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Empowering Education: The FLeD Project's Pursuit of Open Educational Resources

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1. EXECUTIVE SUMMARY

This document describes the use of open resources in the FLeD project. After a brief description of our project, we delve into the description of open resources as given by the UNESCO, together with key criteria these resources must have. We then proceed to describe the open resources we have created in this project, together with the process of feedback, validation and publication of each of these resources. In the conclusions, we reflect on the positive aspects of this process, and also suggest improvements for upcoming open resource publications.

2. OPEN SCIENCE AND OPEN EDUCATIONAL RESOURCES

The European Commission's commitment to open educational resources (OER) and Open Science is a forward-thinking strategy that promotes educational equity, innovation, and transparency in research.

Open Science is at the centre of European research policy, aiming to make European science more efficient, productive, transparent, and responsive to societal needs. The objective is to position Europe to reap the benefits of Open Science by fostering a research system that is open between scientists, disciplines, and society. Open Science facilitates sharing and collaboration, thereby accelerating discovery, improving research quality, and making science more impactful and central to human and societal development. This involves breaking down barriers, developing incentives, enabling data-intensive science, and promoting a scientific approach in public debate. Key practices of Open Science include early and open sharing of research, open collaboration, unrestricted access to scientific outputs, ensuring verifiability and reproducibility, responsible research management in line with the FAIR principles, and promoting public engagement and citizen science (European Commission, n.d.-a).

Open education, a critical aspect of the Commission's strategy, removes barriers to learning, making education more accessible, customizable, and collaborative. It supports the modernization of higher education, frequently using digital technologies, and integrates formal and non-formal educational sectors. By advocating for OER, the Commission ensures that quality educational materials are accessible to all, regardless of socio-economic

background, thus democratizing education and fostering collaborative learning across borders. This initiative aligns with the European Commission's broader goals of inclusivity, innovation, and sustainable development in education (European Commission, n.d.-b).

Open resources are “learning, teaching and research materials in any format and medium that reside in the public domain or are under copyright that have been released under an open license, that permit no-cost access, re-use, re-purpose, adaptation and redistribution by others” (UNESCO). Also known as open educational resources (OER), these resources can include textbooks, lecture notes, syllabi, videos, software, and other materials used in the learning and teaching process. What differentiates open resources from traditional educational materials is their open licensing, typically under licenses such as Creative Commons, which allows users to access, adapt, and distribute the content without restrictions.

Therefore, a key aspect of open resources is their accessibility. By removing financial barriers, open resources enable equitable access to educational materials for learners worldwide, regardless of their socioeconomic status or geographic location. This accessibility is particularly significant in addressing issues of educational inequality and improving access to quality education, especially in communities where access to traditional educational resources may be limited. This is directly related to the inclusive aspect of our project, for we believe inclusion in its many forms (SEND students, gender, ethnicity, etc.) is key if we want our resources to reach the greatest audience possible.

Moreover, open resources promote collaboration and knowledge sharing among educators and learners. Through open licensing, educators can adapt and customize resources to better suit the specific and varied needs of their students. Also, teachers can incorporate diverse perspectives into their teaching materials. This fosters a culture of sharing and innovation in education, where educators can build upon each other's work to continuously improve teaching and learning outcomes.

We have followed the criteria set by UNESCO to generate OERs (UNESCO, 2019). In the FLeD project, there has been a common policy regarding OERs, and all partners have been advised to follow these criteria. In the following points, we describe how we have applied each of the criteria:

- **Accessibility:** Ensuring that resources are easily accessible to all users, including those with disabilities.
 - Our resources are accessible to all users, for they are in PDF and they can be easily “zoomed in” for people with visual disabilities, and may also be read out

loud by artificial intelligence tools. Additionally, the resource of the Better If has been translated to the languages of all our institutions; and the patterns are currently available both in English and Spanish. This allows for non-English speakers to be able to access these resources.

