IO.3 HANDBOOK

HANDWRITING AND WORD PROCESSING HANDBOOK & VIDEO-TUTORIALS

Halo by Erasmus+

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Handbook

HALOPROJECT

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MODULE 1 - Manual writing and new technologies: the main educational devices and software

In the last years, there has been a great debate on handwriting between those who want to enhance it and those who want to make it disappear definitively to foster digital means that offer, at least in some respects, a better functional result.

Digital writing is globally assuming a new and different meaning compared to the period in which technological tools only allowed the use of handwriting for the construction of written language.

For the many who consider handwriting a "World Heritage", we wonder if we can glimpse the possibility of "dialogue" between the two forms of writing, considering them different realities but capable of interacting.

To mention one of the innumerable reasons in favor of handwriting, we can quote the fact that abandoning it could mean not recognizing how much it contributes to activating numerous cognitive processes of increasing

complexity, which allow us to keep alive the basic neurocognitive, emotional and social dynamisms communication deriving from its natural expression.

HALO project's staff is convinced that the wrong choice to bring life and enhance handwriting would be to want to fight technology and the digital world. We consider technology and handwriting two different but not opposing realities, two ways of expressing ourselves and communicating that we must consider complementary, not alternative. Technology has brought an epochal revolution to the world. However deleting the handwriting from human actions because we have the comfort of the touch screen or keyboard is like arguing that it is useless to walk since we have the comfort of the car. Those who support the usefulness of walking do not want to deny the usefulness of the car. Anyone who claims that writing by hand is good for you is not fighting against your own time, but is defending an all-time value.

Handwriting VS Digital Transformation

The comparison between handwriting and digital writing can be discussed whether it is a conflict or an integration, surely there are some points to start reflections, we have listed some of them:

1. Handwriting and digital writing bring different experiences. Handwriting is more tactile and involves a direct connection between the brain and hand, while digital writing offers the convenience of typing and the ability to easily share content.
2. Handwriting stimulates deeper cognitive processing. Studies have shown that taking notes by hand is more effective in understanding and retaining information than typing.
3. Digital writing offers benefits such as speed and ease of editing. You can write faster on a digital device and make changes easily without having to rewrite all the text.
4. Some experts believe it is possible to integrate both methods. For example, take handwritten

notes during a lecture and then type them later to have an organized digital copy.

5. Excessive use of digital writing can lead to an addiction to technology and reduce handwriting skills. It is important to strike a balance between the two methods to ensure the development of handwriting skills and digital skills.
6. Different contexts and purposes require different approaches. Handwriting may be preferable in more creative or personal situations, while digital writing is often needed for professional or shared purposes.
7. Choosing between handwriting and digital writing comes down to personal preferences and individual needs. There is no universal answer, but it is important to consider the advantages and disadvantages of both methods.

For us, handwriting has a unique appeal that digital writing fails to fully replicate. Let's try to list just some of the other reasons why many people still prefer to write by hand, despite the convenience of digital technology.

First, handwriting offers a tactile feel that digital writing can't match. The feel of pen or pencil on paper can be

pleasant and relaxing for many, and this writing process can become almost meditative.

Second, handwriting can be a form of creative expression that allows people to experiment with different handwriting, writing styles, and decorations. This type of personalization is difficult to replicate on digital technology, which tends to standardize the writing style.

Thirdly, handwriting offers greater freedom of expression. When writing by hand, one can easily create sketches, drawings, arrows, annotations and other graphical signs that are not easy to create on digital technology.

Finally, handwriting can be a form of nostalgia and connection to the past. Many of us have school or family memories related to handwriting, and this can make it a very personal and intimate form of writing.

In summary, handwriting has a unique appeal that digital writing cannot fully replicate, thanks to the tactile sensation, creativity, freedom of expression and nostalgia it represents.

Pedagogy and manuscript

Although it is thought that the practice of handwriting is an outdated activity in our digital society, it is still today one of the most frequent activities in the school routine. In fact, students spend a large part of their school day doing handwriting and other fine motor tasks, and research confirms that difficulties encountered in this area can interfere with academic performance and that writing is the most common problem of students with learning disabilities between 9 and 14 years.

Dysgraphia and multimedia interaction

The process of writing by hand or on a computer is radically different. The difference lies in the direct relationship with the medium on which one writes or the digital mediation

It is true that in some schools in the United States and in Finland there is a tendency to replace handwriting from the beginning of elementary school with print characters and the use of the computer, in the belief that this method can facilitate the learning of reading. However, recent scientific research clearly denies these theses, showing how writing by hand has greater advantages for the development of fine motor skills, as well as in the ability to recognize and memorize letters, to learn to read more quickly, but also to

realize a better written production in quantity and quality, compared to those who use a computer keyboard.

But beyond these simple observations, it is more important to ask what are the consequences of writing by hand or on the computer in a child's learning.

Recent studies show how perception through the senses and motor skills are closely linked during development and depend on our direct interaction with the surrounding world.

According to this sensorimotor view, the process of writing by hand or on the computer is radically different. In the first case, it is a specialized motor activity which involves the use of only one writing hand, while the other hand offers only support on the paper. When we write by hand, there is a direct relationship between our act of writing and the graphic product obtained, so our experience involves the whole body and all the senses. Hence the possibility, when handwriting automatisms are well established, to personalize handwriting over time, in a unique and inimitable way.

On the contrary, in writing on the computer, this component of direct contact between the process and the graphic product is completely lost. Both hands are used to press the keys, without awareness of the movement necessary to execute each letter, while visual perception is divided between looking at the keyboard to check the position of the

individual keys corresponding to the letters and looking at the screen to check how long you are writing. Thus contact with the body is completely lost, the combination of the senses correlated to precise fine motor movements, while writing becomes impersonal.

On the other hand, other research in France shows that handwriting compared to computer writing leads children to recognize and memorize letters better, since each letter corresponds to only one movement, whereas when typing on the keyboard, it is simply to locate and activate a point on the keyboard corresponding to that letter.

Furthermore, the risks of excessive use of digital technology in children should not be underestimated, as stated by the German psychologist M. Spitzer: «The results of the first studies on this subject indicate that an increased digitization of writing, which is already appearing in childhood, has negative consequences on the reading ability of children and adults."[1] Consequently, "an effective reading and writing lesson, conducted on the basis of neurobiological learning principles, could even counteract dyslexia and dysgraphia, caused by changes in brain regions responsible for linguistic

[1] Spitzer M., Digital dementia

processing and often in turn causing serious repercussions on individual development.

The learning of handwriting is therefore more positive in the developmental phase than that of word processing and therefore should be accompanied by effective and specific teaching which could have effects of prevention and contrast against learning difficulties.

Digital and Analog

Graphology is the scientific study of handwriting and its analysis to obtain information about an individual's personality, emotions and behavior and operates in a completely analogical way. Digital, on the other hand, refers to technology and its utilization to process, store and transmit information in a digital format.

Digital technology can only be used to support the practice of graphology. There is specific software that uses image analysis to help graphologists interpret handwriting characteristics, such as pressure, letter size, angle of inclination, and so on.

Handwriting analysis software: There are several handwriting analysis software that use artificial intelligence to analyze handwriting traits and provide an interpretation of personality. These software are able to analyze a large amount of data in a short time and are often used by graphology professionals as normal support tools.

Signature analysis programs: Signature analysis programs can be used to analyze and compare signatures. These programs are able to detect the differences between the

signatures and provide an interpretation based on those differences.

Tools for digitizing handwriting analysis: there are also tools that allow you to digitize and archive handwriting analyses. These tools simplify the process of storing and sharing analyzes and allow you to quickly access the information.

In general, digital tools can be used to streamline the handwriting analysis process, making it faster and more accurate. However, it is important to remember that the digital medium does not replace the traditional practice of graphology and that it is necessary to have a solid understanding of the principles of graphology to use digital tools correctly.

These tools will not be studied in depth in this manual, while we intend to deepen those that are the "devices" of digital technology for handwriting.

Digital handwriting devices

There are several options of computer handwriting tools including,

Paper tablets: Digital writing tablets are designed to offer a writing sensation similar to that of a pencil on paper. There are several technologies and materials that can be used to achieve this.

The surface of the tablet can be designed to be paper-like, to provide a slightly textured surface that simulates the writing resistance of paper. This can be achieved by using a matte finish or a satin finish, which creates a more porous and textured surface. Many tablet pens have rubber or silicone tips, which offer more resistance to writing than ballpoint pens. This allows the pen to create a writing feel more like that of pencil or pen on paper.

Paper tablets for writing can use pressure technology to replicate the feel of writing with varying degrees of pressure on the paper. This is done through pressure sensing technology, which allows the tablet to sense the pressure of the pen on the surface and adjust the line width and hue based on the amount of pressure you apply.

Digital pens: they are special pens that allow you to write

on a physical surface such as paper or notebooks, but at the same time digitally capture what you are writing. Some examples include the Moleskine Pen+, Livescribe 3 Smartpen, and Wacom Bamboo Slate.

Tablets with handwriting capabilities: Many modern tablets, such as the iPad Pro or Samsung Galaxy Tab S7, have handwriting capabilities that allow you to write with a special pen directly on the screen.

Handwriting apps: There are several apps available on smartphones and tablets that allow you to write by hand directly on the device screen. Some examples include GoodNotes, Notability and OneNote.

Graphics Tablets: These are special tablets that connect to your computer and allow you to write by hand with a special pen directly on your computer screen.

In general, all these IT handwriting tools aim to create a handwriting experience as similar as possible to traditional writing on paper, but with the addition of some advantages offered by digital technology, such as the possibility to save, edit and share your notes digitally.

Paper tablet

The arrival of Amazon's Kindle Scribe has certainly piqued interest in the E Ink tablet category, which has been around for a long time already and offers a variety of products from different companies with features and functionality that significantly set them apart. Of course, you can write and take notes on any tablet with pen support, but what mainly differentiates these products from an ordinary iPad with a stylus is the feeling you get while writing. The screens of these tablets try to replicate the friction and friction sensation when you pass the pen across the display, creating the illusion that you are actually using a pad of paper. All of this is coupled with the characteristics of E Ink screens, which visually replicate the feel of paper.

E Ink technology has been widespread for years thanks to the success of the E Book reader, also called electronic book reader, it is a portable electronic device that allows you to load a large number of texts in digital format (ebook) and read them similarly to a paper book. eBook readers are designed almost exclusively for reading texts, and in their original meaning they are identified as having

screens with e-ink technology, generally only available in shades of gray. The books can be downloaded for free or for a fee.

Below, in our opinion a list of the best Paper Tablets
(our selection of tests with a particular eye on graphology)

Onyx Boox Note Air2 Plus

The absolute pioneer in the production of E Ink tablets with a stylus for taking notes is Onyx, a Chinese company specializing in eReaders and active since 2009. The first E Ink tablets used a Linux operating system, but since 2013 the company has decided to adopt Android for greater compatibility with third-party apps. The latest addition is the Boox Note Air2 Plus, a 10.3" tablet with a high-definition E Ink Carta display and adjustable lighting in both intensity and tone. Being an Android tablet we have respectable hardware, which includes a Snapdragon 665 octa-core processor, 4GB of RAM and 64GB of internal memory, while the 3700mAh battery can last several weeks on a single charge. Present the Google Play Store, which allows us to install reading apps including those of Kindle and Kobo, annotation apps such as OneNote, and

much more. Among the main functions we have the possibility to take notes on eBooks and documents, to convert writing into electronic text, to transfer files via OTG cable or to share them with various cloud services such as Dropbox, OneDrive or Google Drive, to project the screen on an external display or TV, and listen to multimedia files thanks to the speaker as well as record voice notes with the built-in microphone.

reMarkable 2

Among the most quoted companies in the E Ink tablet sector is the Norwegian reMarkable, operational since 2014 and which in 2017 – after a crowdfunding campaign – launched the first version of its homonymous device. Today you can buy reMarkable 2, a second-generation model with a high-definition 10.3" E Ink Carta display which, however, lacks lighting: in the evening or in poorly lit areas you will need a lamp to be able to read or write. We are talking about a device designed primarily for writing and replacing paper - an aspect in which it succeeds very well - so the hardware is not particularly advanced: we have a not well defined dual-core processor with 1GB of RAM and 8GB of internal memory, a battery from

3000mAh capable of lasting a few weeks with average use. Other features include support for external cloud services, conversion of writing into text and the ability to take notes directly on documents or eBooks. There is no microphone and speaker, nor support for audiobooks. There is a €3/month subscription if you want to enjoy unlimited cloud features.

Kobo Elipsa

No doubt an important name in the world of eReaders is Kobo, Kindle's main competitor and for several years already part of the Japanese giant Rakuten. After a long history in the production of eReaders and tablets, already in 2021 the company launched Kobo Elipsa, its first E Ink tablet with pen. Here too, the display is 10.3" with E Ink Carta technology, with lighting that can only be adjusted in intensity and not in tone. The processor is a quad-core, with 1GB of RAM and 32GB of internal memory, while the 2400mAh battery can last for weeks. We have neither speaker nor microphone, but there is support for audiobooks by connecting headphones or an external speaker via Bluetooth. We can write on books and documents, convert writing to text, and use Dropbox to

export or import notes and documents.

Ratta Supernote A5 X

Another long-lived company in the E Ink tablet sector, although less known in Italy, is the Chinese-Japanese Ratta which offers the Supernote A5X. It is an E Ink tablet with a 10.3" screen without lighting, so as to reproduce the feeling of paper even better and to keep the thickness to a minimum, but which has the properties already seen when speaking of reMarkable - writing conversion, support for third-party cloud services, writing on books and documents – adds integration with the Amazon Kindle app to access your personal library. There is also the possibility of synchronizing email and calendar with Google and Outlook, a property that makes the Supernote also suitable for work. The processor is a quad-core PX30 with 2GB of RAM and 32GB of internal memory, while the 3800mAh battery has an autonomy of several weeks.

