ICT and Critical Thinking: a Multifaceted and Integrated Process in the English Language Learning (ESL)

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Abstract

The increased complexity of our world today calls for learners' active knowledge construction and collaboration in the learning process, as opposed to traditional approaches based on the assumption that knowledge is transmitted from teacher to student. Accordingly, YouTube, in parallel with Moodle forums, emerge as new learning environments, fostering a multifaceted and integrated process consistent with young digital natives' profile and the challenges demanded by a knowledge-based society.

A case study was conducted in English as a second language (ESL), involving eleventh-grade secondary education students in formal and non-formal learning environments, offline and online. The research focussed on the educational value of digital video and Moodle forum discussions and their effective contribution to a meaningful and in-depth learning, aiming to develop critical thinking skills.

First phase results showed that not only were a vast majority of learners not aware of many of the skills involved in critical thinking, but clear intellectual standards inherent to disciplined and critical thinking did not govern them as well. Final results showed major differences regarding learners' achievements, indicating that YouTube and Moodle have promoted the development of critical thinking in English (ESL).

In this paper we present; a) theories that support the integration of digital videos for developing essential skills to the learning process; b) new insights into the way foreign language may be processed; c) methodologies with YouTube and Moodle in the educational context.

1. Introduction

Transformations taking place in the socio-cultural scene throughout recent decades, associated with the impact of digital technologies and the transition to the Knowledge Society, call for a radically new approach to education and training. The continuous acquisition of knowledge and competences is essential not only for enjoying the benefits of the Knowledge Society but also for responding to the challenges of and active participation in this society. So it is of paramount importance to alter the assumptions on which the logic of the educational system is based by modifying attitudes, welcoming innovation, redefining and diversifying concepts and methodological practices, namely in command of the English Language (ESL), considered an essential competence today given its privileged role as the language of international communication [1].

The integration of information and communication technologies (ICTs) at school - aligned with the adoption of active, student-centred methodologies and viewed as means to better learners' thinking, collaboration and communication - is regarded as a response to the desires and aspirations of our young people, who perceive education as a way to learn what they need for tomorrow [2].

2. Theoretical Framework

The pedagogy of this project takes as its philosophical base a constructivist perspective. The emphasis is placed on the cognition, reflection and construction of knowledge on the part of the student, who should adopt a profound and meaningful approach to content in an atmosphere ruled by collaboration, interaction and mediation [3]. In this context the student takes possession of the process, by learning through problem solving experiences, "following the natural human inclination to learn more" [4] and acquiring the consciousness of the importance of meaningful knowledge in the Knowledge Economy.

Underlying the project work is the Integrated Thinking Model proposed by Jonassen [5, 6]. It integrates different competences to be **developed** in this project with the help of videos selected from *YouTube* (critical thinking). In a later phase these competences are put into practice with the creation (creative thinking), publication and sharing of digital videos on this *website*. The learning activities are carried out in English as a Second Language (ESL).

Digital videos and *online* discussion forums are used in the project as cognitive tools, as they help, promote and extend thinking. The development of competences and their transference to new situations in order to construct original ideas, solve problems and take decisions, is provided by these tools defined by Jonassen [5] as *mindtools*.

Learning is approached as a "way of thinking" - a system of integrated thinking - which mobilises competences of elementary thinking and gradually develops competences of critical thinking. Systematically, complex and higher processes oriented towards an action are developed, namely autonomy, independent thinking and collaboration in the solving of problems, the taking of decisions and the conception of new ideas [6]. This line of action implies the critical development of the competence of communication and the competences that interact in its acquisition: general competences (knowledge, know-how, existential competence and ability to learn) and specific competences (linguistic, pragmatic and socio-linguistic). In this sense, the students learn to collaboratively question, investigate, reflect, evaluate, analyse, argue, share and construct knowledge and above all to think clearly and intelligently about problems, objectives, priorities and new challenges that they come across in their everyday lives, at school and, in a near future, in their professional careers. The critical use of the competences of Language Use (listening, reading, writing and speaking) – guided by the intellectual principles that govern disciplined and critical thinking [7] - become essential in the Knowledge Economy in which young people emerge as the main representatives of "Europe's main asset" [1].

3. Project implementation

3.1 Context

This case study took place in a Secondary School in Portugal and it involved two 11th grade classes (H and I) with 42 students aged between 15 and 17 years; learners worked in groups of 3 or 4 elements. The project was developed within an English learning environment (ESL). Taking into account the national curriculum, the areas of reference selected for the study comprised "Our World" in the first phase and later on "The Multicultural World." In the development of the project work, the students self-evaluated themselves in three general competences using three levels: N1 – elementary; N2 – intermediate; N3 – autonomous or adequate operational proficiency. The self-evaluation of the

students was agreed later on with the supervising teacher following the Common European Framework of Reference for Languages guidelines (CEFR) [8].

