# 4 The MOOC-CLIL project: using MOOCs to increase language, and social and online learning skills for 5th grade K-12 students

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## Abstract

This study comprises the outcomes and methods of a one year project using Content and Language Integrated Learning (CLIL) and Massive Open Online Courses (MOOCs) embedded in K-12 classes. The Self-Regulated Learning (SRL) of 42 students enrolled in three 5th grade classes were monitored. The students took the MOOC-CLIL class for one year (2015-2016) at the Guldensporencollege (GUSCO), a Belgian secondary school in Kortrijk. In this weekly, two-hour class, the 16-17 year old students were increasingly guided towards autonomously choosing and learning from MOOCs in a non-native language. At the last phase of the project, the students were asked to autonomously choose and engage in a MOOC. The study used a three step approach to increase autonomous, online learning. Students could choose from French and English MOOCs, while their mother tongue is Flemish (Belgian Dutch). The project consisted of a practical teaching/learning approach rolled out by the teachers, and a research approach enabling a step-by-step evaluation of self-regulated learning. Findings include an increase of practical language use, confidence in planning autonomous learning, and increased social learning skills.

**Keywords: K12, MOOC, lifelong learning, social learning, language learning skills.**

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## 1. Introduction

The aim of this research was two-fold: exploring the use of MOOCs to increase online learning skills in K-12 students through a scaffolded approach; and to provide an open, authentic language opportunity within a school setting. MOOC use has been studied in various contexts but – to the knowledge of the authors – it has never been used in a CLIL set-up, nor have K-12 students been given the opportunity to autonomously choose which MOOC they could take in a secondary school setting.

MOOCs were used within class options offering CLIL, which is an approach for learning content through an additional language. It is based on methodological principles established by research combining language immersion and content-based instruction (Marsh, 2002). In the past, CLIL has proven to "increase vocabularies of technical and semi-technical terms and of general academic language because of the subjects they have studied" (Scott & Beade, 2014, p. 8), as well as provide effective opportunities of using new language skills. Although the project was situated within a formal school setting – at GUSCO in Kortrijk, Belgium – the MOOC-CLIL classes were set up so that the teachers scaffolded the students towards autonomous learning. This MOOC-CLIL pilot answers a call by Grover, Pea, and Cooper (2014) who suggest developing more MOOC based pilot projects.

## 2. Literature

MOOCs have been used in various ways, including the flipped classroom approach. According to Bishop and Verleger (2013), "[t]he flipped classroom is a pedagogical method, which employs asynchronous video lectures and practice problems, such as homework, and active, group-based problem solving activities in the classroom" (p. 1). This pedagogical approach complements traditional classroom teaching through integration of a whole or particular parts of a course in K-12 or higher education (Najafi, Evans, & Federico, 2014; de Waard, 2015). At GUSCO, MOOC content has been integrated into existing

courses in a blended format since 2013. The blending of MOOCs within formal school settings was proposed by Bruff, Fisher, McEwen, and Smith (2013) as a sound way to widen MOOC use. Liu and Cavanaugh (2012) investigated blended introductory mathematics courses and they concluded that having a teacher present in a blended learning setting positively affects student outcomes. As students only had two mandatory hours per week for following MOOCs, we needed to consider the impact of only partially participating in MOOCs. However, research has showed that those learners who access only portions of a course's content still have meaningful learning experiences (de Waard, Kukulska-Hulme, & Sharples, 2015; Ho et al., 2015).

### 2.1. Learning from a variety of MOOCs and designs

As stated by de Waard et al. (2011), "[t]here is […] a need to determine design principles for MOOCs to effectively maximise their self-organising, self-referencing, and knowledge-producing capabilities" (p. 112). This element of understanding is especially needed when considering the variety of current MOOC platforms, as "there is a clear difference in pedagogical approach […and] design of the user interface, […] which results in a challenge to understand all the options within different MOOC platforms" (de Waard, 2015, n.p.). The variety of MOOC designs in combination with the reality of learning to learn in and from MOOCs increased the need for a blended approach so students would be introduced to MOOCs in a teacher supported setting.

