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# Paper or Facebook? An experiment on the comprehension of texts with a group of dropouts

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## Abstract

L'utilizzo sempre più diffuso, specie tra le generazioni più giovani, di pratiche di lettura continua in rete di testi brevi e articolati, tramite diversi dispositivi, pone interrogativi plurimi: sulle competenze necessarie; sul ruolo e l'effetto dei molti distrattori e attrattori presenti; sulla riorganizzazione cognitiva che comporta il cambiamento di strumenti utilizzati per la lettura. Risulta possibile ipotizzare che la comprensione di testi sia destinata, nel tempo, ad essere più accessibile attraverso dispositivi tecnologici piuttosto che attraverso la carta? L'articolo presenta gli esiti di un esperimento condotto con un gruppo di dropout, categoria individuata per la collocazione fuori dal percorso classico di istruzione e dunque più distante dall'uso quotidiano di testi tradizionali, inseriti in un percorso di formazione professionale. Utilizzando prove rilasciate dall'indagine OECD-PISA abbiamo inteso comparare la comprensione degli stessi testi attraverso l'utilizzo di supporti cartacei o attraverso il ricorso a Facebook.

**Parole chiave**: comprensione; lettura; Facebook; dropout; competenze.

## Abstract

Reading texts on the web using technological devices is a practice that is increasing, especially among the younger generation, and this raises questions about the skills that are required to do this, the role and effects of the distractors present around the text, and the cognitive reorganisation that involves a change in the tools used for reading. It appears possible to hypothesise that the meaning of texts is destined, in time, to be more accessible through technological devices rather than via paper. This article presents the results of an experiment conducted with a group of dropouts, a category identified for placement outside the classic route of education, and therefore further removed from the daily use of traditional, printed texts encountered in a professional training course. Using evidence from the survey released by OECD-PISA, our intention is to compare the understanding of these texts when presented on paper compared to when they appeared on Facebook.

**Keywords**: understanding; reading; Facebook; dropouts; skills.

[1] The article and the experiment were prepared/managed together. Therefore, half of each paragraph can be attributed to each of the two authors.

## 1. Dropouts and texts

Dropouts are a phenomenon of alarming proportions in Italy. According to Eurostat data (2013), and coinciding with the percentages provided by the Ministry of Education in Italy, the school dropout rate (for the year 2012 to 2013) was 17.6%, a percentage that captures, albeit loosely, the situation of tens of thousands of children. However, as acknowledged and for a number of reasons, the data related to the dispersion have been underestimated[2]. In fact, according to estimates in other reports, the percentage of subjects that leave the education system may be much higher (closer to a quarter of the total school population), while only 70% of all students complete secondary education on a regular basis (Batini, 2014; Benvenuto, 2011).

In Italy, a significant portion of the school population abandons the educational system from the tenth year of schooling onwards, regardless of the achievement (at best, a lower-secondary education), and that portion is an estimated number of over seven hundred thousand youngsters every year. Some of them are absorbed into professional training channels where they can fulfil the right/duty to education and training, and obtain a qualification (second or third level of the European Qualification Framework – EQF). Italian regions have adopted different devices to provide this opportunity, which is aimed at a professional career for the boys/girls who choose it[3].

Dropouts were chosen for the experimental sample precisely because of their particular characteristics. Dropouts have often had a negative school experience that led them to abandon the system of education (or, according to other perspectives, to be abandoned by it). This may be due to factors such as family background, the network of relationships or the skills they possessed when they began their education (Batini, 2014; Terry, 2008; Trinchero & Tordini, 2011; Wilkins & Williams Bost, 2014). The condition of having an initial disadvantage in the school experience, especially in the Italian system, is not removed and becomes a permanent condition with obvious *counter-distributivity* effects for education (Batini, 2014; Benvenuto, 2011; Trinchero & Tordini, 2011).

