From Slate to Notebook: Improvements in Literacy and Education

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**Historical Context: From Slates to Notebooks**

The history of writing technologies is complex, dynamic and multifaceted, however it is abundantly evident that its evolution has had a significant impact on literacy and education through time. Improvements within writing systems, their dissemination, and applications are largely dependent on the cultural needs and attitudes, as well as people’s interactions with the material available to them. Long before the introduction of the notebook in schools, previous literate civilizations used various media as a means to communicate, inscribe and document educational lessons. While some of these technologies were discarded or replaced, others were modified with the aim to improve the previously established technology (Bolter, 2001). It is undeniable that papyrus scrolls, the manuscript codex and printed books have drastically shaped literacy, however, it is worth noting that the writing slate, the blackboard and the notebook have also played a pivotal role in improving literacy.

Although paper was invented in China in the second century (Ong, 1982), it took several hundred years for it to become commonly used in the classroom. Despite the invention of the papermaking machine in 1798 (Robert C. Williams Museum of Papermaking, 2006), paper and ink remained costly and difficult to obtain for an extent period of time. Slate on the other hand was readily available, cheap and far more durable, such that it became the economical choice as a writing technology, especially in education.

Slate is the result of the metamorphism of shale or mudstone, and could easily be split into thin slabs for various uses such as roofing and flooring, games, directories and scorekeeping (Swords, 2008). Unlike paper, which could essentially only be used once, the writing slate could be reused again and again by scratching the surface with a slate pencil, leaving a white mark that could then be wiped clean with a rag for later use. Therefore, the handheld slate became a popular medium in schools during the eighteenth and nineteenth century and was considered to be a valuable tool in improving teaching and learning practices.

It wasn’t until 1800 when a Scottish headmaster invented the first blackboard by stringing together students’ slates in order to create a larger writing space (Buzbee, 2014). This invention was rapidly adopted in classrooms and became one of the most revolutionary tools as it gave rise to new educational practices. Teachers could demonstrate instructions on the blackboard rather than having to write them individually on students’ slates, thus saving valuable teaching and learning time (Wylie, 2012). Furthermore, the larger writing surface enabled teachers to expand on their instructions, highlight common mistakes to the entire class, and provide visual aids to learners (Wylie, 2012). The pedagogical efficiencies brought on by the blackboard inspired the development of various new teaching strategies that could accommodate larger groups of learners.

During the nineteenth and early twentieth century, improvements in paper productions were on the rise and papermaking eventually became automated. As a result, the cost of paper began to decline and its benefits as a writing medium far outweighed those of the slate-boards. Paper cutting machines supplied evenly cut sheets (Bakewell, 2014) on which students could then write their lessons and keep records of their work. In 1934, the first spiral notebook was introduced when loose sheets of paper were bound together by a coiled piece of wire (Modern Mechanix, 2006). The ability for students to build a repository of information that could be reviewed at a later time transformed learning practices both inside and outside of school.

**Writing slates: Improvements to literacy**

The introduction of the handheld slate into the classroom significantly changed the way students learned how to write and spell. Improvements in spelling abilities were observed as students benefited from having to pay close attention to the dictated word, visualize each letter, and go over the pronunciation of the word as they wrote it down on their slates (Lancaster, 1807). Not only did this method encourage more attention, but students also became more engaged in their lessons. Rather than sitting idly as one student practiced reading a word, the handheld slates enabled the rest of the class to write down the word and practice their spelling, reading and writing all at the same time. Furthermore, writing on their slates enabled students to encode the sound they heard into a visual form, thereby transforming speech and thought into “a new sensory world” (Ong, 1982, p. 83). The writing slate as a medium of instruction was also beneficial to teachers as they could to detect lack of attention, inaccuracies, or mediocre attempts by checking students’ work on their slates (Lancaster, 1807).

Despite the economical and accessible nature of slate, the slate-boards definitely had drawbacks worthy of mention. Prior to the invention of the blackboard, teachers were required to copy the tasks on each individual board and needed to walk around the classroom in order to review students’ work and progress. This proved to be inefficient as it took up valuable teaching and learning time and limited the number of students per classroom. Having to cradle the slate-board in one arm while holding the narrow slate pencil in the other hand made writing a difficult task, especially for younger students whose motor skills were not as fully developed (Davies, 2005). This often resulted in dropped boards and pencils, which fractured easily, rendering them useless afterwards. Lastly, one can only imagine how bothersome it would be to listen to the noise produced by students writing on slate boards with their slate pencils.

