

# EnetCollect – European Network for Combining Language Learning with Crowdsourcing Techniques (COST Action CA16105): a review of the project’s vision, organization, progress, and achievements

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This article reviews the European Network for Combining Language Learning with Crowdsourcing Techniques (enetCollect), an extensive network project created to foster research and innovation (R&I) on the combination of crowdsourcing and language learning. Accordingly, we explain how it began, introduce its overall logic and organization, and discuss its achievements in terms of both (1) creating a new R&I community through a concluded large network project, and (2) fostering R&I on a high-potential and mostly unexplored subject.

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We also discuss the challenges involved and lessons learned, whether in orchestrating and leading a new R&I community or the challenges we faced and generally observed in the efforts of enetCollect members, as they explored the many facets of such a versatile enterprise.

**Keywords:** enetCollect, COST Action, Crowdsourcing, Language Learning

## **1 Introduction**

EnetCollect, the European Network for Combining Language Learning with Crowdsourcing Techniques, was a network project running as a COST Action funded by the COST (European Cooperation in Science and Technology) Association through the Horizon 2020 Framework Programme of the European Union. As explained on the COST website,<sup>1</sup> “A COST Action is an interdisciplinary research network that brings researchers and innovators together to investigate a topic of their choice for four years. COST Actions are typically made up of researchers from academia, SMEs, public institutions and other relevant organizations or interested parties.” EnetCollect started in March 2017 and ended in September 2021 after an extension of six months was granted to partly remediate the challenges posed by the COVID-19 pandemic. Over its 4.5 years of existence, enetCollect involved more than 200 stakeholders from 41 different countries. It served as a starting point or catalyzer for more than 50 scientific publications, as well as several project proposal submissions and related funded research projects.

EnetCollect sought to create a new Research and Innovation (R&I) trend combining the well-established domain of language learning with recent and successful crowdsourcing approaches to leverage for all languages, in the medium- to long-term, the crowdsourcing potential of an ever-growing number of language learners and teachers. Such potential would fuel an innovation breakthrough for producing two types of cost-intensive materials: language learning materials, such as lesson or exercise content, and language-related datasets, such as Natural Language Processing (NLP) resources.

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<sup>1</sup> <https://www.cost.eu/cost-actions/what-are-cost-actions/>

In Section 2, we describe the premise and existing work that enetCollect built upon and, in Section 3, detail its objectives and organization in working groups. In Section 4, we discuss the achievements that could be reached with respect to its objectives, as well as the challenges we faced and the lessons we learned from it. Finally, Section 5 concludes the article and introduces D4Collect,<sup>2</sup> a DARIAH Working Group created as a follow-up to enetCollect.

## **2 Background and related work**

In terms of international groups of stakeholders exploring the combination of crowdsourcing and language learning, enetCollect was a first-of-a-kind project. Indeed, unlike many other network projects that grew out of smaller initiatives (e.g. specialized workshops or task forces), most of the stakeholders had yet to work on the subject, and only a few had interacted with one another before participating in enetCollect. The majority thus spontaneously joined because of enetCollect's appeal to their respective interests, be it in terms of language learning, crowdsourcing or the creation of language-related datasets. Likewise, they started exploring the subject almost from scratch, as very few past works were directly relevant to it.

Indeed, before 2017, only a few initiatives had combined both language learning and crowdsourcing. Notable among them is the well-known online language learning platform Duolingo (von Ahn, 2013), which originally followed an enetCollect-compatible logic to crowdsource translations and, to this day, offers some loyal users the possibility of participating in the creation of language learning material.<sup>3</sup> Moreover, only a limited number of research efforts have combined language learning and crowdsourcing to produce part-of-speech corpora (Sangati et al., 2015) or syntactic knowledge (Hladká et al., 2014).

