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## The Media Literacy of Teenagers: An international study of Competence in Information Search and Multimodal Production

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In this paper, we present the conceptual framework, objectives, and methodology of an interdisciplinary research program (2018–2022) on the media literacy competence of teenagers in French-speaking Belgium, Quebec, France, and Switzerland. The program is undertaken by researchers in four universities, one in each national context. Focusing on information search and multimodal production as core media literacy activities, this program develops a multi-level assessment method to measure media literacy competence at varying levels of complexity. Additionally, we relate task-based measures of competence with self-reported competence and practices and seek to document the influence of the students' interpretation of the tasks contexts and purposes, their motivation and feeling of empowerment, and their collaborative practices on

the exercise of their media literacy. Preliminary results reveal that students report substantially higher levels of competence in information search than in web production; however, this difference is reduced when students assess their ability to perform specific search-related or production-related actions. These results are discussed in light of the potential usefulness of the program for teachers and for curricular design.

Keywords: media literacy, assessment, information search, web production, multimodality

## **1. Introduction**

Digital practices are directly related to the concept of literacy, which is now intended to be much more inclusive, bringing together elements specific to media, contexts, communities, knowledge, skills, and competences. This “new” literacy can be designated by the concept of Media Literacy (ML), traditionally defined as the ability to access media, understand and critically evaluate media and media content, and create media messages in a variety of contexts (Aufderheide & Firestone, 1993; Buckingham, 2005; Livingstone, 2004).

Several studies have shown that the use of digital technology promotes more varied, frequent, and creative literacy practices among the youth (Richard & Lacelle, 2020; Brunel, Quet & Massol, 2018; Bull et al., 2017) and that it supports the progressive mastery of digital competence (Kurtz & Peled, 2016; Önger & Çetin, 2018). However, schools still leave a limited place for digital technology in the education of adolescents (Fiévez, 2017; van Broekhuizen, 2016). The main problem is the lack of integration of digital media literacy skills into school disciplines based on fundamental and empirical research. In order to be able to penetrate school subjects more effectively, reading and writing in a digital environment requires a complete revision of theoretical and empirical knowledge about the processes, textualities, and competences involved.

In this article, we report on an international collaborative research program (2018–2022) on the assessment of teenagers’ media literacy in French-speaking Belgium, Quebec, France, and Switzerland undertaken by researchers in four universities (one in each national context).

In this article, we first introduce the conceptual framework, objectives, and methodological design of the research program as a whole, which centers on the multilevel assessment of teenagers' media literacy competence in online information search and multimodal production in relation to their self-reported levels of competence and their self-reported media practices. Second, as this research program is still in progress at the time of writing this contribution, we report on preliminary results from the first data collection phase in Belgium, which centers on self-reported competence and practices. We then use these partial results, covering only a small subset of the program's research questions, to discuss their implications for teaching practices and the definition of teaching contents within the framework of curricular progression.

## **2. Conceptual framework**

Our work advocates for a “foliated pluralism” (Ruphy 2009; 2010) capitalizing on the multidisciplinary of our consortium, which covers media studies, language sciences, language didactics, and educational technology. As every style of scientific reasoning creates new types of objects (Hacking 2000), our collective brings together our respective styles of reasoning to contribute to a better understanding and social interpretation of media literacy as a form of competence; of the implications of its assessment through tasks; and of the school subject and the tasks, situations, and discourses they are confronted with.

### ***2.1 Media literacy as competence***

Media literacy is defined through a great variety of complementary approaches in the literature (Potter 2004), which draw from the larger debate on how to define literacy in general. Potter (2013) summarizes this debate by stating that the question of “what is literacy” is answered either in terms of knowledge or skills (often related to critical thinking) or in terms of activities and social-cultural practices. In the first case, (media) literacy is considered (and assessed) from a cognitive perspective as a set of individual attributes (knowledge and skills) that are independent from the social and cultural practices that make use of them. This view is contested by a cultural perspective, under which (media) literacy is inherently related to, and cannot be studied outside of, these practices.

Taking a middle path between these two approaches, we consider media literacy as the expression of *competence*, manifest in one's *competent situated action*. The concept of competence is subject to multiple definitions. Our perspective draws on literature from the educational sciences, developed mostly in the French-speaking world in relation to curriculum development (Jonnaert, 2017; Masciotra & Medzo, 2009) and assessment in school (Rey et al., 2012; Scallon, 2004; Tardif, 2006). In this perspective, individuals are deemed competent when they are able to intentionally select and combine their knowledge and skills<sup>1</sup> (resources they can draw upon in a given situation, among other internal and external resources available) and put them to relevant use in order to adapt to novel situations in original and non-stereotypical ways (Scallon, 2004, p. 11; Rey et al., 2012, p. 13).

Competence expresses itself in *families* of situations that share some degree of similarity (Tardif, 2006, p. 15) in that they call upon the mobilization of similar resources, thereby defining a (more or less extended) domain of competence. In fact, the very ability to define and problematize a situation, that is, to grasp the relevant features or dimensions of the situation, is constitutive of one's competence. Competent individuals are able to frame known situations and to construct new frames to face novel situations based on their experience (Schön, 1983). One's ability to frame a situation in more or less complex ways (i.e., integrating more or less dimensions of the situation into a coherent whole) is indicative of their competence level (Sandberg, 2000).

## **2.2 Media activities and media texts in media literacy reference frameworks**

Our work adopts Anderson and Meyer's (1988) definition of media, which considers that a medium is "a recognizable human activity that organizes reality into readable texts for engagement" (p. 316). This activity-centered definition provides a natural articulation with the concept of competence: media literate individuals engage in media-as-activities in competent ways. Additionally, this definition underlines the centrality of the concepts of text (in its semiotic sense) and meaning-making, which have had a structuring role in media literacy research. Texts can be considered here as "any form of expression or communication in fixed and tangible form that uses symbol systems, including language, still and moving images, graphic design, sound, music, and interactivity" (Hobbs, 2010, pp. 16–17).

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<sup>1</sup> Here, a skill consists in the ability to reproduce a learned procedure or routine.

The notion that a text is “a unit of meaning for interpretation and understanding” (Gray, 2017) connects texts to the meaning-making processes that they support (Knobel & Lankshear, 2007).

The centrality of texts and meaning-making in the definition of media literacy contrasts with alternative approaches to new forms of literacy. For example, common definitions of digital literacy seem to emphasize functional skills (Buckingham, 2006) or to consider digital skills as strategic and digital technology as instrumental, with the individual’s mastery of digital technology allowing them to reap the benefits and avoid the risks related to digital media use and prosper in society (or at least not be excluded from it or marginalized) (Scheerder et al., 2017; van Deursen & Helsper, 2015).

Activities and texts are central to the reference frameworks that structure the research program presented in this article, stemming from prior work by two of our consortium’s research teams. On the one hand, the Research Group on Multimodal Media Literacy (GrMML) at the Université du Québec à Montréal considers multimodal media literacy (MML) as central to master digital literacy. Their research started from knowledge about literacy skills to integrate theories on multimodal skills and then digital skills (in their technical, semiotic, and social dimensions). In its latest version, the MML framework<sup>2</sup> includes five categories of competences: cognitive and subjective, pragmatic, semiotic, modal, and multimodal. Recently, several theoretical concepts associated with the reading and production of digital documents (e.g., interactivity, manipulation, multimodality, design, and representation) have made it possible to define MML competencies in a digital environment (Lacelle et al., 2017).

On the other hand, in an effort to map media literacy in terms of competence, Fastrez (2010) proposed to extend the notion of considering media texts from multiple perspectives, commonly associated with an analytical position towards media, to all media activities in which media literate individuals may engage, covered by four general categories: reading, writing, navigating, and organizing. In this definition, the perspectives on media provided by the core concepts of media literacy (e.g., authorship, format, audience, content, and purpose—see Jolls & Wilson, 2014) are

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<sup>2</sup> For a presentation of this framework, see [http://litmedmod.ca/sites/default/files/multimodal-media\\_literacy-competencies-list\\_0.pdf](http://litmedmod.ca/sites/default/files/multimodal-media_literacy-competencies-list_0.pdf).

grouped into three overarching categories: technical, semiotic, and social. The combination of perspectives and activities generates a competence matrix that defines media literacy in terms of the competence required to read, write, navigate, and organize media from technical, semiotic, and social standpoints.