**Writing slates: Rote learning**

The writing slate was a practical technology that enabled students to repeatedly practice their learned skills in the classroom. However, since each tasks needed to be erased before commencing the next, this meant that there were no permanent records of students’ work for later revision (Villarreal, M. E. & Borba, M. C., 2010). Therefore, repetition, memorization and rote learning remained essential strategies for knowledge acquisition during this era. Daily lessons would have involved writing letters or words over and over again on slates and repeatedly reciting important dates and facts. These methods of teaching would have created a learning environment that was very disciplined and would not have encouraged individual reflections, initiative or expression. While the slate-board provided students with a medium on which they could practice their penmanship, writing and arithmetic, many of the lessons and evaluations mainly focused on students’ ability to recite key information they had memorized. The emphasis on repetition as a means to retain information possesses some residual characteristics of oral traditions such that sustained thought was considered “tied in communication” (Ong, 1982, p. 34).

Rote learning is a style of learning based on repetition that places an emphasis on the ability to memorize and recall information exactly how it was presented (Haylock, D. & Thangata, F., 2007). Mayer (2002) indicated that when teaching strategies focus solely on rote learning it prevents students from making meaningful connections between new and prior knowledge. Therefore, regardless of the students’ capability to accurately recall facts or processes, they were unable to truly understand them because concepts were fragmented and disconnected from any context. As a result, a student relying on rote memorization would not be able to transfer the knowledge they have acquired and apply it to a new situation. Even though writing on slates was temporary, thus preventing students from reviewing their work, Kiewra (1989) suggests that the simple act of writing encourages increased attention and facilitates recollection. Therefore, it can be argued that the writing slate was a medium that fostered a more elaborative learning process than simple recitation.

**Notebooks: Improvements to literacy and meaningful learning**

The introduction of notebooks in schools encouraged a series of changes in teaching and learning practices that inevitably improved literacy. As paper became affordable and prominent in society, the transition from slate to notebook demonstrated the need for a writing technology that supported the shift in the characteristics of thought and expression found in text-based cultures. Due to the declining cost of paper, its use in school was no longer limited to advanced grades, which meant that younger students could learn and explore literacy in areas beyond reading (Villarreal, M. E. & Borba, M. C., 2010). One of the major advantages that stemmed from using notebooks in schools was that students could begin to build a repository of information that could be revisited later. Because knowledge could easily be retrieved, the focus on memorization and rote learning lessened and new learning approaches were developed that encouraged spontaneity, reflection and analysis (Ong, 1982).

Unlike the writing slates, students were able to write on loose paper or in their notebooks for extended periods of time without losing their work. This significantly changed the way thoughts were communicated, recorded and assessed in class. No longer were students only required to copy information, but they also learned how to sort, code, analyze and organize the lecture material (Villarreal, M. E. & Borba, M. C., 2010). By noting their interpretations, rephrasing information in their own words, and writing annotations that linked to prior knowledge, students’ learning experiences became more elaborate, personalized and far less controlled. By reviewing their notes, students could improve their understanding of concepts by making meaningful cognitive connections between the new information and their existing knowledge network. As such, assessments in the form of recitation and recall were substituted for ones that required students to apply what they had learned to new situations and demonstrate their understanding in more flexible and complex ways.

The process of note-taking requires considerable attention and careful selection of information. By taking notes, students were able to build an external storage of information, which could be reviewed later in order to enhance recall (Isaacs, 1989). The notebook allowed the spatial organization of thought on paper, thereby providing students with opportunities to make visual and cognitive connections to knowledge stored in their long-termed memory (Boch, F. & Piolat, A., 2005). This method also freed the mind of rote memorization and promoted the development of more intricate thoughts.

During the time of the writing slate, literacy was the described as the ability to read and write and was considered a special skill. However, this meaning changed following the introduction of new writing spaces in the classroom. To be literate not only meant being able to read and write, but also required one to understand the elements and meanings of what was being taught. Literacy was no longer considered a skill for the selected few, but rather a skill required to participate and succeed in society.

**Conclusion**

While it is practically impossible to capture the true complexity of the transition from the writing slate to the notebook, it is evident that the acceptance, use and role of these writing technologies have shaped knowledge production in education over time. When observing the evolution of these technologies, one can see the improvements brought on by each new medium as it either replaced or modified the previously established one. With each remediation, it transformed the appearance of the written word, the means of communication, and ultimately, the meaning of literacy.

**References**

Bakewell, F. C. (1860). *Great Facts: A Popular History and Description of the Most Remarkable Inventions During the Present Century*. New York: D. Appleton and Company. Retrieved October 25th from <http://quod.lib.umich.edu/m/moa/agl3696.0001.001/241?page=root;size=100;view=image>

Boch, F. & Piolat, A. (2005). Note Taking and Learning: A Summary of Research. *The WAC Journal, 16*(1). Retrieved from <http://wac.colostate.edu/journal/vol16/boch.pdf>

Bolter, J. D. (2001). *Writing Spaces: Computers, Hypertext, and the Remediation of Print*. Mahwah, NJ: Lawrence Erlbaum Associates.