Huawei MatePad Paper

After a launch at the beginning of 2022, the first E Ink tablet from Huawei has also recently arrived in Europe,

with an approach more similar to that of Onyx than to that of the other models that focus mainly on the reading and writing experience . MatePad Paper is in fact based on the HarmonyOS 2 operating system, with an octa-core Kirin 820E processor, 4GB of RAM and 64GB of internal memory, but carries the same 10.3" E Ink display as the previous models, with adjustable light also in tone . The 3575mAh battery has an autonomy that hardly exceeds a week, but going to look at the available functions it is probably the most complete model: we find 4 microphones and 2 stereo speakers, support for audiobooks and vocal notes, the possibility of transferring files via Bluetooth as well as via OTG cable and through third-party cloud services (except Google Drive for the reasons we are familiar with); you can write on documents and books, convert your handwriting into digital text, project your screen onto TVs and external displays, and install third-party apps from the AppGallery .

Amazon Kindle Scribe

Recently available in Europe, still not very present on desks even if it has caused a lot of talk about itself, but we are sure that it will soon become the best-selling model:

Amazon probably wanted to see first how its competitors were moving and what the demand for this type was of product before designing and selling one of its own, nevertheless it seems to us that the Kindle Scribe is slightly immature, presenting several shortcomings compared to all the models we have just mentioned. On the one hand we have a 10.2" 300ppi E Ink display, with the highest definition ever among the existing models to date, the lighting that further improves the already excellent one of the Kindle Oasis, bringing the adjustable LEDs to 35 both in intensity and in tone, a MediaTek MT8113 Kompanio 500 octa-core processor, combined with 1GB of RAM and 16, 32 or 64GB of internal memory, and a battery whose capacity we don't know but we know that it can last for weeks. On the other hand, however, we would have expected something more in terms of functionality. In fact, we cannot write on books, but only create virtual post-its that are displayed when necessary, so we cannot even underline some passages of a book freehand; we cannot convert handwriting to text, nor use external cloud services to share notes; there is no microphone or speaker, and for audiobooks we must necessarily associate an external Bluetooth headset or speaker.

Onyx Boox Nova Air C

A decidedly different product from those listed is the brand new Boox Nova Air C by Onyx, capable of doing practically everything we have seen for the Note Air2 Plus, but in a smaller format and in colour. The 7.8” 300ppi E Ink Kaleido Plus display has the characteristic of being able to reproduce up to 4096 colours, and is particularly suitable for those who want to read comics or books with color illustrations, but also for those who draw and want to use the pen for creating color digital paintings. The processor is an octa-core Snapdragon 662, with 3GB of RAM and 32GB of internal memory, while the 2000mAh battery can last for weeks. Present microphone and speaker, as well as the Android operating system with Google Play Store to download applications.

reMarkable

it is the product that fascinates handwriting lovers the most, we tested it for further study and to create a dedicated training pill.

Remarkable is an e-ink tablet designed to mimic the experience of writing on paper. It is designed to be a digital note-taking and sketching device that allows you to capture your thoughts and ideas digitally, while still giving you the feel of pen and paper.

Display: Remarkable paper tablet has a 10.3-inch e-ink display, which is a kind of electronic paper display technology that mimics the look of ink on paper. This gives the device a very natural and paper-like feel when you write or draw on it.

Pen: The Remarkable Paper Tablet comes with a stylus pen that is designed to look like a real pen. It has a pressure- and tilt-sensitive tip, allowing you to write and draw with different line weights and gradients.

Software: The Remarkable paper tablet runs on custom software designed to be minimalistic and simple to use. The software is optimized for note-taking and drawing,

and lets you create and organize notebooks, as well as import and export PDFs.

Cloud Sync: Remarkable paper tablet can sync your notes and sketches to the cloud, which lets you access them from any device with an internet connection. This is especially useful if you need to switch devices frequently or if you need to collaborate with others on a project.

Battery Life: The Remarkable paper tablet has a long battery life of up to two weeks, making it ideal for on the go. You can charge it using the included USB cable.

Overall, the Remarkable Paper Tablet is a unique and innovative device that combines the best features of digital note-taking with the natural feel of pen and paper. It is an ideal tool for those who need to take notes or draw frequently and want to do it in a more natural and intuitive way.

SMART PEN

During the many speeches that were requested of him, Steve Jobs loved to share an anecdote regarding his academic career. He recounted that, despite having attended many years of university, it was that semester in which he had enrolled in an oriental calligraphy course, especially Japanese, that had been of fundamental importance for him: "So I decided to learn calligraphy . I learned the difference between serif and sans-serif fonts, how to vary the space between different combinations of letters, which is very important in typography. It was wonderful. Historical. Artistically subtle in a way that science can't capture. And I found it fascinating, even if it had no hope of practical application in my life. But 10 years later, when we were designing the first Macintosh computer, it all came back. And I've used calligraphy to make the Mac look better, with multiple typefaces or fonts with spaced aspect ratios. “

Unaware of how much these utterances bordered on the habit or were a serious conviction, it is however well known that there are now several studies that confirm how those who write on ink, on the usual, very banal, paper, develop

better thinking and memory skills than to those who use PCs, tablets and smartphones.

Also for this reason, but also for the enormously agile and dynamic use that these devices ensure, more and more companies have begun to offer digital solutions for handwriting: Smartpens.

However, it is a niche market which is therefore rather small.

A digital pen looks like a regular ink or ballpoint pen; then you can take notes with pen and paper as usual. And as your smartpen writes on the paper, optical sensors inside (or a receiver attached to the edge of the page) register your movement.

However, this technology does not work on plain paper for all smartpens; some models need a special paper. This paper often has a series of small dots so that sensors can more easily determine the exact location of the pen.

If you write or draw something on paper with your Livescribe Echo or Livescribe 3 smartpen, the content is immediately scanned and stored in internal flash memory. You can then pass them to your computer via a USB cable. With other models, data is instantly sent to the selected device via Bluetooth or Wi-Fi.

Smartpens can be divided in two ways: first, we would like to differentiate them in terms of the technology of how what is written is cached during digitization.

Smartpen with internal memory: A built-in infrared camera, processor, and lithium battery work together to store data in built-in flash memory. The camera records the movements, plays them in the same sequence and generates an image on the screen.

Smartpen with page border memory: the position is determined by infrared and ultrasound. The data is stored in a memory attached to the edge of the paper which connects to the pen via Bluetooth. No special paper or squared paper is needed for these templates.

Normal or Special: The paper type depends on the pen

When buying a smartpen, we can choose between pens that require special paper and others that can also be used on plain paper. The latter variant has the advantage that you can continue to use your usual notebook or notebook. Regular paper is available almost everywhere for a few euros, even in supermarkets; while the special notebooks for smartpens must be ordered from the same manufacturer as the pen. And they are also more expensive. For example, four Livescribe notebooks cost

around $35.

Compatibility with devices

Not all smartpens are designed for Android or iOS. Then you have to check the manufacturer information and check, for example, whether the smartpen can be paired with the iPad. Even products from the same manufacturer can have different compatibilities. For example, the Livescribe Echo smartpen cannot be connected to Android devices, while the Livescribe smartpen 3 does not support iOS products.

Possibility of audio recording

Some smartpens can record not only handwriting but audio as well. This feature can be particularly useful for students and journalists, for example at press briefings or interviews. However, special caution is required here, because you must obtain the other person's permission before starting the recording.

Converting handwritten text to digital

To convert your handwritten notes into digital text for, for example, working in Word make sure you have an app or PC software in addition to the pen. I also recommend that you take a quick look at the app reviews on the store, so as to avoid unpleasant surprises with non-functioning or

outdated applications.

Below, in our opinion a list of the best SmartPens
(our selection of tests with a particular eye on graphology)

Livescribe 3 Black Edition

Impeccable, both in writing and in drawing, or rather in the Doodles: it is a rounded pen, with a characteristic, very comfortable grip. With rounded curves, it impresses for only thirty seconds of initial preparation; and for syncing with the no-nonsense and efficient mobile app.
This pen showed no hesitation in both writing and drawing tests, the Livescribe app makes any digitizing operation trivial and also allows voice recording from it, as well as from the navigation icons present on Livescribe notebooks.
Guaranteed for 14 hours of continuous use, it charges with the micro-usb connector near its tip. Among the most massive and heaviest we have known, it uses a more comfortable rounded design than the much more widespread triangular-shaped competitors. Competitively priced, and with what it can deliver, it's our favorite as an all-around competitor.

PROS: Maximum accuracy in tests, comfortable design; easy on/off switch.

CONS: No choice of colors; heavy compared to competitors; it requires Livescribe notebooks which are certainly not cheap.

Moleskine Smart Writing Set

The best combination of tradition and innovation: Moleskine Smart Writing Set

For Bruce Chatwin's avid readers, Moleskine notebooks are nothing new, but in this case, a kit that integrates the needs of homo cyberneticus is added to the offer with a literary-intellectual flavour: a glossy paper notebook (which l company calls Paper Tablet) and a smartpen, the Pen+ developed by NeoSmartpen.

NeoLab's NCode technology, present on each page of the notebook, allows the digitizing app to know which page it is on and its precise point; the smartpen, with an internal memory of 90 MB (approx. 1000 recordable pages) connects to the app via Bluetooth. The non-removable battery is declared for use of 2-3 days (but it will vary a lot depending on how you use it); finally, the Moleskine Notes app allows you to modify notes and drawings as you like,

transcribe manuscripts, catalog them using tags and share them in various formats. Such is the pleasure of using this combination of smartpen and Paper Tablet that it will often happen that you leave the pen off, with the result that you will be limited to the classic notebook, and it might even not be too bad, given the yield.

PROS: an emotional product, it will provide different yields based on your predispositions; the third-party pen does not limit the use of the Moleskine notebook; tradition combines gracefully with innovation

CONS: approaching tradition could limit the most 'geeks'; versatile and intuitive app; you will need to have acceptable handwriting to get passable digitizing results

The best pen for Creatives, Wacom Bamboo Folio!

Wacom Solution for Creatives: Wacom Bamboo Folio

With this title, we indicate that category of people who are in possession of a strong artistic vein. As a main advantage, we can use any type of paper we prefer on the supplied pad. The pen does not need to be recharged from the power supply, vice versa the pad can last up to eight

hours before having to be connected via the micro-usb connector on the bottom of the device.
It takes just a minute to pair it with your smartphone, when you're done writing or drawing, just press the button and the pad will synchronize with your smartphone using the Wacom Inkspace app. In addition to viewing, a form, albeit a little crude, of editing is also available directly from the app.

PROS: Works with any type of paper; Extreme precision in both writing and drawing; Very comfortable pen and not to be refilled.
CONS: Paper needs to be aligned with smartpad; no possibility to register; rather short battery life.

Rocketbook Core: the reusable smart notebook
The Rocketbook system is a smart and slightly different take on the smartpen category. Here's the deal: When you buy the Rocketbook notebook, you get a pad made of special erasable paper, plus a Frixion erasable pen. The pen is just a pen, filled with erasable ink. The technology is in the newspaper and in the mobile app. You can choose between different types of notebooks; Rocketbook Core is

a regular notebook, while Fusion has pages for calendar, to-do, lists and general notes. There is also a mini notebook, always smart and with a pen supplied.

Each Rocketbook smart notebook is filled with dots, a series of icons at the bottom, and a QR code. When you're done writing a page, you can use the Rocketbook app to upload it to the app; or send it to OneNote, Dropbox, Google Docs etc. You can choose the destination manually or let it happen automatically based on the icons at the bottom of the page that you mark with your pen.

And here's the best part: when you're done, you can erase the page with a damp microfiber cloth, then use it again. Rocketbook essentially lasts forever and you will only have to replace the (really cheap) Frixion pens.

Apple pencil: the best smartpen for iPad

Apple Pencil is no ordinary smartpen; is a pencil that turns an iPad into a device you can write and draw on. Apple has two different products – Apple Pencil and Apple Pencil (2nd generation).

The second generation Apple smartpen works with the latest iPads (12.9-inch and 11-inch models) and is a powerful and refined tool for writing and drawing. It is

finished in matt white and is flat on one side, which prevents it from rolling. There is no Lightning port for charging; its battery charges when connected to the iPad (which it does magnetically).

Like many other smartpens on this list, Apple Pencil lets you write and draw, albeit only on compatible iPads. There are a wide variety of apps that work with the pencil; you can take handwritten notes, annotate documents and even edit photos. The disadvantage? It is a single-use accessory designed exclusively for iPad.

The Best Digital Pen for teachers, Equil Smartmarker

Digital Marker: Equil Smartmarker

In this case, we are talking about university students, professors, trainers. This pen (or marker, perhaps we should say) allows, in fact, to transfer what you mark on the whiteboard directly to the Equil Note app. Just place the sensor on a whiteboard, turn on the pen and start tracing, the system allows you to capture various colors with the appropriate 'color rings'. These rings are handled manually via the pen binder; black is installed by default,

but green, red and blue are also available.

The instructions are simple to follow, and it only takes two minutes to get started.

If the pupils (or colleagues, depending on whether they are in the classroom or in a conference room) download the software, it becomes quite simple to connect to the streaming sessions. However, it must be added, the quality of the signal demonstrates a general low resolution far below an acceptable result. For its part, Equil devotes an entire section to debugging both infrared and ultrasonic signal quality.

PROS: An ideal marker for those who have to share a lesson in public; the endowment is rich and efficiently presented; writing area up to 5 meters

CONS: the signal from the pen to the receiver is of poor quality and often degraded; exchanging color rings is not easy and can create a considerable embarrassment; erasing often means trying your luck.

