

IMPACT OF MEDIA IN VOCABULARY LEARNING AND TEACHING-LEARNING SETTINGS: A QUASI-EXPERIMENT IN ITALIAN AS HERITAGE LANGUAGE CLASSES

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1. INTRODUCTION

The rapid rise of students with multilingual background in contemporary Europe has invariably amplified the public awareness and specific value of heritage language education. In the context of a changing landscape *vis-à-vis* diversity and technological adoptions, this study initiates a systematic scrutiny around a foundational question: How can heritage language didactics best profit from the increasing opportunity to be exposed to source materials from the country of origin with new technologies? Using videos, new technologies as well as traditional texts as resource conveyors of traditional didactics, this article investigates the development of lexical knowledge in heritage language classes along media variation. This contribution focuses on the lexical learning since the diffusion and the quality of the lexicon are highly correlated with the communication competences. More specifically, the research addresses the following questions: how does media use influence the teaching and learning settings? Do learners' proficiency benefit from different media? Ultimately, the research examines the innovation potential in the use of new technologies for native language learners.

The article is organized as follows: sections § 2 introduces the reader to the environment of native language education in Germany, section § 3 describes the research design and is subdivided in didactical intervention (§ 3.1) and expectations (§ 3.2), section § 4 presents the data through a quantitative (§ 4.1) and qualitative analysis (§ 4.2). Finally § 5 offers concluding remarks.

2. NATIVE LANGUAGE EDUCATION IN GERMANY

The didactic of heritage languages represents a diffuse and under-researched reality in Germany (Reimann, 2016; Schmitz, 2015). The teaching of heritage languages tends to fall under the realm of private initiatives or consulate schools². Indeed in some federal states, lessons of heritage language are structured by the Ministry of Education and organized in the so called *herkunftssprachlicher Unterricht* (from now on HSU) literally *Lesson of origin language*. In the state of North Rhine-Westphalia, Germany's most populous and with the highest migration quota, 50.070 students took part in HSU in the school-year

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² Since the organization of HSU Didactics is domain of regional governments and multiple countries specific initiatives (lessons in consulates, religious centers, etc...) a systematic didactic of HSE has seldom a wide coverage (among others Schader et al., 2016; Schader & Maloku, 2016). However many steps have been recently moved in the HSU research by the Network for Heritage Language (in German *Netzwerk HSU*: <https://www.kombi.uni-hamburg.de/netzwerkhsu.html>).

2016/2017³, among them nearly 8000 in Italian language classes. The underlying logic from the state was that support for heritage languages should promote the cultural and linguistic identity of the student (§ 2 Abs. 10 *Schulgesetz*). Bilingual students, in particular, could find in the HSU a special lesson for their needs recognized by the education system. The heritage language to be spoken in students' familiar context is a prerequisite to attend HSU. Therefore, the main goal of HSU is not to develop basic speaking competences, but to increase language variety for educational purposes (Gogolin, Duarte, 2016; Favaro, 2003) and generate writing competences (KoMBi, 2017; Ministerium-Nordrhein-Westfalen, 2006). In other words, HSU was intended to reinforce Basic Interpersonal Communicative Skills (BICS) and develop Cognitive Academic Language Proficiency (CALP) (Cummins, 1991).

Advantages of a solid heritage language education are known in the existing literature: Kniffka and Siebert-Ott (2009) demonstrated how a sure domain of the heritage language operates effectively as resource for the acquisition of other languages including the main language of the country. Moreover, a balanced form of bilingualism is proven to play an important role in professional qualifications (Coray, Duchêne, 2017). However analysis of the PISA Data 2015 (OECD, 2018) and the German Institute for Statistics (Statistisches Bundesamt, 2017) confirms that the academic underperformance among students with an immigrant background is particularly high in Germany: students with an immigrant background are more than twice as likely to fail baseline academic proficiency as students without an immigrant background (OECD, 2018) and are almost twice as likely to be enrolled in a school without access to higher education than a "Gymnasium" in the State of North Rhine-Westphalia (Ministerium-Nordrhein-Westfalen, 2019). School children with Italian background are especially underrepresented in secondary schools that give access to university and have statistically less likelihood to reach a high education level (FAZ Nr. 78, 2008, quoted in Schmitz, 2015). For this reason, the HSU through an exclusive opportunity for language minorities, offers school support those in need of assistance for education and language training (both in German and in the heritage language).

