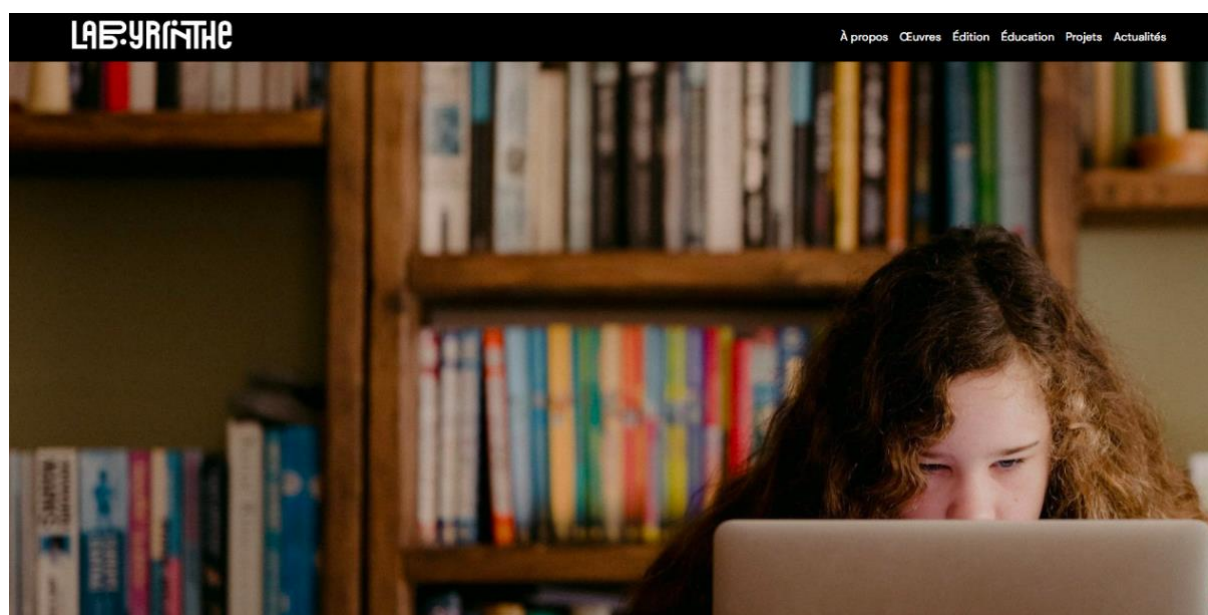


LAB-YRINTHE: AN ONLINE LABORATORY TO OBSERVE CHILDREN'S E-LIT AND SUPPORT DIGITAL LITERACY

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Introduction

The children's and young adults' digital content market is growing at a fast pace and already represents a considerable share of the editorial field, both in terms of downloads and distribution. As of April 2021, 395 000 mobile apps labelled as suitable for children were available in the Apple App Store and 283 000 in the Google Play [Curry, 2021], corresponding respectively to 8,6% and 11,2% of the listing volume overall. In Quebec, where nine out of ten households are connected to the Internet [CEFRIQ, 2017], several public industries, multimedia companies, as well as big and small print publishers have realized important investments to develop new content and new distribution paths, both adapting their previous catalogues and experimenting innovative technological solutions. For instance, *Télé-Québec* has launched a collection of augmented adaptations of print picturebooks intended for primary school pupils. *Fonfon*, a print children's publisher, has developed a catalogue of mobile apps. *La Pastèque*, in collaboration with *La puce à l'oreille*, a Quebecois startup specialized in audio content, has recently launched several podcasts, meant to extend the print picturebooks reading experiences. This editorial effort was accompanied by an impressive augmentation of digital books borrowings, especially during the pandemic. According to the figures published by the prenumerique.ca platform and the statements of the director of the Quebecois digital library *Bibliopresto*, Jean-François Cusson, in Québec, an impressive increase of children's books borrowings was observed in 2020¹ (+176% in the comic books section, +125% in the picturebooks and novels one, and +185% in non-fictional category) [Levesque, 2020].

