El fomento del pensamiento crítico a través de la modificación de verbos interrogativos en actividades de escritura: un estudio

Promoting Critical Thinking through the Modification of Questioning Verbs in Writing Assignments: A Study

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Resumen: Este estudio propone un objetivo doble. Por un lado, un análisis del pensamiento crítico y su aplicación a través de la escritura en alumnos de 3º de la ESO Para ello, se modificó el lenguaje de las preguntas de escritura del libro de texto. A continuación, se implementó una unidad didáctica que destaca la importancia del pensamiento reflexivo para el desarrollo de textos más ricos. Por tanto, el objetivo del estudio es la modificación de verbos de susodichas preguntas por otros en niveles altos de la taxonomía de Bloom. Esta información se recogió a través de observación, cuestionarios inicial y final, y una unidad didáctica con actividades de escritura evaluadas.

Palabras clave: Pensamiento crítico; Composición; Taxonomía de Bloom; Motivación del estudiante; Preguntas/ Enunciados.

Abstract: **The aim of the present study is twofold. First off, an analysis regarding 3rd ESO students' critical thinking application was procured from their performance from a piece of writing. To promote critical thinking, modification of the language of questions in the course book was purposely executed. This was then followed by an implementation of a whole Didactic Unit designed to enhance the role of reflective questions in the creation of more complex writings. This language modification was erected through the use of verbs contained in Bloom's taxonomy higher orders. The changes that led students to write longer texts or express more elaborate ideas are also addressed. The data was collected via observation, pre and post questionnaires, and writing assignments.**

Keywords: **Critical thinking; Writing; Bloom's taxonomy; Student motivation; Questions.**

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Introduction

"I think, therefore I am". Just as accurate as that. Descartes' most iconic and forever lasting quote stresses one among the many and most relevant functions a human being never stops: thinking.

The meaning behind the assemble of letters for "thinking" is often notably understood and conceptualized by almost every reader. Ever since early ages, parents raise their children around the exercising of thinking to survive, succeed and achieve goals. Thinking then has turned to an almost innate and unnoticeably performed reflex. Yet still, what is indeed meant by the word thinking? And, in any case, how does critical in the expression critical thinking relate to thinking? The Oxford Dictionary refers to thinking as [1] "the process of considering or reasoning about something" or [2] "a person's ideas or opinions". Considering these, thinking may be reasserted as a natural process; a natural process by which people assess possibilities and how to proceed in a variety of given situations, be them either expected or unexpected.

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Nonetheless, when thinking is matched to 'critical', a re-consideration of the expression might be done (Caroselli, 2009). In these terms, critical thinking has been an issue extensively subjected to study by many researchers who have devised different ways in which defining 'critical thinking':

> Critical thinking is the use of those cognitive skills or strategies that increase the probability of a desirable outcome. It is used to describe thinking that is purposeful, reasoned, and goal directed to the kind of thinking involved in solving problems, formulating inferences, alculating likelihoods, and making decisions when the thinker is using skills that are thoughtful and effective for the particular context and type of thinking task (Halpern, 2003: 8).

According to Halpern's (2001), when a person is told to think critically, they will presumably need to make use of cognitive skills or strategies in order to acquire an expected result. This idea of individuals using their cognitive skills is not unique to Halpern but also to Dr. Evelyn Bean and Mr. Houston Markham (2008: 6).

Further on this, taking the stance of 'thinking' as an innate capacity humans have, a great amount of thinking is done for humans as babies. It is indeed parents who are in charge of deciding what is best for their children. Only at the point where human beings reach the adequate age, do they start acknowledging their surroundings.

By then, the process of thinking is in its course to full development. Thinking will be engraved in simple actions such as choosing a certain toy to play with. Hence, 'thinking' is so far at a considerable distance from procedures or actions that would rather involve high complex-thinking (Fitzgerald & Baird, 2011).

What's more, critical thinking cannot be assumed to developed individually solely or as if by magic. It needs specific training (Halpern 2001; Walters, 1990). To make matters worse, the result of such 'training' in assorted scenarios –say a classroom, may lead to considerably unpredictable outcomes. In plain, this may go hand in hand with the views of experts such as Global Sociology, who contend

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that critical thinking is just not naturally generated but instead requires the intervention of further agents (Monnier, 2010: 1).

On these grounds, the school stands out as one of the cornerstone agent of socialization. Yet, although meeting new people, mingling, conversing or developing relationships make children move forward cognitively speaking, there is as much veracity too in affirming that without the teachers' job to provide them with opportunities and guidance, students would fail to develop thinking skills adequately.

In light of this, teachers are to be conceived as the ultimate figure in charge of making students ready to get by on their own. Throughout the years, the role of a teacher has been evidently and many a times forcefully accompanied by that of a common utensil: a book. It is hard to imagine a teacher without a book in hand these days.

In spite of the prominence stamped upon critical thinking throughout these lines, as observed through correction of writings, it is still the case these days that critical thinking encounters severe contrariety in the classroom.

The main obstacles seem to be the approach or standards upon which books are generally manufactured[1]. Whether this study has specifically featured a sole manual, *Interface 3* by the editorial *Macmillan*, it may come as no surprise to find at a very quick, heartbeat looks at any 3rd ESO manual for Spanish students of English that they throw no or almost none critically demanding questions. In essence, this means that in search of Bloom's high-order questions –questions where students are invited to develop longer texts by the insertion of cognitively harder engaging verbs, the final count would barely reflect any.

Questions in *Interface 3* –and likely alike manuals, appear similarly uttered, as if massively produced according to rigid and non-negotiable patterns. Typically, the usual protagonists are short sentences

[1] This study only analyzed the book *Interface 3* by Macmillan.

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featuring simpler verbs, as in: *Have you ever been on a long journey? Where did you go?*

While in other countries such as United States teachers and books endorse critical thinking as a major competence for personal growth (McPeck, 1981), the books used in Spanish academic environments, yet more specifically there where *Interface 3* is used, did not appear to provide with these opportunities. Reasonably, this circumstance is quite obviously produced by the way questions are worded, formulated, constructed. *Macmillan* makes sure to include questions with simple and task-simplifying yet redundant and creativity-limiting verbs such as *describe, tell, answer,* etc., with little or no room for imagination and freedom.

For all the above-mentioned, this study aims at first, demonstrating that students prone to compose longer texts when the questions are longer and have more "complex and/or reflective verbs and language". This last is to be done basically by changing the whole wording of questions, making them more reflective and demanding, through the use of questioning and high-order verbs in Bloom's Taxonomy (see *Methodology*).

Last but not least, the second and last aim is to start a debate on whether books in general by extension but specifically *Macmillan's Interface 3,* could improve their questions to motivate students. In this section a point is made towards taking action through Bloom's taxonomy.