Nevertheless, the challenges in the HSU didactics and its organization are high: e.g. HSU groups are constituted by students from multiple classes. Moreover, more than 28,000 Italian citizens emigrated to Nord-Rhine-Westphalia between 2014 and 2018⁴. That fact alone increased the heterogenic composition of HSU-classes constituted partly from a pre-existing community and partly from members of a new diaspora (Natale, Krakenberger, 2016). Conceptually speaking, a standard definition of a heritage speaker is a person «raised in a home where a non-local language is spoken, who speaks or merely understands the heritage language, and who is to some degree bilingual in the local language and the heritage language» (Valdés, 2000: 1). As this definition clearly shows, the linguistic competence of the heritage language speaker can highly vary. As a consequence for the didactics, teachers in HSU classes are suggested to differentiate the syllabus, individualize the learning goals of his/her students and apply particularly cooperative learning methods. New technologies could be particularly helpful to reach such goals in a HSU environment.

³ <https://www.schulministerium.nrw.de/docs/Schulsystem/Unterricht/Lernbereiche-und-Faecher/Herkunftssprachlicher-Unterricht/index.html>.

⁴ Sources: Italian Consulate Cologne (2019.07.09) and Italian Consulate Dortmund. (2019.07.03). E-mail communication.

3. SAMPLING AND RESEARCH DESIGN

The group under focus is composed by school students aged 10-16 belonging to four classes of Italian as heritage language. Two classes were taught by a teacher (A) while other two classes were taught by a second teacher (B). All classes were situated in the German Federal State of North Rhine-Westphalia within the Cologne area. Each teacher had one class taught presenting inputs via video, while another class was taught presenting a text on paper. The total sample size of 37 students was divided in groups as shown by the following table⁵.

Table 1. *Number of subjects involved in the experiment divided by teachers and medium*

	Teacher A	Teacher B
Medium: paper	6 students Group A paper	10 students Group B paper
Medium: screen	12 students Group A screen	9 students Group B screen

Teacher A taught two classes: in one, we selected six students using the paper based input; in the second class, we selected 12 students who benefited from the video input. Similarly, teacher B had two groups: the group taught by paper is composed by 10 students, the group taught on screen is composed by 9 students.

The text on paper contains the same text spoken in the video. The sheets were correlated with about 3 to 10 pictures clarifying a set of advanced vocabulary items. In a similar way, the videos have been created with the on-line software Powtoon to contain animations: while a voice conveys the text, pictures pop-up providing semantic information⁶. For the experiment, we created five lessons, each supported by video and paper. Videos' length was contained between 2'58" and 4'24", while the sheets were between one page and one and half pages long. The range of words varied between 321 and 456.

The topic chosen by the teachers deals with Sicily in cultural, historical and geographical perspective. The choice was grounded on the fact that Sicily was the region where most of students traced back their roots in addition to being the main holiday destination for the majority of those in class. Hence, the topic activated students' curiosity (Shin, Lee, Lee, & Kim, 2019), and fit requirements of the ministerial syllabus.

The experiment took place from the end of January to the beginning of April 2018 in all four groups simultaneously. Students' data were collected before and after the didactical intervention. Students were asked to complete a two-page questionnaire. The first part consisted of a 48-item survey about biographical data, sociolinguistic data, motivation and habits of digital and analog media use. Questions could be replied according to a five graded Likert scale (from "I totally agree" to "I definitely don't agree").

⁵ Due to not regular presence in the classes, many students have to be excluded from the statistical analysis.

⁶ Video used for the lessons can be retrieved at following addresses:

<https://www.youtube.com/watch?v=cc7ellsCIYI>.
<https://www.youtube.com/watch?v=Oeeinm3oliY>.
<https://www.youtube.com/watch?v=pQCyt3nUFHg>.
<https://www.youtube.com/watch?v=Pi-vGwIz9zc>.
<https://www.youtube.com/watch?v=CABmvRC0jew>.

In the second part of the questionnaire, the lexical knowledge was measured through two tests:

- i) C-test containing visualizations and written dialogues to be completed;
- ii) test analyzing students' dialogical and interactional competences asking to perform a role play in the setting "tasting Sicilian street food" (Galaczi, 2010).

After the intervention, students were asked to fill an identical questionnaire (leaving out biographical and sociolinguistic data of the survey). Furthermore, teachers were asked to give an evaluation of students' linguistic performance prior to the intervention according to a 1 to 20 point-scale. In addition, self-evaluation of the students was taken into consideration. The lessons were videotaped giving about 450 minutes per each of the four groups.

