Network platform has been driven by a set of sustainable design principles, which address the limitations of existing CALL approaches as discussed in the previous section. Additionally, the sustainable design of the OpenLang Network platform has been informed by a series of surveys and interviews, which have been previously conducted with Erasmus+ KA1 mobility participants in order to capture their language learning needs [19]. The resulting sustainable design principles of the OpenLang Network platform are the following:

- **Openness**: Offer an open-source code and free access to the platform's language learning materials and services.
- **Customisation**: Provide users with the ability to customise their language learning experience by allowing them to create their own learning paths or integrate third-party tools.
- **Interoperability**: Ensure that the platform can easily exchange data with other learning management systems or educational tools.
- **Mobility**: Create a mobile-responsive design or offer a dedicated mobile application for learning on-the-go.
- **Community support**: Build a community of users who can provide continuous feedback, support and opportunities for collaborative language learning.
- **Monitoring**: Provide language learners with a dashboard that allows them to track their progress and performance while studying a course and that offers teachers detailed reports on the progress of their students.
- **Storytelling**: Enable the creation of interactive and engaging language learning materials, such as simulations, games, or videos, that can help learners engage with language learning through storytelling.
- **Interactivity**: Offer a variety of tools that facilitate interactive and collaborative language learning, such as discussion forums, private messaging, live chats and more.
- **Gamification**: Incorporate gamification techniques, such as badges, in order to increase student motivation and engagement.

A key factor contributing to the sustainable design of the OpenLang Network platform has been the selection of a suitable learning management system (LMS), which provides the technological foundation for the creation, management and delivery of online learning materials [20]. The LMS comprises an integral part of the online learning experience, by enabling educators to design and deliver a wide range of pedagogical activities and by allowing learners to perform these activities either collaboratively or individually and to monitor the progress of their learning. There is currently a plethora of LMSs available to

use for online learning, including both free and paid options. We have selected Moodle, an open-source LMS that has gained a remarkable level of adoption by the global education community, with more than 160,000 Moodle sites offering over 40,000,000 courses to more than 350,000,000 users worldwide, making Moodle the world's most widely used LMS [21].

Moodle fulfils all the above principles for the sustainable design of the OpenLang Network platform. As an open-source software, Moodle is completely free and can be easily modified with custom plugins to extend its codebase. It also supports interoperability with other educational platforms and systems. With its mobile application and responsive interface, Moodle offers a flexible and accessible learning experience for students. Moodle has a large and active community of developers, who continuously provide support and publish new releases. Through its tools for course authoring and third-party plugins, Moodle supports storytelling, interactivity and gamification, while also offering communication tools such as forums, messaging and live chats. Teachers can use Moodle to monitor students' progress and obtain detailed reports.

4. Language Learning Services

Based on the sustainable design principles described in the previous section, the following language learning services have been developed and are offered by the OpenLang Network platform to its community of language learners and teachers.

4.1. Language Placement Tests

As discussed in Section 2, a limitation of existing CALL approaches is the lack of multilingual language learning resources, as well as the lack of self-evaluation opportunities available to language learners. In order to address both of these limitations, the OpenLang Network platform provides 24 language placement tests for all European languages to help users self-assess their proficiency level in a specific language. Each test is accessible through a link and a PDF file, allowing users to take the test online or offline by downloading the PDF file.

The language placement tests that are available via the platform follow the language proficiency levels defined by the Common European Framework of Reference for Languages (CEFR) [22]. According to CEFR, language proficiency is recognised in six levels, A1 to C2, which can be further regrouped into three broader categories: Basic User, Independent User and Proficient User. The language placement tests service of the OpenLang Network platform allows users to self-assess their CEFR level and record it in the platform, so that they can find potential tandem language learning partners, as described in the next section.

4.2. Tandem Language Learning

In order to address the need for peer coaching in language learning, as discussed in Section 2, the OpenLang Network platform provides a matching service that enables platform members to connect with one another and engage in collaborative language learning. This service enables users to locate other members with whom they can communicate both synchronously and asynchronously for the purpose of learning a language together. Furthermore, platform members can find other members with specific language proficiency levels and review their profiles to establish connections and begin studying a language collaboratively.