¹ For previous reports, see <https://bibliopresto.ca/publications.php>

At the same time, educational policies have proven receptive to digital literacy issues and sensitive to the importance of introducing digital and multimodal content in the ordinary curricula. In particular, the *Digital Action Plan (Plan d'Action Numérique)*, released by the Ministry of Education and Higher Education in 2018, has stressed the importance of systematically including digital content and digital competencies in the 21st century educational programs. By insisting on the objectives targeted in the *Educational Success Policy (Politique de la réussite éducative)*, that were already aimed at “better integrating the 21st century skills and the possibilities of digital technology”, the Quebecois *Digital Action Plan* defines 33 measures, intended to achieve “nine objectives, referring to three major orientations, all centered on the needs of educational communities”. The first concerns the modernization of the educational offer, the promotion of digital culture and the development of digital skills and competencies among both young people and adults. The second aims at improving the use of technology for teaching and learning, by encouraging innovative practices, establishing efficient systems for sharing digital resources and activities, and deploying new and varied distance educational offers, based more on learners’ needs and realities. Finally, the third orientation focuses on the educative curricula themselves, on the implementation of digital tools to accompany students’ progressions throughout their education and on the development of fair and safe conditions to access digital technologies [MEES, 2018]. Within this framework, the *Digital competency framework (Cadre de référence de la compétence numérique)*, released as the first measure of the *Digital Action Plan*, has identified twelve dimensions – corresponding to as many competencies and skills – that young Quebecers need to master in order “to become increasingly autonomous in their use of digital technologies in educational or professional contexts as well as in everyday life” [MEES, 2019, p.7]. Digital reading skills and competencies appear transversal, both at primary and secondary levels, and cover most of the twelve dimensions: they are fundamental for developing and mobilizing technological skills (Dimension 2), collaborating, communicating and producing content via digital technology (Dimensions 5, 6 and 7), developing critical thinking with regard the use of digital technology (Dimension 11), adopting an innovative and creative approach the use of digital technology (Dimension 12) [MEES, 2019].

However, despite the sector dynamism and the interest of institutions, teachers and researchers towards digital content and digital literacy, children’s e-literature still presents major issues, in terms of production, distribution and diffusion. Developers, publishers and educators admit their difficulties and their partial knowledge of the editorial offer, of the creative processes, of the reading modes and habits in the digital environments, especially those of young readers.

Thus, in order to support the digital transformation of the Quebec youth e-publishing sector and facilitate both the “discoverability” [Bisailon, 2018] of its products and their use in school context, a team of 10 researchers² from different disciplinary fields (education, literature and art) and 12 partners from the publishing or media fields set out to document the issues, needs and realities of the contemporary digital market between 2017 and 2020, as part of the project “Support for digital publishing initiatives for young people in Quebec based on favorable production, distribution and reception practices” [Lacelle *et al.*, 2017-2020]. More particularly, the research had three objectives: **1) identifying and documenting** the needs, challenges and best practices in the production, distribution and reception of children’s digital literary works; **2) co-constructing** adapted reference tools to analyze and solve the specific issues faced by publishers and educators in conceiving, diffusing and distributing such works; **3) developing** an action plan for the development of innovative e-publishing projects.

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Data was gathered via semi-structured interviews with different actors involved in producing, distributing or accompanying the reception of children's digital literary works.

A preliminary inquiry with 43 primary and secondary levels teachers was conducted in 2017, in order to describe their knowledge of e-literary creations and their effective use. Two cycles of interviews were then conducted with 17 print or digital publishers, developers and producers, that already had significant experience in digital children's publishing and wished to further exploit the potential of technology for their creations, by identifying and overcoming the issues, needs and problems encountered during the creation, production or distribution phases. Their statements, coupled with an inquiry on their needs, expectations and ambitions, as well as scientific literature reviews of digital reading and writing practices, led to identify several major issues, undermining or slowing their initiatives. In parallel, a close look at their production, at the contents available and at the platforms effectively developed in the last five years offered a clear portrait of the current orientations of the digital children's literature publishing field in Quebec.