Nonetheless, the individual states of the art for crowdsourcing, language-related datasets creation and language learning are extensive. While their characteristics and similarities with enetCollect's objectives fall far beyond the scope of this article, we can, however,

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2 <https://www.dariah.eu/activities/working-groups/combining-language-learning-with-crowdsourcing-techniques-d4collect/>

3 As do other platforms, like Memrise (<https://www.memrise.com/>)

point out that they include – with respect to crowdsourcing and NLP dataset creation<sup>4</sup> – numerous efforts implementing approaches such as Wisdom-of-the-Crowd<sup>5</sup> (WoC), Human-based Computation<sup>6</sup> (HC) or Games-With-A-Purpose<sup>7</sup> (GWAP), and – with respect to language learning – an even wider number of efforts related to, among others, the various different Computer-assisted Language Learning (CALL) communities<sup>8</sup>.

### **3 Objectives and organizational structure**

#### **3.1 Objectives**

As previously mentioned, the overall objective of enetCollect was to kickstart a new R&I trend on the combination of language learning and crowdsourcing in order to trigger an innovation breakthrough for the production of both language learning material and language-related datasets, such as NLP resources. Integrating crowdsourcing approaches into the language-learning material-creation workflow promises to facilitate the production of even more diversified language learning materials and language-related datasets at reduced cost by outsourcing part of the cost-intensive manual work to crowds of teachers and learners (see Sections 4.2 and 4.3 for more details and references). This would contribute to addressing the two challenges of (a) fostering the language skills of all citizens in a globalizing world regardless of their diverse social, educational, and linguistic backgrounds, and (b) solving the longstanding challenge of creating extensive language-related datasets for all languages taught, not only those that receive the most financial and research support.

In order to foster this new R&I trend, enetCollect tackled several network- and research-oriented subgoals.

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4 Relevant references can be found by searching for the term “crowdsourcing” in the ACL Anthology (<https://aclanthology.org/>)

5 [https://en.wikipedia.org/wiki/Wisdom\\_of\\_the\\_crowd](https://en.wikipedia.org/wiki/Wisdom_of_the_crowd)

6 [https://en.wikipedia.org/wiki/Human-based\\_computation](https://en.wikipedia.org/wiki/Human-based_computation)

7 [https://en.wikipedia.org/wiki/Human-based\\_computation\\_game](https://en.wikipedia.org/wiki/Human-based_computation_game)

8 E.g. the European Association of Computer Assisted Language Learning (<http://www.euro-call-languages.org/>)

### *Network-oriented goals*

- (1) To bring together relevant stakeholders from different domains (language learning, crowdsourcing, language-related domains, especially NLP, and computer science in a wider sense) interested in exploring the combination of language learning with crowdsourcing techniques to reach their respective objectives.
- (2) To establish and consolidate communication channels and dissemination procedures.
- (3) To foster complementary and follow-up project building and funding acquisition.

### *Research-oriented goals*

- (4) To create a shared understanding and theoretical framework to approach the combination of language learning and crowdsourcing by revising the state of the art, analyzing directly and indirectly related approaches, and establishing a shared terminology.
- (5) To research use cases, work on prototypes combining language learning and crowdsourcing and gather evaluation data.

## 3.2 Network structure

EnetCollect was organized around five distinct yet interconnected working groups whose efforts directly tackled the two aforementioned research-oriented goals:

- WG1, R&I on explicit crowdsourcing for language learning material production,
- WG2, R&I on implicit crowdsourcing for language learning material production,
- WG3, user-oriented design strategies for a competitive solution,
- WG4, technology-oriented specifications for a flexible and robust solution,
- WG5, application-oriented specifications for an ethical, legal and profitable solution.

Working Groups (WGs) 1 and 2 were created to tackle the core objectives of enetCollect, namely researching how crowdsourcing

techniques could be applied to language learning. A practical distinction was made between works focused on *explicit* crowdsourcing (WG1) and works focused on *implicit* crowdsourcing (WG2), where *explicit* crowdsourcing refers to activities where the crowd is aware of their participation in a crowdsourcing effort and intentionally participates. In contrast, in *implicit* crowdsourcing activities the crowd is not necessarily aware of their contribution to a crowdsourcing effort, or the act of contributing is not the primary motivation for their participation. Such a distinction was made pragmatically, as we expected WG1 activities to be mostly targeted at crowds of teachers and WG2 activities at crowds of learners. Accordingly, we expected WG1 members to be less interested in WG2-related activities, and vice versa, and wanted to ensure an effective use of the participants' time and effort.