The best pen for those who do not want to give up comfort, Neo smartpen N2

Classic in shape, revolutionary in concept: Neo SmartPen

N2

In this case we are talking about an extremely slender pen, perhaps even too much, with a clean and functional design, extremely easy to handle. It is recharged via the micro-usb connector positioned on the bottom of the pen, and its location must be quickly learned, given that the battery proves to be unusually short-lived: at five hours, it offers one of the lowest performances in its category. Slim, all metal, it works really well, and is therefore warmly recommended to some extent to all.

PROS: In the series of tests undertaken, it is very comfortable to use; quick setup; e-mail notes with one click.

CONS: Elongated compared to normal pens; excessive weight can counterbalance the extreme comfort of the smartpen; short battery life.

NeoLab M1 Smart Pen: for diary and digital notes

NeoLAB's M1 smartpen brings the convenience of modern technology to traditional writing. It seamlessly converts

anything you write on paper into a digital format viewable on your devices. You can easily share drawings and have everything automatically backed up.

With a standby battery life of 125 days and a combined 6 hours of writing, you can write 1000 pages before needing to recharge.

Works with cloud and note-taking applications such as Evernote, Google Drive, Microsoft One Note and Adobe Creative Cloud. Supported phones are devices running iOS 8.1 (or later), Android 4.4 (or later), or Windows 10.

The combination with the Moleskin smart notebooks is perfect, a classic with large lines, with a water-repellent cardboard cover, expandable internal pocket and elastic closure.

Livescribe 3

it is the SmartPen that brings handwriting lovers closer together, we put it to the test for further study and to create a dedicated training pill.

The Livescribe 3 smartpen is one of the best smart pens we've tested, and while it's pricey, you really get what you pay for. It pairs almost instantly with your smartphone or tablet and the accuracy you get when notes are transferred to digital is first class. This pen is best for people who don't need to take audio recordings (this feature is covered better by other pens, like the Livescribe Symphony) and who don't mind a slightly heavier pen.

If you want to transcribe your handwritten notes into text within the app, send them via SMS or send them to the cloud, this is the ideal smart pen. For those who want something a little lighter or with more advanced features, there are other options to consider.

Livescribe 3 Smartpen: Writing and Drawing Test

No errors in writing or drawing tests

In our writing and drawing accuracy tests, the Livescribe 3 smartpen matched the Livescribe Echo with no errors. That's pretty impressive considering we wrote the 270-

odd words of a historical text with each of our pens and drew at least two pictures with each of the digital pens we tested.

The company advertises that this pen can last 14 hours before it needs to be charged using the included micro-USB charging cable. To turn the pen on, simply turn a dial in the center of the pen and the pen comes to life. We initially feared that it would be easy to accidentally turn off the device while writing, but that was not the case.

The Livescribe 3 was also the fastest to get up and running out of the box. Once we installed the two Livescribe apps on our test smartphone (iOS users only need one app, but Android users need two) it took just 26 seconds to pair the smartpen with a phone and start writing. digitize notes.

Livescribe 3 Smartpen: Apps and Connectivity

App for IOS, Android and Amazon devices

Within the app, you must swipe right or left on a piece of handwriting for the Livescribe app to scan your handwriting and digitize it instantly. You can then copy this text and send it to yourself via any app. messenger or cloud service you have on your device.

Livescribe 3 can be paired via Bluetooth with devices running iOS, Android 4.4.2 and higher, and Amazon Fire

devices. This is the only pen we've tested that can pair with Amazon devices. You can search your phone's app store to make sure your mobile device is compatible.

Livescribe 3 smartpen: comfort and ease of use

The Livescribe 3 is one of the heaviest pens we've tested — it weighs five times as much as a regular Bic pen. However, we appreciate that it's round and doesn't have sharp corners like some of the other pens we tested. We also liked the soft rubber grip on the body. This is wider than a typical pen, but feels good in your hand.

In our comfort test, the Livescribe 3 smartpen scored high thanks to its round design and rubber grip. If you like to write with a wider pen, that's fine. However, users with smaller hands might find the Livescribe 3 a bit too chunky.

Like all Livescribe products we've tested, the Livescribe 3 smartpen requires a special notebook to write on. Although the pen comes with a small pad of this paper, if you plan on using this pen for school, we recommend purchasing a Livescribe notebook which has a sturdier cover and a lot more space for notes. At the bottom of every page in your Livescribe notebook is a small recording icon. If you press the tip of the pen on this icon, the smartphone will start an audio recording.

Intelligent Character Recognition

There are several types of character recognition technologies that can automatically convert handwritten or typed writing into digital characters. The level of accuracy of these types of software varies greatly between different implementations. Some convert on a letter-by-letter basis and some can convert entire words. There are three general categories of this software:
Optical Character Recognition (OCR)
Intelligent Character Recognition (ICR)
Intelligent Word Recognition (IWR)

Intelligent Character Recognition
ICR is a subset of OCR that specializes in converting handwritten text into individual digital characters.
The latest evolution of OCR and ICR is Intelligent Word Recognition software. Rather than recognizing individual characters, it attempts to translate entire handwritten words. Like OCR and ICR, Intelligent Word Recognition can mistranslate words and prompts the user to manually correct any mistakes made.

A good example is Google Keep

At the moment the best solution for OCR on handwritten documents is based on machine learning: in particular, deep-learning.

MODULE 2 - Unit 1 - Overview

Introduction

What is graphic facilitation? It is a methodology of visualizing concepts that are based on handwriting. In this Handbook, we, take you on the discovery of its basic aspects and practices.

For some years now, we have been witnessing the evolution of the educational environment in the classroom through the use of digital tools with which every educator is called upon to become familiar, and there seems to be imposing more and more the urgency to teach in an innovative way, namely: interactive, multi-dimensional, visually engaging.

We are in the wake of an all-out epochal shift between analog and virtual instruments. In this short course we ask three questions:

- What is really happening in education, given this epochal shift, with the advent of screens and interactive electronic whiteboards?
- Next: paper and the classic erasable board, black or white, are they really destined to disappear forever?

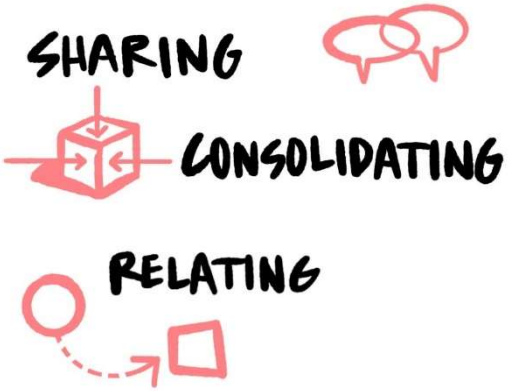
- And finally (this is the most important question for this course): how do writing practices in the face of all this? Or rather: what method we can rely on to learn a new way of writing and visualizing ideas, concepts, arguments?

Let's answer this last question right away: yes, there is a method. The handwriting and the graphic gesture can be maintained and enhanced thanks to new digital tools.

What is it used for

In every teacher's daily routine, the offerings of virtual whiteboards and software to share topics, consolidate knowledge and relate ideas to each other visually, is becoming more and more extensive. The goal, of course, is to enable students to work both as individuals and as a group to solve problems and learn the concepts they are being taught, but also to facilitate their experience on learning and entice them to contribute, to express themselves. At the same time, those who teach have tools available for themselves that can be a great stimulus to collaborate as a teaching staff and perhaps make lesson plans more coordinated, or to design synergistic study activities between subjects, and this either in real time or asynchronously or "offline" with boards, virtual post-its, digital pens and of course the power of hypertext and images. Because in fact the key aspect is that all of this

now takes place no longer on individual notebooks but on a surface open to all, visible, usable, which unlike of a



traditional blackboard is a responsive screen that can also accommodate content that is very dynamic. For all this we are talking in short about three things:

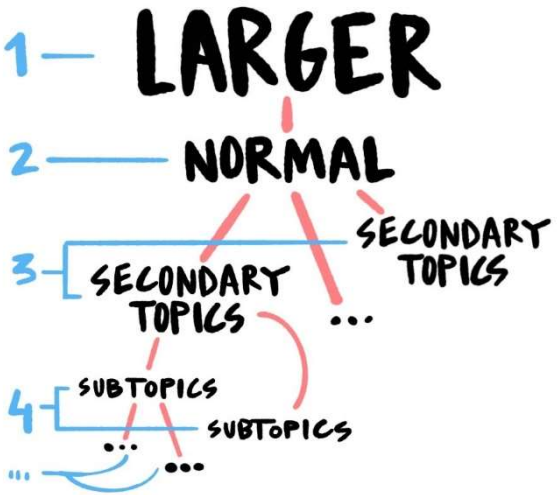
- New skills for brainstorming, which we might call "creative collective creative".
- a return to the centrality of handwriting, which at the first impact of the new digital paradigm (starting about twenty years ago, early 2000s) had suffered something of a setback, and continues to suffer – with the new generations and not only –

with respect to lightning-fast typing.

- and then new elements, for example, the spatial distribution and the visual, metaphorical, iconic representation that opens to the achievement of unexpected levels of meaning.

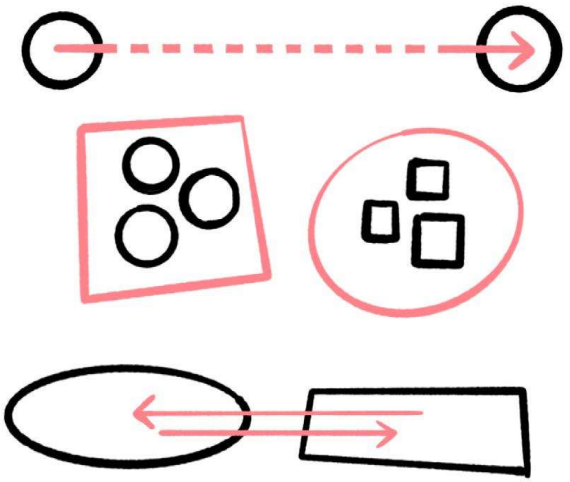
Writing as a map

The basis of graphic facilitation is handwriting, which we call "lettering," understood as input for the creation of concept maps: topics are written with magnitudes varying according to a certain level of importance or dependence, that is, an attempt is made to represent them with a hierarchy.



Meanwhile they are arranged in the space that we have at

our disposal (the "table" created in the software, which may have variable dimensions, may be horizontal or vertical) and as it were augmented i.e. provided with graphic signs to bring out connections, groupings, comparisons, connections, all elements to "orient oneself" in the map of information that thus becomes an object for understanding and memorize visually.



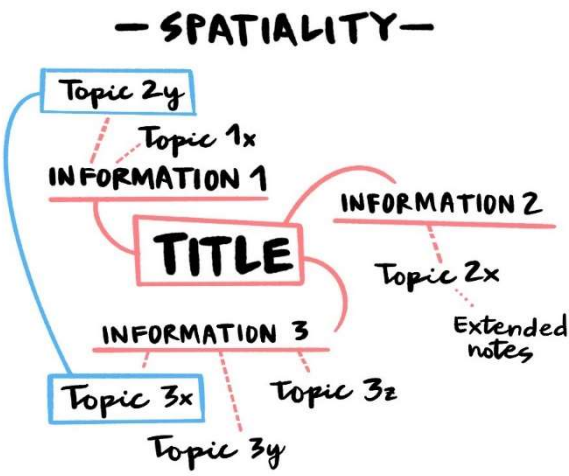
And not only the lecture: you can also make maps of the more open conversations that happen in the classroom to explore, deepen, express opinions, that is, to be an active

part of the learning process. Both for easy things and for more complex things, such as specific topics in the field of science.

The creation and use of these content maps – if you will, we can also call them "visual summaries" because, after all, that is what it is all about, namely facilitation as opposed to any more or less articulated form of storytelling – enhance the ability to observe directly with the eyes those contents, understanding them through spatiality, memorizing them through it and increasing the ability to communicate them.

Spatiality

The aspect of visual spatiality is the most prominent among those of the methodology of graphic facilitation: information is arranged in the two-dimensional area moving slowly to form a kind of illustration, a "notation-image." A spatiality that is constructed from the writing that abandons the linear grid and comes out of the grooves of the page lines between which we used to pin the lesson in school, emphasizing key concepts with underlining, or with the red pen, at most with a few notes written diagonally on the edges of the paper.



Our ability to interpret graphic signs in space is now fully exploited, as much for understanding the world as for keeping track of the information we receive. In many cases, compared to verbal descriptions, graphic visualizations convey meaning that today we might say is augmented, because they know how to represent connections, groupings, links, metaphors, simply knowing how to "show with a picture."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Obiettivo 2030: impatto che conta

16 Marzo 2021 dalle 16:00 alle 18:00

Oltre agli utili, che valore possiamo creare con le nostre imprese?