In this article we present the Lab-yrinhte.ca website and virtual laboratory, which results from the previous research and meets its goals, on one side, by depicting the major issues encountered by publishers and educators and suggesting recommendations and best practices, and, on the other side, by offering a detailed and up-to-date catalogue of the current digital children's literature offer. After having introduced the context of the website and virtual laboratory, we will present its content and intentions in more detail.

1. Context of the virtual laboratory

Educators' and publishers' statements gathered through the interviews have revealed three major issues that seem to hinder the production and the distribution of digital literary content for young readers, as well as their diffusion in school contexts [**Caption 1**].

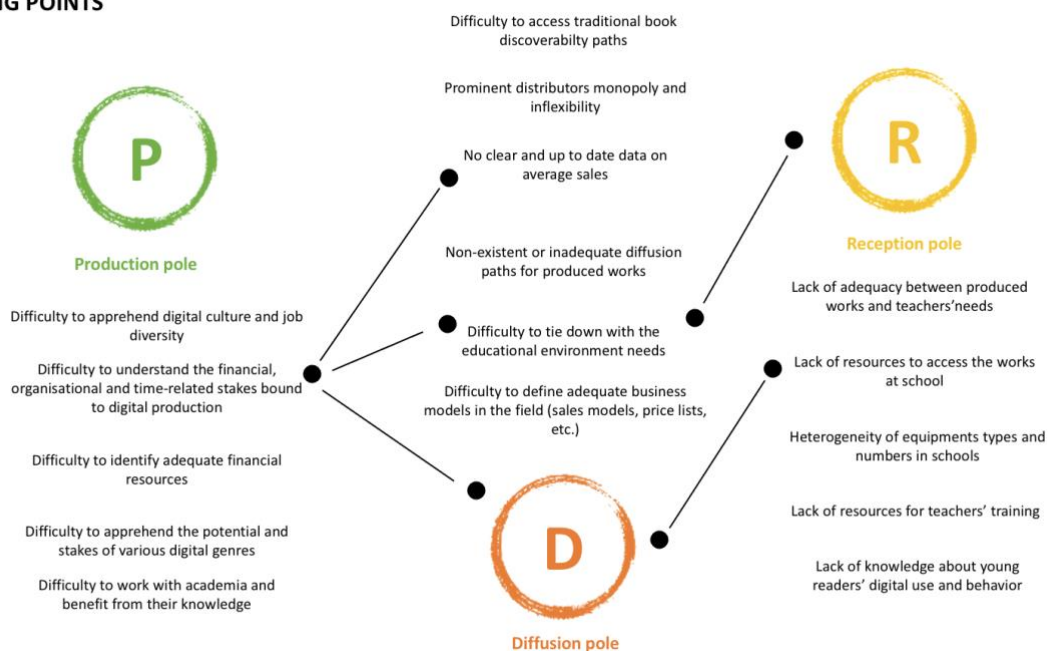
The first one refers to the lack of knowledge about the current editorial offer, by educators, librarians and, more generally, by common readers. Genres, technological solutions and formats, multimodal combinations, poetic and rhetorical effects of literary creations seem to be insufficiently known. However, just like educators and teachers [Stockless and Villeneuve, 2017], publishers and authors feel insecure about their e-literary knowledge and claim they would need a more in-depth training on the specificities of digital literature, as well as on the processes of its production and creation. They equally insist on the importance of improving their collaborations with digital media actors and other print publishers, in order to imbibe ideas, creative solutions, literary and artistic tendencies of their contemporary cultural ecosystem. At the same time, as a necessary part of their acculturation, respondents – educators and publishers – mention the importance of creating and accessing dedicated spaces to discover children's e-literature initiatives, especially those of independent studios, often drowned by the commercial and marketing strategies of bigger competitors.

