



Using video games to foster strategy development and learner autonomy within a secondary school context

Η χρήση βιντεοπαιχνιδιών με σκοπό την ανάπτυξη στρατηγικών μάθησης και μαθησιακής αυτονομίας στα πλαίσια της Δευτεροβάθμιας Εκπαίδευσης

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This paper presents research that focuses on the integration of commercial video games in a Greek Senior Secondary School context with the view to investigating whether such games have the potential to foster the development of language learning strategies and learner autonomy. En route to reaching specific game-related goals, student gamers had to carry out vocabulary and writing tasks, thus developing their vocabulary learning and writing skills at the same time. Although the generalisability and transferability of the results to similar situations cannot be ensured, due to the contextualised nature of the study, research participants were evidenced to employ a variety of strategies, with social strategies being especially associated with the female sample population, as well as feelings of autonomy and independence, while teacher support and guidance were found to be conducive to the development of autonomy.



Η μελέτη αυτή παρουσιάζει μία έρευνα σχετικά με την ενσωμάτωση εμπορικών βιντεοπαιχνιδιών σ' ένα Ελληνικό Λύκειο με σκοπό να διερευνήσει εάν τα παιχνίδια αυτά έχουν τη δυνατότητα να συμβάλουν στην ανάπτυξη στρατηγικών εκμάθησης της γλώσσας και μαθησιακής αυτονομίας. Καθ'οδόν για την εκπλήρωση συγκεκριμένων στόχων σχετικών με το παιχνίδι, οι μαθητές έπρεπε να επιδοθούν σε λεξιλογικές ασκήσεις και δραστηριότητες παραγωγής γραπτού λόγου, αναπτύσσοντας έτσι δεξιότητες εκμάθησης λεξιλογίου και παραγωγής γραπτού λόγου παράλληλα. Αν και η δυνατότητα γενίκευσης και μεταβίβασης των αποτελεσμάτων σε παρόμοιες καταστάσεις δεν είναι δυνατόν να διασφαλιστεί, λόγω της πραγματοποίησης της μελέτης σε συγκεκριμένο πλαίσιο, διαπιστώθηκε ότι οι συμμετέχοντες χρησιμοποίησαν ποικίλες στρατηγικές, με τις κοινωνικές στρατηγικές να συνδέονται ιδιαίτερα με τον θηλυκό πληθυσμό του δείγματος καθώς επίσης και με αισθήματα αυτονομίας κι ανεξαρτησίας, ενώ η υποστήριξη κι η καθοδήγηση του διδάσκοντος αποδείχθηκε ότι συμβάλλουν στην ανάπτυξη της αυτονομίας.

Key words: video games, language learning strategies, vocabulary learning strategies, writing strategies, gameplay strategies, learner autonomy, collaborative learning

1. Introduction

As Buckingham (2007) righteously claims, we are going through an “age of digital culture”, where young people constitute the “Digital Natives” (Prensky, 2001a; 2001b), since they are “all ‘native speakers’ of the digital language of computers, video games and the Internet” (Prensky, 2001a, p. 1). There is no doubt that video games are a powerful entertainment tool that opens up new, enchanting, virtual worlds in which every gamer, regardless of age, sex or origin, is admitted and allowed to “experiment with new and powerful identities” (Shaffer et al., 2005, p. 106). This paper raises the question whether this popular entertaining means could be turned into a powerful learning tool, as well.

To this end, the present study mainly explored the various language learning strategies that students employ when playing video games at home and not in a formal schooling context, at their own pace, alone or with peers. These learning strategies were examined in connection to coping with new vocabulary encountered in a video game and the development of students’ writing skills in a “situated learning” (Gee, 2004) mode. In particular, the study investigated whether

- vocabulary comprehension is facilitated by video gaming
- writing skills are developed in a meaningful, motivating way within the virtual environments gamers immerse themselves in
- learning strategies are developed en route to reaching game-related goals
- learner autonomy and independence are fostered through engaging in video gaming.

Along these lines, this paper will firstly present the theoretical background regarding the educational merit of video games along with important considerations about language learning strategies and learner autonomy and then a discussion of the research per se, its findings, its educational implications and, finally, recommendations for further research will follow.

2. The theoretical background of the research

2.1 Theories of learning informing video gaming

The first roots of video games as learning tools can be traced to Dewey’s theories of education, which emphasized the student’s “direct personal experience” (Warde, 1960) and ‘learning by doing’. Similarly, modern video game scholars advocate the process of learning by doing as a defining trait of video games (Aldrich, 2005; Prensky, 2002; Shaffer et al., 2005), which comes in sharp contrast to the traditional instruction mode of “telling” or lecturing (Prensky, 2010, p. 20).

The theory of learning which best describes the design and use of video games for educational purposes is constructivism, whose main tenet is that learners construct meaning

and knowledge by actively interacting with their environment and reorganizing their mental structures (Phillips, 1995; Resnick, 1989; Tytler, 2002), building upon previous knowledge and experience, which they match against newly-acquired information (Thanasoulas, 2001).