Unlike the first two WGs, Working Group 3 (WG3) was focused on language learning only and aimed at reviewing and exploring user-oriented design strategies for online language learning applications, with the ultimate intent of fostering know-how with regard to attracting and retaining a crowd of teachers and learners.

Finally, Working Groups 4 and 5 (WG4 and WG5) were focused on the technical aspects (WG4) and the ethical, legal, or business-related aspects (WG5) of applications for language learning and crowdsourcing. They were established to account for and study the transversal challenges met by the efforts undertaken in WG1, WG2 and WG3.

Besides the five working groups, three additional coordinating groups called the Outreach coordination, Dissemination coordination and Exploitation coordination, were created to better address WG-transversal needs and ensure, whenever possible and relevant, homogeneous approaches in doing so. Such coordination groups were thus designed to better monitor and support the efforts tackling the three aforementioned network-oriented goals.

## **4 Achievements, failures and lessons learned**

In this section, we discuss the extent to which enetCollect succeeded in pursuing the five goals.

## 4.1 Network-oriented objectives

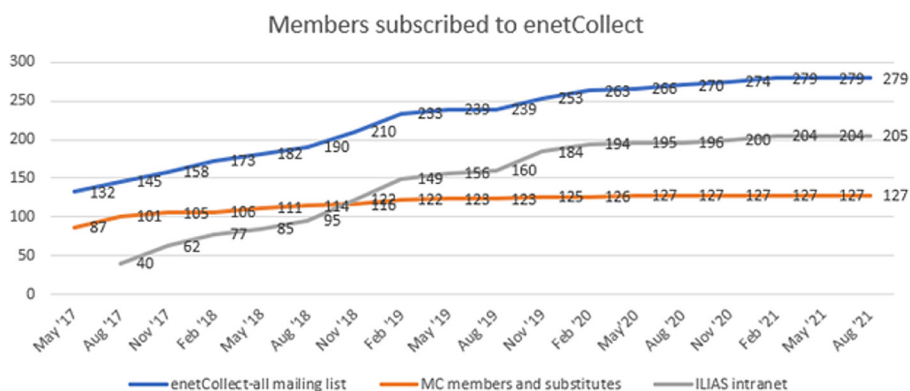
### 4.1.1 *Bringing together relevant stakeholders from different domains*

EnetCollect was originally designed to involve stakeholders fitting four profiles: (1) content-creation experts, ranging from teachers to researchers; (2) content-usage experts, primarily teachers, who would provide end-user perspectives for the creation of crowdsourced material; (3) crowdsourcing experts, mostly researchers, concerned with crowdsourcing strategies and methods; and (4) Content Management System (CMS) developers, especially Learning Management System (LMS) developers, who would provide expert knowledge to study the technical conditions needed to devise an adequate online environment.

As the participants often matched more than one target profile, we are unable to provide precise statistics regarding the composition of the enetCollect network. Nonetheless, we can attest that all four targeted groups were represented, with university stakeholders (researchers and language teachers) making up the greatest part. In contrast, content-creation experts, CMS developers and, in general, non-academic and commercial stakeholders, took much more effort to engage (even though some did participate, especially through meetings). This can be explained by enetCollect's research-oriented nature (like most COST Actions) and by its funding scheme, which does not cover human resources but networking activities. EnetCollect's topic fits into the agenda of researchers, especially young ones, rather than those of language learning teachers, textbook creators or online providers, who usually follow output-oriented, well-defined and established procedures with little room for exploration, even more so when the cost of human resources is not covered.