The MML framework and the media literacy competence matrix served as guides in the design of our methodological protocol to map how the activities included in the task-based assessment (see below) (1) implied the mobilization of technical, semiotic (including modal and multimodal), and social/pragmatic perspectives on digital media; and (2) spanned across a combination of reading, navigating, writing, and organizing (each of which involve specific cognitive operations).

### ***2.3 Media literacy assessment through tasks***

The question of the assessment (or even the necessity) of the media literacy of individuals is approached differently by the cognitive and critical-cultural approaches to (media) literacy introduced earlier. The first favors standardized quantitative measurements of the media-related knowledge and skills of individuals, an approach potentially disconnected from actual practices. The second is at odds with the very idea of assessment and favors qualitative “thick” descriptions (Geertz, 1973) of situated media practices, linked both to their context and to the history of the individual, which hinders any rise in abstraction (Martens, 2010; Litt, 2013).

Our situated approach to media literacy as competence poses that media literacy assessment is indeed possible but cannot be limited to the assessment of media-related knowledge and skills (considered as information the individual holds or procedures they master independently of any context of use); it needs to include the ability to select and articulate relevant knowledge and skills in novel situations. Consequently, our approach requires competence to be evaluated through the individuals’ performance of tasks defined in relation to a given situation. Here, a task is conceived as a contextualized activity that is meaningful for the learner and that presents and is motivated by a finality (Carette, 2009). Tasks designed to evaluate competence need to be novel, in that they should require a certain framing (i.e., a determination of the relevant features of the situation they present) on the part of the student. They also need to be complex, in that they should require the selection and combination of *multiple* internal or external resources (Carette, 2009).

Understanding a text, producing an explanatory document, and identifying sources are tasks that a 15-year-old adolescent has generally practiced at school, according to the goals defined by the school institution. This is the social dimension of the task. The instrumental and didactic approaches to the task (Ronveaux & Schneuwly, 2018) further specify that these purposes are produced according to the curricular progression of a school discipline. The 15-year-old adolescent has been transformed by this discipline (“disciplination process”). It is through an internalization of the social resources of school disciplines that the student develops, reads a text, understands it, produces a document, and so on (Vygotsky, 2014). This disciplination process will have effects on the familiarity with which our subjects will think they are competent and engage in the different types of tasks the assessment presents them with (see below).

### **3. Aims and Research Questions**

Our research is set to produce an assessment of the media literacy competence levels of lower secondary education students (i.e., 13–15-year-olds) in four French-speaking countries (Belgium, Canada, France, and Switzerland) in the context of information search and multimodal production (see “methodological design”). The production of these assessment results is both an objective in itself and a necessary means to achieve four objectives.

This section presents these objectives and their associated research questions. Partial answers to a small subset of these questions will be covered in the results section. These objectives reflect the variety of theoretical and disciplinary backgrounds of our consortium. Our common work seeks to put these alternative perspectives in a productive tension, with each perspective questioning the others.

### ***3.1 Objective 1: Explore the varying complexity of media literacy through its assessment in motivated media activities and in their constitutive actions***

Proponents of the competence-based approach to assessment in education (e.g., Rey, et al. 2012; Carette 2009, Dierendonck & Fagnant 2014) argue that assessments should be constructed as the combination of three types of tasks:

1. a complex and novel task requiring students to frame a situation and integrate a selection of resources to respond to it (cf. *supra*);
2. elementary tasks that each represent a step in the completion of the complex task, presented in their logical order, for which students need to determine the procedure that applies among those they know; and
3. simple decontextualized tasks that correspond to these elementary procedures, explicitly specified by the task instructions, intended to verify that the individual masters the procedures and has the necessary knowledge to solve the complex task.

Whereas these distinctions have been successfully operationalized in the assessment of traditional school disciplines (such as mathematics, see Dierendonck & Fagnant, 2014), such operationalization proves difficult in the context of media literacy—partly because media education does not exist as a school discipline and because the work of didactic transposition of knowledge about the media (and the elementation it involves) is yet to be carried out.

Hence, instead of designing simple tasks that call upon a single determined procedure, we propose to design “simplified” tasks by breaking down activities into their constitutive actions. In activity theory (Kaptelinin, 2013), activities are defined by the relationship of a subject to an object, and the pursuit of the object motivates the activity. Activities can be hierarchically decomposed into actions (which themselves can be decomposed into several levels of sub-actions and, ultimately, into operations corresponding to their implementation). Actions (or sub-actions) are “conscious processes directed at goals which must be undertaken to fulfil the object” (Kaptelinin, 2013). Our protocol is built on a complex task that corresponds to an activity (see the method section) and is then decomposed into the different actions involved in its completion. Each action acts as a template for a simplified task, which may be contextualized in a different situation than that of the original activity.



Each simplified task (e.g., determine authorship of a source as a step towards establishing its validity) defines a goal and spells out how it contributes to the pursuit of the activity's object, isolating certain aspects of the complex task and specifying some of its multiple technical, semiotic, and social dimensions. Such tasks may still call upon the selection and combination of multiple resources, but the span of these resources is necessarily limited compared to that of the whole activity. Thus, the dichotomy between simple and complex tasks is replaced by a continuum of complexity in tasks represented by the variety of technical, semiotic, and social dimensions that need to be considered (and the corresponding variety of resources that need to be combined) to act upon them.

Research question: What articulation can we observe between competence in actions and competence in activity based on our different types of tasks?

### ***3.2 Objective 2: Elucidate the relationship between perceived media literacy competence and measured media literacy competence***

Self-report measures are often used in media literacy and digital literacy evaluations (Fastrez et al., 2016) because they demand few resources and are easily scalable. However, their validity can be questioned because of their problematic relationship to actual competence (Litt, 2013). Our research program aims to examine the relationship between both types of measures systematically, with corresponding self-reported and performance-based measures at the different levels of analysis defined earlier (activities and actions).

Research question: How do the students' perceived levels of media literacy competence relate to their measured levels of competence, both at the scale of activities and at the scale of their constitutive actions?

### ***3.3 Objective 3: Elucidate the relationship between media literacy competence and media practices, in school and outside of school***

Contrary to popular belief, research on the relationship between media literacy and media practices indicates that the use of media does not guarantee the development of skills beyond basic and

operational capabilities (Tilleul, 2020). Notably, several studies which hypothesized a positive relationship between the frequency of internet use and digital skills disproved this hypothesis, at least partially (e.g., Hargittai, 2005; van Dijk & van Deursen, 2014). Specifically, it seems that the frequency of media use does not support the ability to articulate several (semiotic, technical, or social) dimensions during media analysis and production activities.

Therefore, we seek to examine how domestic uses of digital media contribute to developing students' media competence. We hypothesize that these uses differ according to family socialization patterns, as it is the case for the use of traditional print media (see Delarue-Breton & Bautier, 2015). These differences can be explained not in direct relation to the socio-economic context of families but in relation to familiarity with the literacy objects that these different environments allow to develop. Additionally, we hypothesize that students' media literacy competence is not built exclusively in the domestic or friendly sphere: media literacy is also marked by the seal of academic demands and customs, mixing both formal and informal dimensions (Cottier & Burban, 2016).

Research questions:

- How do students' levels of media literacy competence, as measured through our assessment tasks, relate to their reported media practices?
- Is the relationship between their level of competence and their media practices different for school practices and for home or personal practices?

### ***3.4 Objective 4: Examine factors affecting students' ability to engage in the assessment tasks and, hence, the exercise of their media literacy competence***

The way students engage in tasks is related to the meaning they assign to these tasks and to the discourse, the media, and the devices that accompany or constitute them. Indeed, school literacy, whether media literacy or not, is a literacy rooted in the school disciplines, which embody specific content whose scope is not perceived by all in the same way: joint activity does not mean shared meaning (Bautier & Rochex, 2004). Confronted with learning materials in various disciplines, some students develop generic and relevant meanings, which are the expected meanings in the school context, because they are used to these materials, or their uses. Other students, who do not know

these uses and discover them in school, stick to more local or segmented meanings that do not allow students to appropriate school knowledge (Delarue-Breton & Bautier, 2015). Therefore, these differences in students' socialization patterns are also expected to play a role in media literacy. Taking sociodemographic variables into account when studying students' media literacy practices allows us to better understand what differentiates them.