1. Literature Review

1. 1. The relevance of thinking critically: reasons for 'critical thinking' instruction in high school classrooms

Over the last few decades, academically speaking and critical thinking has acquired major importance (McPeck, 1990; Guichard, 2006; Cuseo, 2013;). Many are the studies that have addressed discussion on its relevance for students who ponder whether pursuing

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university degrees (Halx and Reybold, 2006; Gadzella, Ginther & Bryant, 1997). Yet, judging critical thinking as a skill reserved for those students planning to go to college would be utterly erroneous. Because, ultimately, it oozes maturity and independence (Paul *et al.* 1990; Tsui, 2002). According to Elder (1999: 4):

> There is nothing more practical than sound thinking. No matter what your circumstance or what your aim, you are better off if your think is sound. As a shopper, teacher, student, business person, citizen, moral agent, lover, friend, parent- in every real and circumstance of your life good thinking pays off. Poor thinking inevitably causes problems, wastes time and energy, and ensures frustration and pain.

The importance of –sound– thinking does not only have a bearing on students yet on anyone stuck in life, regardless their circumstance. It is in these terms that Elder refers to 'sound thinking', a terminology that goes hand in hand with sheer critical thinking (1999: 4):

> Critical thinking is simply the art of ensuring that you use the best thinking you are capable of – in some set of circumstances and given your present limited knowledge and skill. […] If you play tennis, and you want to play better, there is nothing more advantageous than to look at some films of excellent players in action and then compare how they address the ball in comparison to you. You study your performance.

Although critical thinking should or may not be considered a 'high school-centered' skill, academics and researchers have lately established no disagreement that in spite of that, it should certainly be one of the main concerns in high education, to regard it even as a mandatory one (Halpern, 2001). Along the same line, Tsui (2002) underscores the value of high-order cognitive skills leading to Bloom's taxonomy (2002: 740):

> Higher-order cognitive skills, such as the ability to think critically, are invaluable to students' futures; they prepare individuals to tackle a multitude of challenges that they are likely to face in their personal lives, careers, and duties as responsible citizens. Moreover, by in-stilling critical thinking in students we groom

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> individuals to become in-dependent lifelong learners-thus fulfilling one of the long-term goals of the educational enterprise.

This widespread and well-known scholastic phenomenon of critical thinking does not seem to have a correlation in 'the practice' however by for instance taking account of the cases of the United States or Canada. The issue of implementing 'more thinking' in schools of Canada and United States has long been subject to a debate that still wags its tail. In words of Zascavage *et al.* (2007) and Clark, (2009), putting 'critical thinking' into practice goes for sure down the line of enrolling undergraduate institutions and studies, yet however, it may be as well of resort and usefulness once an adult, in areas as common as looking for a job. Extrapolating this notion to the Spanish context, this was thought relevant enough as to be included in the educational law passed under the name of *LOMCE*, in 2013. New competences, or arguably the title of *point six*, '*sentido de la iniciativa y espíritu emprendedor'*, accounts for it.

For Tsui (2002), despite that Americans are nowadays more educated than ever before, the input they are presented with in American classrooms go in the direction of 'subject matter content coverage'. This, again, clashes with the unavoidable loss of enabling and allowing students the time and resources to acquire other skills (2002). In the same vein, Halpern (2001: 270) argues that "there has been a growing trend among colleges in the United States and Canada to require all students to fulfill a requirement in 'critical thinking' as part of their general education program.

On the other hand, interesting debates on critical thinking as a 'stand-along' subject or domain or in contrast, attached and embedded into other specific areas has also been brought to the front. As evinced by McPeck (1990) 'the thinking skills movement' has always had specific programs in the study programs[2][3]. These study designations essentially place the process of reasoning before content or what is

[2] McPeck makes reference to Feurstein's *Instructional Enrichment Program* (1978).
[3] Here McPeck cites De Bono's *Cort Thinking Lessons* (1974).

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pointedly taught, something that has been longed for years now in the US as well.

Be that as it may, finding a way around incorporating critical thinking into the study program to then put it to use is no *minutiae*. Yet, for a considerable amount of authors (Paul *et al.* 1990; McPeck, 1981, 1990), it's necessary that teachers get students ready to function as independent humans in the real world; a world which eagerly awaits their contributions. Producing autonomous thinkers is linked to critical thinking, a skill in need in the sense that humans are not just born ingrained with the required knowledge or skills to attain such goal.

1. 2. Is it possible to teach critical thinking? The relation between teachers and the textbook

In the lines coming next, a series of authors' theories on the relation teacher-critical thinking is put forth. A 'pairing' that still resonates as unclear and controversial for many.

To start with, Paul *et al.* (1990: 1) stand by the idea that critical thinking unveils assiduously and routinely in the life of adults but also children, namely in the shape of consuming, civism, and love or human and personal relations.

By attempting to generate opportunities to thinking nimbly in class, both students and teachers feel a gratitude that emanates from usefulness and success when duly applied. On these grounds, studies carried out by Tsui (2007) and others such as Pascarella and Terenzini (2005) agree that students experiencing critical thinking in their secondary education do better once they are in college, and that, additionally, there is substantial evidence to suggest that critical thinking can be enhanced by purposeful instruction.

Others nevertheless hesitate about the real and feasible outcome indexing that 'teaching to think' could somehow spawn any significant conclusions. In this degree, as Walton's experiments (2000) have proved, methods and techniques appropriately applied failed to show success in discovering a mechanism to solve the problem of getting

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advanced thinkers. Moreover, Van Gelder (2001) adds the problem that, as referred by Walton, many teachers suspect that their efforts make little difference therefore giving up to discouragement.

The other side of the coin have it that these latter negatively-resulted studies are the minority (Fitzgerald & Baird, 2011). In opposition, a great amount of scholarly work discloses positive outcome thus encouraging policy-makers and educators to continue in their efforts. In Pascarella's words (1991: 10):

> Evidence suggests that critical thinking can be taught, although the average effect is based on a rough estimate and is quite modest in magnitude. Students who receive purposeful instruction and practice in critical thinking and/or problem solving skills appear, on average to gain an advantage in critical thinking skills.

Pascarella, Zascavage *et al.* (2007) studies also echo the probability of succeeding in teaching essential critical thinking skills resorting to proof. This is to say, using goal-oriented intervention modules, students truly show an increase in critical thinking abilities[4].

Promoting critical thinking through practicing it in class is only a small piece of a larger puzzle. In brief, even by admitting that tests and research may be able to demonstrate the efficacy of teaching to think critically, the greatest walls or obstacles are believed to be the secondary school course books (Van Gelder, 2001; Elder, 1999; Paul, *et al.*, 1995a; Pascarella, 1991) and to a lesser extent, the way teachers approach critical thinking itself (Tsui, 2002; Paul *et al.*, 1995b).