3.2 Activities

A diagnosis was made in the first phase concerning the competences of critical thinking as well as the competences of the Use of the Foreign Language (English). Learners wrote reviews and debated themes just like "organic food versus genetically modified organisms" in groups after viewing and discussing *YouTube* videos, such as "Grocery Store Wars".

In the second phase, which is described in this article, the students developed their critical thinking with resort to selected videos from *YouTube* and worksheets produced by the teacher, (and readjusted in the classroom) while constantly discussing the theme and the process in forums using a Moodle platform. The relevance of meaningful learning [9] and in-depth knowledge implied that students should carry out various versions of their work, through thinking and re-thinking, completing and modifying. The new versions of work that resulted from this reformulation would continue until the work was complete

The third phase of the project, which includes the creation and publication of videos on YouTube (creative thinking), will not be reported in this communication, despite it being mentioned occasionally.

3.2.1 Development of competences and sub-competences of critical thinking

3.2.1.1 Evaluating information

The first sub-competence in evaluating information – **1. using a foreign language during the carrying out of activities** – was integrated jointly with the sub-competences proposed by Jonassen given students are aimed at developing competences in the Use of English Language (ESL): listening, reading, writing and speaking.

With respect to the second and third sub-competences – **2.determining appropriate criteria for selecting two videos bearing in mind the functional characteristics of *YouTube* and 3. establishing priorities, selecting only one of the two videos in accordance with the previously determined criteria or adding other** – learners showed difficulties in understanding what "criteria" meant. Some groups used random criteria to select their videos, without any rigour, relevance or logical accuracy, as for example: *debatable information; shared information; viable information; interesting information*. Evidence confirmed the need to stipulate a set of pertinent criteria bearing in mind the specificity of each one of the videos. For this reason they turned to the functionalities of *YouTube*, which operated as an intellectual partner, i.e., the title of the video/comments/ratings/statistics pointing out useful/relevant information; the video publication date indicating if information was up-to-date, honours/category indicating the (un) reliable source (…).

After understanding that the selection of any type of information be it textual, graphical or visual derives from the establishment of criteria that helps to evaluate information, learners focussed themselves and started to **research and select videos from the site**, which constituted the basis for their meaningful learning [6]. The students repeatedly watched and **listened to** the videos attentively, negotiated, took decisions and reached a consensus about their choices. Next, they **read** and selected small texts/phrases contained in the videos, inquired, speculated, **took notes**, **discussed** and justified opinions, solved problems and **interacted** using the foreign language and/or their mother tongue (L1), while setting in motion their previous knowledge at the cognitive, linguistic, discursive and socio-cultural levels related to the activity that was being carried out.

Learners pointed out criteria for the assessment of their videos, based not only on the functionalities of *YouTube* but also on researches done online (relevant background information) or on criteria they considered important (music, humour).

It is to underline that the groups selected their videos bearing in mind the specificity of the content. Nevertheless, the updating of information (recent/current information) - of vital importance according to Siemens [10] – was a criterion established by them spontaneously.

There were groups that pointed out the criterion correct information (from sub-competence 2), however, they did not mention any reason. In informal chats with the groups in question, they supported the establishment of their criteria by claiming a common-sense approach. Having read activity **4**. present in the worksheet – **4. recognising fallacies, manipulation, partiality, errors and inaccuracies in the content of the video and assessing the arguments/facts presented by researching credible sources online** – learners added this criterion assuming that the information was authentic without presenting any conclusive evidence.

Concerning this sub-competence, some groups - after researching online, looking for the veracity of their information in credible sources - concluded that there were inaccuracies in the information contained in the videos, either because they were parodies or because they contained errors or even more because they were fallacies. In spite of these inaccuracies, some videos were considered a good work material, because they contained information considered relevant.

There were groups that - after having understood the importance of truthfulness of information and credibility of the sources – showed all their energy and commitment. Among these, one group stood out managing to contact (via electronic mail) the producer of the video they had selected from YouTube, a student from *Penn State University (Pennsylvania, USA)*, with whom they debated the content of the video.

Others researched about the sources but continued not to confirm their credibility by recording on their worksheets information like: "*the author of the video is a renowned businessman, who is in Facebook;*" "*the source of the video is a popular, respected American programme.*"

Considering the groups that defended the common-sense approach, some pointed out "*this information is known and accepted by everybody" or "it does not have errors nor inaccurate information.*" One group demonstrated stubbornness and assertively declared their opinion, which paid respect to this aspect; the group opposed and refused to accept the superficiality of their thinking [7] and did not reformulate their work, which concerned this step. The group was closely and frequently guided in order to combat their subjectivism - an attitude understood as impeding critical thinking. Although the group had not improved their performance this time, they ended up being aware of the barriers to critical thinking (7).