### 2.2. CLIL and teacher role when including online resources and interactions

By opening up the classroom setting to include content and interactions from online resources – in this case MOOCs – an additional CLIL learning environment is created. However, young learners have less formal educational experience and may require very different supports than older, more educated learners (Guzdial, 2014). This points again towards using a scaffolded approach to increase CLIL success. In her book on telecollaborative language learning for CLIL, Dooly (2008) proposed that the teacher could take up the role of a guide to support the

learners online, as well as in the blended classroom setting. Pellegrino, de Santo, and Vitale (2013) also emphasise the importance of scaffolded teacher support to show the students how to proceed before engaging in online interactions with peers, to ensure a meaningful, communicative practice. Collaborative or social learning is also an important factor of CLIL learning (Martínez, 2011). When students engage in MOOC or classroom based discussions, "learning is promoted as participants share their views with peers, interact with the reading material and participate during sessions" (Viswanathan, 2012 cited in de Waard, 2015, n.p.).

### 2.3. Learning for the future

The actions taken by the students (e.g. choosing how to engage with online resources) prepares them for lifelong learning. MOOCs enable learners to use multiple sources to reach their learning goals (de Waard, 2015). This means that the ability to independently and proactively engage in behavioural processes to increase goal attainment becomes necessary (Zimmerman, 2000). As mentioned by de Waard (2015), "[a] study focusing on [SRL] conducted by Gutiérrez-Rojas et al. (2014, [p. 47]) showed that it is crucial to identify the lack of study skills and work habits as a significant factor, hindering the successful completion of MOOCs by less experienced learners" (n.p.). For this reason, an off-the-shelf instrument was used in our study in ways outlined below, to monitor and measure SRL: the Motivated Strategies for Learning Questionnaire (MSLQ) constructed by Pintrich, Smith, Garcia, and McKeachie (1991).

The emergence of MOOCs affords universities the "opportunity to provide students with preparatory courses before they enter university, at relatively low cost" (Jiang et al., 2014, p. 2). But in order for 5th grade secondary students to be able to quickly pick up the content and interaction opportunities provided in these MOOCs, researchers must understand whether pre-university students benefit from MOOCs, and what their specific challenges might be. For this reason, this study will investigate the effects of language, peer learning, and SRL coming from following MOOCs integrated in CLIL courses.

### 2.4. Research questions

Based on the literature, the following research questions were formulated:

- How do MOOCs impact CLIL learners when used in the CLIL classroom?
- Does learning from MOOCs add to their language learning?
- What is the effect of social learning (peer learning) on CLIL learners?
- Does MOOC learning increase critical learning skills?
- Does MOOC learning impact self-regulated learning?

## 3. Methodology

### 3.1. The MOOC-CLIL project

The MOOC-CLIL project pioneers the combination of both MOOC and CLIL concepts, and as such it is an exploratory study. It was important to use a mixed methods approach, including quantitative data concerning learning, and qualitative data to ensure a correct interpretation of the quantitative data. The quantitative data indicated where the learning was situated looking at the results coming from the MSLQ. The MSLQ was adapted to focus on relevant online learning elements[3]. The questions were put into sub-groups, following the grouping as suggested in Pintrich et al. (1991), and elaborated with questions probing critical online learning factors. The adapted questionnaire consisted of 50 questions, with multiple questions on intrinsic motivation, extrinsic motivation, course value, self-efficacy and learning performance, critical thinking, social learning (peer learning, help seeking), and learning self-awareness.

3. https://drive.google.com/file/d/0B2GekloYrdFQS0N3TGdtUnJCNmM/view

The participants were asked to fill in the online survey prior to the MOOC-CLIL courses and in April (after the EigenMOOC phase, further discussed below). The semi-structured focus group interviews were set up per class in May 2016. The groups were limited to nine students to ensure all students could voice their experiences and this resulted in five focus groups.

The students' learning performance (e.g. language use, interactions, critical thinking, digital skills, cultural sensitivity) was also monitored through teacher-student mentoring. The evaluation consisted of a series of brief evaluations throughout the year (student feedback on the process, activities, and teachers) and evaluations by the teachers using an adapted Skills and Attitudes Measuring (SAM) scale[4].