- **Reusability:** Designing resources that can be reused, revised, remixed, and redistributed.
 - Our resources are reusable in the sense that they are created for a varied audience, and not only for certain educators in a certain education level. The Better If, for example, can be used as a guideline to follow for different European projects. The patterns and scaffolding can be used in different contexts to plan varied classes, regardless of the subject and the educational level. Likewise, the guidelines for inclusion can be reused in different educational contexts, and redistributed wherever needed.
- **Licensing:** Applying open licenses (like Creative Commons) to allow free use and modification.
 - Our open resources use Creative Commons to allow their free use, distribution and, when needed, modification.
- **Quality:** Ensuring high-quality content that meets educational standards.
 - The quality of our resources has been ensured not only because of the expertise of the partners of the project regarding flipped learning, inclusion, and playful experiences within education, but also because all of the OERs have gone through a process of validation that will be described throughout the following section (3. OER within the FLeD project). We have counted with external validators (experts on the corresponding resources we wanted to publish) and with the feedback and approval of the members of our Advisory Board, created at the beginning of our project, which counts with members that are professionals in the field of flipped learning.
- **Interoperability:** Creating resources that can be used across different platforms and technologies.
 - The resources that we have created have mostly been thought of for the creation of the FLeD Tool, a platform that helps teachers design their own flipped classroom activities. However, they can certainly be used in different platforms; for example, the patterns and scaffolding can be used by themselves to create flipped learning activities without a digital tool.
- **Sustainability:** Ensuring the resources can be maintained and updated over time.



- The FLeD website will remain open for another three years after the end of the project. The OERs will be used in the context of universities for the training of teacher trainers, and also with students. The documents of OERs have been created in editable files even though they were uploaded as non-editable files. Editable files are uploaded in digital spaces and shared so the whole consortium can access and edit them in the future.

In European projects, the promotion and requirement of generating open resources are strongly encouraged. This policy aligns with the principles of transparency and accessibility in research and education. At FLeD, we fully embrace and are committed to this policy. We actively generate and share open educational resources to contribute to the broader goals of open science and education, ensuring that our work supports the democratization of knowledge and the fostering of collaborative learning environments. This commitment reflects our dedication to innovation and inclusivity in education.



3. OER WITHIN THE FLED PROJECT

The FLeD project (Learning Design for Flexible Education) stands as a beacon for educators seeking innovative pedagogical approaches. In this project, we have a series of resources that have been created to aid teachers in comprehending and implementing flipped learning methodologies. Recognizing the transformative potential of freely accessible educational materials, the consortium of this project has put special attention to making its resources openly available, fostering a culture of collaboration, innovation, and equitable access to quality educational practices.

Inclusion is one of the pillars of the FLeD project, and it is in fact horizontal to all of the five work packages in which the project is structured. Open resources are a first sign of inclusivity in our project, for we want our content to be available to different audiences in different areas of the world and with diverse economic backgrounds.

In our project, partners have their research networks and participate in academic and professional events where they have been sharing the project's advancements, reaching a broad academic audience interested in flipped learning design, inclusion, and general openness in education. Our goal is that the FLeD results may be reused by any teacher of any field and any level, for the flipped learning method is an umbrella approach suitable to any discipline, context and educational level.

In the project, we have fully embraced and committed to this policy by creating and continuing to develop various open resources, particularly in the pedagogical field. This includes a conceptual framework for flexible learning design in flipped classroom (FC), patterns that guide teachers in designing their own flipped learning scenarios, and scaffolding strategies for teachers to design FC scenarios which are digital, inclusive and self-regulated. The patterns and scaffolding were key for the creation of the FLeD tool (open source), through which teachers can design FC scenarios. Teachers are also guided by a playful co-design experience, another of our project's OER developed. Additionally, we have generated a "Handbook for inclusion" that describes inclusive practices in FC scenarios and that gives guidelines for its implementation in diverse teaching delivery models.

In addition, we created a transversal resource that can be of help for teamwork in European projects. The "Better-if" handbook is a guide with practical indications for social interaction generated that offers suggestions for sustainable, inclusive, gender equality and ethic behaviors based on European guidelines.