One group distinguished itself, because it selected a video about the defence of Israel, as a non-segregated society, and originally decided that the information contained in the video was trustworthy, since the first part presented real facts about *apartheid* in South Africa and a second part appealed to authority by citing notable figures such as Nelson Mandela, ministers, parliamentarians, judges and the Organisation of Human Rights, making use of relevant and persuasive arguments. The students, who showed a lack of previous knowledge at the socio-political level, when questioned in Socratic terms, once again debated the subject in their group. In this discussion the attitude of the most competent member stood out, as this student did some research online and selected the most relevant information from different sources, using principles of clarity, accuracy and fairness of thinking [7]. Straight away they came to the conclusion that the logic defended was not applied in practice, which showed the video to be a very well constructed fallacy that - in its own terms - perfectly illustrated the famous quotation of Plato "Arguments, like men, are often pretenders." For reasons stated, the group resolved to explore the video in question by producing their final video in the same way to mislead their audience (their colleagues and YouTube viewers) with a fallacy that was deconstructed right afterwards.

Some groups explained that - not having encountered arguments/facts that would substantiate the veracity of the information contained in their videos – they paid attention to the credits that went with the videos, researching online and verifying that the sources of production were credible: PSA (Penn State University), *Interscope Records/UMG* (Universal Music Group), SICSR (*Symbiosis Institute of Computer Studies and Research*).

Even so in an attempt to evaluate the facts presented, some groups took great pains in their research and found some information that served as a base for the videos selected by them, as for example, information contained in the *Equality and Human Rights Commission website*, which is presented in the video *Anti-Discrimination Advert*.

3.2.1.2 Analysing information

Regarding the first sub-competence related to analysing information – **1. using a foreign language during the carrying out of activities** – it was noticed that in the set of four groups that frequently used their mother tongue (L1) when speaking among them, one group began using English to express themselves and only resorted to L1 from time to time. With regards to the second sub-competence – **2. identifying and relating the main ideas contained in the video** - the groups identified the ideas but showed some problems in understanding how the ideas related. Considering the third sub-competence – **3. finding a sequential order in the organisation of the ideas** – despite having carried out three versions of their work, one group was not capable of finding a cohesive and coherent sequential order in the organisation of the ideas. Finally, respecting the fourth sub-competence – **4. identifying explicit or implicit purposes**, three groups achieved N1 in their first version and N2 in their second version, because, on the one hand, they were capable of summarising the ideas carried in the video, while, on the other hand, they did not indicate clearly the objectives of the video and they were not capable of untangling and specifying non-explicit information.

3.2.1.3 Relating information

Two sub-competences were more difficult to carry out when developing this general competence: **compare/contrast events** and **infer information**. Considering the first of these, it could now be confirmed that uncritical thinking is vey common among people. In fact, the group of students that at the very start of the process rejected to do online research on credible sources to support their arguments, finally became aware that their first assumptions, which were based on the "pseudo-obvious" and common sense of the type "this *information is known and accepted by everyone,*" lacked foundation and were no more than the result of conformism. In the development of this sub-competence, the students realised the need to research relevant background data in order to relate information and improve their work. Putting it another way, as declared by Albert Einstein, "The significant problems we face cannot be solved at the level of thinking we were at when we created them".

In parallel, a more meticulous attitude was observed on the part of a limited number of students, particularly among group D of class H (topic: *Apartheid*). The group paid more attention, accepting or rejecting different arguments and conclusions presented by various thinkers and analysts on different sites and always looked for credible sources.

In other groups, one could notice learners' difficulties in finding new information to compare or contrast with the information already collected and evaluated. After (re) watching the videos with redoubled attention, the groups continued doing some research online and finally recognised valuable information that led to distinct interpretations about the world surrounding them: information concerning racial nature (Blacks/Caucasians), religious beliefs (Catholicism/ Hinduism) and politico-social issues (the Israeli/Palestinian conflict; British National Party/Hope not Hate campaigns) were, among other topics, examples of their activities.

It was assumed that their research could not only provide an opportunity for discovering and knowing (declarative knowledge) but also to draw inferences. However, the sub-competence **infer information** revealed itself as one of the more difficult for students. If, on the one hand, infer from non-explicit information was difficult for the groups, on the other hand, infer from images, silences and rhythm were exercises that got them involved.

An example of success was the construction of knowledge shared by group C - class I, which analysed the video: "*Black Eyed Peas – Where Is The Love?* The group did made every effort, watching the video step by step, deepening their understanding and relating three situations illustrated in the lyrics to three articles of the Declaration of Human Rights. Similar to this was the case of group F from the same class, who established a parallel between the information carried in their video: "*Stop Discrimination*" and Articles 1, 7 and 29, sub-sections 1, 2 and 3 of the same declaration by justifying each one of the situations in their own words.