## 3.2. Situating the project

The project ran during the 2015-2016 academic year, with a learning/teaching frequency of two hours per week. The MOOC-CLIL courses were part of 'vrije ruimte' (translated: free space), a course option providing innovative learning techniques to students. By using this course option, the content was not restricted, as the 'vrije ruimte' is not part of the mandatory course curriculum.

### *3.2.1. Target population*

During the first MOOC introductory lesson, those students who wanted to volunteer for the MOOC-CLIL research were given an informed consent form with information on the research. All students signed the informed consent form.

The 42 secondary students in this pilot project were 5th grade secondary school students, all 16-17 years old. They were enrolled in those curricula that normally result in college or university entrance. All of their data was anonymised.

4. https://drive.google.com/file/d/0B2GekloYrdFQU18zbDhubE8tcDg/view

### *3.2.2. Three phases to scaffold autonomous learning*

The project consisted of three phases: a GroupMOOC phase (collaboratively looking at the MOOC structure and elements), an EigenMOOC phase (students start to choose and follow MOOCs of their own preference), and a recapturing/production phase (groups of students produced their own MOOC video for next year's 5th graders).

In the GroupMOOC phase, all the students first took an introductory trajectory set out by the teachers that allowed the students to explore MOOC platforms and be introduced to the different learning activities and media options. The MOOC chosen for the English MOOC-CLIL group was the *Rise of Superheroes and Their Impact on Pop Culture*[5] offered through the edX platform, and for the French MOOC group an introduction to the *French school television platform*[6] was chosen. In this stage, the flipped classroom approach was used, providing students with specific MOOC elements followed by performing activities in class (e.g. debate, discussion, and analysing and selecting content). In the GroupMOOC phase, the teachers offered support in terms of language (e.g. indicating which online dictionaries could be used, what was meant by specific MOOC tasks or media).

In the second phase, EigenMOOC, the students chose their own MOOC. During EigenMOOC, the learners increasingly self-regulated their learning. They planned what to learn, how, and when.

In the recapturing phase, students produced a video collaboratively, combining all they had seen (e.g. what is a MOOC, which language activities were used). The videos were used to inform future 5th graders about the MOOC-CLIL courses. The students scripted, edited and narrated the movies themselves[7].

5. https://www.edx.org/course/rise-superheroes-impact-pop-culture-smithsonianx-popx1-5x

6. http://education.francetv.fr/

7. One of the movies can be viewed at https://www.youtube.com/watch?v=vFc1bZOeIQs&feature=youtu.be

# 4. Findings

The findings below come from the online surveys (percentages) and the focus group interviews. The findings showed that most students were intrinsically motivated. As the project was rolled out, more students became aware of their actual learning capacities and their authentic language use increased. We also found that more students started to learn from peers, increased their critical thinking, and gained self-regulated learning skills.

## 4.1. Intrinsic versus extrinsic motivation

Overall, the students were more intrinsically (73%) than extrinsically motivated (35%), and the interviews suggested that this came from the freedom to choose what they wanted to learn: "the fact that I can learn something that I am truly interested in makes me want to learn at home as well" (ST18). The extrinsic motivation decreased as they became more aware of the freedom they had within the class, and grades became less important (44%) than learning something new (100% importance).

## 4.2. More realistic learning awareness

When comparing the results from both MSLQs, some of the self-regulated percentages of the questionnaire had decreased (see Table 1).

Table 1. Comparing percentages related to learning beliefs and learning self-awareness coming from the first and second round of the MSLQ

| Survey learning topics | Results 1st survey | Results 2nd survey |
|---|---|---|
| Learning beliefs | 85% | 80% |
| Learning self-awareness | 70% | 69% |

Comparing results from both MSLQs indicated that the students' learning beliefs (i.e. feeling confident that their learning actions were successful) had decreased and their learning self-awareness (i.e. becoming conscious of the learning they do) was hardly affected. However, the interviews revealed that the participants

had become more aware of their learning capacity, realising they were not as knowledgeable as they had first expected (and indicated). It was this increased awareness that made their second survey percentages representative of what they actually felt performance-wise.

### 4.3. Language learning

During the interviews, all the students reported a dramatic increase in daring to speak either French or English, referring to language proficiency and motivation:

> "the best thing about the course is that I dare to express myself, without being scared" (ST2).