3.1. *Didactical intervention*

The main goal of the lessons was to extend and reinforce lexical competences according a CLIL didactic (Leisen, 2015). The focus was set on the meaning with no explicit mention of grammatical structures. In addition, vocabulary activities were developed to boost functional-communicative competences (Decke-Cornill, Küster, 2015). The teachers were trained to design the lessons according to the same format both in the video-supported and the paper-supported setting. The core procedure consisted of three steps (Grell, Grell, 2010: 104-116) ideally based on the PPP paradigm:

1. In the gathering phase, students were presented with the text and were asked to note some general information. No other type of activity aiming at a general text comprehension (e.g. reciprocal reading, filling a table, reorder information, giving a title, match the pictures...) was assigned in this phase.
2. In the analysis phase, students were asked to develop a deeper understanding of the text and its lexis with the following speaking and writing activities: question loops for pair-work, text understanding questions as well as questions about terms and definitions, completing halves of sentences, or information gap activities with a question sheet to support. As an example in the lesson about Sicilian geography, students were asked to fill their own blind map of Sicily adding all known geographical information, and consequently collecting new information by interacting with partners.
3. In the production phase, students were asked to apply the content learned in the previous phase by creating an original text. As an example from the previously mentioned lesson about Sicilian geography, students have to compose a dialogue for a friend suggesting how she/he could travel through Sicily and what can she/he visit in between.

3.2. *Expectations*

The research questions centered on (i) whether groups taught using videos perform in the vocabulary test differently than in classes taught with text on sheet and (ii) whether the classes built a substantially different learning and teaching setting because of the use of diverse media. According to my expectations, both the lessons supported by video and the ones supported by paper would show an increased lexical performance of the students. On one hand, the expectation was that many students in the short period may

be motivated by the new medium (the instructional video) and may spend more attention and time with the video. Consequently, out of greater engagement with the input material, a positive output could result in the lexical performance. On the other hand, learners exposed to a new didactical strategy such as the introduction of videos, could experience a “motivation valley” with a resulting decrease of interest (Hasselhorn, Gold, 2006: 97). Moreover cognitive effects (Decke-Cornill, Küster, 2015: 167) depending on the input (whether a multimodal medium as video or a written text), may play an important role in the learning performance. Although such effects are probably relevant in how information is processed in learners, this topic *per se* is beyond the scope of this article. In agreement with the teachers’ lesson, the structure should be the same both in the video supported and the paper supported lessons; however I expected that teachers might take different actions according to the medium. I also expected teachers and students in the video-supported context to meet technical challenges that could, in turn, decrease motivation.

4. RESULTS

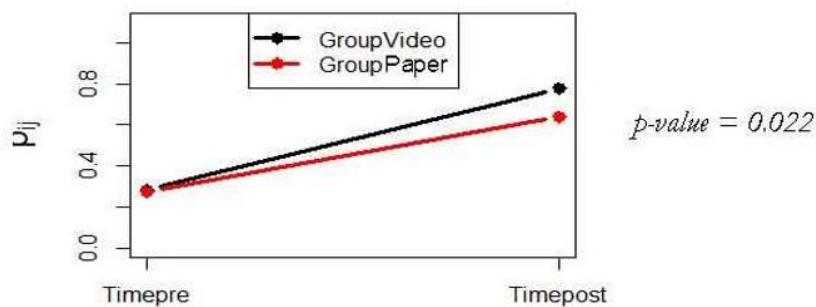
4.1. Quantitative Results

Most of the items gathered in the test were aggregated into the following clusters: satisfaction about the Italian class, media habits, and Italian language proficiency. Prior to the aggregation, reliability was checked⁷. Afterwards, the group of students taught with paper support was compared to the group of students taught with screen support according to satisfaction, media habits, language proficiency and age. For the comparison part, a *t-test* was adopted. No statistically significant difference was found between the control group and the experimental one in the time prior to the didactical intervention in none of these categories except for age ($t\text{-test} > 0,05$)⁸. Moreover, both the experimental group and the control group showed no difference related to the language proficiency ($t(37)=0,87$; $p=0.80$) at the time prior to the experiment.

In order to measure how the language proficiency changed after the intervention, the package NparLD (Noguchi, Gel, Brinner, Konietschke, 2012) was used for the analysis of longitudinal data in factorial settings.