Research question: How does students' interpretation of media literacy tasks relate to their socio-demographic profile?

Our research also takes into account students' willingness to act (i.e., their motivation) and their power to act during the activity—two of the three interdependent poles of competent acting, along with the ability to act (Le Boterf cited by Cachet, 2009). Motivational processes depend both on internal factors specific to the individual and on external factors related to the context and the learning situation. In this view, the perceptions that a learner has of their environment interact with the characteristics of this environment and influence the learner's behavior. Conversely, the learners' behavior will, in turn, exert an influence on their environment or perceptions.

Environmental empowering processes depend on the external resources available to the student, but above all, they depend on the perception of these resources as such (Fernagu-Oudet, 2012). Hence, we wish to analyze the learners' experience of a so-called “empowering” activity, which is likely to increase their cognitive engagement in the activity. The cognitive engagement of learners should be analyzed based on the “individual and collective critical awareness” expressed by the learners (Le Bossé, 2003; Gouédard & Rabardel, 2012).

Research question: How do motivational and empowering processes affect students' engagement in the simplified and complex tasks?

Whereas dominant approaches to competence focus on the individual, our research acknowledges the social dimension of practices, competence, and knowledge. Indeed, the quality of competence is also to be sought in collective and normative dynamics. There are two possible ways of proceeding in the classroom to gauge the influence of collaborative practices (Thibert, 2009). In the first, the emphasis is placed on the cognitive process. Students' autonomy is fundamental, and

the group is built “as they go.” The second is a more directive posture in which the group is organized beforehand. We adopt the first posture to understand whether mutual aid and calls upon the group are common practices.

Research question: To what extent does students’ exercise of media literacy involve collaboration and collective practices?

#### **4. Methodological design**

To achieve the aforementioned objectives, we developed a multi-level method for the assessment of media literacy competence, combining a complex task with multiple simplified tasks. Additionally, our method combines performance-based assessment with self-reported data, where participants assess their own competence in actions and activities and report their own information search and multimodal production practices.

##### ***4.1 From a complex task centered on a motivated activity...***

Our methodological design starts from the definition of a complex task centered on a motivated activity: creating an explanatory multimodal article for an online school newspaper, detailing the results of an in-depth information search on the web.

This activity was selected because it relates to the different activities theoretically defined in the MML framework and the media literacy competence matrix (see section 2.2). As online search and multimodal production may potentially be part of adolescents’ habitual media practices in formal (integral to school learning), non-formal (connected to non-school educational contexts), and informal contexts (related to any other context) (Schugurensky, 2000), students may relate the task to one or another such context depending on the situation that frames it. We chose to position the different tasks included in our assessment in a variety of formal and informal situations. The complex task corresponds to an extracurricular activity (writing for an online school newspaper), which corresponds to an informal learning context. Simplified tasks (see below) are positioned in either formal or informal situations.

Qualitative interviews following the completion of the complex task explore the participants' familiarity with and level of engagement in the activity (Objective 4), their habitual information search and multimedia creation practices, and the strategies they used to complete the complex task.

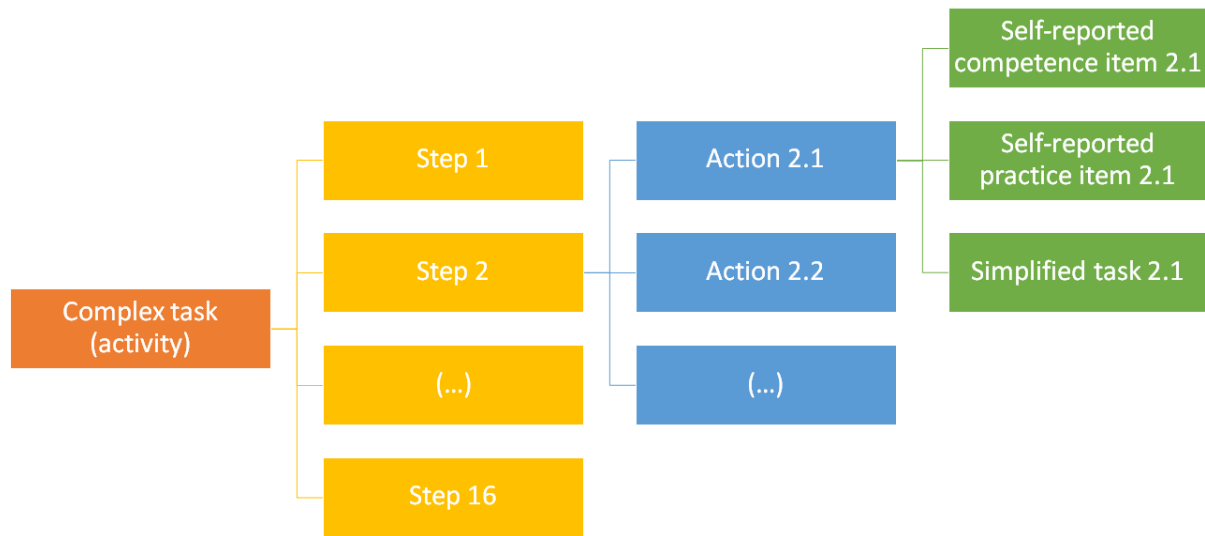
#### 4.2 ...*To its hypothetical constitutive actions*

Assessing students' media literacy at different levels of complexity (Objective 1) requires identifying the actions involved in the completion of the complex task. Accordingly, we first decomposed the complex task into steps (which can be iterative and occur at different times of the activity) that students are likely to follow. We identified sixteen such steps, listed in Table 1.

**Table 1.** Steps identified for carrying out the complex task (production of a multimodal explanatory article based on an online information search)

Information search	Multimodal production
1. Formulate a request concerning information relating to the defined topic.	9. Plan and organize content for production.
2. Examine the list of search results.	10. Consider the audience when planning production.
3. Select one or more relevant documents or sites from the search results.	11. Synthesize the information and ideas retained from the search.
4. Browse the selected media document(s).	12. Use the technical and semio-technical functions of digital media.
5. Identify the content, organization, and perspective of the selected media documents.	13. Choose the codes, modes, languages, and formats appropriate for the message.
6. Evaluate the information contained in a media document.	14. Build a multimodal explanatory discourse.
7. Select and keep the final document(s) for the production of the explanatory article.	15. Verify compliance with sources.
8. Collect, extract, and record (or save) relevant information from final media documents.	16. Evaluate production.

We further decomposed these steps into actions, which we categorized according to the type of cognitive activity (e.g., identifying, selecting, evaluating, applying, etc.) and the semiotic, technical, or social dimensions of digital media they involved, referring mainly to our frameworks (see section 2.2). Additional relevant theories and models were used for the definition of these actions, specifically for actions related to the evaluation of online information (e.g., Serres, 2012), to multimodal production (e.g., Lacelle & Lebrun, 2016; Edwards-Grove, 2010; Braaksma, et al. 2007), and to the production of explanatory text (e.g., Garcia-Debanc, 1988).



**Figure 1.** General decomposition of the complex task into simplified tasks and self-assessment of survey items on media literacy competence and practices

#### 4.3 ...To self-assessment questionnaire items

In line with our objectives, we generated self-report survey items to gauge both the participants' perceived level of competence (Objective 2) and their frequency of practice (Objective 3) for online information search and web production, taken as whole activities, both in the participant's school context and in their personal context.

Additionally, to pursue our first objective, we converted each action identified in the complex task's activity into two survey items: one centered on the participant's perceived level of competence, the other on their corresponding habitual practices. These items were grouped and presented with introductory scenarios that situate them either in the (formal) context of adolescents' school life or in the (informal) context of their everyday life.

In addition, we added socio-demographic questions (age, gender identity, language(s) spoken at home, etc.) to the questionnaire. A first version of the questionnaire was pre-tested in two high school classes from two different schools in Quebec and Belgium. Data from these pre-tests were used to improve the survey items' clarity and eliminate inconsistencies in the questionnaire.