Figure 1 shows the search interface of the OpenLang Network platform for finding tandem language learning partners, by selecting their preferred language, language proficiency level and time zone.

Figure 1. Finding language learning partners on the OpenLang Network platform.

4.3. Recommended Language OERs

The OpenLang Network platform addresses the need for multilingual language learning resources, as discussed in Section 2, by providing a language learning service that recommends high-quality language OERs from reputable educational institutions for learning European languages. The recommended language OERs available via the platform cover a wide range of languages, language proficiency levels, learning activities, as well as language learning skills. The platform users can find these language OERs via a faceted search interface, which allows them to customise their searches by using a range of filters, such as language, target language, level, resource type and more. The search interface for finding recommended language OERs on the OpenLang Network platform, and the set of search filters that enable search customisation, are shown in Figure 2.

Figure 2. Search filters for finding recommended language OERs on the OpenLang Network platform.

4.4. Shared Language OERs

This language learning service of the OpenLang Network platform enables its users to share language OERs within the community of language learners and teachers. Users can also search for shared language OERs, and they can customise their searches by applying the same set of search filters as the ones available in the recommended language OERs

service (see Figure 2 above). A gamification element has been introduced to encourage and motivate the sharing of language OERs on the platform, via the awarding of badges to the uploaders of language OERs. More specifically, users that share language OERs reach the following statuses on the platform and are awarded the corresponding badges:

- **Junior Uploader**: The user has uploaded their first language OER.
- **Senior Uploader**: The user has uploaded 5 language OERs.
- **Super Uploader**: The user has uploaded 10 language OERs.

4.5. Community Discussions

This language learning service offers a forum dedicated for collaborative language learning and discussions between all users of the platform. Through this forum, users can ask questions, search for answers, exchange experiences, seek advice, etc. Users of the platform can also subscribe to the whole forum or certain discussion threads that interest them, so that they receive notifications when a new message is posted in the forum.

4.6. OpenLang MOOC

The OpenLang Network project has developed the massive open online course (MOOC) entitled: *"Exploring how to (re)use Language Open Educational Resources (OERs)"*. The primary audience of the MOOC is language teachers and learners that want to explore the lifecycle of language OERs. The MOOC consists of 4 weeks, with each week comprising a set of modules and a quiz. After studying the learning materials of each week and passing the quiz, learners are awarded a badge. Upon completion of the whole MOOC, learners are awarded a digital certificate of participation.

Additionally, the MOOC features an Announcements forum and a Discussion forum, where announcements about the MOOC are made and discussions about the MOOC take place between learners. It should be noted that several learning activities within the modules of the MOOC invite the learners to post in the Discussion forum in order to share their views and reflections with other learners. Figure 3 shows a snapshot from the introductory materials of the MOOC, featuring a promotional video, a short description of the MOOC, as well as links to the forums of the MOOC.

Welcome to the OPENLang MOOC, a 4 weeks' Massive Open Online Course produced in the framework of the OPENLang Network European project. The OPENLang MOOC aims at the creation, the sharing and the use of multilingual and interactive Language Open Educational Resources (OER). This MOOC is addressed to language teachers, trainers, and learners who wish to explore the (re) use, creation, and sharing of Language OER.

Each of the 4 weeks of this MOOC, consists of a set of modules and a quiz. After you study the modules of each week and pass the quiz, you will be awarded a **badge**. After you complete the whole MOOC, you will earn a **free certificate of participation**.

👥 Announcements

👥 Discussion forum

Figure 3. Snapshot from the introductory materials of the OpenLang MOOC.

4.7. Personal Dashboard

The OpenLang Network platform addresses the need for personalisation in language learning, as discussed in Section 2, by offering a personal dashboard to its registered members. This dashboard displays the personal data of members that have been recorded on the platform, such as the courses they have enrolled in, the messages they have sent and received, their network of contacts, the badges they have earned and a list of other users who are currently online. The personal dashboard serves as a convenient jumping point into the personal learning journey of users on the platform, allowing them to quickly resume their learning activities on the platform from where they left off previously.