Overall, enetCollect brought together an interdisciplinary consortium of more than 120 Management Committee (MC) members, 200 associated members registered on the intranet (including MC members) and more than 275 people signing up to the main mailing list (including associated members). As shown in Figure 1, the growth in intranet and mailing list registration was constant until

the beginning of the COVID-19 pandemic, while the number of MC members almost reached the maximum possible after one year. As the network grew in a rather fast and organic fashion, no transversal need was identified, and the Outreach coordination group that was originally appointed to tackle any such related need quickly became inactive.



**Figure 1:** EnetCollect member statistics over the lifetime of the Action.

In terms of direct in-person interactions and collaborations, the Action funded 54 scientific exchanges between pairs of members and organized two hackathon-like events that allowed members (74 participants overall) to intensively collaborate and start new shared efforts over the span of a few days, and nine meetings allowing members to present and discuss their results (519 participants). Numerous collaborative efforts took place online, especially after the COVID-19 pandemic had started and in-person interactions were not recommended.

We would have considered this goal entirely fulfilled had we managed to involve more of the less-represented profiles noted earlier. Nonetheless, our achievements were satisfying, especially regarding the relatively high number of interactions and participations, as it is comparable with some small- and medium-sized well-established research communities we know of and participate in.



#### *4.1.2 Establishing and consolidating communication channels and dissemination procedures*

In terms of communication, we set up a website, an intranet, three social media accounts (Twitter, Facebook and ResearchGate), a video channel (Videlectures), a Zotero repository for scientific publications, 19 different mailing lists, as well as branding materials (logo, flyers, a Microsoft PowerPoint template, etc.). So as to disseminate enetCollect's achievements outside the network, the Action funded ten participations at scientific events (mostly conferences).

The website's primary use was to share enetCollect's objectives and achievements with a wider audience. Before the COVID-19 pandemic, the website averaged 3,000 visits per month. The use of the intranet was minimal, but allowed us to make available documents and obtain basic yet practical information about the members at registration. The social media accounts, video channels, and publication repository allowed for better internal dissemination among members. In contrast, the numerous mailing lists allowed for better targeting of the relevant set of members for every communication channel. The Dissemination coordination group greatly facilitated the organization of the dissemination efforts in a systematic fashion. Overall, the main communication channels showed a steady increase in use, which subsequently and suddenly dropped with the onset of the pandemic.

While not all communication efforts were fruitful (e.g. some mailing lists remained inactive), we consider dissemination an achieved goal. As a positive side-effect, it also allowed the members contributing to it to gain practical experience and skills, which will certainly be of interest to future network initiatives.

#### *4.1.3 Strategies for related project building and funding acquisition*

Three levels of funding acquisition were actively considered and fostered by sharing information on the enetCollect website and mailing lists, motivating members at meetings and via email, and by offering information and specialized sessions at enetCollect events.

The first level consisted of smaller project funding that could accompany enetCollect as soon as possible and contribute to achieving

its objectives throughout the lifetime of the Action and thereafter. For this line of initiatives, we identified several options: national COST-related funding (as found in Switzerland, Turkey, etc.), PhD scholarships associated with enetCollect member institutions, Marie Curie Individual Fellowship grants and small-scale national funding schemes. EnetCollect members were successful in acquiring some national COST-related funding, PhD scholarships and small-scale national funding, while only one Marie Curie Individual Fellowship was obtained.

The second level of funding corresponded to funding to acquire mid-way through the Action period in order to follow up on specific aspects of enetCollect after its end. For this line of initiatives, the Erasmus+ Key Action 2 scheme, European-funded joint projects across two countries and medium scale national funding schemes were identified as relevant. Related efforts led to a few project applications, which were unfortunately unsuccessful. This was mainly due to the pandemic-related cancellation of meetings and of intensive network interaction during the second half of the Action, leading enetCollect consortia to discontinue the preparation of new proposals and/or the improvement of rejected ones.