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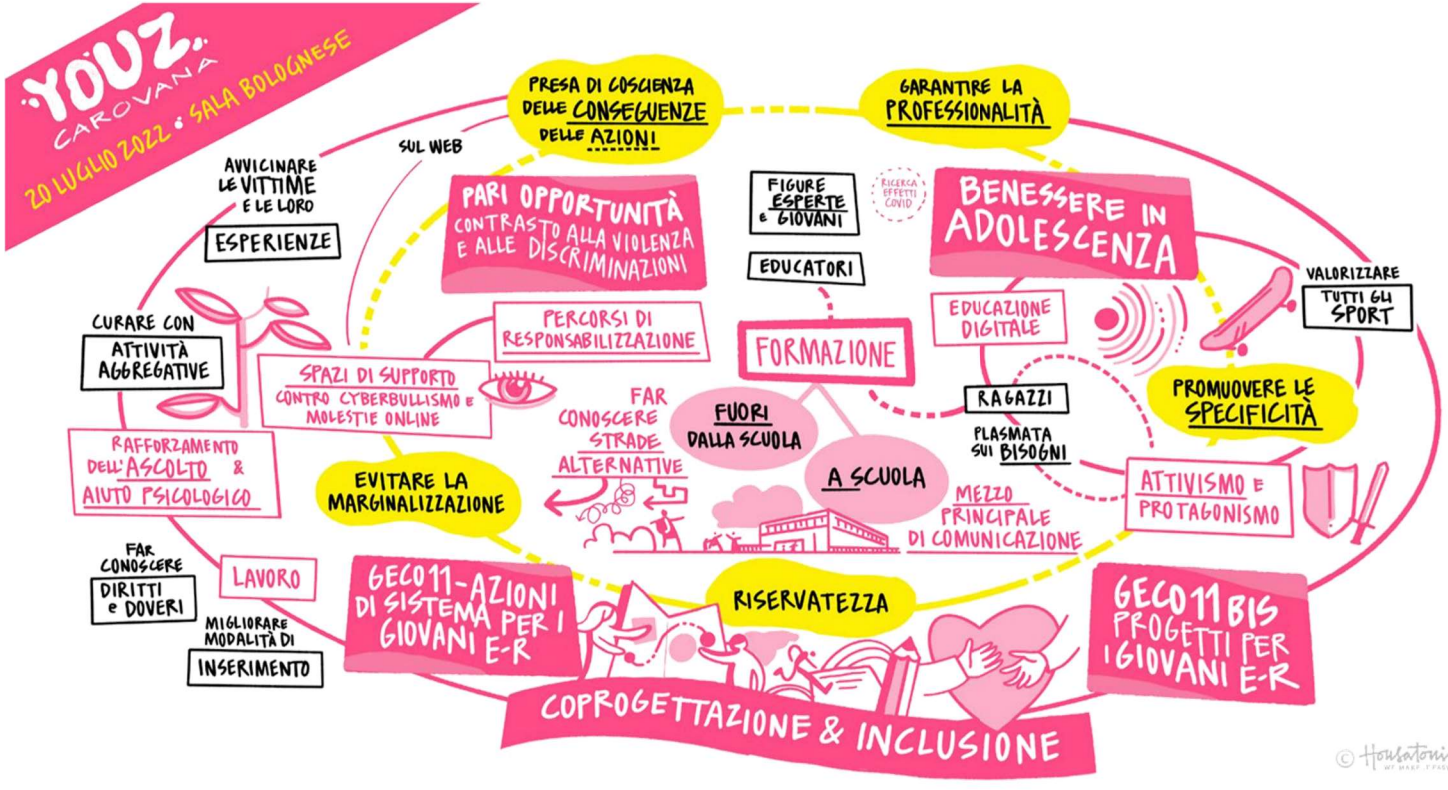
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FORMAZIONE
SPAZI DI SUPPORTO CONTRO CYBERBULLISMO E MOLESTIE ONLINE
FAR CONOSCERE STRADE ALTERNATIVE
FUORI DALLA SCUOLA
RAGAZZI
PROMUOVERE LE SPECIFICITÀ
RAFFORZAMENTO DELL'ASCOLTO & AIUTO PSICOLOGICO
A SCUOLA
PLASMATA SUI BISOGNI
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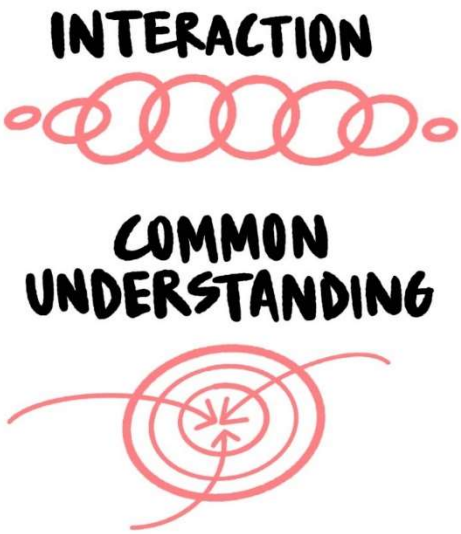
Educational Opportunity

Thinking about classroom work, making educational information even more visible and visually organized to the group of students is better than letting the information be accumulated only by the individual's ability to listen and keep track of the lesson. And it is also conducive to interaction with others, the search for common understanding among individuals, which remains more difficult when relying only on the written text in lines and when delegating to the individual's personal memory alone.

That is why visualization methods must be increasingly exploited in areas such as education and learning. Even research in Education Sciences argues for bringing science closer to everyday life through the popular use of concept

maps, diagrams, images in general (and then videos, simulations, virtual reality, experiential interactive, augmented reality, experiential games...).

Not to mention that this method is now being exploited in so many fields of application and areas of work.



MODULE 2 - Unit 2 – Practice

Introduction

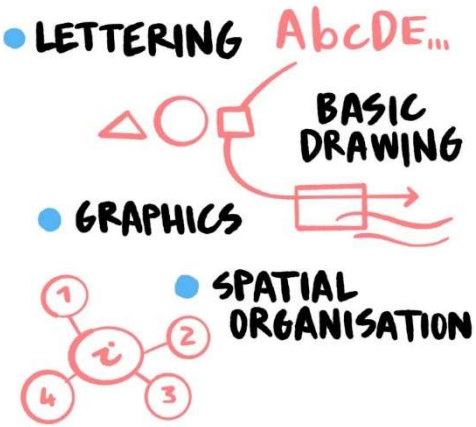
Adopting a visualization methodology today is an opportunity to make the most of **multimedia interactive whiteboards**, which in the classroom are a great opportunity for socialization, collaboration, debate and collective expression among pupils without abandoning the classic whiteboard teaching paradigm. For the teacher, visualization means simplifying information and transferring it clearly, creating a more engaging for communicative exchange between people.

Let's get to the heart of the matter: we will see what the basic elements of visualization are and the techniques with which to practice. As always, constant practice will be the best accomplice.

Basic Components

When we talk about visualization we refer:

- to writing
- to drawing (however "synthetic")
- to the graphic rendering of the two elements and...
- ... to t heir organization in a space.



We will not have a chance to explore the whole figurative

drawing part in detail, although the use of icons and illustrations is one of the basic components. We will focus on writing and its organization in space, while still referring to the simplest graphic signs, since they help to give meaning to the text.

Writing

Contrary to what was most feared until recently, digital tools now make it possible to reconsider the role that handwriting plays in learning and cognitive training, in the development of creativity, personality, and the ability to concentrate. In short: to put handwriting back at the center, the use of which promotes the consolidation of information, understanding of concepts and ideas, precision in the choice of terms, and the enhancement of various types of attention.

Those who take notes by hand remember longer, understand concepts and ideas better than those who use only electronic keyboarding tools. Indeed, language requires a "physicality" that activates those neuro-motor processes that typing on a keyboard does not offer.

There are many skills and abilities that are preferred. To name just a few:

- The stimulation of critical thinking and individual creativity;
- the increase of mental elasticity;
- the organization of concepts and their planning in determined space-time;
- the improvement of interpersonal skills.

We could almost say that a new chapter in the history of handwriting has just begun. It is happening now, in these

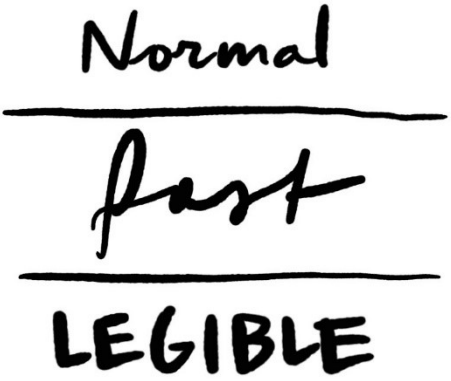
years, but that is precisely why it is still a debated and complex topic to be addressed. This premise is essential in order to put the themes and applications provided in the right perspective.

Let us take a sheet of notebook paper or any white paper, place it vertically and divide it into three horizontal portions.

In the first space at the top, we write in what we believe to be our normal handwriting, calm, unhurried: we write the word "Normal." In the second space we purposely do a fast, almost hurried handwriting: we write the word "Fast." Finally, in the third space, let us concentrate well and we write in a way that can be as readable possible. We write the word "Legible".

Right now, we are focusing on **readability**. And it will have

immediately appeared to the eyes that in order to write in the most readable way, to specifically enhance access to information, we make use of capital letters.



We know that this leaves uncovered – if not outright contradicts – established theoretical aspects, and conflicts with the basics related to **graphic gesture education**, which tends to favor continuity and fluidity of tracing associated with continuity and fluidity of thought.

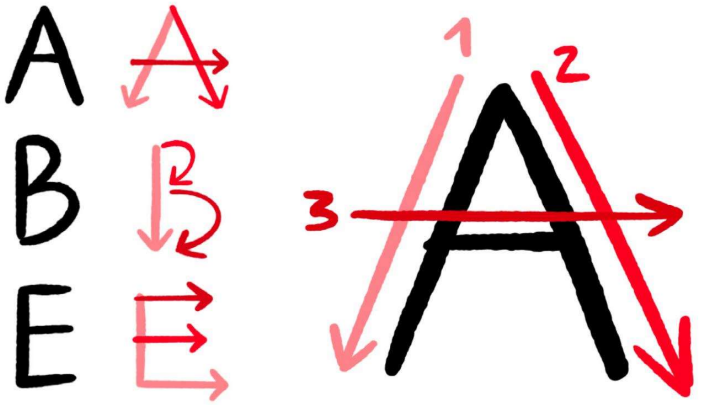
The limited space of this course does not allow us to make all the necessary reflections regarding **the essence of**

cursive for graphology, or to accommodate all the needs related to specific reading disorders. Let us say then that – in the juncture we are going through of reevaluation of handwriting – we are representing a practice, that of graphological facilitation, which has evolved over the last thirty years and can be an object to be observed as a concrete application of a certain kind of manual writing, especially in its potential related to digital technology.[2]

→ [2] *We are in "defense of cursive," certain that this is still the mode of writing to focus on extended descriptions, definitions, even writing on multimedia interactive whiteboards, and to delve inward and outward.*

→ *Yet, if we reflect on how important it is for lecture notes to be clear and readable from the first desk as well as the last by worrying about distance and direction from the blackboard, it may be inferred that even handwriting itself will better serve the purpose of being understandable to all when it is a guarantor of general clarity while running the risk of being more "aseptic".*

Let's practice writing: follow the movements shown in red to understand how to perform and complete some letters,



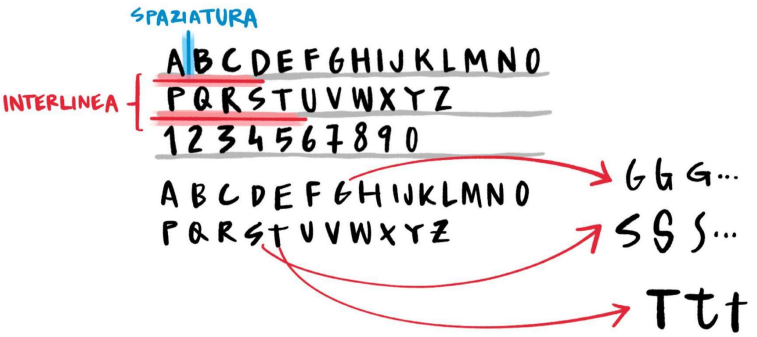
A, B, E, etc...

According to this method, each letter is a sign composed of separate strokes, to be made by making detached movements and lifting the pen from the digital medium each time (or almost each time). It must be admitted that many graphic facilitation practitioners arrive at the practice of handwriting by carrying with them, perhaps for their entire lives, the execution of certain strokes that

Graphic Gesture Education does not associate with the correct technique (experts in this branch will forgive those that should appear to them as irregularities). These modes contradict some basic principles explained by graphic gesture educators and the expressive instances inherent in the graphic gesture expressed by cursive, but they are useful and effective for using handwriting in educational contexts.

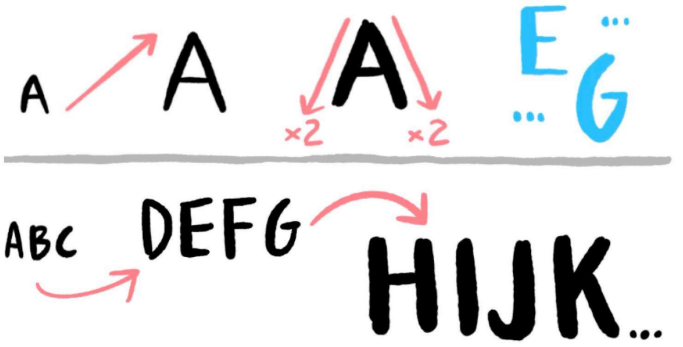
To get used to writing again, to practice readability and slowness, we start with the alphabet. So let's help ourselves with some horizontal lines, as guides for writing straight (imagining that you are using white sheets of paper). We carefully space the letters between them (this is spacing) and give the right space between the lines (this is line spacing). It seems like a boring activity that we thought we had abandoned in our elementary school days, yet it pays to make this effort. By bringing new attention

to how we write, we will again notice the uniqueness with which we write (see opposite the case of G and S).

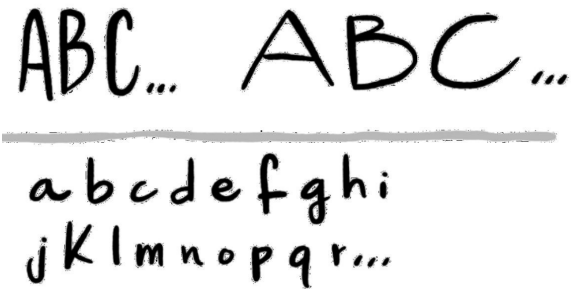


When things start to go well enough, let's try it even without the guides. We start by varying the size of the font or its "weight" a little bit. It will come naturally actually begin to vary the shape of the letters a little bit, in size, width, height. We will be able to create a font of greater emphasis, such as bold, simply by reinforcing certain parts of the letters. Here is the example with the letter A, but

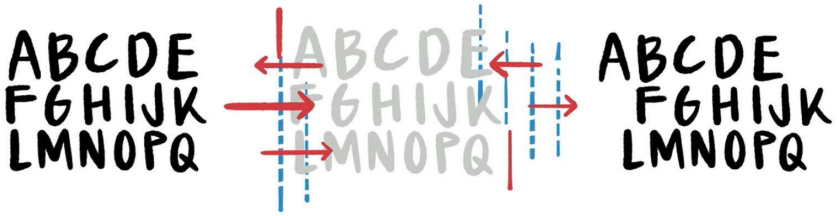
each letter has its own peculiarities.