To sum up, the open resources that we have created in the FLeD Project include (Figure 1):

Figure 1

Open resources within the FLeD project



Following is the list of links (Table 1):

Table 1

List of Open Resources and links

No	Title	Link
1	Conceptual framework for flexible learning design	https://ebooks.uis.no/index.php/USPS/catalog/book/267
2	Better-if handbook	https://ddd.uab.cat/record/275523
3	Meta-pattern: Key decisions for an effective flipped classroom	https://ddd.uab.cat/record/275549?ln=ca
	Pattern 1: Self-regulation and prior preparation in online flipped classrooms	https://ddd.uab.cat/record/275572
	Pattern 2: Team regulation and management in blended flipped classrooms	https://ddd.uab.cat/record/275574
	Pattern 3: Exchange of constructive feedback in face-to-face flipped classroom	https://ddd.uab.cat/record/275575

	Glossary for FLeD patterns:	https://ddd.uab.cat/record/275576
4	Scaffolding	10.13140/RG.2.2.28004.35202
5	Handbook for inclusiveness	https://e-center.uni-sofia.bg/Guidelines for Inclusion for FL.pdf
6	FLeD tool	https://fledtool.upf.edu/
7	Playful co-design experience for teachers	https://repositorioaberto.uab.pt/handle/10400.2/14933

For the creation of all of these resources, we followed an iterative process which included collaborative creation, feedback from the partners of the FLeD consortium, feedback from the FLeD advisory board, and external feedback from experts.

In terms of the **Conceptual framework for flexible learning design**, we received feedback from Dr. Paker Doğu Özdemir, Director at the Center for Research and Best Practice in Teaching and Learning (CELT) at MEF University, in Turkey. According to this expert, the report examines the integration of flexible learning designs with the flipped classroom model, emphasizing flexibility's critical role in adaptable education. It links theoretical frameworks, such as constructivism, with practical applications to promote student-centered learning. He approves how the authors highlight technology's pivotal role in flexible learning and address challenges like institutional barriers and educator adaptation. The report positions the flipped classroom as a transformative framework essential for creating responsive, inclusive educational models, particularly in the post-COVID-19 era. The full report is available [in this link](#).

For the **Better If Handbook**, we asked for validation in three different aspects of the handbook: inclusion, gender equality, and sustainability. In the first two categories, we received feedback from two experts on the subject, and in sustainability, we received feedback from one expert. We also shared the Better If Handbook with all partners from the consortium and asked for their feedback, and then for the translation of this resource for it to be accessible to more people.

Regarding the **Guidelines for inclusion**, these were validated by the consortium, and we then refined this resource according to the feedback that was given by the partners.

After a first draft of the **Playful Design**, apart from being validated by the consortium, it was posted openly in the UAb repository to ask for feedback through LinkedIn, to collect feedback about the playful design. The results are visible in **Figure 2**. The resource was refined based on those feedbacks.

Figure 2



The resource of the **FLeD Tool** has gone through various phases. Firstly, the technical layout was validated by a member of the Advisory Board, with a four step validation process in a report that aimed to gather the views of experts on the technical layout of the tool to validate the technical design, ideas and development plan before starting to build the first working prototype. Next, came the Alpha testing of the tool by partners from the FLeD consortium, which included five participants, from where usability results were extracted. External validation was also given by academics, as we received external feedback from three revisors of the demo paper regarding the tool, which has been accepted to be presented in the [ECTEL 2024](#) conference. The FLeD tool is now continuing to be evaluated by pilot participants, and will be refined after the pilot evaluation.



Finally, we have decided to use the iterative process of the creation and validation of the **patterns and scaffolding** as a more detailed example. Specifically, apart from feedback from the consortium, advisory board, and external experts, we added the step of public feedback, which we believe is an even more inclusive way of refining these patterns and scaffolding for the future.