Buzbee, L. (2014). *The Simple Genius of the Blackboard*. An excerpt from Buzbee, L. (2014). *Blackboard: A Personal History of the Classroom*. Minneapolis: Graywolf Press. Retrieved from <http://www.slate.com/articles/life/education/2014/10/a_history_of_the_blackboard_how_the_blackboard_became_an_effective_and_ubiquitous.html>

Davies, P. (2005). Writing Slates and Schooling. *Australasian Historical Archeology, 23*(1), 63-69. doi:10.2561/1322-9214.23.1201

Haylock, D. & Thangata, F. (2007). *Key Concepts in Teaching Primary Mathematics*. Sage Publications Inc. (US).

Isaacs, G. (1989). Lecture note-taking, learning and recall. *Medical Teacher, 11*(3-4), 295-302. doi:10.3109/01421598909146416

Kiewra, K. A. (1989). A review of note-taking: The encoding-storage paradigm and beyond. *Educational Psychology Review, 1*(2), 147-172. doi:10.1007/BF01326640

Lancaster, J. (1807). Improvements in Education, as It Respects the Industrious Classes of the Community: Containing, among Other Important Particulars, an Account of the Institution for the Education of One Thousand Poor Children, Borough Road, Southwark, and of the New System of Education on Which It Is Conducted (3rd ed.). New York: Printed and Sold by Collins and Perkins.

Modern Mechanix. (2006, July 15). First Spiral Notebook (1934). [Web log comment]. Retrieved from <http://blog.modernmechanix.com/first-spiral-notebook/>

Mayer, R. E. (2002). Rote versus meaningful learning. *Theory into Practice, 41*(4), 226-232. doi:10.1207/s15430421tip4104\_4

Ong, W. (1982). *Orality and Literacy: The technologizing of the word*. London: Methuen.

Robert C. Williams Museum of Papermaking. (2006). The Advent of the Paper Machine. Retrieved October 27th from <http://www.ipst.gatech.edu/amp/collection/museum_machine.htm>

Sears, Roebuck & CO. (2007). *1897 Sears, Roebuck & CO. Catalogue*. Skyhorse Publishing: New York. Retrieved October 27, 2015 from <https://books.google.ca/books?id=_gdrCgAAQBAJ&pg=PA368&lpg=PA368&dq=Hyatt+noiseless+slate&source=bl&ots=x3Ycpmz7qS&sig=VSdh8xETUcs02sBOkW3m3Np7CK4&hl=en&sa=X&ved=0CCoQ6AEwAmoVChMI6NT15YfmyAIVGNZjCh3GCA1U#v=onepage&q=Hyatt%20noiseless%20slate&f=false>

Swords, M. (2008). A Clean Slate: The Archeology of the Donner Party’s Writing Slate Fragments. *Theses, Dissertations, Professional Papers*. Paper 26. Retrieved from <http://scholarworks.umt.edu/etd/26/>

Villarreal, M. E. & Borba, M. C. (2010). Collectives of humans-with-media in mathematics education: notebooks, blackboards, calculators, computers and…notebooks throughout 100 years of ICMI. *ZDM Mathematics Education, 42*(1), 49-62. doi:10.1007/s11858-009-0207-3

Wylie, C. D. (2012). Teaching manuals and the blackboard: Accessing historical classroom practices. *History of Education, 41*(2), 257. doi:10.1080/0046760X.2011.584573

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Alegri (Photographer). (2009). *Blackboard* [Image]. Retrieved from Wikimedia Commons <https://commons.wikimedia.org/wiki/File:Blackboard1257.jpg>

Bartong, S. (2015). *School Boy with Slate”* [Image]. Retrieved from <http://americanhistory.si.edu/blog/slates-crayons-quills-school-supplies>

BBC. (2014). *Children sat at desks* [Image]. Retrieved from <http://www.bbc.co.uk/schools/primaryhistory/victorian_britain/victorian_schools/>

Beeki (Photographer). (2012). [Untitled image of clay]. Retrieved from Pixabay <https://pixabay.com/en/clay-soil-dehydrated-desert-dry-22517/>

Fae (Photographer). (2010). *Cuneiform tablet* [Image]. Retrieved from Wikimedia Commons <https://commons.wikimedia.org/wiki/File:Cuneiform_tablet_BM62788.jpg>

Flyupmike (Photographer). (2012). [Untitled image of slate]. Retrieved from <https://pixabay.com/en/mountains-slate-grey-slate-51699/>

Geralt (Photographer). (2014). *Puzzle, Learn, Arrangement* [Image]. Retrieved from <https://pixabay.com/en/puzzle-learn-arrangement-components-320754/>