In most cases, this outcome has produced a relationship of distrust for all that is considered to be reminiscent of school, including books and paper in general, as they are key mediators in the experience of learning (Batini, 2014; Trinchero & Tordini, 2011). This is almost certainly caused by the exposure time to the medium of paper which, for peers (not dropouts), is superior precisely because of the school experience.

In the school context, the feedback received was usually negative, with serious consequences in terms of internalisation because this is then translated into self-assessment. The extensive experience of recovering basic skills with groups of dropouts

[2] The Student Register is not yet functional and coordinated at the national level. Also, only dropouts who notify the schools that they are leaving are reported to employment centres. Those who simply stop attending are often re-entered automatically for the next year, creating a "ghost consumer".

[3] There is, in reality, a limited choice of alternatives. The possible choices are actually doubly limited. On one hand, the qualifications are limited to a total of twenty-seven established by agreements in the State Regions; the other limitation is the number of qualifications actually activated for that year in the territory (Batini, 2014).

in Tuscany[4] shows that it is possible to intervene effectively in terms of basic skills in a limited period[5], and that the relationship with texts and media can change. Another relevant aspect is the difference between feedback received at school and real skills, which are sometimes not inferior to those of their peers who continued with traditional education.

According to the OECD-PISA (Programme for International Student Assessment) investigations[6], Italy has below average scores in reading performance (with a score of 490), which have remained stable since 2000. 19.5% of students in Italy obtain results below the level of basic reference in reading skills.

At best, these students are able to recognise the main idea or the author's purpose in a text that focuses on an issue that is known to the student, and to make a simple connection between the information contained in the text and useful knowledge in daily life. The dropouts should, logically, be placed in the lower range. At the same time, only 6.7% of Italian students are placed in the upper range of the PISA scale for reading, compared to 8.4% in all the other OECD countries (Invalsi, 2013).

## 2. The research hypothesis

Using comprehension tests selected from those released between the OECD-PISA trials (OECD, 2009), the experiment aimed to verify the understanding of the same texts read in hard copy or on Facebook via a smartphone[7]. The literature on the subject is vast and susceptible to major future developments despite not having received unanimous agreement at present (Cull, 2011; Hillesund, 2010).

Thus, the following assumption has been made: the dropout subjects are able to understand texts of medium and high complexity, compared to surveys OECD-PISA (Invalsi, 2013). The subjects' understanding of the texts could be just as easily through mobile devices as on paper, although all of them obviously learned to read on paper. This because the higher frequency of use of mobile devices require the continuous operation of reading comprehension, compared to a lower frequency with the paper.

The importance of personal preference related to the supposed greater difficulty of electronic texts has already been demonstrated in previous research, such as the study by

[4] In Tuscany, the context of the right and duty to education and training is absolved by professional training for the recovery of basic skills, as defined by D.M. n. 139/2007 and subsequent agreements between the State-Region, as a training action is explicitly dedicated to the recovery of the same skills. Similarly, in integrated pathways between education and training, many Italian regions have different methods for the instruction and retrieval of basic skills.

[5] In particular, the routes are designed and tested by the Association Pratika and are then used by the agency Forium (Santa Croce, Pi), the agency Formatica (Pisa), the agency Zefiro (Lucca), the agency Etruscaform (Massa) and other partners. The path to recovery and the acquisition of basic skills has a weight of 367 hours.

[6] Investigations which, as is known, have measured the skills in reading, mathematics and science of fifteen year olds since 2000.

[7] Remember that the evidence given is no longer used in the subsequent administrations of the OECD-PISA.

Jones and Brown (2011) which, through the use of measurements using standardised tests, showed that the levels of understanding texts did not differ in groups of elementary school children who used paper books or e-books. Similarly, with both young adults and the elderly, who were given three texts presented on different devices (paper, e-readers and tablets), the results for understanding were not different. In addition, through the use of neural correlates (EEG – Electroencephalography – and eye movements), it was shown that, for older adults, it is easier to read using a tablet (Kretzschmar et al., 2013). This because of the frequency of the current use of mobile devices that requires the continuous operation of reading comprehension, compared to a lower frequency of the use of paper.

