Teaching Information and Communication Theories through Arts

Fidelia Ibekwe, *School of Journalism & Communication, Aix Marseille Univ, CNRS, LPL, Aix-en-Provence, France*.
fidelia.ibekwe@univ-amu.fr

This article reports on an experience where arts-informed pedagogy was combined with the traditional lecture-style teaching in a course on information and communication theories delivered at the Masters level in the School of Journalism and Communication Sciences (EJCAM) at Aix-Marseille University in France. After the course content had been delivered orally, students were required to work in groups to create art exhibits that showcased how information and communication theories operated in different historical or contemporary situations in the society. Sixteen impressive art projects were created by the students, and an arts exhibition was held within the school premises. To gauge students' reception of how the arts-informed pedagogy contributed to their appropriation of the course content, they completed an online survey two months after the course. Their responses showed an overwhelmingly positive reception and demand for more creative modes of learning in information and communication studies. The arts approach complemented the verbal mode of learning by creating a recursive and collaborative learning environment that enhanced students' participation, self-esteem, and creativity and served to illustrate the interdependence between theory and practice.

Keywords: arts-informed pedagogy, communication theory, creativity in education, information theory, innovative pedagogy, library and information science education, scholARTistry

Historically, mass higher education has been dominated by the written and oral modes of teaching, thus by a "lecture-based" instruction style. Barrington (2004, p. 423) noted the emphasis on "just two intelligences—verbal/linguistic and logical/mathematical" and the neglect of the other learning modes (kinesics, visual, embodied and emotional). This leaves little room and opportunities for "unexpected insights through new types of learner experiences" (Tudor, 2008). Whereas "human creativity is widely recognised as a catalyst for innovation, adaptability and survival in an increasingly unpredictable and rapidly changing world," not enough attention has been paid to fostering creative teaching strategies among students (Tudor, 2008).

However, there has been a growing awareness of the need to solicit other modes of learning than the oral and written. The relevance of arts-informed pedagogy in education has been recognized worldwide. The First UNESCO World Conference on "Arts Education: Building Creative Capacities for the 21st Century" was held in Lisbon in March 2006. In *Arts-Based Methods in Education Around the World*, Chemi and Du (2017)

recall the historic and theoretical foundations of arts-informed pedagogy and cite numerous handbooks published on arts education and creativity learning. Wehbi (2014, p. 47) defines arts-informed pedagogy as "interventions, research and teaching that use art as a tool to question, challenge and engage." Marshall (2014, p. 105) writes about using "multimodal arts-based learning to enhance comprehension of academic subjects."

Kraehe & Brown (2011, p. 491) argue that "[a]rt and arts-based inquiries offer a model for aesthetic learning experiences that transcends specific subject matter and materials." They further state that "[f]or any field of study, including those not traditionally associated with the arts (e.g., the sciences, business, nursing, teaching, research, and others), aesthetic learning experiences can invite learners to become fully immersed in their pedagogic material (...) This means that learners become absorbed cognitively, somatically, and emotionally within the materiality of the aesthetic learning experience." Weber and Mitchell (1995, p. 34) also affirm that "[d]rawings offer a different kind of glimpse into human sense-making than written or spoken texts do, because they can express that which is easily put into words: the ineffable, the elusive, the not yet-thought-through, the sub-conscious." In addition, Chemi and Du (2017, p. 6) observe that "arts and cultural experiences offer the opportunity to talk to both a real and a fantasy world—therefore addressing different learning approaches (...) The challenges hidden in the arts demand the activation of deep thinking." Like Weber & Mitchell (1995), they observe that arts can offer a means of communicating ideas or phenomena too complex to describe verbally (Chemi & Du, 2017, p. 35).