The third level of funding was sought towards the second half of the Action to further develop enetCollect with the objective of creating a long-term stable research and application context. This funding effort was expected to be piloted by a consortia of enetCollect leaders. For this line of initiatives, we considered the Horizon 2020/Europe research and innovation program and ICT training networks. Similarly to the second level of funding, the work on preparing such a large-scale proposal was discontinued when the COVID-19 pandemic hit, as the consortia of enetCollect leaders focused on keeping their respective parts of enetCollect as active as possible.

For all of the above reasons, we would consider this objective as mostly unfulfilled. As lessons learned, we believe our efforts should have been more narrowly targeted at only a few well-identified funding schemes accessible to most members. In that respect, we believe the Marie Curie Individual Fellowships and the Erasmus+ Key Action 2 schemes to be the most relevant.

## 4.2 Research-oriented objectives

### 4.2.1 *Transversal challenges faced*

Research-wise, we could observe three major transversal challenges.

Regarding the first challenge, network project schemes such as COST Actions do not typically cover human resource costs but primarily rely on a stakeholder's willingness to invest time in the short-term for a medium- to long-term return on investment in the form of scientific publications and/or funded projects. At the same time, because these schemes are open by nature, they rely on meetings and scientific exchanges to define milestones and make progress. While the fact of not covering human resource costs naturally limits the participation of non-publicly funded stakeholders while fostering the participation of publicly funded ones, both this aspect and the need for scientific exchanges and meetings are impossible to fulfill if the participating stakeholders are unable to allocate time or meet in person, which is what happened during the chaotic COVID-19 period. Our experience tells us that network project schemes should cover some minimal human resource costs, especially for the leaders of the project, and should factor in the possibility of being put on hold if extraordinary circumstances require it.

With respect to the second challenge, and as recorded in the Zotero repository, enetCollect members published more than fifty scientific journal, workshop and conference articles, thus creating the groundwork for a previously largely unexplored topic. Nonetheless, enetCollect's own interdisciplinary nature (linguistics, lexicography, language studies, language pedagogy, Computer-Assisted Language Learning, NLP, etc.) proved challenging for the publication of scientific articles for various reasons connected to the emerging and interdisciplinary research subject tackled by enetCollect. As such, its publications indirectly relate to several research areas without having its own venue and audience outside of the project itself. Therefore, publishing works that are related to, but do not fully match the expectations of a research community, has proven to be challenging on various occasions for various reasons. First, reviewers naturally have specialized knowledge and expectations on only part of the interdisciplinary subject discussed (i.e. the language learning or the computational/crowdsourcing side). As a

result, scientific publications need to be tailored to the specific interests of the targeted research community, thus forcing authors to prioritize some research aspects over others. Second, and unexpectedly, a notable number of reviewers also had inadequate expectations regarding aspects they knew little about (e.g. NLP reviewers with respect to CALL-related evaluation procedures), thus compelling authors to spend time addressing their concerns. Third, the research outputs of enetCollect are rather exploratory and were often considered too vague or preliminary. Fourth, since very few related works exist, reference values for evaluation are often missing, thus potentially undermining the credibility of the work. For all these reasons, the need to establish new publication venues for this emerging field seems inevitable.

Regarding the third challenge, stakeholders participating in such networks usually have little time for them, and their innovative nature rarely aligns with their short-term interests, nor are they fully covered by their expertise. As such, most efforts can only be conducted by a group of participants and, in order to further enhance achievements, proper strategies to foster such collaboration are needed. Our experience with enetCollect allowed us to identify one very suitable strategy which fostered a large number of the collaborations that led to the scientific achievements discussed in the upcoming sections. This is the organization of hackathon-like events where some members first answer an open call for topics they would like to tackle collaboratively, and are then asked to lead a taskforce. The topics are later disclosed to the remaining members, who can then ask to participate in one or more of the taskforces. The candidate participants of the topics that received enough attention are then invited to the hackathon-like event to kickstart the task forces by working intensively over the span of a few days and perform the groundwork needed for their collaborations to develop after the end of the event itself.