As recently claimed by Roberta Cardarello and Annamaria Contini (2012), in an era dominated by technology, reading skills have not lost their usefulness. However, it is necessary to change the objects to which to apply them – not just paper, but also liquid crystal displays – and the kinds of texts to be accessed, not only books and newspapers, but also post and fanzines. However the possession of the ability to decode, read and extract meaning from texts is also crucial for the next generation's communication. The importance of knowing how to deal with different texts, and how to recognize and adopt appropriate and flexible strategies may even be increased (Cardarello & Contini, 2012).

The experiment is based on two research activities: the effects of reading compared to various objectives and utilities (Batini & Bartolucci, 2014), and the effectiveness of training and guidance activities (including actions related to reading) with subjects belonging to the categories of Neet (Not engaged in Education, Employment or Training) and dropouts. Batini's study (2014) preceded the latter research, by a wide ranging of cognitive research of the same groups. The experiment is also relevant for the administration's announcement of computerised PISA tests, beginning in 2015 (Invalsi, 2013).

The experimental sample consists of a group of dropouts enrolled in a professional training course called Cook Swing 2 (cook) for the accomplishment of the right/duty to receive education and training[8].

The recovery of the sixteen basic skills was included in the course of professional training planned for these users in Tuscany (D.M. n. 139/2007), with additional expertise provided by the State-Regions Agreements.

The youngsters who leave the education system have their skills certified by the institute of origin. Those who already have certified skills are exempt from the relevant forms. At the conclusion of each module, a test to verify the achievement of the objective competence is conducted. If they fail the test, each candidate can sit a final test to achieve the skills not acquired by the end of the module. The valuations are not of on-off kind but each competence may receive a score of 3, 4 or 5 (below 3 assumes that the competence is not acquired), depending on the number of tests carried out well.

As is known, skills are organised into chunks. From the linguistic point of view, and in order to divide the sample into two homogeneous groups, we identified four crucial skills for the experiment. These are reading, understanding and interpreting written texts of

[8] The course is operated by the Educational Cescot Arezzo, Confesercenti and Pratika (http://www.pratika.net), which made the experiment and access to data for the construction of the sample possible. The authors thank the two agencies and the tutor of the course, Cristina Ieluzzi.

various kinds, communicating in Italian in different contexts and situations, identifying specific strategies for reading and preparation in relation to the purpose and type of text, and using and producing multimedia texts.

We also considered a fundamental key competence: acquiring and interpreting information. However, as the key skills are the result of acquisition of the basic skills (according to the D.M. definition), it was not possible to draw on the expertise of individual assessments[9].

The averages of the final scores of each boy/girl for the four identified competencies were then calculated, and has since carried out a random composition of the two groups, taking into account the variable "results" in the identified skills.

The groups were then homogeneous in terms of the average level of competence. The final two groups consisted of six girls and six boys. The number of original subjects (ten girls and ten boys) had to be reduced because the absence of some individuals made impossible for others to participate in order to maintain the balance of the groups.

The two groups were asked to complete tests extracted from the PISA 2006 trials (the evidence given is not used in subsequent surveys) in order to compare the results of the two groups with those obtained from the reference population[10].

There were three tests, each structured as a continuous text of a different type (an advertisement for employment, a scientific article and prose fiction) and some items. There were 12 items: five for the first text, four for the second and three for the third. The levels of difficulty, as defined by OECD-PISA, were from level 1 to level 5 (four for the first level, two for the second level, three for the third level and two for the fourth and fifth levels).