The second issue is related to young readers' specificities and pertains more particularly to the psycho-cognitive and affective process involved in digital reading, which largely goes beyond publishers' and creators' expertise. On several occasions during the interviews, respondents have claimed their wish to know better young readers' development needs and to capitalize more effectively on the features of the technological devices and environments supporting learning and teaching activities. Similarly, even when they consider the school context as an ideal market for their creations, several respondents admit their difficulty at picturing the class realities and the activities teachers and students may realize with children's e-literature. Moreover, they find information about classroom equipment hard to access, and thus difficult to adjust their content for the devices and the operative systems that are actually available and frequently used at school. With such uncertainties about school practices and young readers' competencies, skills and needs, children's e-literary texts are often standardized in terms of

technological solutions and para-pedagogical enhancements: on one side, publishers and authors tend to prefer formats and interfaces that do not dramatically reformulate the print book codes and formats; on the other side, they overstress the educative orientation of their productions, by adding more or less standardized tools to support the decoding stage, the literal comprehension or the learning of vocabulary.

The third difficulty emerges with slight differences between teachers, librarians and literary mediators and refers to the lack of guiding materials to present and analyze digital creations with young audiences. More particularly, teachers struggle to include e-literary creations in the school canon and mostly restrict their digital reading sessions to the use of digitized adaptations of print texts (even if their technological equipment would support more interactive and dynamic texts). Again, the unfamiliarity with digital texts, with their poetics and their potential didactic usages, seems to represent an obstacle to the implementation of new practices.

BREAKING POINTS



Caption 1. The graphic presents the major issues in production, distribution and reception of children's e-literary contents identified through the analysis of publishers' and educators' statements.

2. Lab-yrinthe: an online laboratory for educators and publishers

In order to reduce the limitations observed during this research, to stimulate reading practices and to help educators developing young readers' competencies in digital literacy, a website and a virtual laboratory dedicated to children's digital creation has been conceived, in partnership with the Littérature Québécoise Mobile partnership, directed by Bertrand Gervais: [Lab-yrinthe](#). The website, launched in May 2021, is intended as a virtual laboratory on the contemporary children's digital literary phenomena and aims at providing information based on scientific observations, as well as conceptual and didactic tools for educators, publishers and researchers. The website is thus organized into six sections: the first section introduces the team and the mission of the website; the second, addressed to teachers, editors and students, offers detailed descriptions of e-literary children's works; the third, directed to publishers, presents recommendations and advice based both on the research and on literature reviews; the fourth, more oriented towards educators and teachers, contains descriptions of theoretical concepts and

notions of digital literature, as well as indications to include digital literature specificities in the literature class; the fifth illustrates some of the projects followed during the research; the last, containing four sub-sections, compile relevant news (events, book releases, conferences, etc.) on digital literature in Quebec.