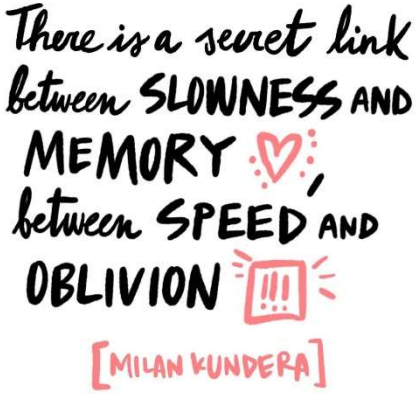
Let us now try changing the font, with some graphic variation: narrower letters, wider wide, or start practicing with a lowercase font.



Another expedient is to "break the block" schematic of writing, to achieve an articulate and dynamic effect by shifting the lines.

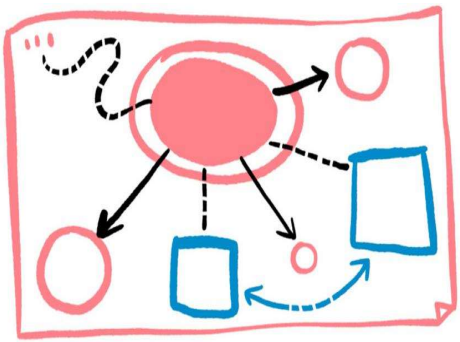


The moment we begin to find an attunement to this procedure and to the digital tool, we can also try to return to our personal cursive writing: the practice of slowness and the tool itself will allow us to recover a dynamic between us and the writing.



In Space

We have seen that by changing the style of writing with a few adjustments, we are already able to indicate the different nature between parts of notions and information. With the versatility of digital environments, word processing becomes an element within an organic system for classifying and organizing content.



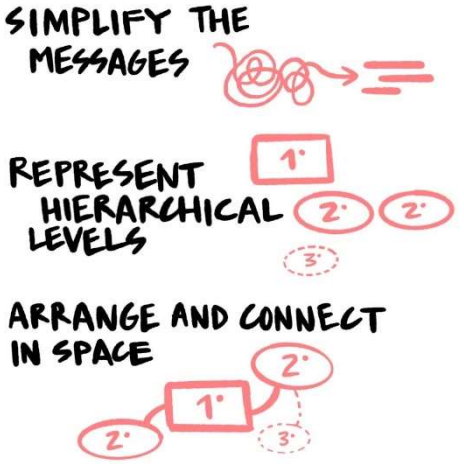
This system is representable as a map, that is, with a **more spatial conception** than linear writing, so that things with their degrees of importance and interconnections appear quickly to the eye and orient on meaningWe have seen that by changing the style of writing with a few adjustments, we are already able to indicate the different nature between parts of notions and information. With the

versatility of digital environments, word processing becomes an element within an organic system for classifying and organizing content. This system is representable as a map, that is, with a more spatial conception than linear writing, so that things with their degrees of importance and interconnections appear quickly to the eye and orient on meaning.

To create a concept map, it is necessary to:

- specify the messages;
- represent hierarchical levels of reading;
- arrange and connect the messages in the given space.

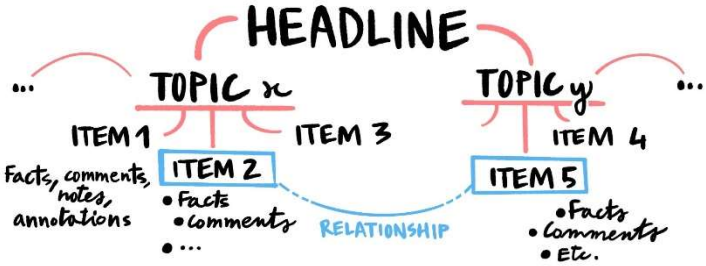
What you get is graphic writing is quite different from the traditional way of writing text line by line.



When we have a headline to start with, and we often do, we certainly have an element to give good emphasis to: at the very least, it will be one word larger than the others.

HEADLINE

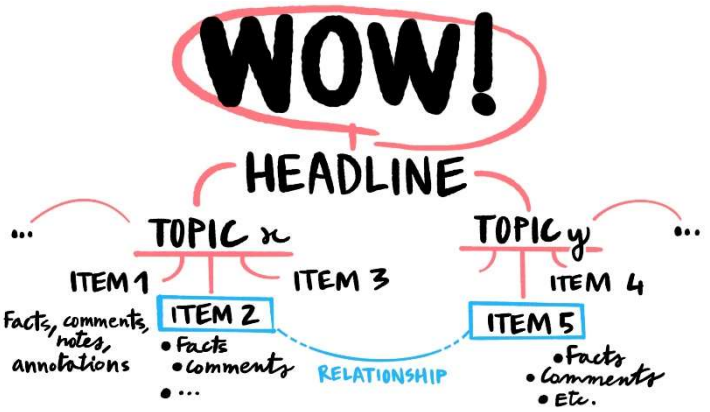
Against this starting point, we will then be able to descend and branch the topics of the discourse.



Each topic can have an untold number of smaller branches, which can populate the picture with increasing detail and complexity, even creating new connections between the various parts.

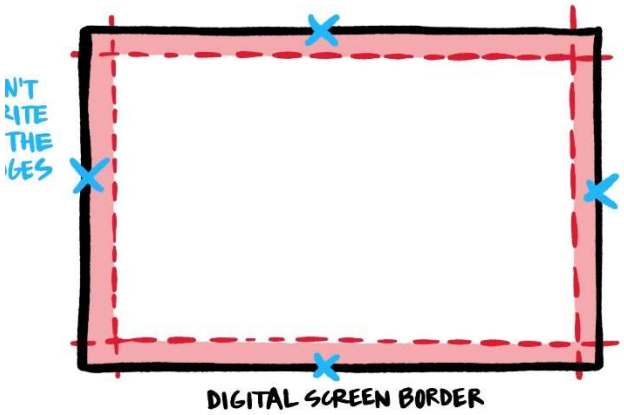
When we find ourselves bringing out the content of a lesson in which we ask for active student input, the title

may not necessarily be the most important element. The students' look at a topic could matter much more, and that is why we should always save some room for the appearance of some sudden "big thought," a concept that was not had been anticipated or prepared for.



Starting with a simple variation in letter size, we defined a hierarchy among the elements, the logical-visual structuring of the text, which is thus organized concisely. What emerged was a map, a layout that orients us in a

space. Managing space also means observing certain compositional rules. In principle, we consider always the importance of maintaining a "safe" area close to the edges of the board digital, or sheet, or blackboard, etc.[3]



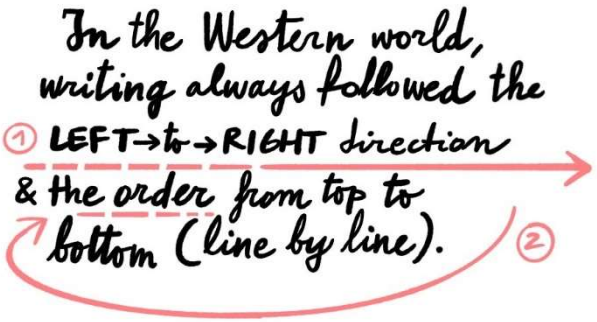
It is a space in which to maintain order and not just fill, but think about the empty spaces.

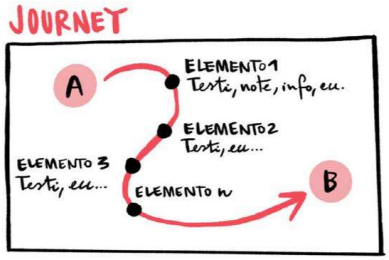
→ [3] *In digital whiteboards, the very idea of a "space limit" is somewhat diminished; rather, we speak of a "layout of representation".*

Here we are perhaps at the crux of the matter, we are faced with a kind of downsizing of the Western mental standard that we could reduce to the pattern of writing: **left → right ↓ new line.**

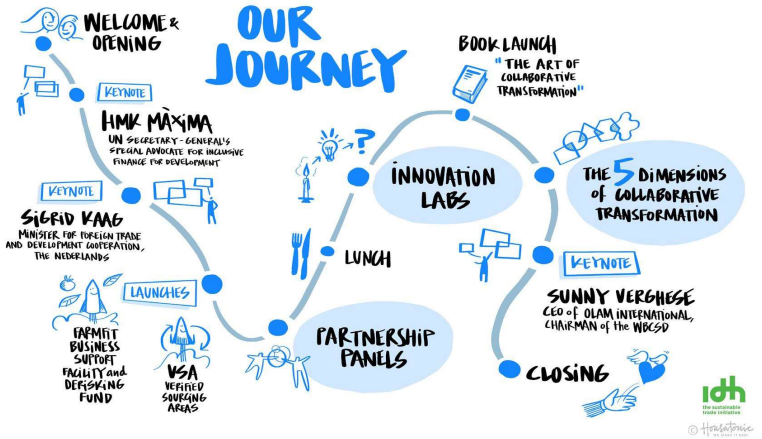
This standard, of course, will never be abandoned by our culture, but the visual use of space brings a granularity and a multidimensionality that opens up new scenarios. Even the classical reference to the upper-left area of space as the starting point of the writing fails, in part or altogether.

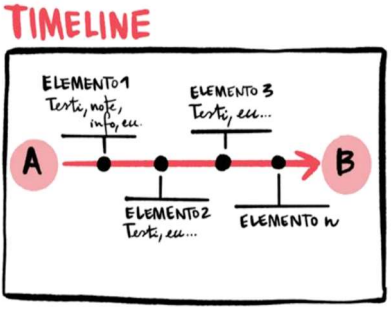
Let's look at some spatial representation possibilities, layouts that might associate with different types of content.



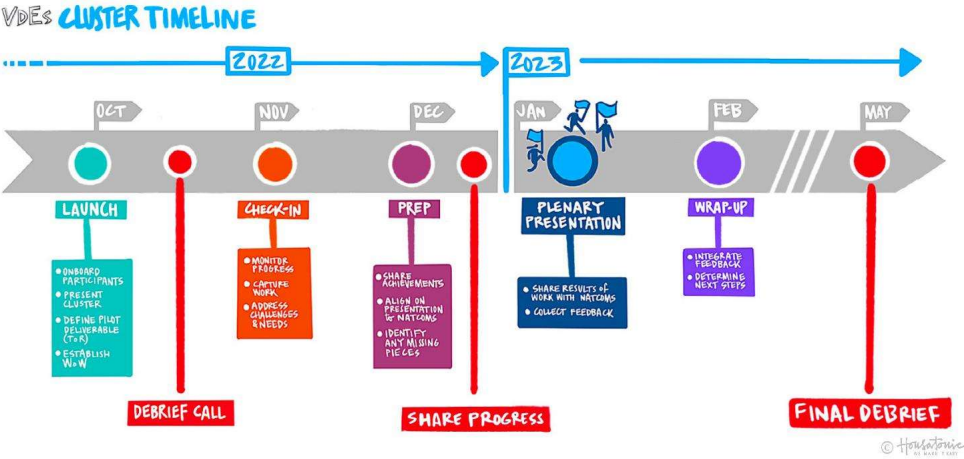


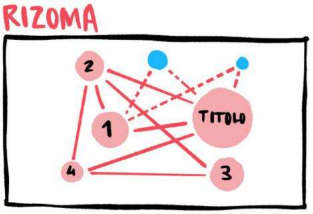
For example, a journey would be suitable for the evolution of a sociocultural or technological object or phenomenon...



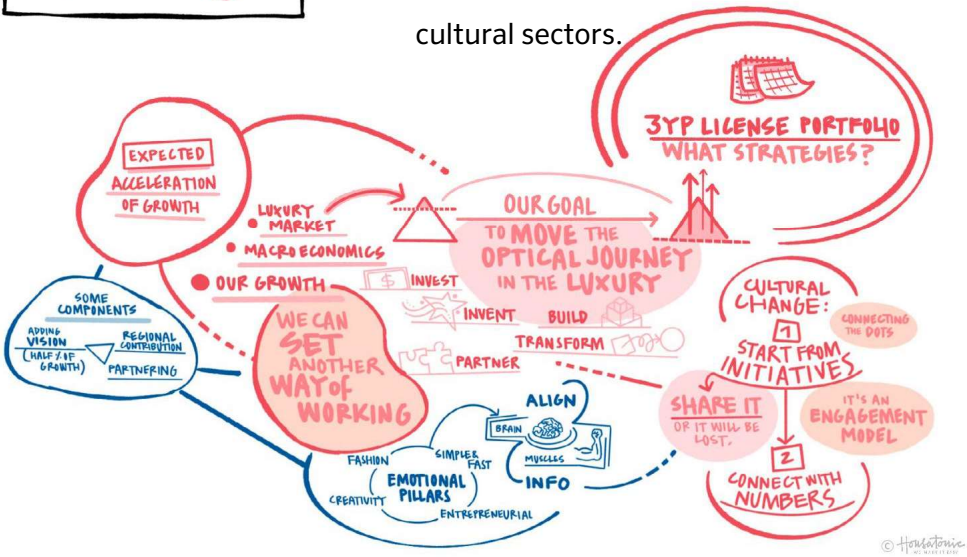


...A timeline would in principle be better suited to the temporal placement of the events...