Tsui (2002) takes in the issue from a more humanistic stance. For the author, teachers are lately teaching in a faulty way because "…rather than devote so much effort to teaching students what to think, perhaps we need to do more to teach them how to think" (2002: 740).

4 Zascavage *et al.* allude to enhancing *Critical Thinking Skills and Dispositions of Pre-service Teachers* by Kong and Seng (2004), *Teaching for critical thinking: Helping College Students Develop the Skills and Dispositions of a Critical Thinker* by Halpern (1999) and *Prediction of Performance in an Academic Course by Scores on Measures of Learning Style And Critical Thinking* by Gadzell *et al.* (1997).

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Paul *et al.* (1995a: 299) goes beyond that to hold that the origin of it all is undoubtedly the teachers themselves. This authors' perspective is in Paul's views, during their college training period, most teachers make it through their majors mainly by "learning 'the standard textbook answer' and were neither given an opportunity nor encouraged to determine whether what the text or the professor said was 'justified by their own thinking'. McPeck (1990) coincides that "the attitude of the teacher, and the learning atmosphere in the class, is likely to have real and important effects on the success of nurturing such autonomous thinking" (1990: 35).

The results of such poor practices are, in the views of Paul *et al.* of a resounding failure: "students on the whole, do not learn how to work by, or think for themselves. They do not learn how to gather, analyze, synthesize, and assess information" (1990: 339).

Further views on the topic involve as well other variables such as calls on supportiveness towards students building critical thinking, or how the hardships involved in producing complex is not about "simply checking a box" (1993: 243). Additional thought is put on the role of the teacher as a helper or facilitator rather than a 'doer', for they cannot interchange with the students and think critically for them (Cohen, 1993).

Last but not least, course books display other weaknesses to bear in mind and bring to the fore. Former investigation conducted by Paul *et al.* (1995a) in their *Critical Thinking Handbook: High School* disclose reveals that, for instance, different approaches to learning usually tend to focus on the same, a superfluous layer:

> Grammar texts, for example, present skills and distinctions, then drill students in their use. Thus, students, not genuinely understanding the material, do not spontaneously recognize situations calling for the skills and distinctions covered. Such 'knowledge' is generally useless to them. They fail to grasp the uses of and reasoning behind the knowledge presented to them (1995a: 299).

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Likewise, in Paul *et al.*'s (1995) view, the time devoted to elaborate reliable 'pure' thinking is a partially mistaken concept. This is also share by Paul *et al.* (1995b) who describe how scarce time is devoted to phrasing stimulating questions. Students are expected to welcome the knowledge passed on to them as in opposition to be encouraged to question what they see written or are told.

Students' personal points of view or philosophies of life seem to be considerably irrelevant in educative environments, possible due to the restrictive and constraining study program. Ninety percent of questions require no higher process or effort beyond 'recalling'. The content taught stands as dense and hasty and then typically followed by content-specific testing (1995b: 41). This is similarly depicted in Walters' (1990: 452) and Elder's *et al.* (1999), who deviates the attention from textbooks to strengthen literature, where critical thinking is to be ultimately found (1999: 4, 40):

> Textbooks typically pay scant attention to big ideas, offer no analysis, and pose no challenging questions. Instead, they provide a tremendous array of information or '*fact lets'*, while they ask questions requiring only that students be able to recite back the sample empty list.

1. 3. Bloom's taxonomy: Modifying the language and verbs of the questions

Figure 1
Bloom's taxonomy

Source: Sosniak, 1994: 1

Among the great problems that students experience in class is reportedly motivation (Freeman, Alston & Winborne, 2008; Schunk, Pintrich & Meece, 2008). Instead of thriving participation, students

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stand on the other side of the end, remaining silent or having fun while loafing around. To make matters worse, another problem that students commonly face is over repetition, where often what a teacher asks for is rather new ideas (Paul, *et al.*, 1990). This phenomenon, also known as 'boredom' leads to a misconception: students' apathy and lack of motivation. Paul (1989) holds the theory that far from that, students are just extenuated from drilling. In general lines, answers are much more driven by questions than by answers (1989: 33-43):

> Feeding students endless content to remember (that is, declarative sentences to remember) is akin to repeatedly stepping on the brakes in a vehicle that is, unfortunately, already at rest. Instead, students need questions to turn on their intellectual engines and they need to generate questions from our questions to get their thinking to go somewhere. Thinking is of no use unless it goes somewhere, and again, the questions we ask determine where our thinking goes.

As to enumerate other linguists who understand questions strength over reflection, Garrison (1991) underscores the weight of profound questions as the core of any good discussion, making them directly responsible for nurturing reflective thinking. Cohen (1993) adds up to Garrison's by enhancing a Socratic and self-critical perspective: students should be given the opportunity to define and value the nature of a problem and in the sequel, its solution.

In this regard, discussions in a higher education atmosphere have been proved to be limited to merely examining problems and solutions, thus missing the essence on how ideas are built. On the whole, as discussed by researchers, the fact that questions –and more explicitly verbs– shape and delimit the type of answers is beyond doubt. On this subject, experts (Tsui, 2007) agree that 'critical thinking' is irrefutably seen to encompass higher-order thinking processes that are by way of illustration shown in the higher orders of Bloom's Taxonomy of Educational Objectives (Sosniak, 1994: 1).

Likewise, Halpern (2001) reports results from a research that took place in Venezuela and United States. In such study, psychologists from both countries devised sixty lesson plans dealing with topics such

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as ordering and classifying events, verbal reasoning, problem solving, decision making, inventive and creative thinking. Last, they were handed out sheets with exercises that asked them to understand tricky language. Halpern notes that "results obtained from hundreds of students showed that students who received specific thinking instruction outperformed control subjects on standard tests of thinking skills." (Halpern, 2001: 278).

This evidence also matches Bean *et al.* (2008) figures. Articulated in their *A Mini-Guide for Teaching Critical Thinking* is how much of the information that a teacher gives can be set into the different levels of Bloom's Taxonomy regardless of adversities and *ifs.* Such is the case that they literally implement Benjamin Bloom's Taxonomy of learning "as a guide" (2008: 6).

For Zascavage *et al.* (2007) teaching to interpret and evaluate language, typically from questions, through the lens of Bloom's taxonomy for instance to undergraduate students might effectively raise their critical thinking ability. This instructing methodology based on Bloom's Taxonomy of Educational Objectives is not new nonetheless. Authors such as Tsui (2007) or Zascavage *et al.* (2007) had already looked at the popular categorization to measure thinking levels, thus proving a useful gauge.