Other studies have reported on the increasing use of arts to study complex phenomena across several disciplines and scientific traditions. Chemi & Du (2017, pp. 7–8) report on how arts have been used in the

KEY POINTS:

- Arts-informed pedagogy was combined with the traditional lecture-style teaching in a course on information and communication theories delivered at the Masters level in the School of Journalism and Communication Sciences (EJCAM) at Aix-Marseille University in France.
- Students worked in groups to create art exhibits using the Bauhaus total arts philosophy as inspiration. These art works showcased how information and communication theories operated in different historical or contemporary situations in the society.
- The arts approach complemented the verbal mode of learning by creating a recursive and collaborative learning environment that enhanced students' participation, self-esteem, and creativity and served to illustrate the interdependence between theory and practice.

neurosciences to "reveal the workings of the artistic brain and how emotions are fundamental to learning"; it was used in philosophy to investigate "the possible disruptive benefits that artistic practices can have on the imagination of future educational environments," and in anthropology and evolutionary biology to study the "the function of survival through social connectedness." Wehbi (2015) reported the use of arts in a graduate class to study the integration of anti-oppressive social responses to situations of marginalization. Likewise, an arts-based approach was deployed in a course aimed at developing teachers' capacities for social justice by raising their awareness of their responsibility in not perpetuating racial, gender, and class stereotypes in their classrooms. Using simple, creative practices, such as drawing pictures, creating conceptual diagrams, and constructing collages, Kraehe & Brown (2011, p. 498) observe that

> participation in arts-based inquiries throughout the course helped students' increase their critical sociocultural knowledge (...) Some students found that arts-based activities gave rise to self reflections that expanded and enlivened the ways they understood course material, themselves, and others.

Arts can take different forms, including the embodied form or enaction. In their review of studies on embodied learning, Kontra, Goldin-Meadow, and Beilock (2012, p. 731) report that "embodiment is frequently associated with high degrees of knowledge and skill." Even a simple action as a gesture has been shown to "affect a wide variety of cognitive processes" (p. 732). In our arts-informed pedagogical experiment, some students had recourse to embodied learning by acting out theories and events invoked in their project.

However, arts-informed pedagogy in higher education is not without limitations or pitfalls, which I will discuss in the last section. But the overwhelming evidence gathered from the literature appears to suggest that the benefits of creative approaches and especially artistic ones in pedagogy outweigh their eventual limitations and pitfalls.

The challenge of teaching theoretical courses

The author of this paper was also the course instructor in the arts-oriented pedagogical experiment described hereafter and will be referred to as "the instructor." Teaching a theoretical subject matter in any field can be challenging, especially if the audience concerned is geared toward practical and professional placement into the workforce. These types of students are often unconvinced about the relevance of theory to their imagined professional practices. The students concerned in our study are such professionally oriented students, destined to work in the communication sector as organizational communication consultants, public relations officers, social media managers, journalists, media spokesperson, web content publishers, digital project managers, and so on. The pedagogical challenge

for the instructor was to convince them that there can be no effective communication strategy without an underlying theory. Hence, the aim of the course was to illustrate the interdependency between theory and practice, that is, the fact that theory informs practice and practice can in turn lead to modifying existing theories or promoting new ones, and also the fact that although the theories they were going to learn about were propounded more than 60 years ago, they are still relevant in our digital society. Another pedagogical goal was to encourage the students to build their own representations of how information and communication theories operate in the society, in both the personal and professional spaces. Lastly, integrating a creative approach in the teaching of a course that can otherwise be boring if delivered entirely in the professoral "lecture-style" mode was motivated by the desire to increase students' engagement and appropriation of the course content.

With these challenges in mind, the course instructor began experimenting with arts-informed pedagogy in teaching a theoretical course in information and communication theories at the Masters level in a French university. During the first three years (2014–2017), the instructor combined the traditional lecture-style teaching (textual/verbal with powerpoint slides) with a light form of arts, where students were invited to make small drawings at the beginning of the course, then to create a story around a set of drawings chosen from all the drawings made by the class, and finally to present their story in front of their peers at the end of the class. The results, reported in Ibekwe-SanJuan (2017) and Ibekwe-SanJuan (2018), showed improved students' engagement and participation in the course. In the winter of 2018, the instructor deployed a full-fledged arts production and exhibition to further enhance students' understanding and appropriation of information and communication theories. Students were asked to produce artworks that illustrated how chosen information and communication theories operated in plausible, real-life, or historic contexts.