Apart from Dewey, other significant contributors to the constructivist theories of learning are Vygotsky and Bruner, whose views are especially important for the use of video games in educational settings. In particular, Vygotsky advocated social constructivism that placed the individual's learning "within social and cultural settings" (Kiili, 2005, p. 57), while Bruner's greatest contribution was the notion of "discovery learning", which he compared with a discovery expedition (1966), during which learners become active seekers and producers of knowledge, breaking away from the role of passive receivers promoted in traditional classrooms. Bruner placed emphasis on simulation activities, a form of which is role play, which teachers should prepare and organize (Ελληνιάδου et al., 2008, p. 37) if they are to facilitate students' active participation in self-directed, inquiry-based, problem-centered, experiential learning. Needless to say, nowadays, the natural environment for simulation and role play situations is video games since in most of them players have to "don" the role of a character, ranging from a chef to a detective to an investment banker, depending on the game (Anton, 2010). By assuming different roles, players get to think as those characters, talk, understand the situation, make informed decisions, and act accordingly in order to win the game. This rich experience creates a powerful context for learning (ibid.) or what Gee (2004) calls "situated" learning, i.e. learning situated in the context where it occurs.

Within the constructivist paradigm described above, digital learning environments, which gamers immerse themselves in, aim at supporting learner gamers' knowledge construction process, either individually or socially (Kiili, 2005, p. 54), depending on whether they play in a single or a multiplayer mode respectively, in the same sense as traditional instruction does in formal educational settings. The difference is that, in the case of video games, the tools used are more appropriate for and adjusted to the "digital generation" (Papert, 1996) of the 21st century, with their personal interests and lives beyond the classroom walls assuming a central role in the learning process and not considered irrelevant or treated peripherally to it.

In more recent years, some other theories were put forward in an attempt for the digital generation's learning, including the educational merit of video gaming, to be accounted for. These theories include constructionism, connectivism and the flow theory. In particular, Papert introduced "learning-by-making" (1991) as the central principle of his constructionist theory of learning, which places the well-known tenet of learning by doing on a more practical basis since, in Papert's own words, learning "happens especially felicitously in a context where the learner is consciously engaged in constructing a public entity, whether it's a sand castle on the beach or a theory of the universe" (1991, p. 1).

Connectivism, or the "learning theory for the digital age", was formulated by Siemens (2005) with the view to exploring how people learn today, where a great part of instruction does not come from formal school settings but from other sources, namely technology and the Internet, and brings another dimension of education into play. Apart from "know-how" and "know-what", there is "know-where", i.e. "the understanding of where to find knowledge needed" (Siemens, 2005). The latter is associated with life-long learning and the concept of "learning how to learn". The development of this crucial skill constitutes a fundamental goal in most, if not all, educational systems worldwide. This is the case in the Greek context as well, as evidenced in the DEPPS, the 2003 cross-disciplinary Greek EFL curriculum for primary

and secondary education, and even more so in the more recent unified curriculum for the teaching of foreign languages in state schools, the EPS-XG (2011).

Siemens' claim that "[l]earning may reside in non-human appliances" (2005) can make a case for the integration of video games in educational contexts and their use as learning tools. In line with connectivism, what bonds gamers together is their common interest in video gaming and digital technology, which urges them to seek solutions to puzzles and problems encountered in virtual worlds, even by joining online gaming communities - what Gee (2004; 2005) calls "affinity spaces". It is a very common practice nowadays, thus contributing to the construction and propagation of knowledge worldwide.

Finally, Csikszentmihalyi's flow theory (1990) is considered central to video games (Squire, 2011), since it describes the state of completely focused motivation, absorption and immersion in the task at hand, which "becomes intrinsically rewarding, done for its own sake" (Stevenson and Kaplan, 2010, p. 155), a state that video games are believed to foster and favour. Game designers manage to keep players in such "flow" states, in which educators would like to see learners in formal instruction settings, as well, but, in fact, "few current curricular practices are designed to foster" (ibid.).

2.2 Video games as learning tools

Hays (2010) provides a concise but accurate definition of video game as "an artificially constructed, competitive activity with a specific goal, a set of rules and constraints that is located in a specific context" (p. 251). Video games are often classified into educational games known collectively as "edutainment" (Prensky, 2010, p. 21), in an effort to combine entertainment with educational purposes. Commercial off-the-shelf (COTS) games, which are designed and created for pure entertainment purposes, have succeeded in captivating their audiences in ways that no educational application has managed to do so far.

Coming to the reasons advocating the integration of video games in educational settings, it must have become obvious from our discussion by now that the design and creation of most video games are based on sound learning principles. Various arguments in favour of the integration of video games in educational contexts have been put forward in the relevant literature, although research into this newly emerging field is quite recent and still in progress. In particular, through video games students "experience a sense of autonomy" (Stevenson & Kaplan, 2010, p. 152), since players are continuously asked to "make active choices in simulated settings", simultaneously developing their critical thinking skills on "a multilayered platform of insights and discoveries" (ibid.). Video games also offer opportunities for differentiation, by catering for different learning styles, in line with Gardner's Multiple Intelligences theory (1983), mainly through the use of multimedia. Besides, they provide student gamers the facility to archive and return to their learning, by allowing them to save information that is often impossible to record and store through traditional means, at various points during gameplay. Needless to say, the latter holds great advantages for teachers too, since they can "track[...] students' progress, return[...] to previous assignments and provid[e] repeated instruction of needed or favorite lessons" (Stevenson & Kaplan, 2010, p. 153). Finally, students are also exposed to technology, practicing where they can develop and practice vital skills for the 21st century.