The patterns were started based on scientific evidence in a collective literature review process. Next, we defined the structure of patterns and scaffolding, selected main FC needs, and developed the artifacts in a collective process. Throughout the iterations, 10 people of our institutions participated in the discussion of every artifact. Next, we asked for validation from 9 experts from diverse countries in Europe, and also from the 6 members of our project's Advisory Board.

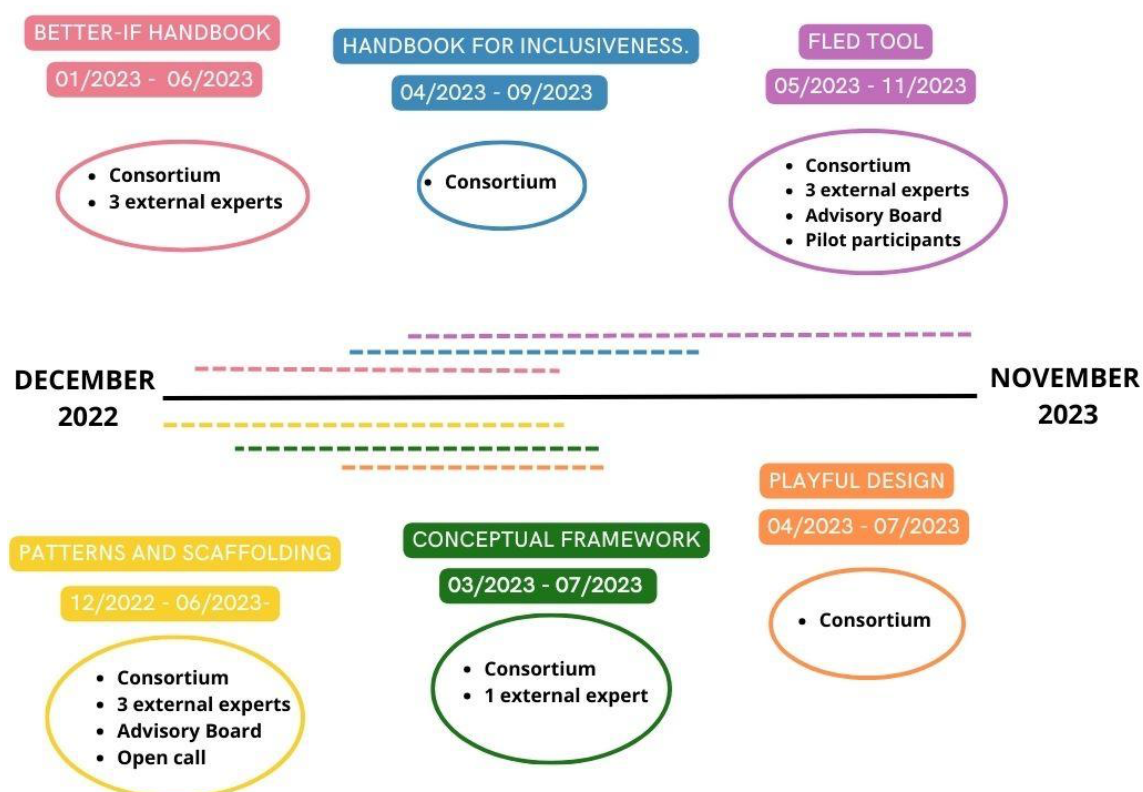
Additionally, we disseminated a call for participation regarding the patterns and scaffolding through 3 platforms: Twitter, our website blog, and the flippedclassroom network. To the moment, we have maintained communication with a total of 36 participants with whom we have met online. In June 2024, we sent the survey asking for feedback, and to the moment have received 4 responses. We will then analyse and integrate such data.

The following Figure 2 shows a general picture of how each OER was validated, including the partners of the consortium in charge of the OER, the different validators/feedback providers, and the first date that it was published openly.