Theoretical background of the artworks: The Bauhaus artistic and philosophical movement

An added requirement in this pedagogical experiment was that students were required to draw inspiration, in designing their artwork, from the Bauhaus artistic and ideological movement. The Bauhaus was an art school founded by Walter Gropius during the Weimar Republic in Germany in 1919. The German term Bauhaus—literally "building house"—promoted the ideal of total art in which arts, crafts, fine arts, and architecture are combined. As shown in this excerpt of Walter Gropuis's call, arts is not simply arts; it is also a philosophy as well as a political and social program:

> Architects, sculptors, painters, let us create a new guild of craftsmen without the class distinction that raise an arrogant barrier between craftsman and artist. Together, let us create the new structure of the future which will one day rise toward heaven from the

> hands of a million workers, like the crystal symbol of a new faith. (as cited in McCarthy & Bron, 2019)

With Hitler's coming to power in 1933, the Bauhaus movement and its members became *persona non grata* and many fled to other countries. Gropuis emigrated to the United Kingdom and then to the United States, where he gained worldwide recognition and was appointed to the Havard Graduate School of Design in 1937. The Bauhaus has had considerable influence on the artistic and intellectual communities in the Western world, and the Bauhaus style has become one of the most influential currents in modern design.

In his book *The Democratic Surround*, Fred Turner gives an account of how, during World War II, the Bauhaus movement inspired American intellectuals gathered under the Committee for National Morale (CNM) created in 1941 by President Franklin Roosevelt. These intellectuals, who were mostly from the social sciences and humanities, and some of whom—like Gregory Bateson and Margaret Mead—later founded the field of interpersonal communication, sought ways to guard Americans from descending into the fascism that was sweeping through Germany and many other European countries. They were convinced that the use of mass media by Hitler had contributed to the creation of obedient and robotic individuals, and thus to Nazism, because the mass media function in a unidirectional, top-down manner that increased the enrolment and conformity effect. These intellectuals saw in the Bauhaus's ideal of total arts a philosophical grounding and a practical means by which to shield Americans from fascism and Nazism. Their idea was to "surround" American citizens with a multimedia environment that exposed them to varied information sources, thus fostering free and autonomous thinking that in turn would lead to the formation of democratic individuals. After the end of World War II, several artistic exhibitions inspired by the Bauhaus philosophy, such as *Road to Victory* or the *Family of Man*[1] took place in the United States.

During the theoretical part of the course, the students learned of the influence of the Bauhaus on American intellectuals who sought to "fashion democratic citizens," which in itself is another form of manipulation. Incidentally, 2019 marked the centenary of the birth of Bauhaus. A BBC Radio 4 documentary series (McCarthy & Bron, 2019) retraced the history of this movement and the life of Walter Gropius, which the instructor shared with the students after the course had ended. This gave the students further illustration that not only do theories affect our real-life practices, beliefs, and ideologies, but also the movement on which their arts exhibitions were based is internationally recognized and still being discussed a century later.

Methodology

The course was organized as a three-hour-per-week lecture spread over seven weeks. In the first class, the instructor explained to students that the course had two parts: a lecture part and the art-project part. They were

then asked to form groups of five to six students and choose information and communication theories discussed in the lecture part of the course to showcase in their artworks. Below, I describe in more details the organization of both parts of the course.

The lecture-style part of the course

The first five weeks of the course were delivered in the traditional lecture-style verbal mode. The instructor gave a historical and conceptual exposition of the following topics and theories:

- rhetoric in ancient Greece and the origins of communication studies;
- propaganda techniques in the two world wars, the emergence of mass media, public relations studies, mass marketing campaigns, and the first research programs in communication;
- Norbert Wiener's Cybernetic theory (Wiener, 1948);
- Shannon's Mathematical Theory of Communication (Shannon & Weaver, 1948);
- Gregory Bateson and the Palo Alto school's axioms on interpersonal communication (Bateson 1972; Watzlawick, Beavin-Bavelas, & Jackson, 1967).

Students had access to powerpoint slides ahead of the lectures on which the instructor had consigned the salient facts around each topic to aid retention. To gauge students' understanding of the postulates of each theory, a short Q-A session was organized at the end of each topic.

The choice of the topics and theories covered in the lecture part was done in consultation with another course instructor who teaches the same course in the second semester but focuses on other theories. Hence, in the second semester, the same students were exposed to Harold Lasswell's 5W theory, which posited the immediate and direct impact of mass media on public opinion; to Paul Lazarsfeld's middle range theory, which nuanced Lasswell's theory; to McCombs and Shaw's agenda setting theory; and to Katz, Blumler, and Gurevitch's uses and gratification theory of the mass media.