2.3 Language learning strategies: definitions and classifications

Following Oxford (1990, p. 1), learning strategies can be defined as “steps taken by students to enhance their own learning”, and their being “tools for active, self-directed involvement, which is essential for developing communicative competence”, render them particularly important for language learning purposes. Such strategies can ultimately lead to learner autonomy, “learning how to learn”, and life-long learning skills development, which are the ultimate goals of any educational system designed for the 21st century global citizen, the Greek system being no exception. In practical terms, strategies are deliberate, intentional, goal-directed actions undertaken by learners until they become automatic, through extensive practice, and transform into unconscious habits (Oxford, 2011).

Although the literature is rife with various strategy classifications and distinctions, both general (Manolopoulou-Sergi, 2004; O’ Malley and Chamot, 1990; Oxford, 1990; Oxford, 2011; Papaefthymiou-Lytra, 1987) and vocabulary- (Gu and Johnson, 1996; Nation, 2001; Schmitt, 1997) or writing-specific (Arndt, 1987; Mu, 2005; Riazi, 1997; Sasaki, 2000; Victori, 1995; Wenden, 1991), which are especially related to the research in question, the present study draws mainly from Oxford and her well-known classification system (1990), since it is considered the most influential to date. Oxford’s taxonomy consists of two broad categories, namely direct and indirect strategies, which are further subdivided into a total of six groups – memory, cognitive and compensation under the direct category, and metacognitive, affective and social under the indirect category.

2.4 Learner autonomy: definitions and important considerations

Closely linked to learning strategies is the concept of learner autonomy, which has lately become a fundamental goal of foreign language education. Autonomy can be broadly defined as “the capacity to take control over one’s own learning” (Benson, 2011, p. 2), while, with regard to strategies, autonomy could also be described as “the capacity to make use of strategies that are clearly associated with the idea of control of learning” (ibid., p. 97).

According to Benson (2011, p. 2), one necessary condition for the development of autonomy is providing learners with opportunities to exercise control over their learning. Given the nature of language learning, which is enhanced by interaction with others, thus autonomy assuming a social aspect, control becomes “a question of collective decision-making rather than individual choice” (Benson, 1996, p. 33). In the present study, learners were given the opportunity to “take responsibility for their own learning and to apply active, personally relevant strategies” (Littlewood, 1997, p. 81). To this end, they were asked to play a video game out of the formal schooling context, at home, either alone or in pairs/groups, without the physical presence of the teacher.

3. The research design

3.1 The sample population

The research was conducted with a group of twenty 16-year-old students, attending the first grade of a Senior High School in a Greek provincial town. A non-probability sampling strategy was used, and in particular ‘convenience or opportunity sampling’, since the sample was a class the teacher-researcher taught at the time of the research and thus the selection was

based on such criteria as availability and easy accessibility (Dörnyei, 2007, pp. 98-99). The sample consisted of twelve female and eight male students comprising a mixed-ability class, as is usually the case with Greek state schools, whose English language proficiency level mainly ranged from waystage (A2) to vantage (B2), according to the Common European Framework of Reference for Languages (Council of Europe, 2001), while there were a female effective operational proficiency (C1) level and a male mastery (C2) level student among them.

Within this context, the researcher had to select a video game that would potentially engage the majority of the participants and serve the purposes of the study well.

3.2 Selection criteria of the video game

The video game selected and used for the research was *Agatha Christie: Murder on the Orient Express* (The Adventure Company, 2006), a COTS game, for a variety of reasons. Firstly, mysteries, detective stories and thrillers appeal especially to teenagers, who find them interesting and engaging, as the specific target group confirmed as well. Second, the whole game is based on dialogue as well as written notes and letters, and whether players proceed in the game or not depends on their understanding of the target language. This served the purposes of the research since players are forced to employ strategies in order to deal with vocabulary difficulties and move on. Another important criterion is that the train passengers in the game come from different countries and players are, thus, exposed to World Englishes, namely different varieties of English belonging both to the inner as well as the expanding circles of countries where English is spoken, in line with Kachru's (1985) well-known categorisation¹. At the same time, they have the opportunity to become acquainted with slang terms or expressions some characters in the game often utter, and the fact that learners are not usually exposed to such terms within formal education settings makes it even more imperative that they resort to strategies in order to cope.

Finally, the game is based on a famous novel by the same title, written by Agatha Christie, and some students might have heard about the story or seen a movie based on the book, too. This information could activate their background schemata and help them overcome or anticipate certain difficulties as far as the storyline is concerned. Nevertheless, there is a twist in the end that differentiates the game from the book, with the view to keeping even those familiar with the plot engaged and interested.

In particular, players have to don the main character of the game, wander in a virtual world, seek clues that might reveal the identity of a murderer, solve a number of simple and more complex puzzles as they proceed in the game, collect fingerprints and footprints, and interrogate suspects until the true identity of the killer is revealed in the end; in other words, they have to act the same way the police would in real life.