2.1. A portrait of children's e-lit

The “[Digital works](#)” section of the Lab-yrinthe website presents a catalog of heterogeneous digital literary works produced or distributed in Quebec, including enriched books, mobile apps, narrative video games, geolocated narrations, augmented reality creations, interactive theater performances, virtual installations and podcasts [**Caption 2**]. Each creation is analyzed from a set of descriptive parameters conceived by the research team [Acerra, Lacelle *et al.*, 2021] with the purpose of illustrating the semiotic, multimodal and technological materials of the text, as well as the poetic or rhetorical effects of their combinations. Moving from a consideration of digital literature as an amalgam of literary and technological components, and methodologically choosing to identify elements that repeatedly appear, regardless of the formal and stylistic specificities of each textual typology, we took account of three interdependent levels. The first one describes the formal structures of children's literary texts; the second focuses on content representation modes, and the third one puts the accent on the types of interactions required for the empirical subject. The analysis of the formal structures allowed to classify digital literary works according to their genres and the different roles given to their model reader. On one side, we were able to distinguish creations displaying linearity and sequentiality from others presenting non-linear structures, tabular or multiple paths, depending totally, or in part, on the readers' choices. On the other side, the implied postures of the readers led to classify works according to the kind of interventions required for young readers, and eventually to distinguish creations favouring playful encounter, linear reading, or sound or tactile discovery. Regarding the dimension of content representation modes, we adapted the Aarseth [1997] model and identified works in which the textual materials remain fixed for the entire time of the reading session, or evolve according to the readers' requests or to (semi)automated devices' and programs' orders. We therefore distinguished creations allowing to reactivate, replay and relaunch elements already read, seen, listened to or played under the same conditions as the first reading, from those suggesting a number of variations from the first execution. By focusing more precisely on textual materials accessibility, we classified digital children's e-literary works according to the conditions allowing the content to display: textual materials could either appear in a clear and immediate way, or be blurred, delayed and hindered. Finally, by considering the interactivity “a mediated and programmed possibility of choice and action” [Archibald and Gervais, 2006, p. 31], we identified works in which the readers' actions and gestures provoke a modification in the narrative scheme, in the computer code or in the representation of the text itself. Within this category, we distinguished digital works programming compulsory and explicitly required manipulations, from others requiring optional and implicit interventions.

Following this descriptive parameters' grid, we analyzed each digital work and presented their structures and main themes, as well as their user experiences, according to the different devices and their technologies. Each record was completed by some educational and didactic suggestions, both based on the works themes and on their techno-literary features. This subsection, directed to teachers, is meant to offer some reading and analysis keys and, at the same time, to suggest clear examples of the possible exploitations of digital texts in school context.



La saga des Trois-Rivières

La série de bande dessinée numérique *La saga des Trois-Rivières* (2018) est une collection d'histoires de fiction historique situées dans les environs de Trois-Rivières au XVII^e et XVIII^e siècles. Le tome 1 aborde le thème des conflits entre la nation atikamek et les colons de la Nouvelle-France, qui ont pris fin avec le siège de Trois-Rivières en 1653. Le second tome met en place une enquête autour de la disparition [...]



Le club des créatures mystérieuses – Le mystère du Caddy

Dans l'histoire *Le club des créatures mystérieuses – Le mystère du Caddy*, deux amis, Emma et Elliot, se retrouvent sur l'île de Vancouver pour les vacances. Ayant appris dans le journal la nouvelle d'une énième manifestation dans la baie de Cadboro du *Cadborosaurus Willsi*, [...]



Un à zéro pour Charlot

L'application *Un à zéro pour Charlot* (2016) est une adaptation de l'album éponyme de Jannick Lachapelle et Pishier, publié en 2015 par les Éditions Fonfon. Elle aborde le thème de la maladie chez les enfants en racontant, avec humour et honnêteté, les épreuves de Charlot, 6 ans, atteint de cancer [...]

Caption 2. An overview of the « Digital works » catalog.

Keywords regarding the main concepts and notions of digital literature mobilized in the descriptions are linked to the “Education” section, where more detailed theoretical and critical information is provided.

2.2. A repertory of educative tools

The “[Education](#)” section of the website is more specifically dedicated to introducing, in an accessible language, a selection of concepts and theories necessary to teach digital literature, present e-literary genres and describe the techno-literary features to young audiences. Each entry summarizes theoretical and critical works, about, for instance, the multimodality framework, the notion of “genre” in e-literary theory, the concepts of lability and obsolescence, or the opposition between linearity and non-linearity [**Caption 3**]. These aspects are finally observed in an educative and didactic perspective, underlining the elements that young readers should be aware of, in order to read, understand, interpret and appreciate digital literary creations, their codes and their specificities. Educators are supposed to refer to this section of the website to enter the e-literary critiques and to identify the elements necessary to train young audiences. Publishers may consult this section to examine other publishing or self-publishing choices, and to be eventually reinvested in the development of innovative, relevant and varied children’s content.