As a matter of fact, Bloom's taxonomy profitability may go as far back as 1977, when Johnson managed to immerse students in an experimental training by which *Integrating Educational Theory and History* was born:

> Bloom's taxonomy proved to be a useful tool. […] The taxonomy did help to clarify objectives and sharpen the critical, analytical, and creative skills of the students. We felt the course worked and that the result more than justified our cautious optimism. Indeed, of the courses I have taught over the past ten years this was one of the most enjoyable and creative" (Johnson, 1977: 431).

With this in mind, a series of researchers called Benson, Sporakowski and Stremmel (1992) published an article called *Writing Reviews of Family Literature: Guiding Students Using Bloom's*

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Taxonomy of Cognitive Objectives in which they went through all the levels of Bloom's taxonomy breaking down one by one, providing helpful information about all of them. As proposed in the article, from an investigative perspective, and in connection with prior research, isolating each 'Bloom's level' in analysis may be compelling as to then implement on different activities in the classroom with a wide range of verbs (Tsui, 2007).

To conclude, Bloom's taxonomy has been used for other different means. And in some occasions some more practical ones. An example is that of Kastberg who in 2003 employed the so-mentioned taxonomy for high school students' assessment and grading (2003: 402).

2. Methodology

This study became an idea and was made possible only after several weeks of observation at a high school in which students of 3rd ESO were exposed to a great variety of work and tasks. A defined amount of time was also allotted to watch students' class behavior, writing patters, attitudes and overall performing observation. This would also typically involve monitoring attitude towards exams, participation, their role in class and so forth.

During this observational period, there were many instances where as an intern, I would go over the exams in detail in search of potential room for improvement, detecting minor flaws if anything that could 'ignite the spark' towards improvement.

After several weeks, it struck me that students were given little or no opportunity to either write long texts or express their ideas. Checking with them for the elementary reasons they did not, it was very much the case that they got the impression from the questions that they were asked to respond briefly. This, in my opinion, had long been originated due the language of the question. The next step consisted of revising a considerable meaningful amount of these exercises, where to

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my bewilderment it was made clear that students barely developed thoughtful long ideas, nor made lengthy compositions.

Besides, it was soon noted too that this was not an isolated fact uniquely common to exams *per se*. Exams handed by the teacher in class seemed to leave substantial gaps waiting to be filled with further creativity and thinking. Alongside exams, textbooks offered the same pattern repeated: a total lack or very small sample of high-order verbs prompting students to think creatively and critically, meaning no deep ideas and 'longer' compositions were expected or encouraged. What would happen otherwise, if students were stimulated by more complex verbs?

In this regard, the research questions of this project were:

- Do course books, and specifically *Interface 3* by *Macmillan* propose questions whose verbs and language stimulate students to write more –or longer- than usually?
- Would students compose longer texts if the language of these appointed questions was different -more profound or complex?

And thus, the consequent hypotheses:

- Students write longer texts when the language of the questions is more profound and complex.
- Using Bloom's taxonomy to replace 'Low Order Thinking' verbs typical of habitual course books and specifically *Interface 3* by *Macmillan* such as *describe* or *tell* by 'High Order Thinking' verbs such as *hypothesize* or *imagine* make students reflect more and think of more ideas, thus making longer texts also.
- Books, and concretely *Interface 3* by *Macmillan* as representative, do not enhance enough critical thinking as a direct consequence of disdaining higher order verbs

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thus making shallower questions to be answered by the student in no more than three lines.

As for other instances, the dependent variable of this research project initially was the amount of ideas that students managed to produce and write. With regards to the independent variable consider first Bloom's taxonomy and second the alteration of language, i.e. questioning verbs.

This research consisted of a sample of 16 of 3rd ESO (also known as compulsory higher education) students. *English as a Foreign Language* was, specifically, the subject in which the study was developed at a high school in Alcorcon, a southern village in the Community of Madrid. The participants of this investigation had a middle-low level of English – somewhere between A2 and B1- although none of them needed curriculum modification. The group consisted of 10 female and 6 male students, thus a 62,5% of females and 37'5% of males. Moreover, the rate of immigration was about 25%, making 4 students. Their origins are varied, from countries such as Ecuador, Colombia and Portugal.

The main instrument devoted to instruct or teach was a partially goal-oriented didactic unit designed specifically on purpose that pointedly encompassed materials from the course book for the sake of complying with the syllabus for this year.

Concerning the actual material from where students would later on be assessed, in each photocopy 'question one' – the low order thinking question- remained exactly the same as the question provided in the writing section of the book. In opposition, 'question two' –the higher order thinking question- was redesigned on purpose yet sticking to the same topic of that in question number one.

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Figure 2
Bloom's taxonomy low and high order thinking verbs

Low Order Thinking verbs (LOT)	High Order Thinking verbs (HOT)
Describe, Tell, Write, List, Identify, Explain.	Hypothesize, Evaluate, Critique, Justify, Create, Analyze.

Source: Original content purposely designed by author

Finally, with a view to grading each writing precisely, a rubric was designed based on *Harmer's Teacher Knowledge* (2012) and subsequently, *e-asTTle* writing marking rubric (2012). There were three evaluative worksheets[5] taken into grading that consisted on:

1. Evaluative Worksheet #1: students imagine they were the president of the USA back to 1848 and immediately after, describe the situation and why people were coming to California. Similarly, question two, encouraged them to *imagine* they were the president of the USA back to 1848, then *evaluate* the situation and *tell why* they believed it would be good to come to California, *making their own critique.*

2. Evaluative Worksheet #2: the first question was about describing the clip they had just watched with respect to travelling the world with only a backpack. Question two dealt with the same topic, yet, students were emboldened to *hypothesize* with respect to travelling the world the way they have seen in the video, but this time *justifying* their answer.

3. Evaluative Worksheet #3: the first question of this third worksheet was designed to make students write a short e-mail describing a journey going wrong. Equally, question two also incited to imagine a trip going wrong and then *creating* an e-mail in which *analyzing* the emergent problems and the way to overcome them.

[5] The worksheets may be available through contact at *pabloagustinartero@ucm.es.*

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3. Analysis and Interpretation of Results

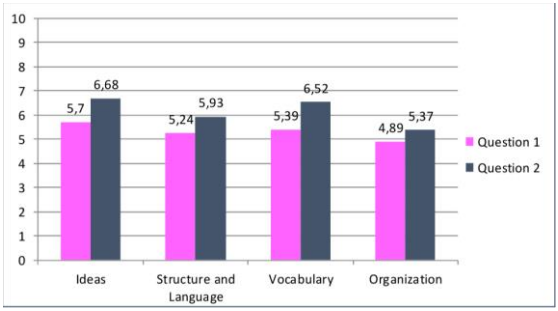
Disclaimer: here next, readers will find a series of specific and meaningfully selected results worked out in order to adapt them into the length constraints proper to publication issues. For the sake of originality and getting the full scope, the project is accessible through the master de profesorado at Complutense University of Madrid website. If in need of further information you may contact the author at pabloagustinartero@ucm.es

Next, a series of final graphics containing the definite averages and percentages in each field in which students were assessed is shown henceforth for the sake of providing a clear and detailed parse analysis.