Below, graph 1 shows the performance of the test (i) in the group taught by paper-support and in the group taught by screen support at a point in time before the didactical intervention and after.

Graph 1. *Performance in the test (i) prior and after the intervention*



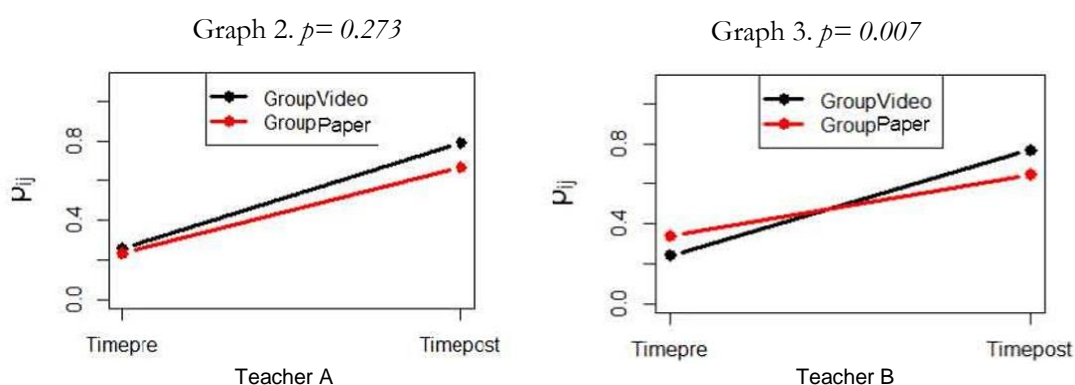
⁷ Cronbach’s alpha value for the chosen categories was > 0.6

⁸ Indeed the groups B were multi aged learning groups, while the groups A were built by students from 9th degree and 10th degree.

Despite the low population examined, the data obtained have statistical significance (p -value= 0.022). Several tendencies from graph 1 can be noted:

- a) both groups have the same lexical performance in time prior to the didactical intervention (as proofed in footnote 6);
- b) both groups perform better after the didactical intervention;
- c) the experimental group perform slightly better than the group taught by paper.

One can wonder whether the growth of lexical competence follows the same pattern both in the groups taught by teacher A and on the groups taught by teacher B, or better said, groups perform better with the audiovisual medium independently from the teacher. In the experiment, both groups taught by teacher A and by teacher B behaved according to the same pattern: the groups supported by video registered higher lexical competences after the intervention under both teachers.



Graph 2 represents the group of teacher A, and Graph 3 of teacher B. The p -value of the first group shows low statistical significance while the second indicate strong evidence⁹ against the null hypothesis (Levshina, 2015).

Moreover, the dialogical performance in the role-play in time prior and after the intervention was compared. We took into consideration the number (token) of lexemes used in the role-play as well as the number and length of communication-exchanges. All the mentioned categories did not show any significant development in the time prior and after the intervention in any of the groups. Merely word type changed in time after the intervention: students used lexicon learned in the lessons contributing to lexical wealth and diversity in the dialogue. In other words, although the statistic shows low significance ($p = 0.831$), the intervention seems not to have generated quantitative transfer on the communicative and interactive performance of the students in the test situation. Indeed, the focus of the intervention was not directed on increasing dialogical competences.