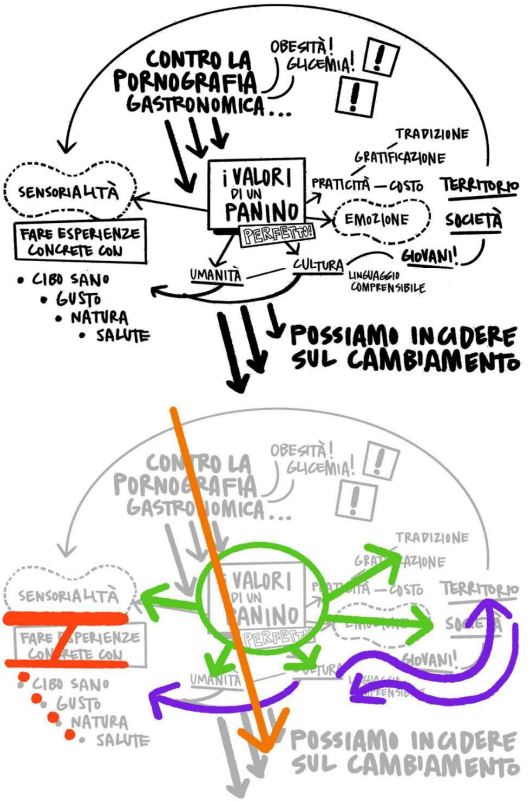




... and a rhizome (on the next page below) would have the advantage of visually developing similarities between areas of communicating cultural sectors.



The multiplicity of notions is condensed into the unity of composition, into a "big picture." These layout patterns, however, are to be considered mostly "invisible" visual outlines, to be kept in mind rather than traced, that is, to be used with elasticity and ready to "break" and mix them up.

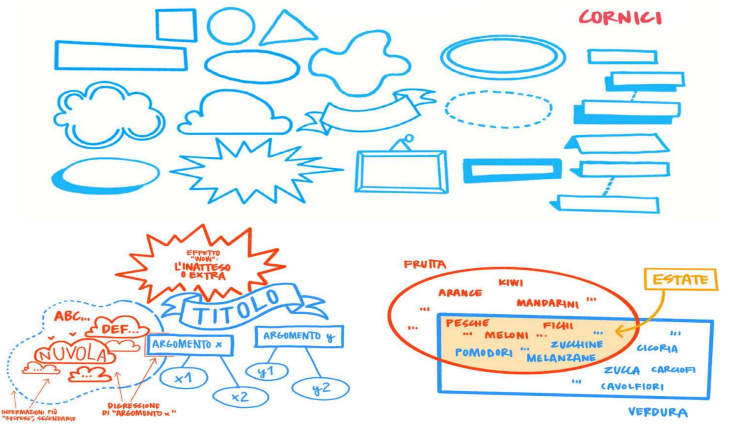


Basic Shapes

As mentioned at the beginning, we cannot deal with actual illustration with this paper. However, there is a family of graphic shapes, basic geometric figures, which serve the conceptual organization of the content and to direct attention to the map, to define a coherent image, or as we say in jargon: to create a visual pattern.

The appeal of basic shapes is answered first by frames: rectangles, ellipses, broken linear shapes or more organic ones such as "little clouds," which are used to contour words and thus further emphasize and make people recognize levels of equivalence and diversity in information, or to create large sets of information, to signal overlaps, shared areasThe appeal of basic shapes is answered first by frames: rectangles, ellipses, broken linear shapes or more organic ones such as "little clouds,"

which are used to contour words and thus further emphasize and make people recognize levels of equivalence and diversity in information, or to create large sets of information, to signal overlaps, shared areas...[4]



→ [4] *In computer science, there are predetermined forms that are used in flowcharts: it is a codified method of representation that serves as guidance to specialists.*

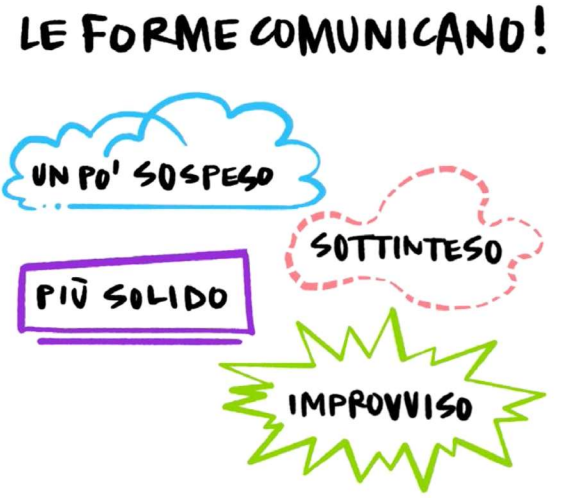
→ *We can imagine what would be the convenience and usefulness of creating a kind of alphabet of graphic codes to be shared among subjects.*

We are responsible for evaluating, from time to time, the meaning of our representation on an emotional perceptual level. Forms themselves convey meanings given by the symbolism we normally ascribe to the world around us. An angular, broken shape can indicate the "dangerous." curvilinear shapes may indicate something softer and more welcoming.

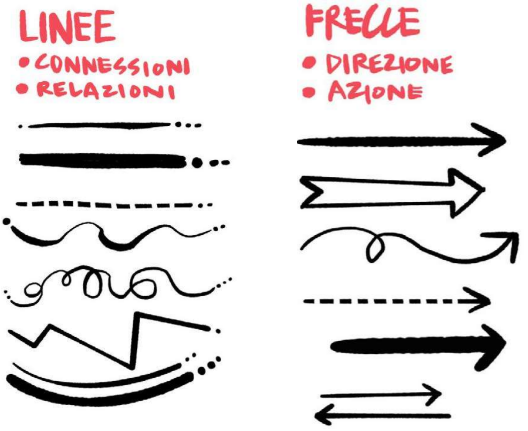
Frames (and sets) circumscribe elements and initialize the visual pattern, associating or diversifying elements, grouping and classifying information.

All these elements can be connected by signs such as

straight, curved, broken, dashed lines and so on.

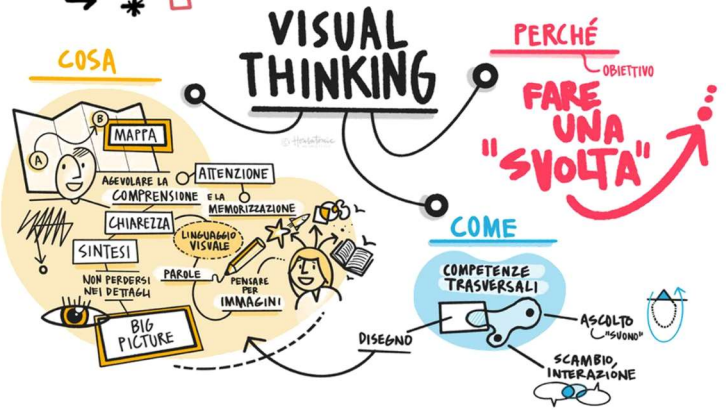


Lines that can then become arrows to make visible a force, a direction, an action between one element and another, and can be more or less subtle, robust or articulated to qualify different relationships.

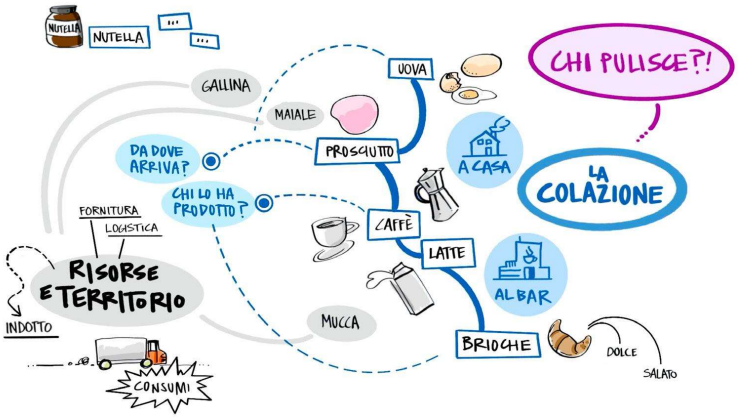


Another simple but absolutely noteworthy graphic element is the dot-list.

In general, one can slowly indulge with these basic shapes, perhaps enriching them with small figurative details, such as shadows or edges more carefully



Let's try a concrete exercise: imagine making a map of the breakfast we had this morning!



The pictures speak for themselves: we are listing and rendering in map form the ingredients and details of a breakfast. The invitation is of course to do the same thing with some more specific topic, something about your life or your class, a general or something very specific.

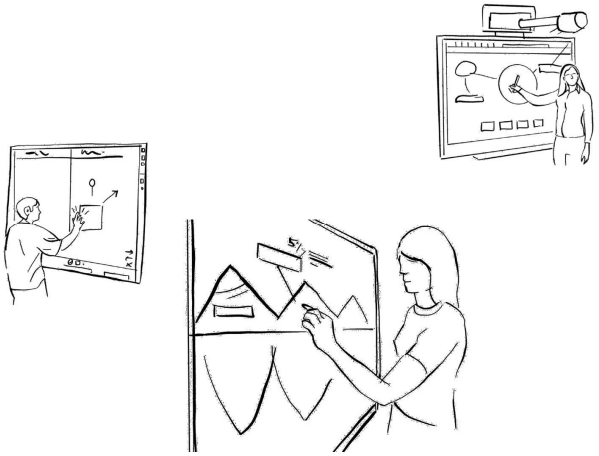
MODULE 2 - Unit 3 - Tools

Introduction

the multimedia interactive whiteboard, which we call by the acronym MIW, is now common in almost every school. It makes it possible to go beyond the classic oral lecture, showing videos and images and directly engaging in creation, to extend the scope of concepts and target them as stimuli for children's attention. The new generations, after all, are born in close contact with computers and smartphones and are perfectly comfortable with these tools

Initially, the interactive whiteboard consisted of a computer "peripheral" made up of a projector, a surface and a special marker. But with ever-evolving technology, today one finds systems through which one can act with

any kind of surface and marker, even with the fingers of one's hands, as well as true interactive touchscreens that have a built-in, connected computer. The latter are so-called all-in-one solutions.[5]



→ [5] *A peripheral interactive whiteboard needs drivers necessary for its recognition by the PC to which it is connected, and thus for its operation. An all-in-one interactive whiteboard does not need drivers. Make sure the drivers have been installed and that everything is working properly by getting help from the school's technical staff or vendors*

Without dwelling on the many complex technical details, whatever the hardware, the essence of the interactive whiteboard as a digital device is obviously the software, that is, a variety of interactive programs that take advantage of the ability to use multimedia materials by bringing handwriting and traditional teaching methods back to the forefront.

With these programs you can write by hand, recognize handwriting and edit it as digitized text, make graphics, draw pictures, open web pages and interactive objects, listen to sounds and audio files, watch videos, and most importantly put it all together. We will do a roundup of the most commonly used software, either built into the hardware or downloadable for free or with a license. Since there are different manufacturers, there are consequently

also different basic software, each with its own characteristics.

Here are some names of interactive whiteboards with related basic software:

- **SMARTmedia** - the proprietary software is Smart Notebook
- **Promethean** - the proprietary software is ActivInspire
- **Ligra** - the proprietary software is Luxiboard
- **Acer** - the proprietary software is Interactive WhiteBoard

There are others, but it is good to keep in mind at the outset that, in addition to the basic software, on each interactive whiteboard other efficient and useful programs can be installed:

- **Jamboard**
- **Nabability**
- **OneNote**
- **OpenBoard**
- **Whiteboard**
- **PowerPoint**

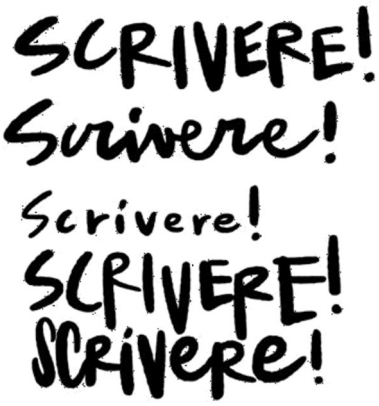
Many of these tools are known, the point is to decide what to use, and on this it is worth experimenting, discovering independently the characteristics of each and learning how to use it in daily work. It is right to keep in mind that in some cases it will be necessary to purchase user licenses, although these often come with the devices purchased by the school.

Among these software there are also free or open-source ones, such as Jamboard and Openboard. The fact that they

are free is also an advantage because the teacher can install it on his or her own computer to prepare material at home and then offer it at school.

It is also worth mentioning that browsers are also available on the interactive whiteboard, those programs now the order of the day such as Chrome or Firefox that allow us to surf the Internet and take advantage of the enormity of content and applications available there.

Interactive whiteboard programs have similar tools among them, if anything placed in different places on the interface, but all are absolutely intuitive. To use the interactive whiteboard, however, it certainly helps to already have some familiarity with the computer, for example, with navigating the folder structure, saving files, and basic operations such as copying and pasting.



A good start to becoming familiar with the interactive whiteboard is writing! And just writing is back at the center of it all. Writing practice will help you become familiar with the tool in general, changing stroke thickness, color, using the marker to move and edit objects.

With use, you will feel like inserting colorful backgrounds or with graphic elements, inserting and retouching images, working on multiple pages or with hidden elements that show up as you go, to create an experience

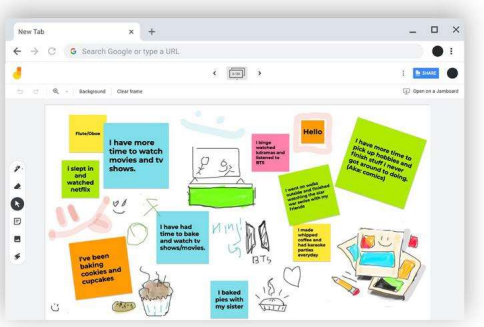
both temporal and so-called **gamification**.