One group received a hard copy of the texts and the related items, while the second group had to access the texts and questions in a Facebook "event" that was created for the purpose, and only used paper to note their responses on the answer sheet. It must therefore be considered that, for the respondents who used Facebook, the questions, texts and answer sheets constituted three different "sources" – in other words, it was not possible to look at all three simultaneously. For those who worked on paper, it was possible to have the reference text, the questions and the answer sheet on the same page, and the text could be reviewed by merely turning back a page.

The difficulty of reading texts on Facebook is obvious: we need to press "more" several times to see the entire text. Questions about each text were inserted in the comments below the post related to the text. However, as we have had occasion to point out, the user is more accustomed to the daily and prolonged use of a smartphone than s/he is to paper. This was apparent during the division of the sample, when some people assigned to the hard copy group asked why they were not included in the group that would work online.

[9] Simply put, the children's basic skills are assessed, and it is then assumed that achieving all the basic skills means that they have also developed key skills.

[10] The research material, including the file used for the experiment, is available on the blog http://federicobatini.wordpress.com (section materials research), and is freely available.

## 3. Results and discussion

The results of the experiment were not easily foreseeable, particularly when compared to those presented in the literature. As is known, it is postulated that the cognitive load determined by reading in an online environment is greater because of the references, the distractors present, and the ability to click and go to other links (Wolf, 2012). In addition, the users, as repeatedly stressed, have little familiarity with the concentration required in a school-type performance. Reading on a smartphone should therefore have produced more difficulties in the group that had to respond to a call on Facebook, join an event and find text and questions there. As this was connected to the participants' individual Facebook profiles, not only did they the distractions present on Facebook pages, especially in the columns on the two margins of the page, but they could also receive calls, chat, receive messages, get alerts regarding friends' activities, and so on. The effect of familiarity, possibly combined with the motivation of wanting to demonstrate the usability of content on their smartphones, produced significant responses by the youngsters in the group that worked online. The trend of attention/concentration is evident when looking at the histograms that represent the percentage of questions that were answered correctly, as was a high prevalence of the percentage of correct answers among the youngsters who used smartphones when compared to the group that used a paper format.

The most interesting dimension is, in fact, the absence of answers, particularly in relation to the last text, in the group that worked with paper. By contrast, those who worked on their smartphones showed a greater tendency to complete the test, in addition to having better results at the higher levels.

The experimental conditions were for both of them particularly strenuous. The experiment was, in fact, carried out after they had already had five hours of lessons in their professional qualification course. Tiredness was, therefore, a common condition, but the data certainly confirm the hypothesis. Given the low number of respondents, the comparison with the national average has little relevance, but the performances are still very interesting, especially at levels 3, 4 and 5, and particularly when considering the educational backgrounds of these subjects and the assessments they received in school curriculum. A group that was expected be in the lower quartile of the population obtained unexpected results, particularly at the higher levels which, according to OECD-PISA, are only obtained by a small part of the Italian population[11].

The statistical significance, even given the evidence of the overall trend, is reached only in level 2 (Figure 1), but it is also obtained by comparing the results of the two groups in terms of the items related to the last text (the last for both groups), which was also the longest test and the one in which two level 5 items were present[12].

[11] The comparison with the national percentage is, of course, only by way of example and to provide a reference, without any claim of statistical validity or generalisation. To obtain this comparison, we considered only correct and partially correct answers to be valid, according to the official adjudicator for OECD-PISA (downloadable from the previously indicated site containing all the research materials), for both groups and for the national averages for each item. We then averaged the correct responses to unify the item level (and not for each text).

[12] In this case, therefore, the items were grouped regardless of their level for the text, while Figure 1 shows a comparison of the levels of the items, without considering the report item/text.