#### ***4.4 ...To simplified tasks***

In line with our first objective, we designed simplified tasks based on the constitutive actions of the complex task's activity. At the end of spring 2020, a first version of these simplified tasks was pre-tested with 14-to-15-year-old adolescents from the four project regions. Data from these pre-tests were used to eliminate non-essential tasks and improve the task instructions' clarity. As a result, two questionnaires with nine simplified tasks each were finalized, one for online information search and one for digital media production.

Self-report questions on the participant's prior knowledge of each task's subject, their familiarity with each task, and their overall level of engagement were added to the two questionnaires (Objective 4).

Table 2 presents two concrete examples of the whole process of creating survey items and simplified tasks from the constitutive actions of the complex task.

**Table 2.** Corresponding self-report items and simplified tasks for two of the complex task's constitutive actions

	Information search	Multimodal production
<i>Step of the complex task</i>	Step 5. Identify the content, organization and perspective of the selected media documents	Step 11: Synthesize the information and ideas retained from the search
<i>Contextualized action</i>	Identifying the purpose of the document while reading it	Presenting information through transmodalisation (e.g., choosing an image to describe a phenomenon) and multimodalisation (e.g., integrating an image or sound into a text)
<i>Self-assessed competence context</i>	"You have chosen a search result from the list provided by the search engine and clicked on its link. A document is displayed. Do you feel able to..."	"As part of a school project, you will work with text, images, video, music, etc. How would you describe your ability to do the following tasks?"
<i>Self-assessed competence item</i>	"identify the purpose of the document (to convince, entertain, inform, get something done, etc.)."	"Choose an image, an audio recording or a video to complete a text (e.g.: images for your story, videos for your blog)"
<i>Self-reported practice context</i>	"When you search the Internet for information to understand a topic, what do you do when you look at a document (video, text, image, soundtrack, etc.)?"	"As part of your personal activities, have you already done the following activities?" AND "Have you done any of the following activities as part of your school activities?"
<i>Self-reported practice item</i>	"You identify the purpose of the document (to convince, entertain, inform, get something done, etc.)."	"Produce texts in which you insert images, video or audio recordings."
<i>Situation of the simplified task</i>	"While surfing on YouTube, you come across the following advertisement (video A) which praises the quality of Nutella. After watching video A, you decide to cross-reference the information it contains with a video that comments on this ad (video B)."	"You have found a summer job: writing blog posts for your local youth center's website. You will have to write about various topics that may interest young people your age. School starts again next week, and you have been asked to write a blog post about the "performance anxiety" experienced by some teens to inform them about the stress, fear of failure and distress that school evaluations can generate"
<i>Simplified task instruction</i>	<p>"In the following list, what is the main purpose of video A, and what is the main purpose of video B? Check only one answer per video."</p> <p>List of response items: Persuade   Entertain   Sell   Warn</p>	<p>"You want to add images, videos or podcasts to complete your article. For each of the documents below, please indicate whether it adds additional information to..."</p> <ul style="list-style-type: none"> <li>- illustrate the distress of young people who experience performance anxiety.</li> <li>- suggest possible solutions to reduce anxiety.</li> <li>- explain the differences between anxiety and other similar problems.</li> <li>- none of the above"</li> </ul>

## 5. Data collection phases

The data collection and analysis process of our project is organized in two phases. In the first phase, a large sample of lower secondary education students (i.e., 13-15-year-olds; N~2000 in each participating country) completes the self-assessment questionnaire (either electronically or on paper).

The sampling method for this phase is non-probabilistic, stratified convenience sampling. French-speaking schools (excluding special-needs education schools) in the four regions are used as primary sampling units. Different socio-demographic variables are used to determine the samples' strata in the four regions, depending on their respective national contexts.



For example, the Belgian sample's strata are defined according to the schools' socio-economic index, its degree of urbanization (rural, urban, and peri-urban), and forms of education (general education, technical transition education, technical qualification education, and vocational education).

This first phase has already taken place in Belgium (2018–2019), in French-speaking Switzerland (2019–2020), and in Quebec (2020–2021), and it is in preparation in Normandy, France (2022). The data collected in Belgium contributed to inform the design of the simplified tasks for the second phase as well as the redesign of the declarative questionnaire.

In the second data collection phase, a smaller convenience sample composed of new participants of the same age range ( $N \sim 100$ – $200$  in each participating country) will complete a modified version of the first phase questionnaire as well as a test of simplified tasks. A subsample of the respondents ( $N \sim 25$ ) will also participate in the complex task and qualitative interviews. This second phase is completed in Belgium (2020–2021) and will take place during the 2021–2022 academic year in Switzerland, in Quebec and in France.

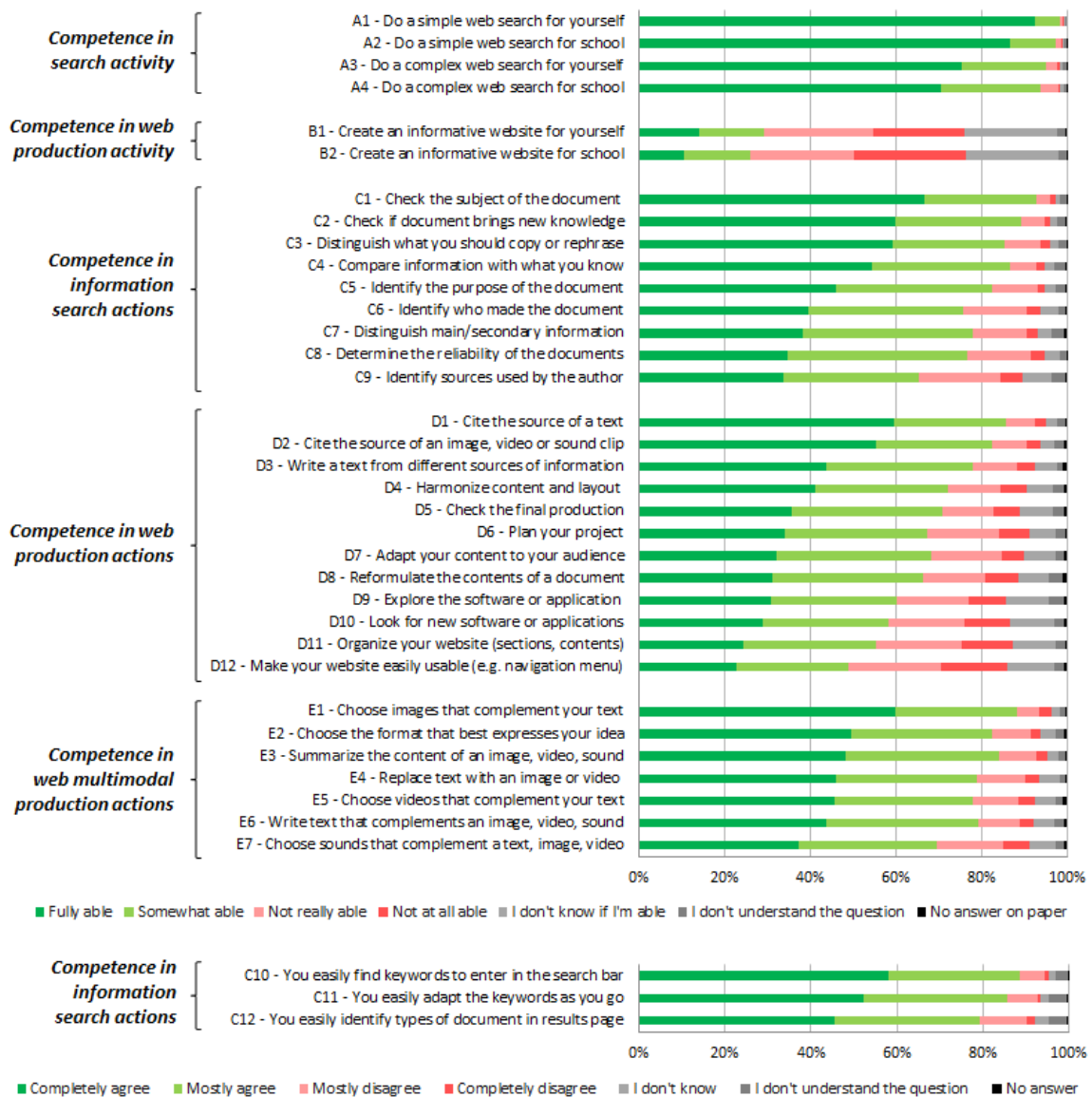
## 6. Results

This section presents preliminary results from the first phase in French-speaking Belgium. A total of 2,076 students in their third year of secondary school participated in the survey. Responses from 153 participants who had not completed the questionnaire were excluded, leaving a total of 1,923 completed questionnaires (age mean = 14.99; s.d. = 1.068; gender ratio = 51.7% girls and 45.8% boys; 2.4% refused to answer). The data was weighted using a raking ratio post-stratification method to match the distribution of the reference population against three levels of socio-economic index, three levels of urbanization, and four forms of education. As the variables analyzed in this section correspond to ordinal data (i.e., responses on Likert scales), non-parametric tests were used in the analyses.