To start with, despite the hypothesis confirmation, students seemed to obtain low grades only. This was regardless the worksheet, the activity or whether exercises were done in class or by contrast, given as homework.

Note that for what follows next, *Question 1* refers to questions strictly retrieved from the book, those initially seen as 'the problem'. In this fashion, they were mirrored onto the worksheets. *Question 2* is distinctively what stands as the experimental question outlined, concretely, for the students' hypothetical provocation to ideally result in a stream or flow of ideas and wit.

Figure 3
Analysis of results 1



Source: Original content purposely designed by author

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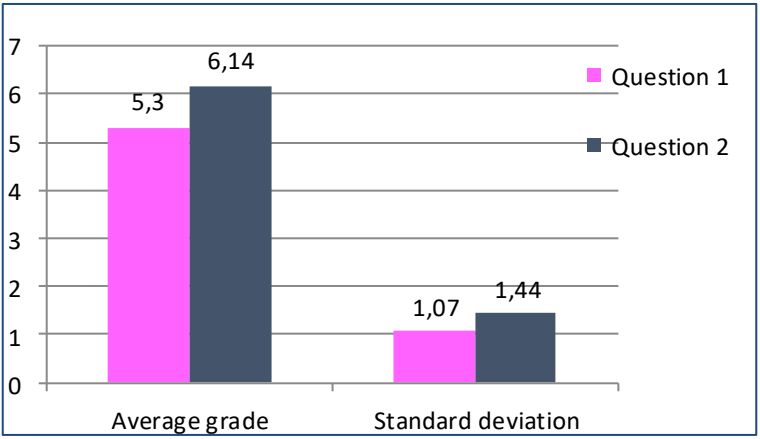
As observable in *figure 3*, students did better at *ideas* and *vocabulary*, almost reaching a 'good' or *grade 7*. For most standards both questions got similar grades, except for *organization* in question 1. This may be explained by the fact, broadly speaking, that a great majority of writings for question one were too short to even consider whether there was any sort of organization.

Even though it is certain that question 1 has one value under the mark that resolves a *pass* or *fail*, specifically *organization* , the definite mean screens a 'fair' mark, let alone according to the rubric[6] used as a tool for assessment. As a result, even though the bar representing question two also marks a 'fair', it could be stated that critical thinking was achieved as question two overtakes question one in 0.84 points.

Figure 4
Analysis of results 2



Source: Original content purposely designed by author

There are two clear conclusions to draw from *Figure 4.* On the one hand, the confirmed theory that the grades, averagely speaking, came to be higher where Bloom's high-order verbs were implemented. As for the second conclusion nevertheless, the standard deviation the element marking uniformity or regularity, constancy throughout the

[6] Contact the author for more information on the rubric and related issues.

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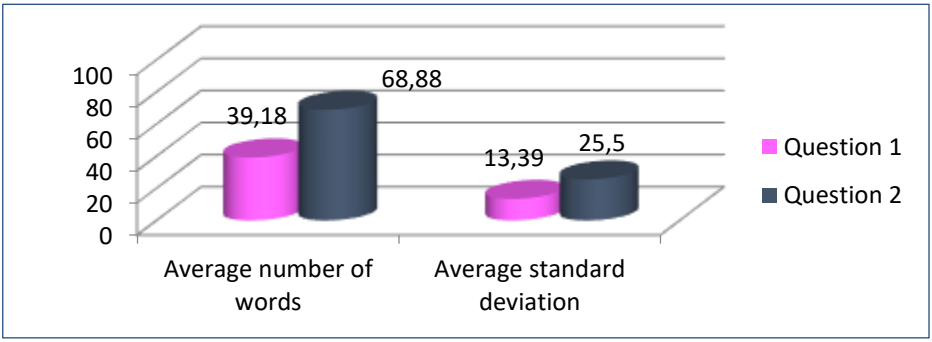
assessed papers was higher too, revealing more irregularity and heterogeneity. What this may bespeaks is that while a great percentage of students developed similar writings in length, others, for whatever reason, wrote extremely less. In all fairness, this feature embodies a common claim or behavior when it comes to high school students' compositions. In more detail, length stands as one of the most regular variables.

Figure 5
Analysis of results 3



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In regards to drawing conclusions from the quantitative analysis as well, *figure 5* depicts roughly the same verdict as that in the qualitative analysis. While the total amount of words increased as much as 29.27 units –confirming the initial hypothesis, the imbalance between the *quantity of words* in each composition was also ampler. In other words, there was much more variation and disparity when it comes to the compositions length.

Come this point, it appears safe to claim that in spite of considerable differences between the amount of words produced by different students, all of them incorporated more of them, leading to a summary where verb-replacement practice is what triggered longer texts and subsequently, validate all three hypotheses.

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Figure 6
Analysis of results 4

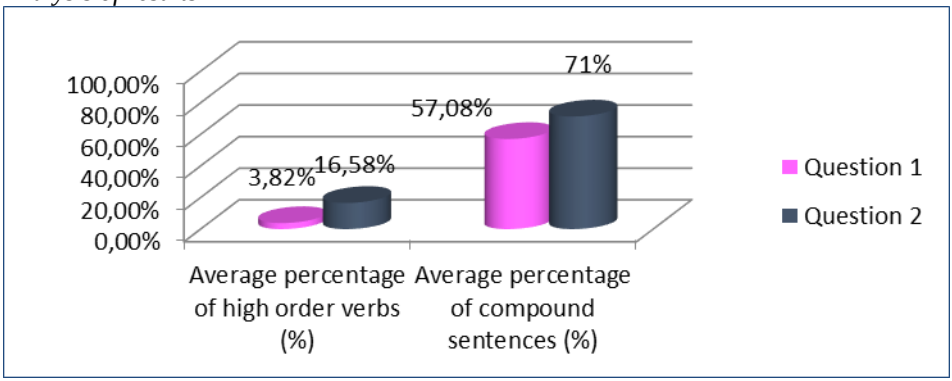

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Figure 6, unfolds relevant information likewise. The average percentage of the *higher-level* verbs students' brought out in question two distances from question one at a remarkable 12.76%. Without much doubt, this study has shown advance on for one thing, making students write a greater number of high order verbs.

The second element this study looks at is the average percentage of *compound sentences*: they reflect a growth of nearly 14%. Nevertheless, *question one* 57% of *compound sentences* exhibits that, regardless of the type of the question, students already developed more than half of their texts using these complex syntactical structures.

The charts offered so far are, in all, a compendium of approximately other fourteen graphs were information and numbers were laid out much more explicitly.