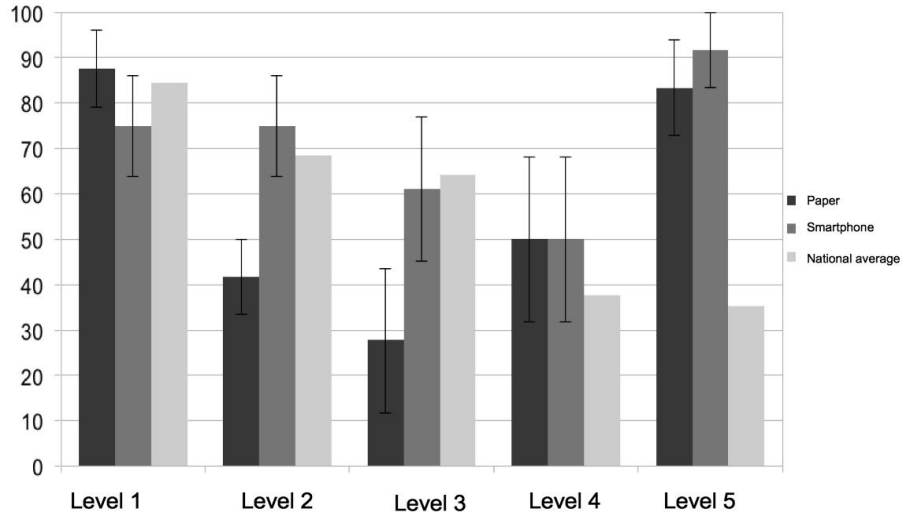


Figure 1. Percentages of the two groups compared to the national average results (OECD-PISA). level 2 shows a difference (P = 0.038 and F = 5.714) favouring those who used a smartphone.

Figure 2 represents the performance of the two groups in relation to the last text, "The Gift".

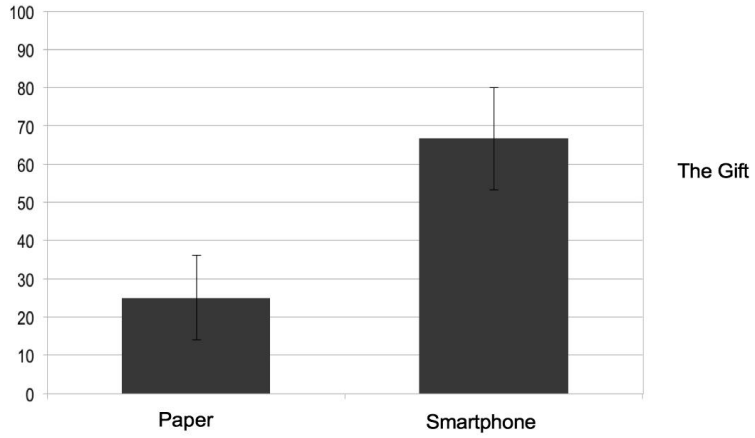


Figure 2. Comparison between the two groups according to the results of the items relating to the last stimulus text, "The Gift" (P = 0.042 and F = 5.435).

## 6. Conclusions

It is necessary to underline that the small sample size of the two experimental groups and the statistical significance, which was clear only with respect to the two dimensions outlined in the discussion of the results, force us to use caution when formulating conclusions. Nonetheless, the hypothesis can be considered to be confirmed. For this group of respondents, the technological medium is neither an impediment nor an obstacle to the understanding and use of texts, at least as far as the narrative texts are concerned. The results would also seem to indicate that, compared to other specific tasks, Facebook

does not cause more lapses in concentration or distractions than does paper. We can surely ascribe the peculiarity of the performances shown on this occasion by the group of youngsters involved in the case study, especially those who used smartphones; however, future developments in the research itself are conceivable.

The authors, who co-conceived, designed, managed and analysed the experiment, intend to continue and provide a final structure, and to then repeat the same experiment with other groups in a bigger research project on reading and on dropouts.