These results allow us to jumpstart the reflection on two of our program's objectives: exploring the varying complexity of media literacy through assessment in motivated media activities and in their constitutive actions (Objective 1) and elucidating the relationship between media literacy

competence and media practices, in school and outside of school (Objective 3). Specifically, we provide results for the eight specific research questions mentioned below.

## 6.1 Results on perceived competence



**Figure 2.** Distribution of responses to survey items related to perceived competence<sup>3</sup>

<sup>3</sup> Response items were abbreviated in Figure 2 and Figure 3 for readability. Full items are presented in Appendix A.

Figure 2 presents the distributions of students' statements on their perceived levels of competence in information search or web production, taken as whole activities, and perceived levels of competence for some of their constitutive actions.

## *6.1.1 Do students report different levels of perceived competence between online information search and web production activities? Do these levels of perceived competence differ in the school context and outside the school context?*

Students reported higher levels of competence in online information search activities, both for simple and complex searches, than in web production activities. Friedman's analysis of variance revealed statistically significant differences between these items ( $\chi^2_5 = 4,612.537$ ;  $p < 0.001$ ). Post-hoc tests<sup>4</sup> showed statistically significant differences for all comparisons between simple search items, complex search items, and web production items but not between items pointing to the same activity (e.g., simple search) in the personal or school context ( $0.144 < p < 1.000$ ).

## *6.1.2 Do students report different levels of perceived competence between online search activities and their constitutive search actions?*

Students reported higher levels of competence for search activities than for their constitutive search actions. For example, whereas over 80% of them reported being fully able to "find the answer to a simple personal question online" (86.9% for school and 92.4% for personal activities), only 34.7% reported being fully able to "determine the reliability of documents." Friedman's analysis of variance revealed statistically significant differences between these items ( $\chi^2_{15} = 3,506.250$ ;  $p < 0.001$ ). Post-hoc tests showed statistically significant differences for all comparisons ( $p < 0.001$ ) except for the comparison between "checking the subject of a document" and "doing a complex web search" ( $p = 1.000$ ).

## *6.1.3 Do students report different levels of perceived competence between web production activities and their constitutive actions?*

Unlike for search activities and actions, students reported lower levels of competence for web production activities than for their constitutive search actions. For example, while only 13.9% reported being fully able to "create an informative website for themselves," 41.3% reported being

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<sup>4</sup> All post-hoc comparisons in this article were computed using the Dunn-Bonferroni test.

fully able to “harmonize content and layout so that the website is pleasant.” Friedman’s analysis of variance revealed statistically significant differences between these items ( $\chi^2_{20} = 3,713.986$ ;  $p < 0.001$ ). Post-hoc tests showed statistically significant differences for all comparisons between each web production activity item and each web production action item ( $p < 0.001$ ), whereas comparisons between the nineteen web production action items revealed twelve overlapping homogenous subsets of two to five items.

#### *6.1.4 Do students’ self-reported levels of competence in online search and web production activities differ according to their socio-demographic profile?*

Mann-Whitney U tests revealed a statistically significant difference between general education students and vocational education students.<sup>5</sup> General education students reported higher levels of competence than vocational education students for all items related to information search activities (all  $p < 0.001$  except for the “complex web search for school” item, for which  $p = 0.035$ ). Vocational education students reported higher levels of competence than general education students for both items related to web production activities (both  $p < 0.001$ ).

### **6.2 Results on reported practices**

Figure 3 presents the distributions of students’ statements on their practices in information search and web production—distinguishing between general practices (defined at the level of whole activities), specific practices (defined at the level of their constitutive actions), search practices centered on a specific mode, and web production practices involving different forms of multimodality.

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<sup>5</sup> Due to space constraints, we chose to only report comparisons on the two most contrasted forms of education in Belgium and exclude comparisons with technical transition education and technical qualification education.

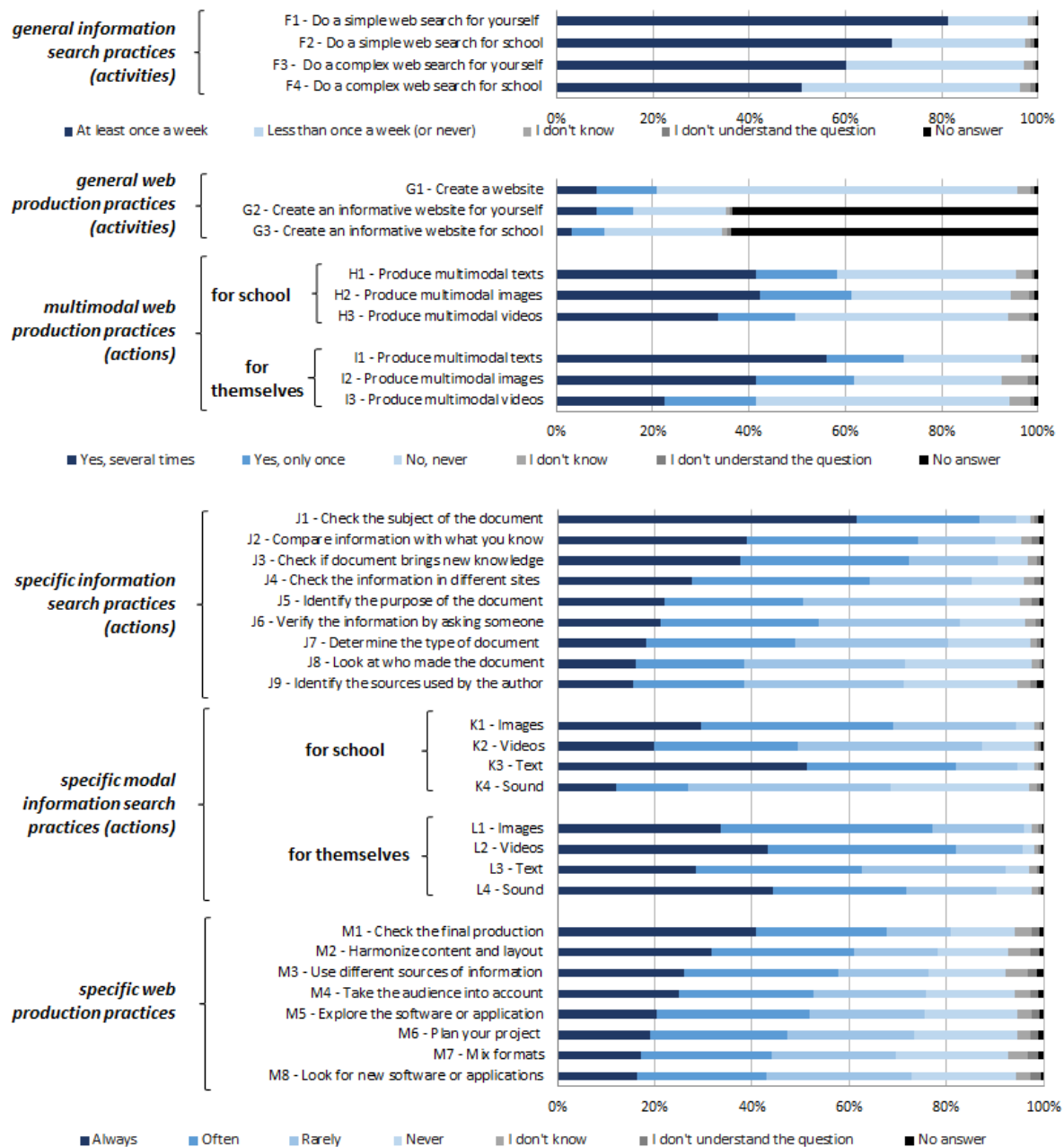


Figure 3. Distribution of responses to survey items related to reported practices