Figures de style

L'identification des combinaisons intermodales et l'analyse des interactions utilisées pour exprimer un message littéraire dans le corpus littéraire numérique pour la jeunesse a permis d'esquisser un répertoire de « figures de style », qui intègre et complète le répertoire de figures de la « lecture », du « texte » et du [...]



Interactivité

La notion d'interactivité est utilisée tant dans le langage ordinaire que scientifique de manière polyvalente. Dans le langage ordinaire, elle peut indiquer à la fois le rapport des usagers aux écrans, la modernité des dispositifs technologiques ou les possibilités de personnalisation qu'ils offrent. Dans le langage scientifique, elle peut faire référence à la capacité du dispositif à répondre de manière cohérente aux impulsions [...]



Obsolescence

Les œuvres numériques sont soumises à deux phénomènes qui mettent à l'épreuve leur pérennité : l'obsolescence et la labilité (Boots, 2014). L'obsolescence dépend de la durée de vie des supports technologiques ; le destin des œuvres numériques étant lié à celui du dispositif et des logiciels nécessaires à son exécution, la disparition des uns comportera [...]

Caption 3. An overview of the contents analyzed in the “Education” section.

2.3. Recommendations for publishers

Resulting from seven research reports dedicated to analyzing the major issues that emerged during the data collection (the need, for publishers and creators, to improve their knowledge of: digital cultures; techn(olog)ical savoir-faire, funding possibilities, discoverability paths, scientific results, school practices, readers behaviors and habits), the “Publishing” section offers recommendations to answer publishers’ concerns. It consists of nine modules, organized in a similar tripartite structure. After a recall of five participants’ key quotes [Caption 4], the first part of each notice describes several aspects of the topics that members of our sample considered problematic [Caption 5]. The “Digital professions” module, for instance, first presents an overview of the issue at hand and explains how the complexification of the creative process in the digital environment and, more particularly, the necessary involvement of several analogue and digital experts (authors, graphic artists, developers, sound creators, narrative architects, etc.) may represent a challenge for several print publishers. The following four subsections respectively analyze the temporal constraints associated with the digital production scheduling; the roles of the creative, technical and educative poles ideally involved in the design and development processes; their possible interactions; and the missions of the so called “digital passeurs” [Lieutier, 2021], who may facilitate the communication between the different creative units. Finally, the last part of the module presents five recommendations, which may support publishers and creators to overcome their barriers and difficulties.

Les citations clés

Citation #1 Citation #2 Citation #3 Citation #4 Citation #5

« Les auteurs, les illustrateurs, les chercheurs, on les questionne sans arrêt. Et sans arrêt on remet le travail sur l'ouvrage, parce qu'on sait bien qu'on est en train de construire une matière qui est vraiment en émergence. Donc, le rôle du chef d'orchestre, l'éditeur, c'est vraiment aller sentir toutes les sensibilités, les faire chanter ensemble et puis, à un moment donné, arriver à la bonne... Partir d'une partition, la faire bouger, arriver au bon rendu. Ça, c'est un travail de remise en cause permanente. »

M. Sousse, 2h60

Caption 4. An example of key quotes presented in the “Publishing” section.

Les observations

En production numérique, les rôles et compétences nécessaires au développement de projets sont multiples et éclectiques. Il est possible de rapidement passer et, ce, en fonction de la complexité de l'objet produit, à une équipe de plusieurs dizaines de personnes aux expertises diverses, configuration qu'il peut être difficile d'envisager, de comprendre, et de gérer pour des éditeur.trices issus de l'édition traditionnelle dans le cadre de la production de livres interactifs numériques dépassant le simple livre homothétique.

La création de ce type d'œuvres s'accompagne ainsi de la mise en place tâtonnante, et encore grandement itérative, de nouvelles configurations de travail, individuelles comme collaboratives.