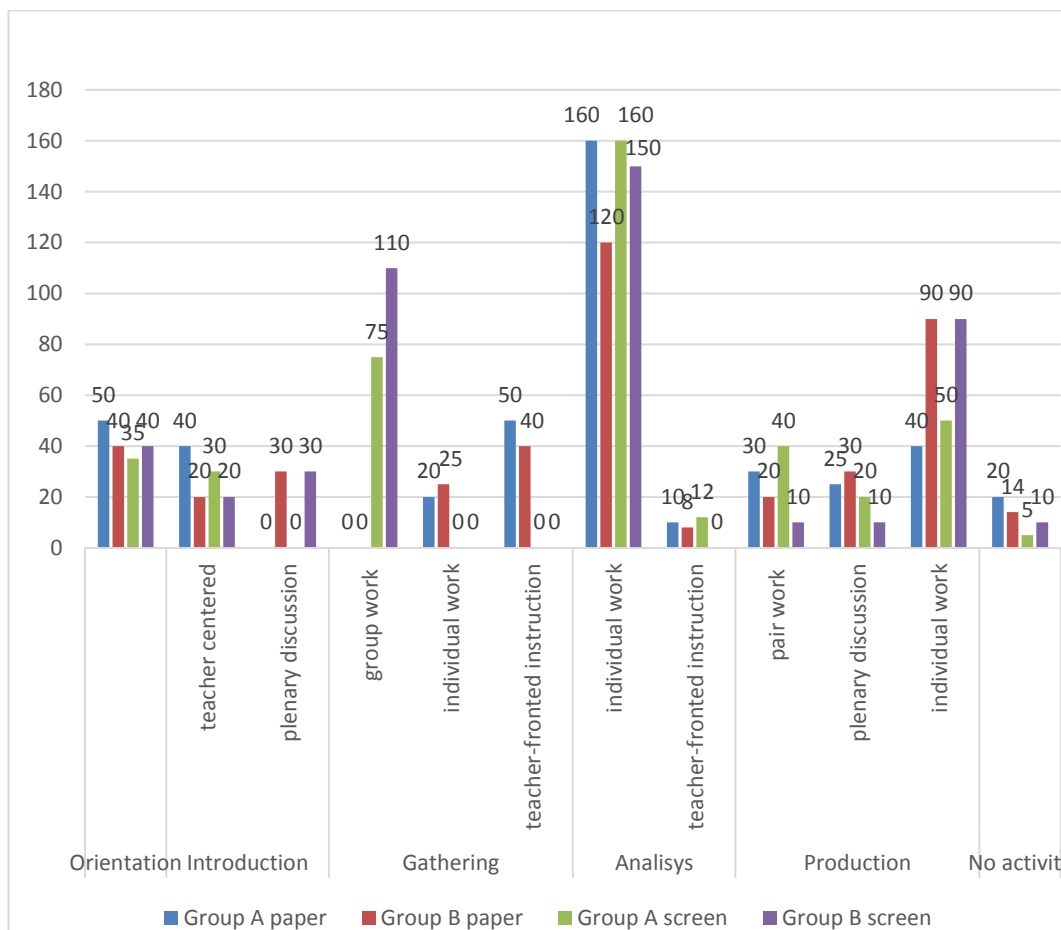
4.2. *Qualitative analysis of the lessons*

Results of quantitative data on learning of lexical items are in line with previous research on the effects of audio-visual methods (Hattie, 2009: 299; Edmondson, House, 2011: 117), proved to have a medium-low impact in learning. The following qualitative analysis will help to investigate the reason. Qualitative observations of the different phases of the lesson (Doff, 2012) noted consistent differences between the two teaching/learning settings under analysis.

⁹ P -value being significant if ≤ 0.05 .

The entire lesson time was sorted according to the following five parts: orientation, introduction, gathering, analysis, production- and no didactical activity. In the following description, I focus on the time dedicated to each part and their didactical arrangements, as illustrated in the bar graph below.

Graph 4. *Part of the lessons and their teaching and learning setting in*



The orientation part, considered as the initial welcome phase of the lesson, did not show language didactical differences in time and modality in none of the groups.

As for the paper supported teaching-learning setting, the introduction part (considered as the warming-up phase to recall previous students' knowledge about a topic) saw groups with paper-based text introduced to the topic either with a short plenary discussion heavily led by the teacher or by a teacher monologue. Afterwards, in the gathering part students were asked to read the text. In three times out of five (in the text about the mafia, the immigration and the Sicilian historical background) the teachers led the reading phase with a reading aloud strategy alternating students' reading with in-plenum-explanation of words or sentences. In the other two times (in the texts about Sicilian geography and street food) teachers opted for a silent reading preferring a more autonomous learning setting. In the latter, students were informed before the reading started about the different exercises and activities they had to complete after reading in different working stations; students could individually decide how much time they have to spend in the reading and in each workstation. In the times in which teachers decided to lead the reading phase, students were engaged in the text understanding for 15 minutes on average, twice the time

dedicated to the text if read alone¹⁰. In both cases, in the reading aloud with the teacher and in the reading alone strategy, students underlined some text passages and rarely took notes.

The analysis part demanded the longest time slot of the lesson, mostly organized in individual written filling of worksheets. Completed sheets were collected in a file to deliver and be evaluated in the end of the five lessons. In the production part, teachers engaged the students in different activities as a written task, or a dialogue to present in class or a plenary discussion. Finally, the time as short pauses or phases of general distraction were recorded as “no didactical activity”. No particular differences dependent of the media type were founded in these last three parts.