#### 4.3 Creating a shared understanding and a theoretical framework for approaching the combination of language learning and crowdsourcing

With respect to this theory-oriented goal, a literature review conducted in 2017/2018 by WG1 members revealed that there were very few

examples of past crowdsourcing efforts in the field of language learning at that time. They also gathered the opinions of relevant stakeholders in three ways. Firstly, they conducted a short survey among themselves to identify the aspects of language learning with the most potential for crowdsourcing. Secondly, they circulated a survey among teachers to assess their familiarity with crowdsourcing methods, and find possible use cases in teaching practice (Arhar Holdt et al., 2020). Finally, they circulated another survey among learners to determine their familiarity with crowdsourcing, and their attitudes towards materials (potentially) produced in this way (Hatipoglu et al., 2020; Miloshevska et al., 2021). Understanding stakeholders' perspectives was crucial in setting up a suitable theoretical framework, and to identify the areas with the most potential for crowdsourcing. WG1 members also explored specific subjects, including how to develop an open dictionary for the contemporary Serbian language using crowdsourcing techniques (Lazić Konjik and Milenković, 2021), how to develop pedagogically appropriate language corpora through crowdsourcing and gamification (Zviel-Girshin et al., 2021) to crowdsource linguistic knowledge regarding Dutch blends, neologisms and language variation (Dekker and Schoonheim, 2018), and how to crowdsource second language learning material, with a focus on vocabulary lists, in order to reduce dependency on costly expert manpower (Alfter et al., 2020).

The efforts of WG2 members mostly focused on learners as the most relevant crowd to perform implicit crowdsourcing, and can for the most part be related to an overarching paradigm that pairs up a type of exercise with a specific type of language-related dataset, which can be used to generate exercise content (Nicolas et al., 2020, 2021). More specifically, in order to understand how such a paradigm could be implemented, these efforts studied its context: some efforts studied the exercises compatible with the paradigm (i.e. which content could be automatically generated from specific language-related datasets, Lyding et al., 2022), other efforts studied the type of language-related datasets most commonly crowdsourced,<sup>9</sup> or aimed at mapping the existing language learning platforms where such a paradigm could be integrated. Other specific efforts researched how to adequately apply

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<sup>9</sup> The results of these efforts have yet to be published.

this paradigm to crowdsource semantic relations between English or Romanian words (Lyding et al., 2019; Nicolas et al., 2021; Rodosthenous et al., 2019, 2020), defined new workflows to include teachers and crowdsource linguistic knowledge about English verb-particle constructions (Grace Araneta et al., 2020), as well as crowds of relatives of learners to crowdsource Alsatian lexical knowledge (Millour et al., 2019). While they did not specifically target a crowd of learners or teachers, others studied how to crowdsource recordings of Italian Dialects (Sangati et al., 2018) and complex associations among words by means of a board game workflow (Smrz, 2019).

WG3 objectives were largely pursued together with WG1, WG2 and WG5 objectives. Some related efforts made it possible to map and study a rather large number of existing language learning solutions (Bączkowska, 2021; Bodorik and Bédi, 2018; Grygo and Gajek, 2018). Other work allowed us to better understand teachers' and learners' perception of crowdsourcing as a concept (Arhar Holdt et al., 2020; Hatipoglu et al., 2020), while other studies presented enetCollect from a language learning perspective (Gajek, 2020; Lyding et al., 2018). In a number of publications (Cornillie, 2018; Gajek, 2018; Murray and Giralt, 2018), WG3 members also discussed important design choices when creating a language learning application, especially one that made use of crowdsourcing, and in others (Cucchiariini and Strik, 2018; Ostanina-Olszewska, 2019; Pereira et al., 2018) they discussed recent language learning technologies.

WG4 efforts, which aimed at defining technology-oriented specifications, allowed us to draw two conclusions. Firstly, the developments made in the context of enetCollect were still too heterogeneous and prototypical to define any transversal technical solution they could share and rely on. Indeed, even though many approaches undertaken shared some common needs (e.g. aggregation methods to cross-check the linguistic inputs that were crowdsourced), it was too early to establish technical solutions encoding sophisticated and standardized methods. Secondly, no open-source solution was readily available to implement a language learning platform and, regarding the closest solutions that could have been adapted (i.e. the Learning Management Systems, also known as LMS), the related communities at the time

had little interest in language learning but were more focused on other subjects (e.g. mathematics or physics) posing fewer subject-specific technical challenges. Indeed, because of its nature, language learning requires specific technologies, such as automatic speech recognition. This explained the absence of readily available solutions for Language Learning and the difficulty in involving LMS-oriented stakeholders.