This was substantiated by feedback from the teachers based on the students' active language use within the classroom. The students emphasised the importance of speaking another language for two hours straight every week, and immersing themselves in topics with a vocabulary related to their own interests. All students felt that they used language more proficiently and authentically. They found the vocabulary they picked up also enriched regular language classes.

The English MOOC-CLIL students saw English as a major asset: "it is a global language" (ST13). 83% of students found they were now capable of expressing themselves autonomously in English or French. Participants reported that the MOOC media design allowed them to slow down videos, read transcripts of the content and select those media that they preferred (e.g. video or texts). However, some of the MOOC content was too complex to fully understand which was at times demotivating.

### 4.4. Social learning

Seeking help decreased from 71% of respondents at the commencement of the course to 60% at its completion. The answers to the questionnaires revealed a shift in help-seeking focus, moving from the teacher to peers (see Table 2).

Table 2. Percentages on help-seeking from both MSLQs

| Survey learning topics | Results 1st survey | Results 2nd survey |
|---|---|---|
| Help-seeking (any) | 71% | 60% |
| Help-seeking from teacher | 75% | 59% |
| Help-seeking from peers | 61% | 83% |

During the interviews, students indicated they were relying on the teacher's knowledge to get started ("the teacher gave us links to online language dictionaries which were very useful" (ST9)), but that after the first few weeks they only needed the teachers' help for specific MOOC task descriptions.

The interviews revealed enthusiasm for peer learning and connecting with global peers: "someone actually liked a comment I wrote in the discussion threads!" (ST35). This was supported by the results from the questionnaires, in which 68% gained knowledge by interacting with peers. The participants also indicated that social learning extended to learning to communicate respectfully, plan learning (sharing expertise with classmates), and improve critical thinking through discussions with classmates.

### 4.5. Critical thinking

The survey questions on critical thinking revealed that 63% of the students carefully considered what they were learning: "I now understand that I need to reflect on the content that is provided and whether this seems to be real or fake" (ST26). Students also trusted content coming from those MOOCs coming across as professional (good language use, comprehensible content). Online empathy (i.e. awareness of staying respectful in online discussions) rose from 93% to 100%, as students understood the language factor of potentially misunderstanding others (see Table 3).

Table 3. Evolution in critical thinking and online empathy from both MSLQs

| Survey learning topics | Results 1st survey | Results 2nd survey |
|---|---|---|
| Critical thinking | 55% | 63% |
| Online empathy | 93% | 100% |

### 4.6. Self-regulated learning

Increasingly, more students indicated they became more capable of digesting complex content, and more students started planning their learning one week ahead (see Table 4). The students became more critically aware of how content was delivered – language and content wise – which made them select more qualitatively strong MOOCs. More students felt the benefit of planning their learning: "MOOCs give an overview of the material in advance… it makes it easier to learn ahead of time as I know what is coming up and when" (ST39).

Table 4. Comparing percentages on SRL from both MSLQs

| Survey learning topics | Results 1st survey | Results 2nd survey |
|---|---|---|
| Understanding complex content | 35% | 50% |
| Planning one week ahead | 10% | 19% |

### 4.7. Sustainability of the project

By the end of the EigenMOOC phase, 72% of the students had independently started to follow a MOOC in their spare time. As the students were enthusiastic and showed an increase in their language skills (based on the SAM scale feedback), the school decided to deploy this approach in the years to come, increasing the number of students that could choose this type of class. At the start of the 2016-2017 academic year, 82 students enrolled in MOOC-CLIL.

## 5. Conclusions

Improved use of the foreign language in informal settings was a key learning outcome of this project: daring to speak and communicate with peers inside classrooms and MOOCs. As a result, students prepared for their futures, developed specific vocabulary in a professional area of their interest, and also became more efficient in planning their own learning and appreciating the benefits of peer and social learning.

This study proved once more that an exploratory study benefits from using a mixed methods approach, as qualitative vignettes from participants were used to provide additional substance to the quantitative element of the study. If the study had relied solely on the adapted MSLQ, the results (e.g. capacity to self-regulate learning) could have been misinterpreted due to lack of understanding behind those numbers (the students re-evaluating their capacity to learn to fit realistic assumptions).

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