*6.2.1 Do students report practicing online search more or less than web production activities, and more or less frequently at school or outside of school?*

Proportions of participants who reported performing online searches at least once a week range from 49.4% to 80.4% depending on the type and context of search (95% IC [0.786, 0.821] for simple personal searches; 95% IC [0.669, 0.711] for simple school searches; 95% IC [0.570, 0.613] for complex personal searches; 95% IC [0.472, 0.517] for complex school searches).<sup>6</sup>

Comparatively, proportions of participants who reported creating an informative website at least once range from 9% to 20.9% depending on whether they responded in general, for themselves or for school (95% IC [0.191, 0.228] for web production in general; 95% IC [0.132, 0.164] for personal web production; 95% IC [0.078, 0.104] for school web production). As none of the confidence intervals overlap between information search and web production, it appears that in our sample, general search practices are considerably more frequent than web production practices.<sup>7</sup>

Cochran's Q test revealed statistically significant differences between the relative reported frequencies of the four search activities ( $Q = 672.845$   $p < 0.001$ ). Post-hoc tests showed all paired comparisons to be significant, with decreasing frequencies in the following order: simple personal searches (most frequent), simple school searches, complex personal searches, and complex school searches (least frequent).

Friedman's analysis of variance revealed statistically significant differences between the relative frequencies of web production activities for school and for personal reasons ( $\chi^2_1 = 78.896$ ;  $p < 0.001$ ), with personal web production being more frequent than school web production activities.

*6.2.2 Do students report differences in their online search practices depending on the mode (text, image, video, or sound) they involve and the context (in school or outside of school)?*

Friedman's analysis of variance revealed statistically significant differences in the modes most often consulted by students as part of their searches ( $\chi^2_7 = 2,731.258$ ;  $p < 0.001$ ).

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<sup>6</sup> Confidence intervals were computed using the Clopper-Pearson method.

<sup>7</sup> As information search and web production items were associated with different response scales, a single analysis of variance including all items could not be computed.

Post-hoc tests showed statistically significant differences between the following homogeneous subsets (in decreasing order of frequency):

- text consulted for school and videos consulted for oneself (most frequent);
- sounds and images consulted for oneself;
- images consulted for school and text consulted for oneself;
- videos consulted for school; and
- sound consulted for school (least frequent).

*6.2.3 Do students report differences in their production practices depending on the type of multimodality they involve and the context (in school or outside of school)?*

Friedman's analysis of variance revealed statistically significant differences between the frequencies of multimodal practices reported by students ( $\chi^2_7 = 575.486$ ;  $p < 0.001$ ). Post-hoc tests showed statistically significant differences between the following homogeneous subsets of production practices (in decreasing order of frequency):

1. texts in which you insert images, video, or sound for school (most frequent);
2. images that integrate photos, text, logos, etc. for school, or for yourself, and texts in which you insert images, video, or sound for yourself;
3. videos in which you insert sound, text, or image for yourself; and
4. videos in which you insert sound, text, or image for school (least frequent).

*6.2.4 Do students' self-reported frequency of practices in online search and web production activities differ according to their socio-demographic profile?*

Mann-Whitney U tests revealed that general education students reported performing simple searches for school more often than vocational education students ( $U = 179,037.5$ ;  $p < 0.001$ ), whereas vocational education students reported performing complex searches for school more often than general education students ( $U = 182,295$ ;  $p = 0.009$ ). The same test revealed that vocational education students reported more frequent practices in web production activity than general education students, both in general ( $U = 166,389.5$ ;  $p < 0.001$ ) and for personal reasons ( $U = 24,044.5$ ;  $p = 0.029$ ).

## **7. Discussion**

Although limited in their scope compared to the extent of our protocol, the preliminary results presented in the previous section open several avenues of discussion. We consider these as hypotheses that could be confirmed by future work. We first discuss four major findings based on the results themselves, and then we turn to the usefulness of our research for schools and teachers.

A first finding pertains to the differences in students' perceived levels of competence across different activities and actions. Overall, students in our sample reported substantially higher levels of competence in information search than in web production, a difference that corresponds to general search practices being considerably more frequent than web production practices. Interestingly, this difference appears smaller when one looks at the corresponding actions for these two activities. Students are more confident in their competence in information search activities as a whole than in their ability to perform specific search-related actions, but they are less confident in their competence in web production as a whole than in their ability to perform specific production-related actions. This inverted relationship confirms the interest in confronting the measurement of media literacy competence at different levels of complexity.

The contrast between perceptions of information search as being familiar practice, ubiquitous in the teenagers' lives, and web production as a complex, rarely experienced undertaking may cause students to overestimate their competence in the former case and underestimate it in the latter. Students' responses to items tied to specific aspects of either of these activities point to another discrepancy—between how they picture the two activities as a whole and what they actually involve. Hence, as the students may be able to relate some of the actions involved in web production to simpler digital production practices (e.g., social network posts or “stories”), these actions may seem less complex than “creating a website.” On the contrary, students seem to change their minds about how easy it is to find information once asked about the different actions this implies, some of which they perceive as complex (and tend not to carry out when searching for information). This is particularly apparent for the competence items related to the evaluation of documents (e.g., identifying their authors and the sources they used or determining their reliability). Again, the connection to the corresponding practices sheds light on these responses, as few students are used to “identifying sources used in a document” or “identifying who made the document” while doing



a web search. These results tend to corroborate various studies (e.g., Boyd, 2014) denouncing the myth of the “native digital” in favor of a figure of the “digital naïve,” which differentiates between the ease of handling technical tools and the complexity of the intellectual mastery of these tools (e.g., Fluckiger, 2014).

A second finding is related to the relationship between competence and practices at school and outside of school. Whereas students systematically report that their information search and web production practices are more frequent outside of school than at school, these differences do not translate into different levels of perceived competence between these two contexts, for which students feel they have similar levels of competence. If the extra practice does not generate a greater sense of competence, can we conclude that they think of their home practices as less likely to develop their competence than their school practices?

This discrepancy can be interpreted in different ways. One could consider that for a part of the students, there is no reason to point out a difference between the competence linked to their personal media practices and the one linked to the school media practices because there is indeed no or little difference when the family socialization modes are very literate and connivant with the school socialization, especially for students coming from a milieu with a strong cultural capital. This is what Delarue-Breton and Bautier (2019) observe regarding traditional literacy. Some students are already familiar with school literacy practices at home and do not discover them at school, even though school, of course, also contributes to developing their competence related to these practices. In the research presented here, this may be the case, for example, for students who report being quite capable of “determining the reliability of documents.” Even if their media practices in the classroom and at home do not overlap, they nonetheless contribute to the development of competence that is not so much digital as it is literate. One might add that non-school (or even non-media) literacy practices can also contribute to the development of literacy competence in general, whether they are required in school or not and whether they are media-related or not.

Conversely, other students may not report a difference between media competence required in school and non-school contexts, not because they are not different but because they are not perceived to be different. This may be confirmed by the fact that some students report being competent overall in both academic and non-academic settings (see results point 6.1), whereas when asked about competence for specific tasks, they report being less competent on tasks related to document reliability, which requires a certain level of literacy.

Third, students in vocational education report feeling more competent in web production than students from general education do. Their practices in web production are also significantly higher than those of students in general education. At this stage, our data does not allow us to assess the extent to which vocational education promotes web design practices more than general education, but we can nonetheless formulate some hypotheses that will have to be investigated in the next stages of our research.

It is possible that vocational education places more emphasis on the development of skills useful for web production, particularly through the regular use of computer tools. Teachers in vocational education may have more flexibility to engage students in pedagogical projects that mobilize digital competence, whereas teachers in general education may focus more on simple search tasks to access content school knowledge. This would mean that school socialization could have a positive effect, at least for vocational education students, on competence development related to web production and to complex searches.