Finally, WG5 aimed at devising application-oriented specifications for an ethical, legal and profitable solution. Similarly to WG4, the efforts pursued in the context of enetCollect were still too recent to define any transversal specifications on these aspects. Nonetheless, several WG5 members managed to tackle relevant issues in a prospective fashion and discussed aspects such as the ownership of the data, the need for private or open-source code, third-party dependencies or privacy (Chua et al., 2018; Chua and Rayner, 2018); how to balance a collaboration between teachers and academics (Chua and Rayner, 2019); how to implement gamification strategies in an ethical fashion (Murray and Giralt, 2018); as well as legal issues with respect to European regulations of online learning platforms such as LMS, Massive Open Online Courses (MOOCS) or Open Educational Resources (OERs) (Zdravkova, 2018, 2019). Finally, a framework to address ethical issues affecting three groups of stakeholders (collaborative content creators, prospective users, and the institutions intending to implement the approach for educational purposes) was proposed (Zdravkova, 2020). As no direct collaboration with business-oriented stakeholders could be established, the question of defining business guidelines was not explored.

Overall, with respect to this objective, the versatility of the relevant aspects discussed is far greater than we originally expected and without much overlap in terms of main focus. Such versatility allows us to draw two further conclusions. Firstly, a dedicated R&I community is needed to adequately take on the topic. Second, the lack of convergence in terms of main focus (most of the aforementioned publications could hardly cite one another in their state of the art as a directly comparable work), might lead one to think that the paths followed still have many interesting results to yield, while others are still waiting to be explored. In other words, we believe that the research on the

combination of crowdsourcing and language learning has progressed and gained notable results, but is still in its early stages.

#### 4.4 To research use cases and work on prototypes

With respect to this output-oriented objective, most achievements were obtained in the context of WG1 and WG2, often in collaboration with WG3 and WG4.

In the context of WG1, experiments were performed to crowdsource linguistic knowledge regarding Dutch blends, neologisms and language variation (Dekker and Schoonheim, 2018), and to crowdsource vocabulary lists to be used as L2 learning material (Alfter et al., 2020). Other efforts fostered the development of a mobile application for the gamified improvement of two automatically compiled dictionaries for Slovene (Arhar Holdt et al., 2021; Arhar Holdt and Čibej, 2020; Čibej and Arhar Holdt, 2019), and the development of LARA, a learning and reading assistant with explicit crowdsourcing abilities aimed at teachers (Akhlaghi et al., 2019b, 2019a, 2020; Bédi, Bernharðsson, et al., 2020; Bédi, Butterweck, et al., 2020; Bédi et al., 2019; Butterweck et al., 2019; Chua and Rayner, 2019; Habibi, 2019).

In the context of WG2, the V-trel vocabulary trainer with implicit crowdsourcing abilities is geared toward learners and teaches them – through a Telegram bot<sup>10</sup> – English and Romanian semantic relations between words, while crowdsourcing their linguistic judgements (Lyding et al., 2019; Nicolas et al., 2021; Rodosthenous et al., 2019, 2020). Two other prototypes were also implemented – again through Telegram bots – a new learning and teaching workflow to generate exercises and crowdsource linguistic knowledge about English verb-particle constructions (Grace Araneta et al., 2020), as well as a crowdsourcing mechanism to obtain recordings of Italian dialects (Sangati et al., 2018). The prototype described in Millour et al. (2019), however, relied on a role-playing game framework to crowdsource Alsatian lexical knowledge from learners and their relatives. The prototype discussed in Smrz (2019) fully reimplemented a popular board game in order to crowdsource complex associations among words.