3. 1. Questionnaire results

Aspiring to gather as much information from students as possible, after the study was done and the worksheets handed in, a questionnaire comprising seventeen questions (14 closed and 3 open sentences) was provided. Students were told to respond sincerely, filling as many questions as they desired.

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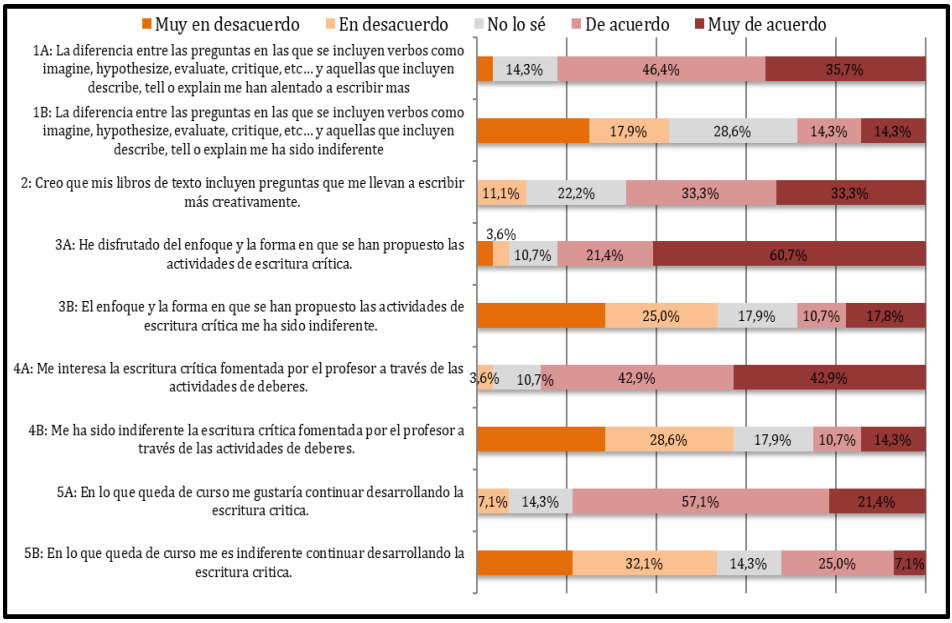
Essentially, the questionnaire gave them the chance to express their position with respect to three different issues: motivation, recognition of the task –how difficult they conceived the method had been– and usefulness and efficiency of the activities.

The analysis of the data obtained was arranged separating each block so that the percentages in each answer are competently evaluated. Once again, the data displayed in the forthcoming lines is a selection of a 'broader picture' that can be consulted any time at the *Complutense University* portal.

Figure 7
Questionnaire – motivation block



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This first block has to do with *motivation*. The *first two questions* refer to the difference between *high order verbs* and *low order verbs*. A rate of 46% students showed their understanding that the inclusion of *high order verbs* encouraged them to write more. Moreover, another 35% totally agreed with this affirmation, making a whole 77%.

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In this regard, for *question two*, asking the opposite, whether high order verbs had been indifferent, 42% of students expressed total disagreement or sheer disagreement. Another 28% could not seem to be able to tell.

Question two nevertheless showed unexpected results or inconsistency. The answers given for *questions 1A and 1B and 2* did not match. This is, 66% of students ticked '*agree*' and '*totally agree'* with the fact that *Interface 3* by *Macmillan* included questions that inspired their creativity, falling into a potential limitation of the study. Students may have not understood, at least not fully, what high and low order verbs were. Additionally, it may also suggest that critical thinking as a variant or sub discipline has never been explained to them. *Question 6* in the next block corroborates to that by a not-insignificant 53%.

On the other hand, *questions 3A and 3B* featuring the topic of enjoyment revealed a positive change thanks to the experimental units. The result for *questions 4A/4B and 5A/5B* were quite alike. Looking at these results in perspective, it can be said that students liked both the way this research fostered critical thinking – 86%– as well as their consent to potentially continuing developing critical thinking/writing by a 78%.

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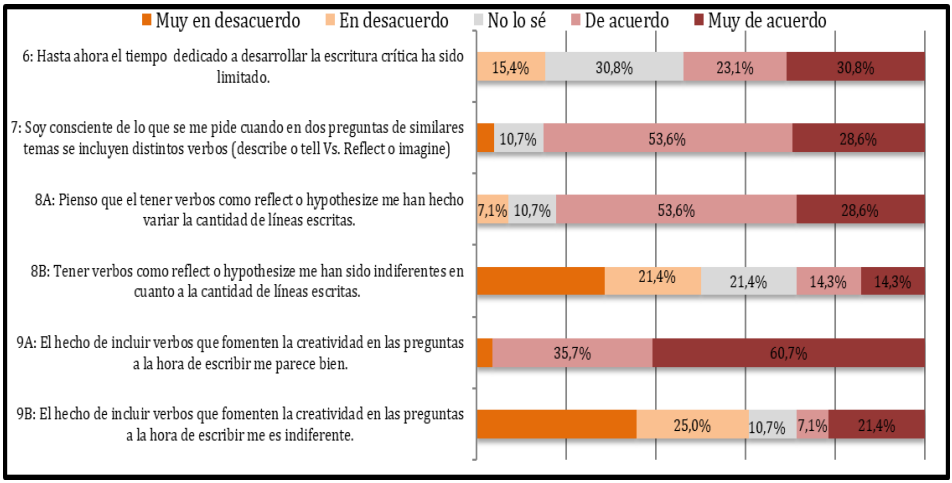
Figure 8
Questionnaire – on tasks featuring high and low order verbs



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In addition, *figure 8* depicts the students' opinion on the writing tasks they were presented with during the research period, meaning, specifically, the replacement of low-order verbs for a range of high-other verbs. The questions discussed next thus were selected after the percentages they show to corroborate on the hypotheses.

An example of this is *question 7:* an 81% revealed that students were aware at all times of what they were required when different verbs in different questions were set. In the same way, *question 9A* evinces through an impressive 96% how higher order verbs such as *hypothesize*, made the participants want to vary the length of their compositions. *Section 3: Analysis and interpretation of results* gives account of this same pattern.