As the lectures progressed, students posed questions about the horizon of possibilities within the art project, i.e. what they could or could not do. Many had questions about the number of theories they should showcase through their artwork. Others had questions about the relevance of their ideas and the scenarii they were imagining. In response to these questions, they were informed that their artwork would be assessed based on whether the message they wanted to convey was consistent with the tenets of the particular information and communication theories they chose to showcase.

The arts project design and organization

The sixth class was organized as a workshop. Sixteen groups had been formed from a class of 93 students. The instructor spent time with each group to make sure that their ideas were realizable within the logistics

constraints of the school, given that students had only one week between this workshop and the exhibition day, which took place at the seventh and last class. Students worked with their project groups to design their artwork: finalizing the scenario and choosing materials with which to build the objects, planning on how and where to obtain the materials and when to build the artwork, and so on. To create their artwork, students used materials such as cartons, glue, coloured paper and polystyrene, wool, nails, and wood planks. The artwork exhibit was publicized to the administrative staff, faculty, and students enrolled in other courses via email invitations.

Students were required to explain their artworks to visitors during the exhibit, focusing on how they illustrated their chosen information and communication theories. Short videos of their interactions with visitors were captured and hosted on the University's podcast server and on the instructor's website.[2] Along with the artwork, each group was also required to submit an exhibition booklet which documented the conception and design of their artwork and how it illustrated the workings of the chosen information and communication theories. The sixteen booklets thus collected serve as the archives of the artworks, especially given that the artworks had to be dismantled after the event. Hence, people who could not attend the exhibit can read about it, see archival photos and videos of it, and understand how the theories were portrayed through arts.

Course assessment modalities

The assessment of students was also done in two parts. The lecture part of the course was assessed through a written individual end-of-term exam. The assessment of the arts project took into account the correspondence between the artwork and the theories evoked in each exhibit. For instance, an exhibit that used Wiener's cybernetic theory to explicate a linear transmission of information without feedback would be factually wrong. Such situations did not arise, as the scenario the students envisaged had been discussed with the instructor before the actual artwork was designed.

When the arts illuminate information and communication theories

On the exhibition day, students arrived early to take up their allotted spaces and set up their artwork within the school premises. The audience was then allowed to come and view the artwork, engaging with the students as they explained how their art exhibits reflected the functioning of chosen information and communication theories. The students also visited their peers' arts exhibits and interacted with them. In Table 1, I provide a short description of each artwork.

In the sections below, I describe in more detail five of the most impressive artworks produced by the students. I first describe the physical design of each artwork and then underline how they showcased chosen information and communication theories based on the students' written analysis as seen in their booklets.

Table 1: Description of students' artwork

	Artwork	Short description
1	Entropia Tree	This artwork showcased how knowledge is acquired in a cyclic and cumulative process by evoking Norbert Wiener's cybernetic theory; Shannon's Mathematical Theory of Communication (MTC); Gregory Bateson and the Palo Alto school's five axioms on interpersonal communication.
2	The Rwandan genocide	The role of the mass media in disseminating propaganda and facilitating the orchestration of the genocide of 800,000 Tutsis in 1994 in less than 100 days by the Hutus, their ethnic neighbours. Theories showcased include Norbert Wiener's cybernetics, Ludwig von Bertalanffy's systemics, and Edward Bernays's engineering of consent.
3	Maya the bee	This exhibit showcased the central role that information and communication played in the bees' ecosystem. The theories evoked were Shannon's MTC and the systemics theory, which also inspired Wiener's cybernetics.
4	The myth of Icarus	This exhibit was composed of two separate artworks. One used the myth of Icarus to illustrate the attraction but also the inherent dangers of Artificial Intelligence to which it led. This illustrated Norbert Wiener's cybernetics, his ambivalence with automation, and his fears that his inventions would take control of humans. The second exhibit illustrated how people's emotions are manipulated by showcasing Aristotle's treatise on rhetoric as an art of persuasion.
5	Doctor consultation	This exhibit showcased interpersonal communication problems between a doctor and his patient through the prism of the five interpersonal communication axioms developed by Gregory Bateson and the Palo Alto school.
6	Communication molecules	This exhibit showcased Gregory Bateson and Paul Watzlawick's five axioms of interpersonal communication, the two key figures of the Palo Alto school. At another level, this exhibit was a metaphor expressing the fact that without communication, we cannot function harmoniously as a society.
7	DATA'ART	This exhibit sought to create the Bauhaus 360° effect by visually representing the exploitation of personal data by the GAFAM. Data were represented as an intricate web that each visitor weaves with different-coloured cotton wool onto a 3D structure. Theories invoked here include Wiener's cybernetics and Shannon's MTC.
8	Hiroshima bomb	Using Shannon's MTC as theoretical grounding, this artwork illustrated how noise (in this case, an error of translation) led to communication breakdown between Japan and America and contributed to the decision by the latter to drop the atomic bombs on Hiroshima and Nagasaki, with horrific consequences.
9	Bauhaus 360 degrees	This artwork created a "surround and immersive effect" by placing several displays in a circle that "imprisoned" the visitor, where some displays contained conflicting and paradoxical messages, thus showcasing the Palo Alto school's double bind theory, which is characteristic of schizophrenic communication situations.