Ces nouvelles configurations sont observables dans les différents pôles composant une production de ce type, qu'il s'agisse du travail de gestion (éditorial, financement, direction de projet, etc.), artistique (textes, images, musique, effets sonores, narration), de conception (ergonomie, architecture narrative), technique (développement, programmation, tests, etc.) ou encore pédagogique (conseil pédagogique, recherche).



Les différents acteur.trices impliqués commencent peu à peu à identifier les composantes et les limites de leurs rôles respectifs, apprenant à travailler ensemble dans des dynamiques qu'ils n'avaient souvent que peu ou jamais eu l'occasion d'explorer. Nous avons ici sciemment choisi de rassembler l'ensemble de ces acteur.trices sous le terme de créateur.trices, car nos observations de terrain nous ont permis de constater que, du fait du caractère novateur de ces créations mais aussi de la nature polyvalente et agile des équipes convoquées, dans la très grande majorité des cas, ils.elles ont un impact créatif sur le résultat final.

Caption 5. An example of the “Observations” concerning the issues emerged during the research.

2.4. Partnership projects

The [fourth section](#) of the website is aimed at presenting the main projects, carried out in partnership with several actors from the Quebecois cultural industry, ranging from the national television, public libraries and archives to independent picturebook publishers, local poetry events and bookfairs promoters. Each record recalls the goals of the partner's e-publishing initiatives and the expectations regarding the collaboration with the research team.

Moreover, answering to the second main objective of the research (“co-constructing reference tools adapted to analyze and solve the specific issues faced by publishers and educators in conceiving, diffusing and distributing digital works”), this section of the website describes the approaches, actions and solutions effectively adopted by the responsible researcher(s) to support the development, the production, the distribution or the mediation with teachers, literary mediators or young readers. In this case, publishers' and producers' requests fell within five axes of requirements. In this case, publishers' and producers' requests fell within five axes of support requirements. The first was strictly related to the need of acquiring a proper and secure digital culture: partners wanted to know the specificities of children's digital literature better, as well as the economic, technological and temporal constraints implied in digital publishing processes. The second axis, partially linked to the previous one, pertains to the need to access popularized scientific works in didactics, as well as in digital and multimodal literacy: publishers and creators felt necessary to understand teachers' and programs' orientations better and, at the same time, to distinguish approximations and clichés about children and screens from objective data. The third pole of requests was product-oriented. Several partners asked for support in conceptualizing user experiences, defining aims for interactive or audio elements inscribed in their creations, identifying remediations strategies or even writing some narratives. In this context, a fourth axis, more specifically focused on developing content and enhancements for school uses, emerged: the research team was therefore solicited to create pedagogical resources and content, suggest digital functionalities and study the relevance of specific features or elements. Finally, a fifth pole of needs and requests concerned the mediation

dimension: researchers were asked to offer presentations about digital books to different audiences, to conceive and organize innovative physical spaces for promoting e-literary creations, and to test the efficiency of some mediation strategies chosen by the different partners.

Conclusion. Where we are and where we want to go.

[Lab-yrinthe](#) is the result of an ambitious project and of the will, shared by all the researchers of the *Multimodal media literacy* (LMM) research team, to create a favorable ecosystem to observe and support new texts and new practices. The website will be constantly enriched with new content, both to update the catalog of digital publications and to follow the evolution of the dynamics of production, distribution and reception of children's e-literature. The results of a survey about the pandemic effects on the development processes, on the audience uses, as well as on sales and downloads, will be published soon as a module in the "Publishing" section. Information on the legal aspects associated with the use of digital content in school context will also be added in June 2021, as they seem to be a source of concern for publishers and an area of highly uneven – and not always legitimate – practices among teachers.

Without abandoning its ambitious nature, [Lab-yrinthe](#) aspires to become a laboratory of reading and writing practices. Eventually, the website will be the showcase for a multidisciplinary team of emergent digital artists and developers, and will describe their work, creative processes and artistic choices. By cultivating its educational vocation, it will also continue to gather and analyze new school practices, co-creating with teachers, pupils and students new patterns for reading and writing.

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