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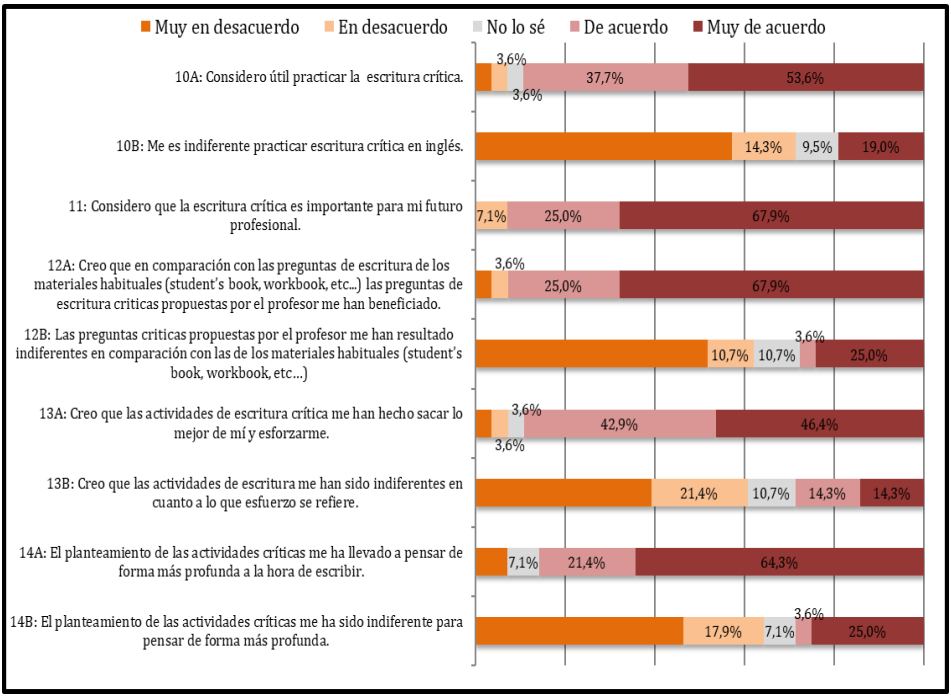
Figure 9
Questionnaire – tasks efficiency



Source: Original content purposely designed by author

Finally, *figure 9* submits the efficiency and/or the differences that students noticed –if any– after the questions/writing tasks were implemented.

Hence, *questions 10A and 11A* draw very positive results. This is to say, a 91% of respondents thought that practicing 'critical writing' was useful. Likewise, *question 11*, successfully accounted for a 92% 'agree' or 'totally agree'. In other words, they presumed critical writing was or could be important for their near future.

As a brief synthesis for the remaining questions, *12A* portrays an aspect of primordial relevance as well: students believed inasmuch as a 93% that the 'modified questions' were beneficial in comparison to usual normative questions in the book. Likewise, for an 89% of the participants –question *13A*, the way the questions were proposed led

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them to do better or make an extra effort. For another 85%, this experiment or approach utilized drove moved them as to think deeper or more creatively/critically.

Conclusions, limitations of the study and lines for further investigation

Regarding the answers provided first-hand by students through questioners as well as the previously exposed quantitative analysis can be both pointed at as the confirmation for the initial hypotheses and research questions. The mission was, except for the limitations to take into account, fully accomplished.

At first, the conducted study was addressed to analyze whether critical thinking could be promoted or not within the framework of high school education, particularly through the modification of questioning verbs in writing assignments provided in the course book –*Interface 3* by *Macmillan* editorial.

The initial premise of a students' potential production of longer texts, filled with more complex or richer ideas uniquely from a verbs' replacement policy led to a search of professionalization when it comes to marking. Certainly, the difficultness to assess and give a faithful mark as far as ideas were concerned led to use a rubric to make it as accurate as possible. In this sense, a limitation of the study might be, arguably, that the grades were to some extent subjectively given. It is worth highlighting however that grading objectively continues to be a controversial area with much room for improvement. There is no official way or procedure to give an idea, a thought, one mark or another. What's more, it is often the case that teachers grade same pieces of writing differently.

Even admitting that the percentages of improvement were moderate, they still appear sufficient to claim that in the hypothetical case that students were provided with high-order-verbs questions, they would definitely be swayed to think deeper and write longer.

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Qualitatively speaking, all through the research period, students improved their grades an average by means of one point. By virtue of the quantitative analysis though, students also managed to ameliorate the three aspects assessed: the amount of words per writing, (increase of 42%), the inclusion of higher order verbs (rising about 12%) and lastly, a higher amount of compound sentences too (an additional 14%).

Judging by the numbers and percentages laid out, it is our point of view that *Interface 3* and maybe other course books as well should consider a restructuration in regards to the questions' language and specifically, verbs.

On account of this, the hypothesis referring to *Interface 3* by *MacMillan* particularly on their failure to sufficiently promote the skill of critical thinking proved right too since the questionnaire showed students perception that the questions in such book were hardly to be answered in more than 3 lines. In this fashion, the definite re-counting that included both questions showed a positive imbalance of 30 words in favor of question 2, where the original verbs had been replaced for other higher in Bloom's Taxonomy: question 1 revealed an average of 38 words per writing; question 2 accounted for 68 words on average. This difference may as well evince a much worrying feature: at present, *Interface 3* and probably course books in general may be formulating their writing questions poorly from a 'critical thinking' point of view.

To such a degree, it may be reasonable to affirm that if as a general rule, students wrote longer compositions for question two, reflective verbs such as hypothesize or imagine indeed influenced them as the key for such change.

Another limitation to consider may be the pairing 'prompt-teacher'. Whether the teacher remained silent during the completion of both questions 1 and 2, and in fact no further explanation, interpretation or detail were not given for the sake of impartiality, solidity and reliability as it was the specific purpose of the study, close attention

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should be put into the matter, meaning that this may well be laid out here as a possible limitation of the study equally.

Taking all this into account, the outcome is irrefutably positive and edifying and was not only a success from an academic point of view. Instead, students expressed their most honest gratitude for having had the opportunity to work innovatively, through different approaches and technique. They claimed to have been inspired to think 'out of the box'.

Going further, this study was able to prove that through motivation and innovation yet applied to the same materials, students performed better in general lines. As a matter of fact, their writings could be also linked to other variables such as: a higher grade average, much more confidence, a more positive atmosphere, greater participation or a stronger will and mindset towards facing challenges or demanding subjects that additionally seek to avoid boredom as much as possible and enhance creativity.

Teaching critical thinking nevertheless remains somewhat an unsolved field that headed towards perfection but as of today still in need of deeper and prospective investigation (Tsui, 2002). Authors such as Paul *et al.* (1995) also share such view and offer further reflection upon other future possibilities to help teachers designing original instructive ways for a better student command of thinking. This studio has laid out the relation between critical thinking and students' performance in exams as a potentially interesting and perhaps productive field to explore.

In relation with this another proposal that may be worth addressing consists of re-casting this same analysis including, even, the same questions and materials. The variation would come with regards to the groups with which the hypothesis would be tested. This means that two groups would be needed. Hypothetically, *group A*, would complete the first question, that of the book, including no modification whatsoever. This would be the *control group*. *Group B* would be the group subject to the same question except for verbs which would

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undergo change in terms of a higher level within Bloom's Taxonomy. This way, an afterwards comparison may announce objectively as well possible changes.