In the third phase of the project, as already mentioned, the students have developed their creative thinking by producing videos that have been published and shared on *YouTube*.

4. Results

Qualitative and quantitative data collected throughout the implementation of the project, show a significant result concerning the development of learners' critical thinking, which involves their ability to solve problems and take decisions. In this respect the quantitative data points to a success rate between 57% and 71%.

Learners' main difficulties resided in the following sub-competences: determining appropriate criteria for selecting of information, evaluating the truthfulness of information and the credibility of the sources, relating ideas, identifying purposes, comparing/contrasting and inferring information.

The number of versions carried out by most of the groups (three versions) indicated their awareness respecting the need to enhance their knowledge, guiding themselves by the intellectual principles that govern this form of thinking. However, the undertaking of various versions until they reached the desired level showed itself to be the most difficult and unthankful part of the work, as testified by the students in the forums. This fact emphasised the difficulty that the students initially had in deepening their knowledge and reflecting on what they did and tried to construct, obliging them to think and re-think, doing things again, adding and/or retracting ideas, rearranging and re-writing their work.

Progressively, the students started to reflect about their difficulties as thinkers by questioning themselves critically about these aspects. Apparently, this consciousness helped to strengthen the thinking processes of a majority of the students, who gradually cultivated an attitude of curiosity and the willpower to expand their perspectives and to augment their knowledge by devoting more of their time in a non-formal atmosphere in order to carry out their activities. Nevertheless, a body of the students (three groups) - regardless of their difficulty in expressing themselves in the foreign language, particularly regarding oral production and interaction - did not make concerted efforts to augment their knowledge, this showing intellectual laziness, a reluctance to question conventional knowledge, lack of curiosity, conformity and haste to finish.

Apparently these young people 8similarly to the great majority when not guided) followed their own nature, having speed, immediate responses and a lack of rigour or superficial thinking prevailed, to the detriment of their search for the truth, careful observation, logical correctness, fair and deep thinking [7]. An exemplifying situation was the attitude shown by the group that selected the previously mention video "*Is Israel an Apartheid State?*" It is possible to confirm that the students read the information rapidly and did not watch or observe attentively. Neither did the group give any attention to the video credits "*Produced by Darrik* defendingzionism@blogspot.com" nor did they research about Zionism

and the Israeli-Palestinian conflict. If, on the one hand, they have selected information related to World Politics and History, showing they felt moved to these subjects, on the other, the aforementioned opinion of Bauerlein [11] is confirmed regarding their lack of knowledge, despite their easy access to it through information and communication technologies, always at their disposal. Most students also showed lack of initiative for evaluating dubious information or distinguishing between facts and fiction, an idea opposite to Tapscott's [12]. Yet, they showed themselves to be receptive, open-minded and mature enough [13] by deciding to choose such a theme, focussing not only on the content but also on the fallacy in itself, thus affirming the *customisation* peculiarity mentioned by Tapscott [12].

Learners' testimonies, conveyed in the final forum, gave account of how a great majority of them, were not alert to the verification of information or the sources of information, which contradicts Tapscott's assertion [11] "Net Geners are the new scrutinisers".

Only in two groups was an opposing situation noticed. In fact, only seven students verified from the very start of the project all the data in the videos they had selected, thus corresponding this behaviour to the beliefs of Tapscott [12] "The Net Generation knows to be skeptical whenever they're online. Trust but verify would be an apt motto for today's youth."

Similarly - from the point of view of the majority of the students expressed in the final forum - the rapidity and carrying out of various tasks at the same time could not be compatible with the intellectual principles that govern critical thinking. Nevertheless, a minority defended the absence of this incompatibility.

5. Conclusion

Developing critical thinking competences while creating innovative products can constitute an appropriate methodology according to different authors, who defend the use of digital video as an alternative approach. However, in the first phase of the study, a large majority of the students were proved not to recognise many of the competences and sub-competences incorporating critical thinking [6] and they were not governed by intellectual principles inherent to disciplined and critical thinking [7]. On the other hand, their frequent preoccupation with the final product to the detriment of the process, giving technical aspects more value than to the content itself, leads to superficial learning. Aside from this, both immediacy, multitasking, the tendency for processing information rapidly and the assertion of view points often sustained only by common sense were found not to be compatible with effective in-depth knowledge, creation of meaning and development of a higher order thinking. The development of thinking competences involved in the understanding and representation of knowledge is a slow process that demands time and implies the clear definition of objectives and guidance that needs to be carried out throughout the different phases.

Bearing in mind the above views, first comes the need to carry out activities aimed at the development of critical thinking competences, by working on the general competences and various sub-competences so as to learn to think for oneself "how to think", and only afterwards put this knowledge into action while developing creative thinking and more advanced processes oriented to a higher-order-thinking.

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