Figure 4 shows a snapshot from the personal dashboard of a user of the platform featuring, among other elements, the badges earned by the user upon completing the 4 weeks of the OpenLang MOOC, as well as the badges earned for sharing more than 10 language OERs on the platform.
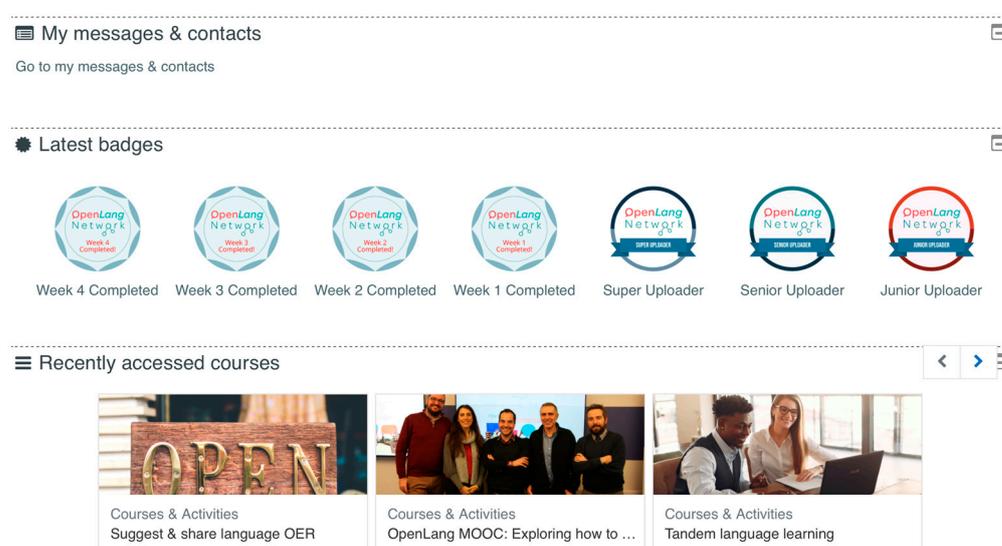

Figure 4. Snapshot from the personal dashboard available on the OpenLang Network platform.

5. User Evaluation

5.1. Methodology

The purpose of this user evaluation is to investigate the views of end users about the sustainable design of the OpenLang Network platform and measure the satisfaction levels of end users from using the language learning services of the platform. Additionally, this user evaluation intends to collect the views of end users about the continuous sustainability of the platform beyond the lifetime of the OpenLang Network project.

The user evaluation of the OpenLang Network platform has been conducted via an online survey administered via email to members of its community of language learners and teachers. The survey was administered in the English language, as this is the most widely spoken language in this community. The sampling method employed was judgment/purposive sampling, according to which participants are selected for a specific quality relevant to the study in question [23].

The survey sample of platform members was selected based on their level of engagement with the platform. More specifically, community members were selected based on the number of language learning services that they have used on the platform, as well as the amount of time that they have spent using these services. We have therefore included in this user evaluation community members that could provide informed feedback based on their high level of knowledge of the platform's language learning services.

Based on the judgment/purposive sampling method, 112 members of the platform were selected and invited via email to respond to the online survey. A total of 61 community members (Females = 38, Males = 22, N/A = 1) responded to the online survey (54% response

rate). Their average age was 36–45 years. Most of them (36) had a medium level of digital skills, 19 stated a high level and 6 perceived their level of digital skills to be low.

Additional feedback was collected from members of the OpenLang community of language learners and teachers via an online consultation workshop. During this workshop, the outcomes of the OpenLang Network project were presented, and discussions were held about the sustainability of the OpenLang Network platform beyond the end of the project. The workshop was attended by 56 participants (Females = 29, Males = 27) with an average age of 36–45 years. Most of the participants (33) were language teachers and the rest were language learners (9) and academics/researchers (14).