Media dependent differences in the time and learning-teaching setting could be found only in the gathering part. Contrary to the groups supported by paper, teachers did not intervene in the gathering phase while students watched the videos. Giving the fact that only 2-3 screens were available per classroom, sometimes students had to show the videos in large groups (up to six students). Sometimes teachers organized classwork differently so a lower number of students (2-3 students) could watch the video together, while other students were engaged in other activities. In the first times students were exposed to the videos, they first watched it “passively” and had to re-watch it a second time in order to take notes (Ebel, 2018: 34). Later on, students reduced the time dedicated to the first passive watching and took quicker notes. Contrary to any expectation, students took high quantity of notes in their own notebooks. Often they preferred transcribing entire sentences or even paragraphs listen in the video, especially the parts they assumed to be important for the exercises they could not totally understand nor memorize. In many cases, students wrote down the listened text as they were writing a self-paced dictation, stopping and writing down repeatedly. Since students had to share the screen, they started negotiations about when they should stop and replay the video to better take notes. Alone in those interactions, students shared important interpretations about the meaning of each statement and its importance for the entire understanding of the text. Interactions and negotiations during the gathering part in the groups supported by video were common in both screen-groups even if more evident in the groups B.

An analysis of the time dedicated to the gathering-phase can give insights into the different intensity of interaction: Students who worked with the text on paper¹¹ dedicated 13'.30" reading each text, while the students who used the screen were engaged on average 18'.20" in each video. The longer time dedicated to gather information from text by itself is not enough to justify different performances in the vocabulary test. Indeed students approached differently the work sheets in the analysis part. One common strategy used by students taught by paper in the analysis phase was to work with the text on paper and quickly scan it seeking for required information. Once they found the requested information, they elaborated statements partially transcribing utterances of the original text. In contrast, students who worked with the video could not go back to the screen: common strategies were recalling lexical items in their memory or searching through their notes. In both cases higher cognitive elaboration and cooperation was demanded. Solutions of the worksheets with help of students' notes provided a positive learning experience in students boosting their self-efficiency perception. Such methodology is probably responsible for promote the acquisition of lexical items based on personal elaboration of information (encoding), storage and retrieval of information for the use in a new setting (Brown, Roediger, McDaniel, 2014).

¹⁰ The reading alone activity resulted in different reading times. The time was calculated on the core group of students.

¹¹ Group A paper and B paper as well as Group A video and B video are considered together. Moreover the reading-alone and the reading aloud setting are summed.

5. CONCLUSION

The current study shows results of an experiment on the lexical learning in classes of Italian as heritage language in Germany along two different media (paper and video). Students taught through a video screen-supported setting showed a better, albeit slightly significant, learning development. The use of the media deeply conditioned the time and the manner students spent in gathering information from the text: in the groups taught by screen, students spent longer time in the gathering phase, adopted autonomously-selected learning strategies (taking notes and self-paced dictation) and underwent a multi-modal-elaboration (from audiovisual to hand written). At first sight, it seems surprising that the media might deeply condition the way students reuse the lexicon in the analysis of the text since students in the video classes have to rely more on their own efforts (via notes or memory). Through a deeper analysis, however, the effects of media on learning outcomes are less clear than the significant manner in which they shape teaching and teachers.

The different retention capacity between a written vs audiovisual input can also be clearly identified. Since many heritage language learners have a nearly native competence in the oral reception but lack competence in written skills, a more accessible input by video can help them gather and elaborate information, and finally perform better in the retention of lexicon.

As critical points, one can see that the investigated population was low and some results are not significant. Results in the way students collaborated in the gathering phases negotiating in a large workgroup the pace of vision, demonstrated a high openness to cooperation and empathy, which can vary based on the group composition and cohesion as well as of teachers' attitudes. Nevertheless, the data are in line with established results on the impact of technologies (Calvani, Vivanet, 2014; Clark, 1994) confirming the following big picture:

1. If the control on the medium is in the hands of the learner, the learning effects are more consistent (Hattie, 2009);
2. Multi modal reiteration (listening-writing-rewriting) boosts learning;
3. Methods affect the learning enhancement more than technologies (Clark, 1994; Hattie, 2009).

This contribution presents the first set of preliminary data of a larger empirical investigation on HSU Classes. Further and deeper quantitative and qualitative observations regarding motivations and correlation between intervention and lexical development are under analysis.

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