3.3 The research methods

The researcher selected the so-called "mixed methods research" (Creswell et al., 2003) as the most appropriate and effective means to collect data within the specific context. This means that both qualitative (QUAL) and quantitative (QUAN) research were employed in an attempt to combine the case-specificity and subjectivity of the former with the objectivity and generalizability of the latter, when it comes to the analysis of the data collected.

Nevertheless, despite drawing from both QUAL and QUAN research, mixed methods designs usually “display a dominant method” (Dörnyei, 2007, p. 63). Within this mixed methods research paradigm, the main method employed was the case study, namely the study of the “particularity and complexity of a single case” (Stake, 1995, p. xi), which lies within the QUAL research paradigm, enhanced by QUAN research practices. The sample described above constitutes the ‘case’ the present research focused on.

3.4 The research instruments

As mentioned above, the instruments employed for this study belonged both to QUAL and QUAN inquiry fields, namely a number of diaries, in which students had to make entries at various points during the research, and a final questionnaire administered at the end of the research respectively. Through the use of more than one instruments coming from both QUAL and QUAN fields, triangulation is effected, which allows the researcher to “confirm or challenge the findings of one method with those of another” (Laws et al., 2003, p. 281), thus contributing to the improvement of research validity and maximizing reliability at the same time. A third concept playing a pivotal role in research settings is the generalizability of the findings, what certain writers (Eisenhart and Howe, 1992; Lincoln and Guba, 1985) refer to as “comparability” with other similar research findings and “transferability” to similar situations, which can also be increased by evidence obtained through the use of multiple methods (Dörnyei, 2007, p. 46).

The main research instrument constructed to serve the purposes of the present research and coming from the QUAL research field was diaries. To initiate diary writing at certain points during the game, the researcher had entered written prompts and hints as to what kind of entry students were expected to make each time. In the third and final diary, students were invited to reflect on their whole gaming experience and even make suggestions for future similar projects (see Appendix).

The second data collection instrument, a questionnaire, belonged to the QUAN research field and aimed at complementing and enhancing the data collected through the diaries. To this end, a great number of items - on rating scales and a Likert scale - focused on behavioural issues, namely the particular actions student gamers took to deal with vocabulary and writing difficulties as well as problems encountered regarding gameplay per se. Other items addressed the respondents’ beliefs about and attitudes towards the whole video gaming experience and the effects the latter had on them as foreign language learners, in terms of vocabulary learning, writing skill development and learner autonomy (for the research instruments see Palaogiannis, 2012).

3.5 The procedures followed

The research lasted from November 2011 to March 2012. On the basis of such factors as distance, the relationship the participants had with each other beyond class time, and personal preference, one group of three and three pairs were formed while the remaining eleven students played alone.

The video game consists of three distinct parts, but the research focused on the first two parts, during which students had to carry out specific vocabulary and writing game-related tasks, prepared and handed out to them by the teacher researcher prior to their engaging in

each of the corresponding game parts. The tasks aimed at making gameplay meaningful and purposeful for their learning and not just a purely entertaining activity, and keeping them focused on certain aspects of the game that were prompted to “notice”, in line with Schmidt’s (1990) Noticing hypothesis. This noticing process would serve the purposes of the present study, such as the realization of the need to employ specific strategies if they wanted to cope with difficulties and advance the storyline. Several briefing and debriefing sessions, “critical” conditions for the integration of video games into educational settings (Betrus and Botturi, 2010, p. 49), preceded and followed video game playing respectively, taking place in the regular EFL classroom. During these sessions, language as well as gameplay problems were brought to the fore, solutions were suggested, and opinions were exchanged and commented upon both by the teacher and students alike.

Since the greatest part of the research was conducted outside the school context, without the presence of the teacher to provide support or guidance if any such need arose, the researcher set up a group on the Facebook called *The Murder On The Orient Express Game Group*, which all research participants could join, establishing an online learning community. Within this community, information flow could take place, members could provide feedback to each other and seek solutions to problems encountered in the virtual world of the video game.

At the end of each part, which was temporally predetermined and commonly agreed upon by both the researcher and the participants, the students had to carry out a writing task in the school’s computer lab. To this end, the process writing approach was adopted as the most compatible with the application of strategies any writer normally resorts to, through the recursive stages of generating ideas, focusing, structuring, drafting, evaluating and reviewing, as presented in White and Arndt’s well-known model (1991). The participants had to write letters as the main character to their employer, informing him about the progress of the murder investigation, any potential suspects and so on. In this way, situated learning took place through role-play, game-based activities that facilitated students’ active participation in a powerful context for learning. All procedures are illustrated in Figure 1 below.