The sample of this user evaluation has been deemed sufficient for the analysis of the collected data, based on several factors. Firstly, the research objectives and scope of the study were considered, focusing on specific themes or patterns within the collected responses. Secondly, the concept of saturation was taken into account, ensuring that new information or insights were no longer emerging from additional participants. Moreover, the research context, including the diversity of the population, was considered to determine the adequacy of the sample size. Finally, practical constraints, such as time and resources, were considered when determining the sample size.

We adopted a mixed methods approach by collecting and analysing both qualitative and quantitative data from the users of the platform. In this way, we acquired more thorough user feedback than from a standalone qualitative or quantitative evaluation. More specifically, qualitative data were collected via open-ended questions in the administered survey, as well as by recording the discussion sessions with participants during the online consultation workshop. Quantitative data were collected via Likert scale questions in the administered survey. Subsequently, content analysis was performed for the analysis of the qualitative data collected via the survey and the workshop. For the analysis of the quantitative data collected via the survey, descriptive statistics methods were used. The results from this analysis are presented and discussed in the following sections.

5.2. Results

Table 1 shows the results of the Likert scale questions of the administered survey regarding user experience with the OpenLang Network platform. As depicted in Table 1, all survey items were rated above 4.00 out of 5.00, indicating a positive experience with the platform and its language learning services.

Table 1. Descriptive statistics of the survey results regarding user experience with the OpenLang Network platform.

Question	Min	Max	Mean	Std. Deviation
The platform is easy to use.	3	5	4.42	0.752
The speed of the platform is sufficient not causing any access delays.	3	5	4.21	0.631
The platform can be accessed using any device (desktop, laptop, smartphone, etc.) and any operating system (Windows, MacOS, iOS, Android, Linux, etc.).	3	5	4.28	0.705
The platform functions well all the time.	3	5	4.11	0.790
The technical support of the platform solved any technical problems that I encountered.	3	5	4.37	0.694

A set of open-ended questions in the administered survey captured the views of respondents about the positive and negative aspects of the platform, suggestions for potential improvements of the platform's language learning services, as well as how the teaching and learning practices of respondents have been affected as a result of using the platform's language learning services. Some indicative responses were the following:

> *"I especially came to understand the existence and potential of reaching, using and sharing OERs in my own teaching setting."*

"I am planning to develop a Reading course based solely on the use, revision and adaptation of OERs by applying the knowledge and skills I gained from the [OpenLang] MOOC."

"[The platform is] easy to navigate. The material is clearly presented and easy to follow."

"[The platform offers] self-paced learning and networking opportunities."

"[The platform offers] useful suggestions to OER directories, platforms, repositories."

"Just one thing I can suggest is that there should have been a clear and tangible demonstration of a working example of an adapted and real OER in the form of a running course."

"I would like a hands-on workshop to consolidate knowledge acquired."

5.3. Discussion

The results of the user evaluation indicate that users had a positive experience with the platform and its language learning services. More specifically, they found the platform to be easy to navigate and to use, to be sufficiently responsive, to be easily accessed from various devices, as well as to provide sufficient technical support. The platform had a positive impact on the teaching and learning practices of teachers and learners, specifically regarding the use, adaptation and sharing of language OERs.

During the discussion sessions of the online consultation workshop, participants indicated that continued technical and end-user support is critical for the sustainability of the OpenLang Network platform. Another sustainability factor that emerged from the workshop discussions was the need for community events (online, face-to-face, or hybrid) that will bring together members of the community to discuss and share their views on common language learning and teaching issues, as well as to share their best practices on language learning and teaching.

All these factors will be taken into consideration by the consortium of the OpenLang Network project, in order to ensure the sustainability of the OpenLang Network platform and the growth of its community of language learners and teachers beyond the lifetime of the project. Additionally, the analysis of the qualitative feedback collected via the survey and via the workshop led to the identification of a set of best practices and challenges, which are presented in the following section.