Figure 3

OER development table



It is important to clearly state that, on one hand, we have committed to the collaborative creation of resources within the consortium members, involving diverse perspectives and expertise to ensure high-quality outputs. Secondly, we have pursued holistic validation from various stakeholders, including educators, researchers, and experts on the field, to ensure that the resources are robust, practical, and applicable in real-world settings. Finally, the open resources have been published in the open repositories of each institution that coordinated the resource generation, ensuring widespread accessibility and dissemination. This approach not only enhances the credibility and usability of the resources but also supports the broader goals of open education and knowledge sharing.

4. CONCLUSIONS

a. OPEN RESOURCES: HOW CHALLENGES CAN LEAD TO STRENGTHS

Generally, there was a set period for receiving feedback on the resources, initially from the consortium and subsequently from experts or practitioners. This process of validation and refinement means that the development time for the resources is longer, but it ensures a higher quality product. By incorporating diverse feedback and undergoing multiple rounds of review, the resources are more robust and better suited to meet the needs of various users, ultimately enhancing their effectiveness and impact.

Additionally, in terms of the patterns and scaffolding, the call for public feedback was successful. We believe that a call for public feedback for other resources would also be beneficial for the refinement of our products. The use of social media tools such as Twitter (X) and European Portals is key for this public call. However, in all cases, the fact of receiving feedback means firstly that the resources are known from people who do not belong to the consortium of the FLED project, and secondly that the results are of higher quality and adjusted to reality

It is worth noting that after sharing the patterns on Twitter, we reached out to interested individuals via email. From our project experience, employing Twitter (X) specialized flipped classroom networks, and contacts from the different partners of the FLED project (and thus, sending direct e-mails) tends to yield more favorable results than solely disseminating an open resource and relying passively on feedback. This direct form of communication fosters a sense of involvement and accountability among recipients, thereby enhancing engagement with the educational resource.

According to EDUCAUSE, the downsides of OER are that they require significant investment for creation, adoption, and maintenance. Additionally, a challenge to their widespread adoption is the perception among some academics that open content is inferior to traditional educational materials, leading to persistent resistance against the concept of open education. In our project, the publication of open resources has been prioritized because of our commitment to open science and open resources, taking into account that we want these to be accessible to everyone. In the following stages, we will put more weight on scientific dissemination.



OERs improve teaching and learning, and promote social justice in higher education by enhancing access to materials, adapting to student needs, and allowing diverse communities to share their voices and knowledge (Clinton et. al). Our primary focus has been on promoting access to materials. As demonstrated in this document, our resources are primarily directed towards providing access to materials on the open access platforms of our various institutions. Additionally, by offering a meta pattern and three specific patterns, we have aimed to address the diverse needs of students.

b. IMPORTANCE OF EXPANDING THE CREATION AND USE OF OPEN RESOURCES IN OTHER EUROPEAN PROJECTS

In the FLeD project, we believe that education should be inclusive and accessible to all individuals. While acknowledging the demanding nature of creating OERs, we are convinced that the creation of these resources, characterized by collaboration and feedback mechanisms, helps involve society and researchers in the process of validation, and trains them to work on their collaborative skills. This is a good practice, particularly in projects that research and aim to improve educational methods and outcomes. Likewise, the possibility of educators and academics being able to have access to OERs encourages the co-creation of educational resources, and may stimulate educators from different contexts to share resources focused not only in *what* is taught, but on *how* it is taught. We find this “how” to be key. The collaborative nature of OER development encourages diverse perspectives and expertise, enriching the educational experience for learners and educators alike.

Expanding the creation and use of open educational resources beyond the confines of the FLeD project holds significant importance in the broader European educational landscape. Embracing open education practices not only fosters a culture of knowledge sharing and collaboration; it also addresses issues of equity and inclusivity within education.

Furthermore, the integration of OERs into other European projects serves to amplify the impact and reach of these initiatives. By leveraging the expertise and resources of multiple projects, synergies can be created, leading to the development of innovative educational materials. This collaborative approach not only maximizes the efficiency of resource utilization, but also facilitates the exchange of best practices and lessons learned.



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