In short, **imagination and creativity will be the passwords**, and they will be added to the teaching design habits and tools of each teacher, aware of the potential and specific conditions of their pupils.

One tip is to **observe how interactive whiteboard, visualization and multimedia is used by other teachers**, even and especially of subjects other than your own: the secret of 21st century design also lies very much in grasping and personally repurposing the solutions of others.

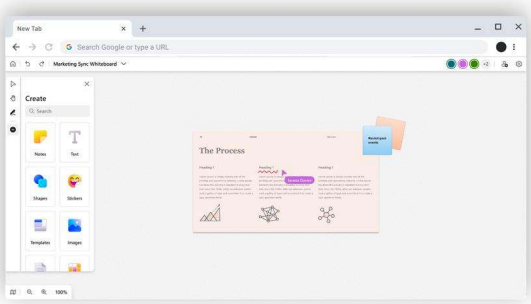
Of course, on the Internet, YouTube and so on, one can find very interesting videos, tutorials and tips to enrich one's experience.

Jamboard



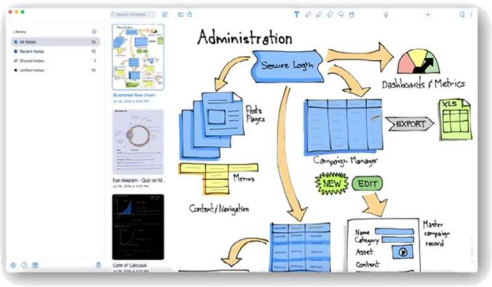
Developed by Google, Jamboard is a cloud service, meaning you don't download any programs but only work when connected to the Internet, and among many things it allows you to collaborate with other people in real time on the same board and at a distance. To use it, you need a Google account.

Whiteboard



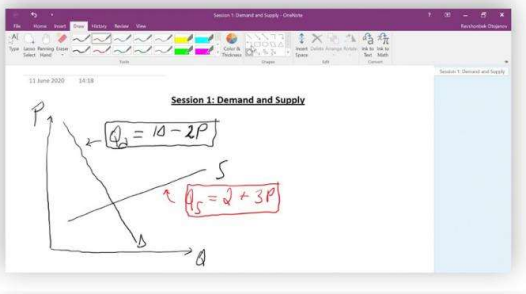
Similar to Jamboard is Whiteboard, which then allows you to access an online whiteboard as if we were on a website, for free but this time without account registration. It is a bit more limited as the tools that are available.

Notability



Notability is an app that takes advantage of the full functionality of a digital pen via an iPad that will need to be connected to the interactive whiteboard. You can set backgrounds with guides, create perfectly straight lines and scalable basic geometric shapes; it is great for math and physics teachers but also for various labs, art history or subjects that require freehand drawing and image insertion. It works only on Apple and is charged.

OneNote

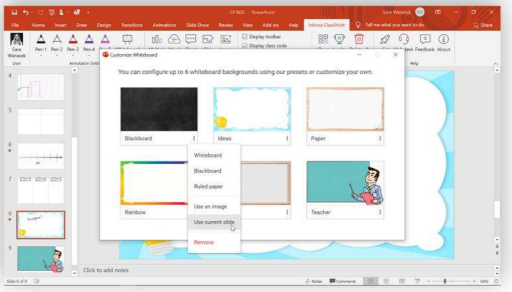


OneNote is a Microsoft-branded app that is among the most widely used for doing online classes with digital whiteboard. It is free to access, can be used safely on Apple/macOS systems, Windows, iPadOS, Android, but not on Linux.

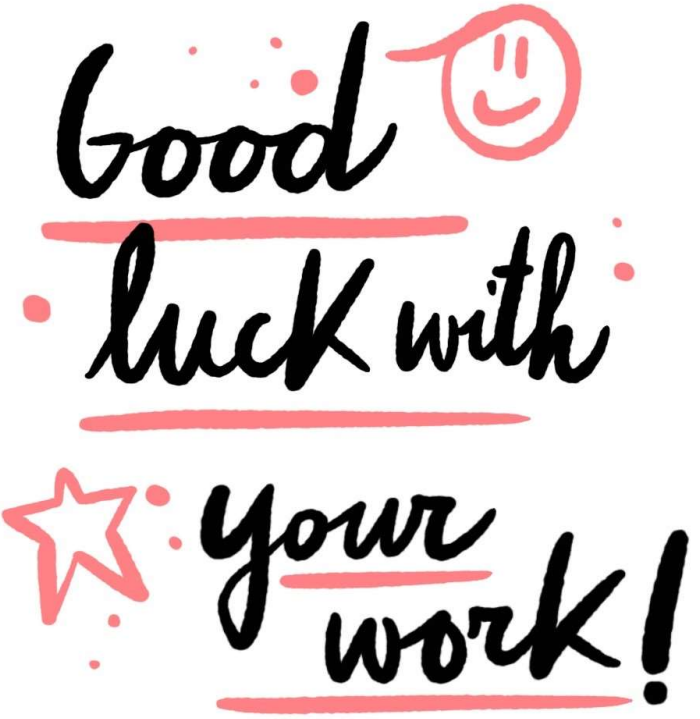
OpenBoard

One of the simplest and most comprehensive free interactive multimedia whiteboards in the world is OpenBoard, an open space project that you can choose instead of other proprietary software, and which provides functionality tailored to your needs.

Microsoft Office (PowerPoint, Word, Excel)



Office is not free, and buying licenses for the whole school is expensive. There are good free alternatives that do the same job as Office: first among them is Google, which in addition to its Jamboard provides tools such as Docs, Sheets, Slides, etc. PowerPoint, however, is the "template" for a number of slide-based apps that offer preset objects for creating charts, diagrams, presentations, representing a topic visually and concisely, for taking notes to summarize and remember the lecture.


Good
luck with
your
work!

MODULE 3 - Practical examples of teaching methodologies with manual word processing

Technology in the classroom

In the last years, digital technologies have forcefully entered our daily and working lives, partially changing our way of communicating, accessing information or collaborating (Schwab, 2016)

For young people, in particular, technology currently plays a central role in everyday activities and in their growth process by participating, through social networks and the various shared channels, in the construction of their identity. Moreover, young people are the most involved consumers and the most skilled users of IT channels and devices, contributing with their behavior to defining the

direction of development of technologies.

Digital technologies have changed not only the way we manage our free time but have also changed work processes since they, increasingly digitized and automated, progressively provide for the replacement of the worker with the machine or robot and solicit the birth of new roles professionals that include personnel with a highly qualified profile.

The urgency of not being unprepared for the use of new technologies has suggested the drafting of protocols that serve as a reference, including, for example, DigComp. It is a set of guidelines drawn up by the European Commission relating to digital skills and whose recipients are all citizens. Through the definition of good practices, they are shown how to use new technologies so that they can improve the quality of their lives, contribute to the formation and protection of a democratic society and allow

the realization of satisfactory work activities. The full title of DigComp is DigComp: Framework for Developing and Understanding Digital Competence in Europe . More than a list of characteristics, DigComp considers 5 dimensions in continuous remodeling and updating defined, specifically, by: 1. Areas of expertise, 2. Competences, 3. Levels of expertise, 4. Examples of knowledge, skills and attitudes, 5. Usage examples. Since 2013, the year of proposal of the first version of DigComp, there have been 3 other versions, of which the latest is DigComp 2.2. of 2022 where the knowledge examples are implemented. Not only ordinary citizens are the recipients of it but among the ideal users are political leaders and teachers: the former so that they formulate economic-social policies that support the development of digital skills in order to favor the latter, in the context of their role as trainers and in the context of education, to plan initiatives and methods capable of

supporting and improving these skills.

Attention to education in the use of new technologies therefore provides for the conception of programs aimed at training young people as responsible citizens and future workers able to compete well within the challenges that technology continually offers. Therefore educational contexts are born in which technologization, computer processing and digital computation represent the means by which to study and deepen the various school subjects. An example of this transformation process is the definition of STEM disciplines (Science, Technology, Engineering and Mathematics) whose learning represents a priority of the educational systems considered on a global level, with the creation of ad hoc paths in which to specialize [6]. The importance of digitization is felt in every school context,

[6]https://www.istruzione.it/scuola_digitale/prog-stem.shtml

even in humanistic orientations, and responds to it through a general facilitation of the use of new technologies within the various activities.

After all, technology has not only become an object of learning but also a means through which teachers present teaching material and a channel through which to organise, deepen and structure the contents to be learned by students.

Education systems are therefore doubly involved: on the one hand they are called upon to prepare young people for a digital world and therefore to include digital skills in their curricula and, on the other hand, technologies can influence the way education is delivered and how students learn and take action to do so. The two aspects, understandably, interact continuously.

If technology is introduced into teaching/learning methodologies, it is correct to try to understand its

effectiveness even if a long-term evaluation is necessary. Furthermore, it is not the medium itself that conditions the results but how it is used and for what purposes. The literature on the subject, especially within the Evidence-Based Education paradigm [7], highlights the positive and negative aspects of integrating technologies at school. The results highlight that they do not represent the main factor for improving teaching or learning, but that the teachers' skills and the teaching methods adopted remain the basis of a good school; important is «the teacher's guidance (to

[7]With the name of Evidence Based Education we refer to an approach that intends to evaluate, produce, collect and disseminate reliable knowledge about the effectiveness of teaching methodologies that can support teachers but in an extended way, all educators and those who have a management role of programs and policies in making informed decisions.

whom it is necessary to provide adequate professional training opportunities), aimed in particular at enhancing feedback from students and directing teaching towards well-defined objectives, through adequate strategies » (Calvani and Vivanet, 2014).

The discussion was also studied at an academic level [8]and it was possible to verify that technologies can only be useful if the following aspects are taken into account.

First of all, their use requires an approach in which the student is at the centre: the teacher must ask himself what the student needs and structure the lesson so that it is the end that justifies the means and not the means that prevail

[8]In this regard, see, for example, the contributions of Borkowski and Muthukrishna (2011), Higgins et al. (2016), Süss, Lampert and Wijnen (2013), McKnight et al. (2016), Döbeli Honegger (2017), Bonaiuti, Calvani, Menichetti and Vivanet (2020)

over the end; traditional teaching always represents the fundamental trace and the introduction of technologies has a supplementary and not a substitute function; sharing and collaboration between peers and with the teacher, as well as between teachers, are aspects that characterize good teaching methodologies and cannot be abandoned with digitization but represent a way of working supported by technology; a constant and regular use of technologies over time is suggested, but controlled in terms of duration and involvement of resources of both those who teach and those who learn: flexibility in passing from one acquisition tool to another is a characteristic that must be stimulated in order to propose more learning methods and diversified strategies for students, also defined by the particular subject considered.

The unique value of handwriting

As seen, the exclusivity of digital does not seem the safest way to go in order to guarantee effective teaching; on the other hand, more and more research has shown and is showing that the very act of abandoning analog is a big risk. In particular, the practice of handwriting turns out to have enormous value that it is not wise to lose. This is not only supported by academic knowledge but underlined in the daily information through the media that refer to the topic.

The debate is in full swing: handwriting or digital writing? Experts from different disciplines point out the many aspects of advantage in the use of handwriting.

First of all, handwriting has been shown to simultaneously activate a greater number of brain areas than digital writing, confirming that the action of writing manually is much more intense and rich. In fact, freehand writing

forces us to plan and carry out eye-hand coordination actions , to orient ourselves in the space of the sheet, producing a highly variable and customizable result: this very variability makes the creation of each single grapheme like a moment of experimentation, a learning opportunity.

Furthermore, handwriting involves our senses: touch in appreciating the sheet, in holding the pen; the sight of the letters that we gradually create and of our hand as it produces them and the sound associated with the contact of the pen or pencil as we trace the various signs on the paper. All this favors a sense of presence in what we are doing, facilitating awareness and good cognitive management of thought which will then be materialized in the writing gesture.

It has been shown that writing by hand helps to strengthen planning memory and prospective thinking which is used

to organize plans and actions. The effective mnemonic and planning training which is stimulated by the act of writing by hand creates a precious behavioral trace which is also expressed in managing different actions and which generally strengthens the learning processes. Think of what happens when you take notes: since handwriting is slower, it is not possible to write down everything and it is necessary to select the most important information to write down, helping memorize it. Furthermore, while we write we look at the tip of the pen: eye and hand converge in the same direction, input and output correspond and this favors memorization, unlike when we write on the keyboard where our gaze is shifted on the screen (keyboard input is dissociated from the screen output). After all, the need to continuously set the movement of the hand with the direction of our gaze helps in general to improve the global coordination of the movement.

The training activated in recognizing the letters and in attributing them continuity and synthesis within words and sentences facilitates contiguous learning such as, for example, that of reading. It has been seen that handwriting also promotes the development of skills in both mathematics and music and generally improves creativity. Writing by hand forces you to pay attention and develops concentration, both because it is a more complex task than pressing a key, and because we try to avoid making mistakes which would then be more difficult to correct, compared to digital writing. Moreover, the action of deleting the mistake and writing the correct version next to it facilitates the memory of that experience, avoiding repeating it and improving awareness.

From what has been highlighted, it is understood that the act of handwriting is an activity in which cognition and corporeity are associated in an extremely effective way. To

understand this, the concept of embodied cognition is important . This expression was proposed by cognitive psychology which investigated how cognitive development is fundamentally dependent on the body, its postures and its movements in a continuous exchange with the environment in which we are inserted : cognition is therefore embodied, i.e. "based on reintegrations of external (perception) and internal (proprioception) states as well as by bodily actions that produce simulations of previous experiences » (Kiefer & Trumpp, 2012). This is because we move in a world that we learn to know and evaluate only through the action we carry out in it with our body, on the basis of our intentions and the actual results we obtain in interacting with our surroundings. When we write we move with the hand and with the thought on the sheet that represents our environment and the writing is the trace of this virtual exchange in which activity,

communication and expression coexist. By tracing the letters, positioning them and giving them a completely personal shape, we represent ourselves, with our characteristics, our aspirations, our fears, our critical issues and our resources in a highly expressive non-verbal language that regulates it graphological is able to translate. Writing is an experience in which thought, action and emotion are closely related and constitutes a representative activity of the embodied cognition paradigm.