6. Best Practices and Associated Challenges

Building and sustaining an online community of language learners and teachers requires the careful consideration of strategies that can help ensure the long-term viability of such an initiative. Based on the analysis of the user feedback received from the community of the OpenLang Network platform, we identified the following set of best practices and challenges associated with ensuring the sustainability of such a community:

1. **Fostering community engagement**: Encouraging users to participate actively in the community by promoting a friendly and inclusive online environment, encouraging open communication and collaboration and providing opportunities for users to interact with each other can foster engagement and interaction among members, thus creating a sense of community.
2. **Providing high-quality resources**: Providing high-quality resources, such as language learning OERs and other interactive language learning services, can attract members and create value for them. However, it can be challenging to provide relevant and up-to-date resources that meet the diverse needs of community members.
3. **Promoting user-generated content**: Encouraging users to create and share their own language learning resources, such as OERs, can help to build a more diverse and comprehensive set of resources, as well as increase user engagement. However, ensuring the quality and accuracy of user-generated content can be challenging,

especially when dealing with a large number of contributors. This challenge can be partially overcome by allowing users to rate user-generated content.

4. **Ensuring effective communication**: Ensuring effective communication among members of the community can facilitate collaboration, knowledge sharing, as well as the exchange of language learning strategies. However, it can be challenging to ensure effective communication due to language barriers, different time zones, as well as technical issues.

5. **Providing continuous support and feedback**: Providing users with access to support resources, such as FAQs and help forums, as well as regularly soliciting feedback from users to identify areas for improvement and address user concerns is an important sustainability factor. Nevertheless, it can be challenging to provide effective support and feedback when dealing with a large and diverse user base. Additionally, addressing user concerns can be time-consuming and resource intensive.

6. **Maintaining up-to-date technology**: Keeping the community platform and the associated technology up-to-date to ensure compatibility, security and accessibility can help to ensure the sustainability of the community in the long term. Nevertheless, maintaining up-to-date technology can be quite challenging, especially when dealing with limited resources or technological barriers.

The above best practices can potentially offer opportunities to language learners and teachers by creating an inclusive and collaborative online environment for learning, teaching and sharing language learning resources. Members can benefit from high-quality language learning resources and services, gain access to a network of peers and experts and improve their language skills and cultural knowledge. However, each of the above best practices presents unique challenges that must be addressed in order to ensure the long-term sustainability of an online language learning community.

7. Conclusions

The goal of the OpenLang Network platform is to address the EU language skills gap by offering a sustainable online environment to language teachers, language learners and Erasmus+ mobility participants who desire to enhance their language abilities and cultural knowledge. The contribution of this work is primarily in the field of computer-assisted language learning and, specifically, in addressing the limitations of existing CALL approaches, including the lack of openness, the lack of multilingual language learning resources, the lack of self-evaluation opportunities available to language learners, the lack of peer coaching, as well as the lack of opportunities for collaborative language learning. In order to address these limitations, we have employed a set of sustainable design principles and we have developed a wide range of language learning services. The design of the OpenLang Network platform has been based on the sustainable design principles of openness, customisation, interoperability, mobility, community support, monitoring, storytelling, interactivity and gamification. The OpenLang Network platform is an inclusive and collaborative online environment that offers a wide range of language learning services, notably language placement tests, tandem language learning, as well as a vast array of language OERs. We have adopted a mixed methods approach in order to collect and analyse user feedback about the platform. The feedback collected from this user evaluation has been distilled into a set of best practices towards ensuring the sustainability of an online language learning community.

A limitation of the present study has been the limited number of participants in the user evaluation of the platform. This limitation is attributed to the relatively small number of participants that have been actively using the platform during its early stages of development. The authors plan to address this limitation in subsequent user evaluation studies that will enable larger numbers of platform members to participate, as the community of language learners and teachers that are actively using the platform is growing over time. Another direction for future work is further investigating and monitoring the continued sustainability of the platform by organising additional consultation workshops

with more members of the platform's community. Additionally, the authors will continue improving the platform's language learning services as a means to further sustain the platform. Such improvement plans include enhancing the accessibility of the platform by ensuring compliance with accessibility standards and providing tools to assist learners with disabilities.

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