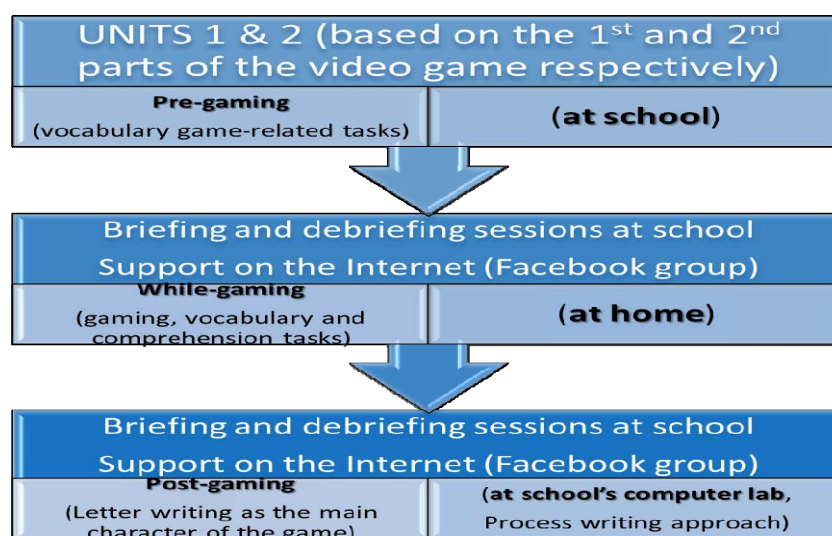


Figure 1. The procedures followed during the research

Participants had to submit three diaries, the first two after finishing each corresponding game part and the last one upon reaching the end of the game. The final questionnaire was firstly piloted on a sample similar, in terms of sex, age and interests, to the target sample with the view to ensuring that respondents in the actual study would experience no difficulties in completing the instrument, regarding the “clarity of wording” (Cohen et al., 2007) either in the items per se or the instructions, the time taken to complete it, or its difficulty level.

4. The research findings

4.1 Practical considerations

As regards the diaries, qualitative content analysis (Dörnyei, 2007) was employed, in that specific patterns and themes were identified in the data (Dörnyei, 2007; Taylor-Powell and Renner, 2003), on the basis of which relevant categories were established. To protect the participants’ anonymity, during the diary entries as well as the questionnaire data analysis, identification numbers were assigned to them ranging from S1 to S20 (where S=Student) while, for comprehensibility purposes, some participant entries were slightly edited by the researcher. Besides, some aspects of the data were ‘quantitised’, in other words converted into numerical codes (Dörnyei, 2007), in an effort to integrate it with its quantitative counterpart used in this research, in line with a most common practice within the mixed methods data analysis field, namely ‘data transformation’ (Miles and Huberman, 1994; Tashakkori and Teddlie, 1998).

Both the ‘quantitised’ qualitative data coming from the diaries and the quantitative data that the questionnaire yielded were subjected to statistical analysis through the use of a statistical package widely employed in applied linguistic research, SPSS.

4.2 The analysis of the data

Following Oxford (1990) and in line with other strategy taxonomies (Gu and Johnson, 1996; Mu, 2005), the questions on vocabulary and writing strategies were placed into specific categories. In particular, in the vocabulary section of the questionnaire, the questions were categorized as cognitive, compensation, social or metacognitive strategies. In the same vein, in the writing section, they were categorized as metacognitive, cognitive, social or compensation strategies. The participants who gave at least one positive response (sometimes, often or always) to a question belonging to a specific category are supposed to have resorted to that category during gameplay, while those who have provided negative responses (never or rarely) to all questions of a category have not used it. Along these lines, with regard to vocabulary, 90% employed compensation strategies, 80% employed cognitive and social strategies while 65% resorted to metacognitive strategies (Chart 1). As regards writing, all (100%) used both metacognitive and cognitive strategies, 85% resorted to social strategies while 80% employed compensation strategies (Chart 2).

The diaries yielded some important data concerning the participants’ attitudes towards vocabulary and writing. In particular, 70% found the vocabulary tasks they carried out in class, at the pre-gaming stages, helpful during gameplay. As regards the latter, 75% felt excited about the writing task in the computer room and all (100%) expressed positive feelings about the process of collaborative writing (Chart 3).