Our data also show that students who engage in vocational education report that they practice web production outside of school (e.g., blogging or producing tutorials) more frequently than students in general education do. This could mean that school and non-school practices could reinforce each other, at least for some student profiles, and contribute to developing new complex skills in web production—even if those practices may not have the same purpose inside and outside school and differ on the type of multimodal production they favor (text versus video), depending on the context.

Finally, data on modal and multimodal information search and web production practices in and out of school reveal interesting variations. For example, young people report that they most often read information from written texts at school while they consult more videos in their personal search activities. Conversely, consulting videos at school and texts for oneself appears to be significantly less frequent for students, revealing a significant gap between school reading practices, which are still very much written-centered, and personal multimodal practices. On the other hand, the differences between the frequency of textual and multimodal production are less marked, probably because multimodal personal production practices are still marginal. Another interesting fact is that teenagers use images rather than video or sound in their multimodal school practices. Reading and producing written illustrated texts predominate over reading and producing audio or audiovisual documents (which contain almost no written text). This suggests that school might not encourage students enough to consult and produce web documents; it also suggests that teenagers seem to have elementary school multimodal practices, which may affect the frequency and quality of their personal multimodal productions.

How can we foresee the potential usefulness of these preliminary results, the additional results to come from our program, and the methods that generated them for school and for teachers? The complex interplay of contrast between what adolescents claim to achieve at school or at home and their related sense of competence can be exploited on three levels.

At the student level, such results make it possible to better describe the activity of the students engaged in the tasks, to draw on the personal resources based on which they declare themselves competent, and to anticipate (and remedy) their declared shortcomings. A task described as simplified is no less complex to perform than a task considered as complex. A good part of the feeling of competence is also linked to the familiarity of students with a task that they interpret and recognize as academic.

At the level of the objects of teaching, the results show the effects of academic tools on the production of complex language objects such as texts. They help determine the new elements in situations of reception and production, but also the relevance of the old elements.

They provide guidelines for defining new content and linking it to old content (knowledge, know-hows, and interpersonal skills).

At the level of curricula and school subjects, our survey should make it possible to specify the school subject(s) that should be solicited to define new tools and adapt the old ones.

## **8. Conclusion**

In this paper, we presented the conceptual framework, objectives, and methodology of an interdisciplinary research program on the media literacy competence of teenagers in four French-speaking countries. Focusing on information search and multimodal production as core media literacy activities, this program develops a multi-level assessment method to measure media literacy competence at varying levels of complexity; to relate task-based measures of competence with self-reported competence and practices; and to document the influence of the students' interpretation of the tasks contexts and purposes, their motivation and feeling of empowerment, and their collaborative practices on the exercise of their media literacy.

The initial findings discussed in the previous section have important didactic implications. For example, in the process of integrating media literacy knowledge and skills, school disciplines (especially in language didactics) should focus on the transferability of reading and writing cognitive processes in digital environments; on learning new media textualities (contemporary texts); and thus on the multiple representations of combinations between codes, modes, and digital processes (e.g., navigation and interaction). Based on the preliminary results of our investigation and on the starting postulate of the research (i.e., that media literacy is a teachable competence with specific knowledge and skills), we formulate the following hypothesis: An anticipation of media forms, their discursive processes, and their digital substrates (techno-semiotic dimensions) through diversified and meaningful social practices of media literacy (socio-semiotic dimensions) seems to influence the competence to read and produce digital documents (semio-cognitive dimensions). Thus, a disciplinary didactic approach focusing on media literacy activities and practices in its cognitive-semio-social-technical dimensions, along with a continuum of training on the processes of reading and producing digital media, should help young people become more aware of their media literacy competence. Hence, a better understanding of media literacy competence—theoretically and

empirically—would promote the transferability between in-school learning and out-of-school literacy practices as well as between out-of-school learning and in-school literacy practices.

In a subsequent stage of our research, students will have to produce a web page on a blogging platform based on an extended online information search. The competence assessment grids for the students' productions developed for this program will be used to identify the media literacy skills to be eventually taught in French language didactics (or in other school disciplines) and to design an evidence-based curriculum, grounded in data on the students' competence.

### References

- Anderson, J. A., & Meyer, T. P. (1988). *Mediated communication: A social action perspective*. Sage Publications.
- Aufderheide, P., & Firestone, C. M. (1993). *Media Literacy. A Report of the National Leadership Conference on Media Literacy*. Washington: Aspen Institute, Communications and Society Program.
- Bautier, É. & Rochex, J.-Y. (2004). Activité conjointe ne signifie pas significations partagées. In C. Moro & R. Rickenmann (Eds.). *Situations éducatives et significations* (pp.199-220). Bruxelles: De Boeck.
- Boyd, D. (2014). *It's complicated: The social lives of networked teens*. Yale: University Press.
- Braaksma, M., Rijlaarsdam, G., & Janssen, T. (2007). Writing Hypertexts: Proposed effects on writing processes and knowledge acquisition. *L1 Educational Studies in Language and Literature*, 7(4). <https://doi.org/10.17239/L1ESLL-2007.07.04.06>
- Brunel, M., Quet, F., & Massol, J.-F. (Eds.). (2018). *L'enseignement de la littérature avec le numérique*. Brussels: Peter Lang.
- Buckingham, D. (2005). *Media Literacy of Children and Young People Literature Review: A Review of the Research Literature on Behalf of OFCOM*. OFCOM. <http://discovery.ucl.ac.uk/10000145/1/Buckinghammedialiteracy.pdf>
- Buckingham, D. (2006). Defining digital literacy – What do young people need to know about digital media? *Nordic Journal of Digital Literacy*, 1(4), 263–276.

- Bull, G., Schmidt-Crawford, D. A., McKenna, M. C., & Cohoon, J. (2017). Storymaking: Combining making and storytelling in a school makerspace. *Theory Into Practice*, 54, 271-281.
- Cachet, O. (2009). Professionnalisme des enseignants et complexité : vers une conception dynamique de l'agir. *Lidil*, 39, 133-150. <https://doi.org/10.4000/lidil.2747>
- Carette, V. (2009). Chapitre 8. Et si on évaluait des compétences en classe ? À la recherche du « cadrage instruit ». In L. Mottier Lopez & M. Crahay (Eds.), *Évaluations en tension* (p. 147). De Boeck Supérieur. <https://doi.org/10.3917/dbu.motti.2009.01.0147>
- Cottier, P. & Burban, F. (Eds) (2016) *Le lycée en régime numérique - Usages et recomposition des acteurs*, Toulouse: Octares
- Delarue-Breton C. & Bautier, É. (2019). Littératie scolaire : ambitions exigeantes, difficultés de mise en œuvre. *Pratiques*, 183-184. [Online] : <https://journals.openedition.org/pratiques/7011>
- Delarue-Breton C. & Bautier É. (2015a). Nouvelle littératie scolaire et inégalités des élèves dans la production de signification. *Le Français aujourd'hui*, 190, 51-60
- Dierendonck, C., & Fagnant, A. (2014). Approche par compétences et évaluation à large échelle: Deux logiques incompatibles? *Mesure et évaluation en éducation*, 37(1), 43–82. <https://doi.org/10.7202/1034583ar>
- Edwards-Groves, C. J. (2010). The multimodal writing process: Changing practices in contemporary classrooms. *Language and Education*, 25(1), 49-64. <https://doi.org/10.1080/09500782.2010.523468>
- Fastrez, P., Tilleul, C., & De Smedt, T. (2016). Media literacy evaluation: A critical discussion of reliability and usefulness issues. *Media Education Research Journal*, 7(1), 36–55.
- Fastrez, P. (2010). Quelles compétences le concept de littératie médiatique englobe-t-il? Une proposition de définition matricielle. *Recherches en Communication*, 33, 35–52.
- Fernagu Oudet, S. (2012). Concevoir des environnements de travail capacitants: l'exemple d'un réseau réciproque d'échanges des savoirs. *Formation emploi*, 119, 7-27.
- Fiévez, A. (2017). *L'intégration des TIC en contexte éducatif. Modèles, réalités et enjeux*. Québec: Presses de l'Université du Québec.
- Fluckiger, C. (2014). Outils numériques, continuités et ruptures entre pratiques scolaires et pratiques personnelles. *Recherches*, 60, p. 57-65.