In fact, dropouts' demonstration of a lack of affection for and motivation towards the medium used in institutional contexts of education, given their training history (Batini, 2014), and having an extremely positive disposition towards technological devices that are mainly used for personal purposes, could constitute an experimental group of extreme interest for broader research by providing future suggestions for prevention interventions for those considering leaving school. It will also be possible to verify if the same results can be produced with a larger sample and in other areas of expertise. This could be achieved through the use of OECD-PISA evidence and/or Invalsi evidence providing comparative data compared to age-placed in the education field (Invalsi, 2013). This will then be verified via a comparison of the paper and technological devices preferred by the dropouts, the linguistic area and other areas, particularly those related to mathematics and science, in order to determine whether the peculiarities detected here and the impact of the technological tools can be extended to a larger sample, as well as to see whether textual understanding, other operations with textual material and the approach to tests and exercises are the same in the scientific-mathematical field.

## References

Batini, F. (2014). *Drop-out.* Arezzo: Fuorionda.

Batini, F., & Bartolucci, M. (2014). Reading, memory and dementia: a pilot study. CQIA - *Formazione, lavoro, persona*, *4*(11), 117–125. http://www.unibg.it/dati/bacheca/434/69942.pdf (ver. 04.04.2015).

Benvenuto, G. (2011). *La scuola diseguale. Dispersione ed equità nel sistema di istruzione e formazione.* Roma: Anicia.

Cull, B. W. (2011). Reading revolution: Online digital text and implication for reading in academe. *First Monday*, *16*(6). http://pear.accc.uic.edu/ojs/index.php/fm/article/view/3340/2985 (ver. 04.04.2015).

Cardarello, R., & Contini, A. (eds.). (2012). *Parole immagini metafore. Per una didattica della comprensione*. Bergamo: Junior.Decreto Ministeriale 22 agosto 2007, n. 139. *Regolamento recante norme in materia di adempimento dell'obbligo di istruzione*. http://archivio.pubblica.istruzione.it/normativa/2007/dm139_07.shtml (ver. 04.04.2015).

Federico Batini blog. https://federicobatini.wordpress.com/ (ver. 04.04.2015).

Hillesund, T. (2010). Digital reading spaces: How expert readers and handle books, the Web and electronic paper. *First Monday*, *15*(4). http://uncommonculture.org/ojs/index.php/fm/article/view/2762/2504#p6 (ver. 04.04.2015).

Kretzschmar, F., Pleimling, D., Hosemann, J., Füssel, S., Bornkessel-Schlesewsky, I., & Schlesewsky, M. (2013). Subjective Impressions Do Not Mirror Online Reading Effort: Concurrent EEG-Eyetracking Evidence from the Reading of Books and Digital Media. *Plos One*, *8*(2). http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0056178 (ver. 04.04.2015).

Jones, T., & Brown, C. (2011). Reading engagement: a comparison between e-book and traditional print books in an elementary classroom. *International Journal of Instruction*, *4*(2), 5–22.

Invalsi. Istituto Nazionale per la Valutazione del Sistema educativo di istruzione e di formazione (2013). *OCSE PISA 2012. Sintesi dei risultati per l'Italia.* http://www.istruzione.it/allegati/focus031213_all1.pdf (ver. 04.04.2015).

OECD. Organization for Economic Co-operation and Development (2009). *PISA 2009 Assessment Framework. Key competencies in reading, mathematics and science*. Paris: OECD Publishing.

Pratika - Formazione e Orientamento. http://www.pratika.net/portal/ (ver. 04.04.2015).

Terry, M. (2008). The Effects that Family Members and Peers Have on Students' Decisions to Drop Out of School. *Educational Research Quarterly*, *31*(3), 25–38.

Trinchero, R., & Tordini, M.L. (2011). *Responsabilità e disagio. Una ricerca empirica sugli adolescenti piemontesi.* Milano: Franco Angeli.

Wilkins, J., & Williams Bost, L. (2014). Reengaging school dropouts with emotional and behavioral disorders**.** *Phi Delta Kappan*, *96*(4), 52–56.

Wolf, M. (2012). *Proust e il calamaro. Storia e scienza del cervello che legge*. Milano: Vita e Pensiero.