Getty Images (n.d.). *Primary Education* [Image]. Retrieved from <http://www.gettyimages.ie/detail/photo/primary-education-high-res-stock-photography/HE9390-001>

Hill Museum & Manuscript Library. (n.d.) *Weiner Codex 21 – Ethiopian biblical manuscript* [Image]. Retrieved from Wikimedia Commons <https://commons.wikimedia.org/wiki/File:Weiner_Codex_21_Ethiopian_Biblical_Manuscript_18th_century.jpg>

Hine, L. (Photographer). (1936). *Mt. Holyoke, Massachusetts - Paper. American Writing Paper Co. Cyliner machine (making matchboard)* [Image]. Retrieved from Wikimedia Commons <https://commons.wikimedia.org/wiki/File:Holyoke,_Massachusetts_-_Paper._American_Writing_Paper_Co._Cyliner_machine_%28making_matchboard%29._-_NARA_-_518335.jpg>

Keating, J. & Sheldon, N. (2012). *Lavender Hill School 1925 or 1926, courtesy of John Geddes* [Image]. Retrieved from <http://www.history.ac.uk/history-in-education/about.html>

Kizzzbeth (Photographer). (2012). *Note Taking* [Image]. Retrieved from <https://www.flickr.com/photos/31403417@N00/6933461571>

Marvel (2012). *Slate & slate pencil* [Image]. Retrieved from <http://pastperiodspress.com/2012/08/31/slates-slate-pencils/>

Modern Mechanix (2006). *First Spiral Notebook (Sep, 1934)* [Image]. Retrieved from <http://blog.modernmechanix.com/first-spiral-notebook/>

Nile (Photographer). (2015). [Untitled image of paper sheets]. Retrieved from <https://pixabay.com/en/paper-leaf-font-old-antique-leave-623167/>

NYC Wanderer (Photographer). (2009). *Gutenberg Bible* [Image]. Retrieved from <https://www.flickr.com/photos/10183029@N00/3631902258>

Paper Making [Image]. (2009). Retrieved from Wikimedia Commons <https://commons.wikimedia.org/wiki/File:Making_Paper_1.PNG>

Pink Sherbet Photography (2010). *Blank Pages In An Open Notebook* [Image]. Retrieved from Wikimedia Commons <https://commons.wikimedia.org/wiki/File:Blank_Pages_In_An_Open_Notebook_%284812269151%29.jpg>

QldPics (1910). *School teaching, Mount Beppo, Queensland, 1910* [Image]. Retrieved from <http://www.bonzle.com/pictures-over-time/pictures-taken-in-1910/page-1/australian-localities/size-3/picture-hrdh2k1c/mount-beppo/school-teaching-mount-beppo-queensland-1910>

Riis, J. (Photographer). (1914). *Classroom* [Image]. Retrieved from Wikimedia Commons <https://commons.wikimedia.org/wiki/File:Classroom_-_Jacob_A._Riis.jpg>

Sagdejev, I. (Photographer). (2008). *Stacked roofing slate* [Image]. Retrieved from Wikimedia Commons <https://commons.wikimedia.org/wiki/File:2008-06-26_Stacked_roofing_slate_1.jpg>

Schengili-Roberts, K. (Photographer). (2006). *The Westcar Papyrus* [Image]. Retrieved from Wikimedia Commons <https://commons.wikimedia.org/wiki/File:PapyrusWestcar_photomerge-AltesMuseum-Berlin-3.jpg>

Sharma, A. (Photographer). (2006). *Books* [Image]. Retrieved from <https://www.flickr.com/photos/abee5/8314929977>

Spork (Photographer). (2010). *Slate roof in Andorra* [Image]. Retrieved from Wikimedia Commons <https://commons.wikimedia.org/wiki/File:Slate_roof_in_Andorra.jpg>

Stephencdickson (Photographer). (2015). *Bust of Prof James Pillans by Peter Slater, 1852* [Image]. Retrieved from Wikimedia Commons <https://commons.wikimedia.org/wiki/File:Bust_of_Prof_James_Pillans_by_Peter_Slater,_1852,_Old_College,_University_of_Edinburgh.jpg>

The History of Education Centre. (n.d.). [Untitled image of slate boards with letters]. Retrieved from <http://www.histedcentre.org.uk/DOD15.html>

Tubifex (Photographer). (2009). *Cyperus papyrus – Botanical Garden Bremen* [Image]. Retrieved from Wikimedia Commons <https://commons.wikimedia.org/wiki/File:01756_-_Cyperus_papyrus_%28Papyrus-Staude%29.JPG>

Upper Yarra Museum. (2012). *Writing slate* [Image]. Retrieved from <http://victoriancollections.net.au/items/4f72a84597f83e0308602dd1>