Assuming this other way may as well be worth of carrying out and so reading, I personally doubt that it should necessarily be regarded as a more reliable experiment since each student has their abilities and strengths. What this means is that comparing two different questions from two different students that, bear in mind, would undoubtedly have their unalike strengths and weaknesses or even excel at complete opposite subjects would seem, to my mind, unjust and biased. It is my personal stance that comparing two writings from a same subject will always appear more objective since they will continue to have their same skills and 'defects'. Yet, as previously said, such study may as well shed light upon other fields or areas or even within the same. That, for now, remains to be seen.

Working with a view to discovering new 'powerful thinkers' has also been suggested by William, Oliver and Stockdale (2004) who have in the past upheld the yet to discover potential behind *critical thinking.*

Teaching or fostering critical thinking in the classroom should be neither stopped nor given scarce prominence come this point. This being so, "critical thinking is at the heart of our future because we live in a world of flagrant dogmatism and relativism, radically lacking in intellectual discipline" (Elder *et al.*, 1999: 34).

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Bibliography

Bean, E. & Markham, H. (2008). A Mini-Guide for Teaching Critical Thinking. Retrieved 2015, 20-February from The Air University: http://www.au.af.mil/au/awc/awcgate/eaker/teaching_critical_thinking.pdf.

Benson, M. J., Sporakowski, M. J. & Stremmel, A. J. (1992). Writing reviews of family literature: Guiding students using bloom's taxonomy of cognitive objectives. *Family Relations*, *41* (1), 65-69.

Caroselli, Marlene (2009). *50 Activities for Developing Critical Thinking Skills*. Amherst, Massachusetts: HDR Press.

Clark, M. M. (2009). Beyond critical thinking. *Pedagogy*, *9*(2), 325-330.

Cohen, M. (1993). Making critical thinking a classroom reality. *PS: Political Science & Politics, 26*(02), 241-244.

Cuseo, J. (2013). Los Angeles Valley College. Retrieved 25-February, 2015, from http://www.lavc.edu/profdev/promotethink.pdf.

E-asttle (2012). e-asTTle. Retrieved March 25, 2015, from e-asTTle:http://easttle.tki.org.nz/content/download/1556/6262/file/easTTle%20generic %20rubric.pdf.

Elder, L. & Paul, R. (1999). *Critical thinking: Basic theory & Instructional structures*. Dillon Beach, CA: The Foundation for Critical Thinking.

Fitzgerald, J. & Baird, V. A. (2011). Taking a step back: Teaching critical thinking by distinguishing appropriate types of evidence. *PS: Political Science & Politics, 44*(03), 619-624.

Freeman, K. E., Alston, S. T., & Winborne, D. G. (2008). Do learning communities enhance the quality of students' learning and motivation in STEM? *The Journal of Negro Education*, 77 (3), 227-240.

Gadzella, B., Ginther, D. & Bryant, G. (1997). Prediction of performance in an academic course by scores on measures of learning style and critical thinking. *Psychological Report*, *81*, 595-602.

Garrison, D. R. (1991). Critical thinking and adult education: A conceptual model for developing critical thinking in adult learners. *International Journal of Lifelong Education*, *10*(4), 287-303.

 ISSN: 1988-8430

Guichard, J. (2006). Shifting pedagogy: Integrating critical thinking and artistic practice in the voice and speech classroom. *Theatre Topics*, *16(2)*, 145-166.

Halpern, D. F. (2001). Assessing the effectiveness of critical thinking instruction. *The Journal of General Education*, *50*(4), 270-286.

Halpern, D. F. (2003). *Thought and knowledge: An introduction to critical thinking*. New York: Routledge.

Halx, M. D., & Reybold, L. E. (2006). A pedagogy of force: Faculty perspectives of critical thinking capacity in undergraduate students. *The Journal of General Education*, *54*(4), 293-315.

Harmer, J. (2012). *Teacher Knowledge*. Harlow, Essex: Pearson Education.

Johnson, J. P. (1977). Integrating educational theory and history. *History Teacher*, 425-433.

Kastberg, S. E. (2003). Using bloom's taxonomy as a framework for classroom assessment. Mathematics. *Teacher-Washington then Reston Va*, *96*(6), 402-405.

McPeck, J. E. (1981). *Critical thinking and education*. New York: St. Martin's.

McPeck, J. E. (1990). *Teaching Critical thinking: Dialogue and Dialectic*. New York: Routledge.

Monnier, C. (2010). GlobalSociology. Retrieved February 20, 2015, from Globalsociology: https://globalsociology.pbworks.com/w/page/14711154/Agents%20of%20Socialization.

Pascarella, E. T., & Terenzini, P. T. (1991). *How college affects students*. San Francisco: Jossey-Bass.

Paul, R. (1989). *Critical Thinking Handbook: High School. A Guide for Redesigning Instruction. Center for Critical Thinking and Moral Critique*. Sonoma State University.

Paul, R., Binker, A. J. A., Jensen, K., & Kreklau, H. (1990). *Critical thinking handbook: 4th-6th grades. A guide for remodeling lesson plans in language arts, social studies, and science*. ERIC.

 ISSN: 1988-8430

Paul, R., Binker, A. J. A., Martin, D. & Adamson, K. (1995a). *Critical thinking handbook: High school*. Rohnert Park, CA: Sonoma State University.

Paul, R., Binker, A.J.A., Martin, D., Vetrano, C. & Kreklau, H. (1995b). *Critical thinking handbook: 6th-9th grades*. Rohnert Park, CA: Sonoma State University.

Schunk, D., Pintrich, P., & Meece, J. (2008). *Motivation in education: Theory, research, and applications* (3rd edition). Upper Saddle River, NJ: Pearson Education.

Sosniak, L. A. (1994). *Bloom's taxonomy*. L. W. Anderson (Ed.). Chicago: Univ. Chicago Press.

Tsui, L. (2002). Fostering critical thinking through effective pedagogy: Evidence from four institutional case studies. *The Journal of Higher Education*, *73*(6), 740-763.

Tsui, L. (2007). Cultivating critical thinking: Insights from an elite liberal arts college. *The Journal of General Education*, *56*(3), 200-227.

Van Gelder, T. (2001). How to improve critical thinking using educational technology. *Meeting at the Crossroads: Proceedings of the 18th Annual Conference of the Australasian Society for Computers in Learning in Tertiary Education*, 539-548.

Walters, K. S. (1990). Critical thinking, rationality, and the vulcanization of students. *The Journal of Higher Education*, *61*, 448-467.

Zascavage, V., Masten, W. G., Schroeder-Steward, J., & Nichols, C. (2007). Comparison of critical thinking in undergraduates and graduates in special education. *International Journal of Special Education*, *22*(1), 25-31.

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