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<sup>10</sup> <https://telegram.org/>



Overall, the research on use cases and the work on prototypes has been more limited than we originally hoped, as attested by the limited number of outputs to crowdsource linguistic knowledge other than lexical knowledge. We identified two main reasons for this. Firstly, the minimal involvement of non-academic stakeholders had noticeable implications for devising and testing prototypes. Indeed, enetCollect was somehow lacking direct evaluation and feedback from those stakeholders who use and create language learning solutions daily. It also prevented enetCollect from accessing existing exercise content or the involvement of large crowds of students and online learners needed to more extensively test the prototypes that were devised. Secondly, the efforts to tackle this goal were mostly planned for the second half of the action, while the efforts planned for the first half would for most part focus on building the network and researching the theoretical framework. As such, the bulk of efforts with regard to research on use cases and work on prototypes only began some months before the COVID-19 pandemic itself started, which obviously limited many of these efforts and completely halted others.

## **5 Conclusions and future steps**

While the achievements of enetCollect were rated by the COST agency as “excellent” and “very good” in their mid-way and final formal evaluations, our overall assessment is more modest.

Regarding the network-oriented goals, we believe that enetCollect mostly fulfilled its role. Indeed, given the rather large number of stakeholders that participated and collaborated, we believe it is fair to say that a new research community was created. We also believe that enetCollect could have achieved even greater results had it been supported by the COST agency with more readily available tools, procedures or guidelines to tackle various transversal aspects, such as dissemination or funding acquisition.

Regarding research-oriented objectives, the high-potential of the language learning and crowdsourcing combination was more widely acknowledged than we had originally imagined, as attested by the large participation of an international audience of stakeholders, who

deemed enetCollect worth their time. In terms of outputs, we believe the number of publications achieved and the prototypes devised to be fair considering the innovative nature of enetCollect and the disruption caused by COVID-19. Nonetheless, for the reasons discussed in Sections 4.4 and 4.5, we believe that the research on this topic is still in its early stages.

As a follow-up to enetCollect, we have established the DARIAH Working Group *Combining Language Learning with Crowdsourcing Techniques* (D4COLLECT), which will serve as a flexible and dynamic bottom-up institutional framework for knowledge exchange, research coordination and capacity building. Following in enetCollect's footsteps, D4COLLECT aims to bring together language teachers and experts in linguistics, computational linguistics, educational sciences, software engineering and the digital humanities to explore digital workflows, tools, and solutions for deploying implicit and explicit crowdsourcing methods in the creation of language-learning materials and the collection of language datasets. Our first efforts will target the organization of hackathon-like events (see Section 4.2.1). D4COLLECT will also serve as a practical context to promote the submission of project proposals that, if funded, would allow to speed up and better shape the efforts of the Working Group's members.

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## EnetCollect – Evropska mreža za združevanje jezikovnega izobraževanja s tehnikami množičenja (COST Action CA16105): pregled projektne vizije, ureditve, napredka in dosežkov

V tem članku predstavljamo pregled Evropske mreže za združevanje jezikovnega izobraževanja s tehnikami množičenja (enetCollect), obseženega projekta za spodbujanje raziskav in inovacij (R&I) na področju združevanja množičenja in učenja jezikov. Opisujemo začetke projekta, predstavljamo njegovo splošno zasnovo in ureditev ter razpravljamo o dosežkih v smislu (1) ustvarjanja nove skupnosti za raziskave in inovacije z zaključenim obsežnim mrežnim projektom in (2) spodbujanja raziskav in inovacij na večinoma neraziskanem področju z velikim potencialom.

Razpravljamo tudi o povezanih izzivih in pridobljenih izkušnjah pri oblikovanju in vodenju nove skupnosti R&I ter izzivih, ki smo jih opazili pri delu članic mreže enetCollect med spoznavanjem številnih plati tako raznolikega projekta.

**Ključne besede:** enetCollect, COST Action, množičenje, jezikovno izobraževanje