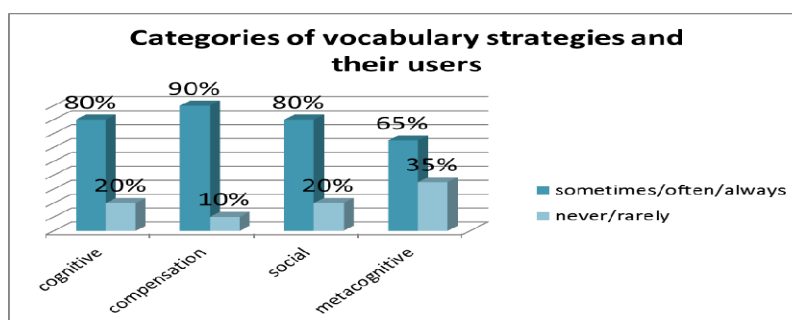


Chart 1

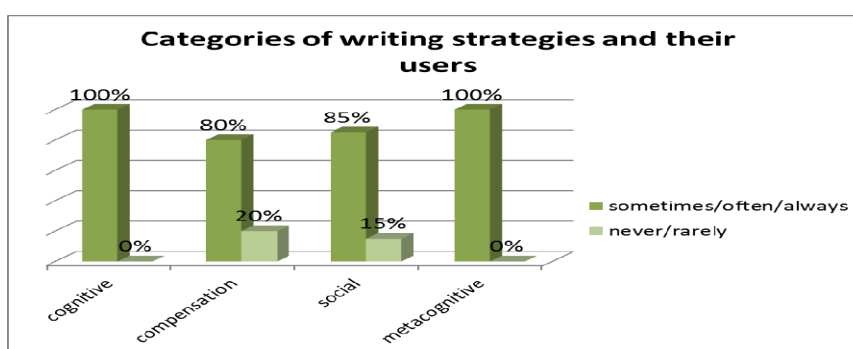


Chart 2

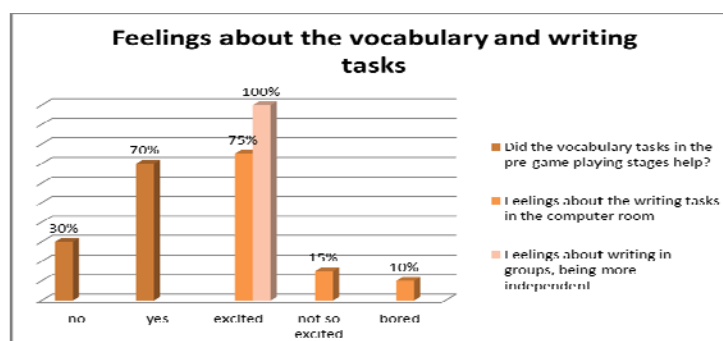


Chart 3

Turning to gameplay, by analogy to the vocabulary and writing strategies classifications illustrated above, the researcher classified three questions in the questionnaire section on gameplay as social strategies, since they were based on collaboration and face-to-face interaction, while the rest were treated as separate, stand-alone categories. In this vein, the analysis showed that the vast majority of the participants (95%) employed social strategies to deal with difficulties regarding the game per se, 60% replayed certain parts of the game to make sure they had made the right moves or decisions, 40% visited the Facebook group site, set up by the teacher, to ask for help, while 15% searched the Internet for possible solutions (Chart 4).

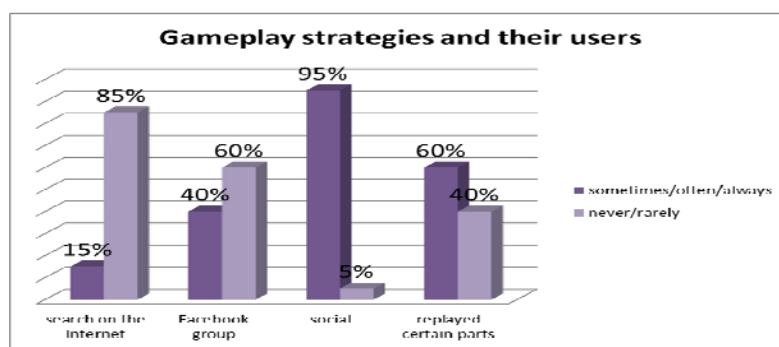


Chart 4

With regard to participant beliefs and attitudes about the whole video gaming experience, 90% agree that playing the video game helped them understand new vocabulary, 90% agree that understanding the meaning of new words helped them solve problems and move on in the game, 30% believe that writing letters as the main character of the game gave them a real life purpose for writing, while 50% believe that writing letters as the main character of the game made video gaming an interesting experience to them. Finally, 60% agree that writing in collaboration with their classmates made them feel more confident and 55% believe that playing the video game at home, making their own decisions about their own learning, made them feel more independent and autonomous as learners (Chart 5).

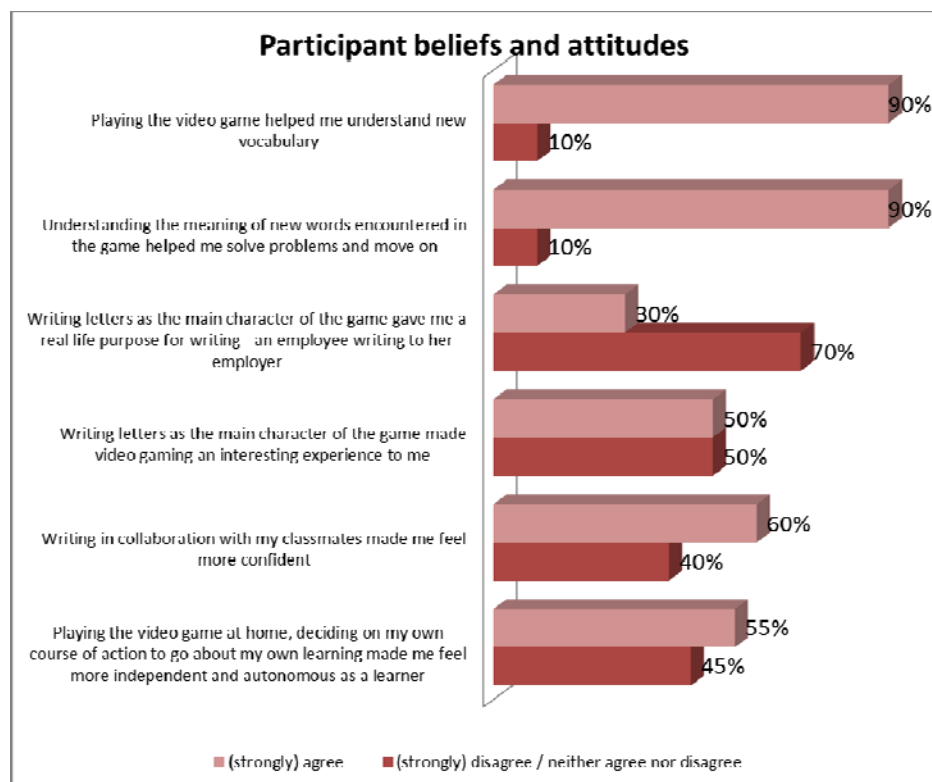


Chart 5

The data was statistically analysed through the performance of certain tests, namely Chi-Square tests and especially Fisher's Exact Test, due to the small sample size, to check whether a statistically significant correlation between variables existed. The tests were performed at the level of significance $p=0.05^2$, meaning that any $p\text{-value}<0.05$ constituted a statistically significant difference, which indicated a strong correlation between the variables checked each time. The findings showed a statistically significant correlation between:

- vocabulary social strategies and gender ($p=0,014<0,05$), with all female participants (100%) and only half of the male (50%) employing social strategies to tackle vocabulary problems.
- vocabulary social strategies and the belief that playing the game at home and making their own decisions regarding their own learning made the participants feel more independent and autonomous ($p=0,026<0,05$). Specifically, all of those (100%) who feel that way employed social strategies to deal with vocabulary, while only 55,6% of those who disagree did.

The Pearson Chi-Square test of independence was also performed to check whether the participants' feelings were associated with the other variables involved in the research. The findings indicated a statistically significant correlation between:

- the participants' feelings before playing the game and the belief that playing the game helped them understand new vocabulary ($p=0,021<0,05$). 92,3% of the 'excited' and all (100%) 'nervous' and 'bored' students believe that the game helped them understand new vocabulary, while the remaining 'indifferent' student does not believe so.
- the participants' feelings while playing Part 1 and the belief that understanding the meaning of new words helped them solve problems and move on ($p=0,036<0,05$). All (100%) 'excited' and 'nervous' gamers believe that understanding the meaning of new words during gameplay helped them, while 60% of the 'bored' gamers share the same belief.
- the participants' feelings while playing Part 2 and the belief that playing the game helped them understand new vocabulary ($p=0,036<0,05$). All 'excited' and 'bored' gamers (100%) share that belief, while only 60% of the 'nervous' gamers do.
- the belief that the vocabulary tasks in the pre-gaming stages helped the participants and the one that playing the game at home and making decisions about their own learning made them feel autonomous as learners ($p=0,024<0,05$). 71,4% in favour of the vocabulary tasks believe that the video gaming experience made them feel more autonomous, while only 16,7% of those that did not find the vocabulary tasks helpful share the same belief about autonomy.

4.3 The interpretation of the data

The findings were be evaluated and interpreted in regard to the research questions of the present study. The first research question refers to whether video gaming can facilitate students' understanding of new vocabulary. The vast majority (90%) of the specific sample believe that understanding new vocabulary and video gaming are linked to each other (Chart 5), since the former enhances the latter and vice versa. In this vein, video gaming promotes purposeful, meaningful vocabulary learning in a way that formal education cannot, since only by understanding new words encountered in the digital worlds of video gaming can gamers come up with solutions to problems and move on in the game. The evidence

provided by the statistical analysis indicates that almost all participants, regardless of their feelings, felt that gameplay and vocabulary learning were positively interrelated at some point during the game (see section 3.2).

The second research question refers to situated learning and specifically whether video games provide students with a context that will help them develop their writing skills in a meaningful, motivating way. 75% of the participants expressed their enthusiasm for this situated writing (Chart 3) in their diary entries since “it was just like [they] had lived this event in real life and [they were] a real detective [themselves]” (S20, diary 1). In terms of gender, 30% were male and 45% were female, comprising 75% and 74,9% of the total male and female sample population respectively. This means that the vast majority of the male and female participants were in favour of having their writing skills developed, while acting as the main character of a video game.

Regarding the third research question, this study also explored whether video games foster the development of learning strategies while gamers try to reach specific goals during gameplay. All learners employed strategies in order to deal with vocabulary and writing difficulties, otherwise they wouldn’t be able to solve problems and advance the storyline. In particular, regarding the former, most recruited compensation strategies (90%, Chart 1), which is understandable due to the great word load they admittedly encountered during gameplay, while with regard to writing, all learners (100%) used metacognitive and cognitive strategies, followed by social (85%) and then compensation strategies (80%, Chart 2). The evidence also indicates that video gaming and the various technical or storyline difficulties, encountered during gameplay, favour especially collaboration and the use of social strategies among gamers (95%, Chart 4). The evidence provided by statistics indicates that all female participants showed a preference for social strategies to deal with vocabulary, which might be suggesting that girls are more in need for support and encouragement when it comes to a genre stereotypically associated with boys, while social strategies were also evidenced to be associated with those who felt more autonomous during gameplay since all of the latter (100%) employed such strategies.

With regard to the last research question, the present study attempted to investigate whether video games facilitate learner autonomy and independence. The majority of the participants believe that the video gaming experience made them feel more autonomous and independent and collaborative writing boosted their confidence (55% and 60% respectively), a feeling often associated with autonomy (Chart 5). Collaborative writing and autonomy are associated with social strategies and the majority of the sample population (100% female, 50% male) used such strategies. Besides, the statistical tests indicated that those who found the vocabulary tasks in the pre-gaming stages helpful were the ones who expressed feelings of autonomy, meaning that they considered teacher support conducive to the development of their autonomy and independence.