- Garcia-Debanc, C. (1988). Propositions pour une didactique du texte explicatif. *ASTER*, 6, 129-163. <https://doi.org/10.4267/2042/9168>
- Geertz, C. (1973). Thick Description. Toward an Interpretive Theory of Culture. In *The interpretation of cultures: Selected essays* (pp. 3–30). Basic Books.
- Gouédard, C., & Rabardel, P. (2012). Pouvoir d’agir et capacités d’agir : Une perspective méthodologique ? Illustration dans le champ de la santé, sécurité et conditions de travail. *Perspectives interdisciplinaires sur le travail et la santé*, 14-2. <https://doi.org/10.4000/pistes.2808>
- Gray, J. (2017). Text. In L. Ouellette & J. Gray (Eds.), *Keywords for Media Studies*. NYU Press.
- Hacking, I. (2000). *The Social Construction of What?* Harvard University Press.
- Hargittai, E. (2005). Survey Measures of Web-Oriented Digital Literacy. *Social Science Computer Review*, 23(3), 371-379. <https://doi.org/10.1177/0894439305275911>
- Hobbs, R. (2010). *Digital and Media Literacy: A Plan of Action* (Communications and Society Program). The Aspen Institute. <http://www.knightcomm.org/digital-and-media-literacy-a-plan-of-action/>
- Jolls, T., & Wilson, C. (2014). The Core Concepts: Fundamental to Media Literacy Yesterday, Today and Tomorrow. *Journal of Media Literacy Education*, 6(2), 68–78.
- Jonnaert, P. (2017). La notion de compétence: Une réflexion toujours inachevée. *Ethique Publique. Revue Internationale d'éthique Sociétale et Gouvernementale*, 19(1). <https://doi.org/10.4000/ethiquepublique.2932>
- Kaptelinin, V. (2013). Activity Theory. In *The Encyclopedia of Human-Computer Interaction* (2nd edition). The Interaction Design Foundation. <https://www.interaction-design.org/literature/book/the-encyclopedia-of-human-computer-interaction-2nd-ed/activity-theory>
- Knobel, M., & Lankshear, C. (Eds.). (2007). *A New Literacies Sampler*. Peter Lang Inc., International Academic Publishers.
- Kurtz, G. et Peled, Y. (2016). Digital Learning Literacies - A Validation Study. *Issues in Informing Science and Information Technology*, 13, 145-158.
- Lacelle, N., Boutin, J.F, & Lebrun, M. (2017). *Littératie médiatique appliquée en contexte numérique - LMM@: Outils conceptuels et didactiques*. Ste-Foy: Presses de l’Université du Québec.

- Lacelle, N. et Lebrun, M. (2016). La formation à l'écriture numérique : 20 recommandations pour passer du papier à l'écran. *Revue de recherches en littératie médiatique multimodale*, 3. <http://dx.doi.org/10.7202/1047131ar>
- Le Bossé, Y. (2003). De l'« habilitation » au « pouvoir d'agir » : Vers une appréhension plus circonscrite de la notion d'empowerment. *Nouvelles pratiques sociales*, 16(2), 30-51. <https://doi.org/10.7202/009841ar>
- Litt, E. (2013). Measuring users' internet skills: A review of past assessments and a look toward the future. *New Media & Society*, 15(4), 612-630. <https://doi.org/10.1177/1461444813475424>
- Livingstone, S. (2004). Media literacy and the challenge of new information and communication technologies. *Communication Review*, 7(1), 3-14. <https://doi.org/10.1080/10714420490280152>
- Martens, H. (2010). Evaluating Media Literacy Education: Concepts, Theories and Future Directions. *Journal of Media Literacy Education*, 2(1). <http://digitalcommons.uri.edu/jmle/vol2/iss1/1>
- Masciotra, D., Medzo, F. (2009), *Développer un agir compétent. Vers un curriculum pour la vie*. Bruxelles: De Boeck.
- Önger, S. et Çetin, T. (2018). An Investigation into Digital Literacy Views of Social Studies Preservice Teachers in the Context of Authentic Learning. *Review of International Geography Education Online*, 8(1), 109-124.
- Potter, W. J. (2004). *Theory of Media Literacy: A Cognitive Approach*. Sage Publications, Inc.
- Potter, W. J. (2013). Review of Literature on Media Literacy. *Sociology Compass*, 7(6), 417-435. <https://doi.org/10.1111/soc4.12041>
- Rey, B., Carette, V., Defrance, A., & Kahn, S. (2012). *Les compétences à l'école: Apprentissage et évaluation* (3rd ed.). Bruxelles: De Boeck.
- Richard, M., & Lacelle, N. (Eds.). (2020). *Croiser littératie, art et culture des jeunes. Impacts sur l'enseignement des arts et des langues*. Québec : Presses de l'Université du Québec.
- Ronveaux, Chr., & Schneuwly, B. (2018). *Lire des textes réputés littéraires : disciplinatio et sédimentation. Enquête au fil des degrés scolaires en Suisse romande* (ThéoCrit). Bern : Peter Lang.
- Ruphy, S. (2009). Unité ou pluralité des sciences: nouvelles questions, nouveaux enjeux. In T. Martin (ed.), *L'Unité des sciences. Nouvelles perspectives* (pp. 109-120), Paris: Vuibert.



- Ruphy, S. (2010). From Hacking's plurality of styles of scientific reasoning to foliated pluralism: a philosophically robust form of ontologico-methodological pluralism. *Philosophy of Science Association*, 22nd Biennial, , <http://philsci-archive.pitt.edu/8397/>
- Sandberg, J. (2000). Understanding Human Competence at Work: An Interpretative Approach. *The Academy of Management Journal*, 43(1), 9–25. <https://doi.org/10.2307/1556383>
- Scallon, G. (2004). *L'évaluation des apprentissages dans une approche par compétences* (2e ed.). De Boeck Université.
- Scheerder, A., van Deursen, A., & van Dijk, J. (2017). Determinants of Internet skills, uses and outcomes. A systematic review of the second- and third-level digital divide. *Telematics and Informatics*, 34(8), 1607-1624. <https://doi.org/10.1016/j.tele.2017.07.007>
- Schön, D. A. (1983). *The Reflective Practitioner: How Professionals Think In Action*. Basic Books.
- Schugurensky, D. (2000). *The forms of informal learning: Towards a conceptualization of the field* (WALL Working Paper No 19). Ontario Institute for Studies in Education of the University of Toronto. <https://tspace.library.utoronto.ca/handle/1807/2733>
- Serres, A. (2012). *Dans le labyrinthe : évaluer l'information sur internet*. C&F Editions.
- Snow, C. E. (2006). What Counts as Literacy in Early Childhood? In K. McCartney et D. Phillips. *Blackwell Handbook of Early Childhood Development* (pp. 274-294). Blackwell Publishing Ltd.
- Tardif, J. (2006). *L'évaluation des compétences : Documenter le parcours de développement*. Chenelière éducation.
- Thibert, R. (2009). Quelles pratiques collaboratives à l'heure des TIC? *Dossier d'actualité Veille et Analyses* (Institut français de l'éducation), 43. ENS Lyon. <http://veille-et-analyses.ens-lyon.fr/LettreVST/43-mars-2009.php>
- Tilleul, C. (2020). *Etude des relations entre les pratiques des jeunes adultes sur les réseaux socionumériques et le développement de leurs compétences en littératie médiatique* [Unpublished doctoral dissertation]. Université catholique de Louvain.
- van Broekhuizen, L. (2016). *The paradox of classroom technology: Despite proliferation and access, students not using technology for learning*. Alpharetta: AdvancED Research.

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van Deursen, A. J. A. M., Helsper, E. J., & Eynon, R. (2015). Development and validation of the Internet Skills Scale (ISS). *Information, Communication & Society*, 19, 804-823.  
<https://doi.org/10.1080/1369118X.2015.1078834>

van Dijk, J. A. G. M., & van Deursen, A. J. A. M. (2014). *Digital Skills: Unlocking the Information Society*. Palgrave Macmillan.

Vygotsky, L.S. (2014 [1928-30]). *Histoire du développement des fonctions psychiques supérieures*. Paris: La Dispute.