Associated with the latter is the concept of embodied education , an innovative approach to teaching practices and learning processes and which could be summarized as the fact that feeling totally immersed, mind and body, in the learning experience leads the subject to feel invested by knowledge, to become knowledge himself. Due to its characteristics, handwriting is a fundamental tool within

the methodologies that are based on embodied education and should be favored because it activates, simply through its constant use, all the typical benefits of learning from a learning by doing perspective , being a particularly engaging "doing" also on an emotional-affective level.

These aspects of great importance that underline the importance of handwriting are associated with one that is completely banal but at the same time fundamental: using handwriting makes us independent from technology. In any situation, without electricity, without devices, we are able to communicate, to write notes, reflections, communications and projects on paper.

Closely linked to the embodied and symbolically expressive character of handwriting is the essential benefit proposed by its constant use: support in developing one's personality to the fullest. Writing by hand facilitates the training of patience and reflection, promotes body-mind

balance, increases self-confidence and the ability to be flexible and adapt to situations, promotes self-knowledge and self-awareness as well as the ability to get together with others. A handwritten diary page tells much more about us than a blog screenshot can do and allows us to get in touch, subtly and unconsciously, with our intimacy, with our history and with our desires , precisely because the manuscript, without us realizing it, speaks of us.

Only the main aspects listed up to here make it clear that handwriting is something to be defended and protected, especially at school, the place where writing is taught.

In this digital age in which everything is technological, one cannot deny the goals of technique but it is ideal to integrate handwriting with new technologies, putting their strengths in synergy.

The advantages of integrating technologies and handwriting in teaching methodologies

We will briefly describe how teaching methodologies that integrate handwriting with new technologies can prove to be advantageous.

First of all, the use of digital makes it possible to create extremely innovative and stimulating learning environments. In these environments, handwriting favors intellectual/emotional involvement, thanks to the expressiveness and embodied aspects of the graphic gesture .

Technologies increase the possibilities for communication, collaboration and publication in an extended and facilitated way, both within the classroom and with the

outside world. We can combine each didactic experience with manual graphic productions (text, drawings, diagrams,...) through devices that directly allow the translation from analogue to digital or through subsequent transformation or simply by attaching them in graphic format as an image. This makes it possible to combine the connectivity of technology with the expressiveness and creativity of the graphic gesture.

Technologies allow multimedia: texts, images, video and audio used in an integrated way bring more resources into play and meet the different ways of learning. Handwritten contributions can be inserted as a further interactive element or handwriting experiences can be proposed alternating with digital practice. Moreover, it is known that multimedia if used incorrectly can lead to a high cognitive load and be an obstacle to learning.

The use of digital technology allows the production of

easily modifiable documents, favoring the implementation of metacognitive paths in which a rapid restructuring of the text is required, while handwriting can be proposed for activities in which it is instead necessary to learn to immediately define the logical path, training decision-making skills and developing self-confidence. Once the learning experience with handwriting is over, the result can always be converted into a digital version using ICR (Intelligent Character Recognition) programs.

The technologies make it possible to obtain immediate feedback on the activities carried out, with the evidence of corrections or the publication of solutions (useful for certain training objectives such as tests, questionnaires, quizzes, for example). The possibility of carrying out activities of this type using pen drives or tablets that allow you to use handwriting is not excluded.

Research has highlighted how technologies cool down the

emotional charge activated when an error is presented, facilitating its acceptance and stimulating improvement; however they do not help to develop attention; as anticipated, the experience of visually detecting the error as a product of one's own writing and deleting it and then writing the correct version allows for better memorization of the results, avoiding repeating the conditions that generated it again. Extremely effective is the possibility that the teacher can intervene with corrections, also written by hand, in a close exchange, of heart and mind, with the student.

Technologies facilitate the personalization of learning through specific educational paths that are activated by choosing the contents and methods of a lesson based on the needs of the individual student. Handwriting can be used with appropriate devices in digital texts to highlight certain topics, emphasizing the interested party, or to

integrate and deepen concepts, inserting short handwritten notes.

Schemes or maps can be drawn by hand during the explanation phase by the teacher and during the study by the student.

The use of digital devices allows for interactive simulations (active learning) and experimental testing of concepts, hypotheses and skills. An advantage of digital simulations is that they can be performed repeatedly without the need for special materials or even in situations that are risky or otherwise impossible to practice (for example looking at your city from above with Google Maps; simulating the functioning of the respiratory system or the effect of forces in physics, through virtual reality (Virtual Reality, VR) or

through the so-called Mixed Reality (MR) [9]The integration of parts in which manual word processing becomes the protagonist is welcome.

Technologies make it possible to use and have access to current and remote contents by providing large amounts of information and news and handwriting , through the immediate construction of maps, sketches and notes on paper or Jamboard (or other devices) allows the selection of sources , the choice of contents and an initial mapping of information.

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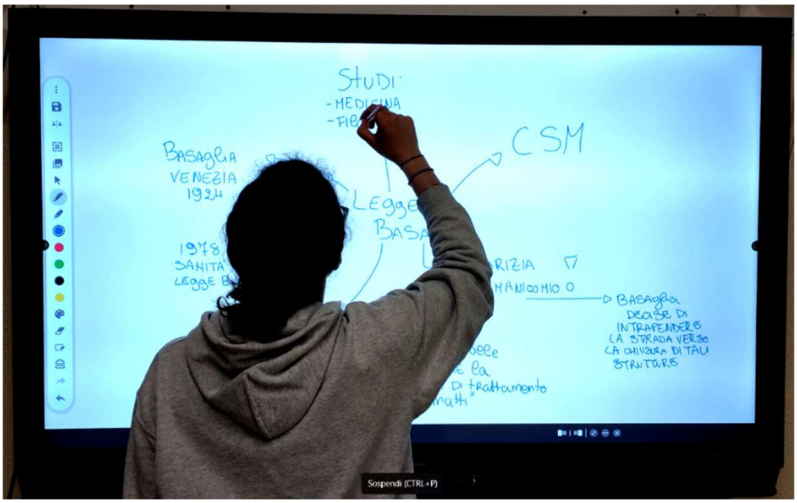
[9]MR superimposes intelligent interfaces on the real environment, adding one or more additional information (3D, sound, video, etc.) to the sensory data detected by the subject, in a sort of fusion of real and virtual worlds so that both are perceived in the same field of vision» (Riva, 2004, Par. 9.3.2) Riva, G. (2004). Psychology of new media. Bologna: the Mill.

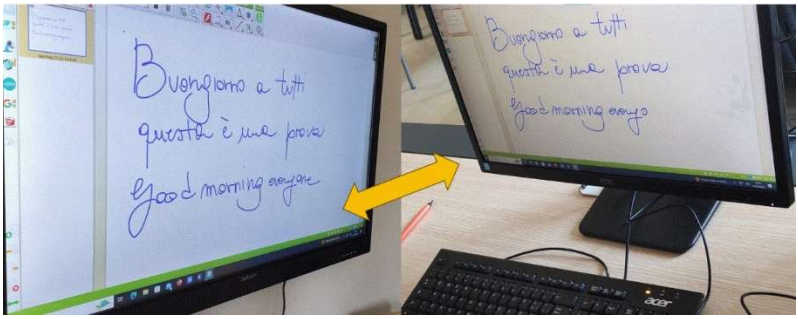
Technologies can also act as cognitive amplifiers if used as cognitive tools (Calvani, 2020). Cognitive tools are tools that allow to amplify people's abilities and cognitive processes; a typical example is the calculator, the use of which must be correctly integrated with the learning of mental calculation. A typical cognitive tool whose effectiveness has been recognized for some time now is precisely that of fixing concepts with pen and paper, through written and/or graphic summaries of the contents.

In the following photo, a student is using a touch screen monitor to make a concept map with the help of a digital pen and device management software that allows sharing and saving functions. In this case the teacher is explaining a topic to the whole class and the student summarizes what the teacher has illustrated in real time. You can choose different colors and effects, for example with a

thicker writing stroke, underline, highlight, create shapes in which to insert words to facilitate the memorization of concepts. The writing surface goes beyond the actual size of the screen allowing for desired enlargements and the possibility of enlarging and reducing what has been written. At the end of the topic, the whole class participates in completing the map with suggestions for modification or integration. Once finished, the map can be saved and shared: as soon as it is created, it is already available to be used in review and reinforcement actions.

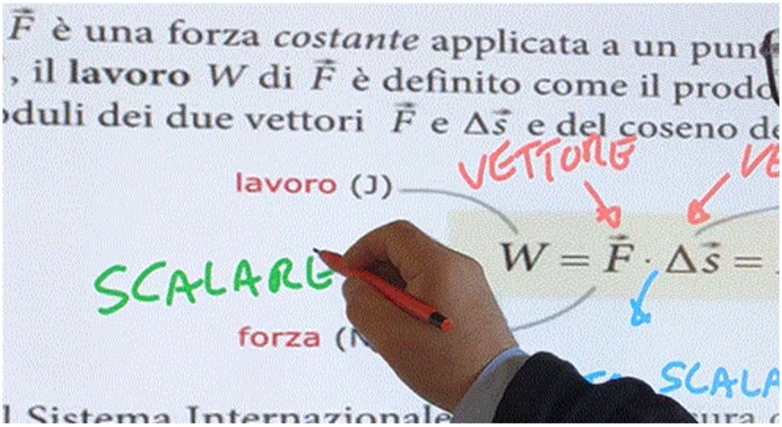


A document, image or digital book can be projected onto the touch screen.

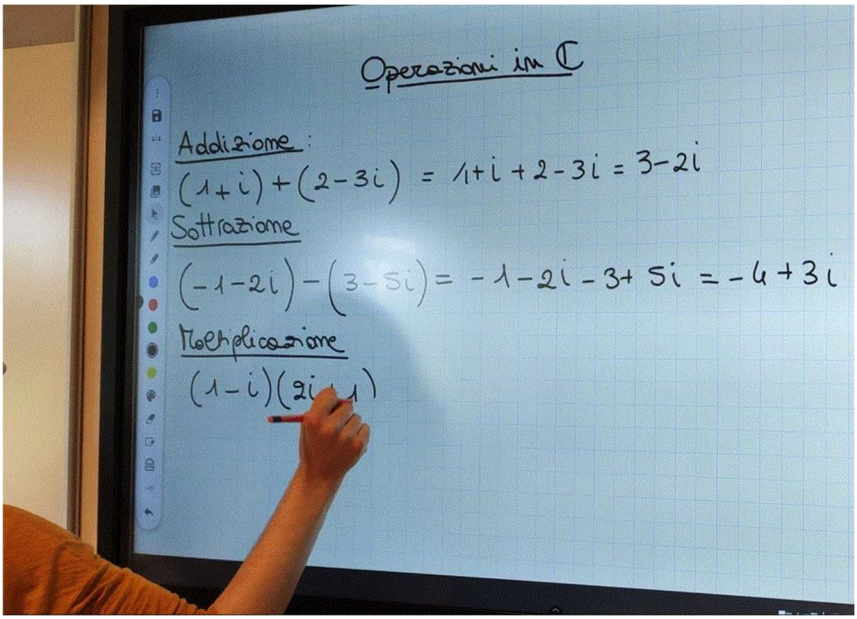


During the explanation, the teacher who wishes to add annotations on the school text to deepen and clarify some concepts can do so in a completely personalized way thanks to the use of the graphic gesture. He can write, draw and highlight as if it were a page of a paper book with the advantage that students see the additions and can report them precisely in their texts and notes. This can be done by combining the use of the PC with that of the touch

screen. If a digital text is available on the PC, the teacher can for example decide to carry out an exercise by extrapolating it from the book, selecting the part of the text concerned from the PC screen and, by duplicating the PC screen on the touch screen monitor, solve it as it would on a classic slate blackboard, with the advantage of having the original text alongside. The students follow the development by noting it in their notebook. The screenshot with the resolution is saved as a file and can be shared and /or archived for later consultation even offline.



For scientific disciplines, the possibility of using the multimedia whiteboard is very convenient because there is no sufficiently agile alternative to manual writing when reporting mathematical symbols.



An exercise performed on the touch screen can be reworked with ad hoc software (for example GeoGebra) and the resulting graph can be shared via Lim. This combined use facilitates learning by integrating different

technologies and writing methods. On the one hand, the flexibility and creativity of handwriting is exploited in organizing the development of the exercise, while on the other, the precision of the software that creates the graph is taken advantage of.

The work of teachers in this phase of defining roles between handwriting and digital technologies is very difficult and, at the same time, precious. Handwriting needs school to survive, because school is the environment in which it is learned, practiced and made indispensable, but school also needs handwriting, its potential, its support, as a faithful companion of the learning and growth path of our children.

As Voltaire said, writing is the painting of the voice, a wonderful painting that is expressed in the handwriting of our boys through the creation of their unique and

biographical "paintings".

At the end of our Halo project, designed for students, teachers and counselors to support them in their personal and professional evolutionary path, I propose the image of an education that takes into account the reality of the individual in all its facets to promote harmonious growth , growth in which the graphic gesture and the graphological discipline that studies it are confirmed as faithful, sincere and knowledgeable allies of everyone's history in the fullness of its truth.

Make every effort to direct all of your energy towards your head, and stay confined there.

Never blossom like a flower.

Everyone has a heart, and certainly a right education would be divided into three parts:

education of the body, because the body has its own

mystery;

education of the mind, because the mind has its own great strength as regards investigating objects;

and education of the heart, for love, which is completely denied.

(Osho, That dark interval is love)

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Summary


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