5. Teaching implications, limitations and recommendations for further research

5.1 Teaching implications

On the grounds of the specific research and the relevant literature, fruitful conclusions can be drawn, regarding the integration of video games in educational settings and its effects on the teaching and learning process.

First of all, games are one of the best methods to motivate learners intrinsically since they can be fun and highly engaging, thus turning the learning process into a meaningful and memorable experience. Besides, video games foster skills “immediately generalizable” to real-life situations (Prensky, 2006, p. 8), such as reasoning, problem-solving and decision-making.

Through video games collaborative learning is promoted and students develop cooperative learning skills as they work in partnerships or small groups having synchronized goals and objectives (Stevison and Kaplan, 2010, p. 152). This is a very important point since collaborative learning and social strategies employed during gameplay were evidenced to be closely associated with participant feelings of autonomy and independence in the present study. In this vein, by engaging students in video gaming tasks that involve and presuppose collaboration, the teacher can facilitate the development of autonomy and life-long learning skills among learners. The engagement in such projects also seems to contribute, as the present research showed, to the establishment of a friendly rapport between the teacher and the learners in a non-threatening, supportive environment for everyone involved.

An important principle, which is built into video games and supports their use as powerful learning tools, is the “multimodal principle” (Gee, 2007). Video games aim at familiarizing students with multiple modalities, that is the combination of written words, sounds, still or moving images and video to convey messages, which Digital Natives have to master if they are to survive and succeed in the technologically demanding world of the 21st century. To refer back to the Greek context, this familiarization with multimodal texts is also emphasized and promoted as a fundamental goal of foreign language instruction by the new, unified curriculum, the EPS-XG (2011), and video games could help in that direction.

5.2 Limitations of the present study

Since this was a small scale research, it cannot be considered representative of a population. We cannot be really sure that the results of the study can be generalizable and transferable to similar situations since the selection of a different video game for use with the same sample or the use of the specific game with another sample of the same age and characteristics could easily yield quite different results.

In the same vein, the limited number of the subjects – a class of twenty students in total – might have played, to a greater or lesser extent, a decisive role in the experiment, ultimately influencing its results.

5.3 Recommendations for further research

First of all, learners could play a video game in the school’s computer lab, instead of home, over a whole school year, which would allow the researcher to observe their behaviour during gameplay and draw fruitful conclusions. Participants have expressed their wish to do something like that in school not only in English but other subjects as well (see Appendix), which could lead to cross-curricular projects and open up new educational possibilities and perspectives.

Furthermore, it would be interesting to see how conventional, standard instruction compares with innovative, alternative teaching approaches, by setting up an 'experimental design' (Dörnyei, 2007) with a 'control' and a 'treatment' group of students sharing similar characteristics and attending the same class. The former could be taught through conventional teaching methods, while a video game, computers and software could be used to teach the latter, promoting collaborative learning and group work. Certainly, such a study could yield important insights, which would inform future teaching practices.

6. Conclusion

On the basis of the research participants' diary writing and questionnaire responses, positive evidence for the use of video games as learning tools was yielded since they employed a variety of strategies to cope with vocabulary, writing, as well as gameplay difficulties, and reach various goals set during gaming. A great number of the participants also expressed positive feelings about writing as the main character of the game since they got into the skin of their role and gained insights into the game. Not surprisingly, all learners showed their approval and appreciation of the collaborative learning procedures, which, in turn, were evidenced to be associated with participant feelings of autonomy and independence.

This research and its findings will, hopefully, pave the way for the implementation of educational innovations, by providing teachers with insights into and inducing them to reflect on the innumerable possibilities they have at their disposal, especially due to the advent of new technologies and the students being enchanted and allured by them (Beastall, 2006).

Notes

1. According to the categorisation that Kachru (1985) devised, the English-speaking world is divided into three concentric circles: the inner, the outer, and the expanding circle. The outer circle comprises countries in which English is spoken as a first language, such as Britain, the United States and Australia, the outer circle includes countries in which English is used as a second language, such as Singapore, India or Nigeria, while countries where English is learnt as a foreign language for commercial or cultural purposes, such as China or Greece, belong to the expanding circle.
2. "[Statistical] Significance is measured by a probability coefficient (p) ... In social sciences we typically consider a result significant if $p < 0.05$, that is, if the probability of the result not being real but only due to chance... is less than 5 per cent" (Dörnyei, 2007, p. 210).

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APPENDIX

PARTICIPANTS' SUGGESTIONS FOR FUTURE PROJECTS

No tasks or diaries next time because they were tiring!

I wish school were more organised and we could play video games in it!

It would be good if such projects were done at school because they make it easier for students to learn foreign languages

I believe it is the best educational method for learning English, it would be great if this was done all over the country

Next time I would try something like that I would like it to be shorter, have more suspense and the vocabulary to be more familiar to me at some points

Something like that would be great for a school project because we would learn many things in English such as new words and all this having fun at the same time

It would be nice to do such projects in other subjects as well because we learn to collaborate with our classmates better

I would prefer all of us to work necessarily in groups next time so that weaker students could be helped more

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