(*Continued*)

	Artwork	Short description
10	Baltazar	Using a scenario of an imaginary character called Baltazar, a musician faced with different communication situations, this multimedia artwork showcased Palo Alto's five axioms of interpersonal communication.
11	Everybody loves puzzles	This artwork sought to convey Shannon's MTC through a storyline of the conveyance of a puzzle that was transported from one point to another but due to turbulence (noise) during the journey, arrived in disarray, thus creating uncertainty. Lasswell's 5W model and Palo Alto's interpersonal communication five axioms served to illustrate the ensuing communication between sender and receiver in order to solve the puzzle.
12	Eating the "Apple"	This artwork illustrated propaganda and manipulation of opinions by the mass media, using as scenarios international publicity campaigns by household names such as Apple and McDonalds and invoking Shannon's MTC.
13	Non-verbal political communication	This participatory artwork showcased famous politicians in the act of talking and gesticulating and asked visitors to place a sticker with the emotion conveyed by the politician's body language, thus emphasising the importance of non-verbal communication (kinesics and proxemics).
14	Comics publicity	This artwork consisted of a video sequence showing how people interpret media messages, in this case, a publicity campaign around a comic, using as a theoretical lens Wiener's definition of feedback, the Palo Alto school's axiom that "we cannot not communicate," and Aristotle's rhetoric.
15	Communication game	Using various material objects to create the Bauhaus effect, this participatory artwork encouraged visitors to participate in a game where they had to guess the theory at work in the different settings showcased. The three theories invoked were the Palo Alto school's axiom that one cannot not communicate, Paul Lazarsfeld's middle range theory (two-step flow of communication) on how the mass media affect people's opinions, and Shannon's MTC on linear transmission of information.
16	Balance	This display sought to illustrate the concept of homeostasis through a staging of two people whose relationship evolves as their exchanges progress, thus showing that communication and relationships are dynamic entities that we seek to regulate in order to maintain a state of homeostasis, which is necessary to prevent society from descending into chaos and wars which will be synonymous with an increase in entropy, an evil in Wiener's cybernetics theory.

Entropia: The tree of life, of communication, and of knowledge

This project involved six female students, with one of them clearly being the project leader.

As the students explained in the accompanying booklet to their exhibit, the choice of a tree was governed by its symbolism: it exists in all cultures and represents life and communication. The roots of the tree

reach deep into the earth. Its trunk represents the interdisciplinary nature of information and communication theories, which were promoted by pioneers from several disciplines (mathematics, engineering, neurosciences, psychiatry, psychology, sociology, anthropology, etc.). The branches of the tree represent the subfields of information and communication sciences (communication, media studies, journalism, information studies, library and information science, cultural studies, etc.). The coloured autumnal leaves on the branches represent knowledge already accumulated by our predecessors.

The design of the tree

The tree was made with brown kraft paper with a solid trunk. Its branches were covered with colourful cardboard paper (see Figure 1).

To facilitate the participation of visitors, students prepared a bag filled with balloons, inside which they had inserted pieces of paper with writing or drawings on them. Each visitor was asked to choose a balloon from a bag, pierce it, take out the piece of paper and then place the image or the quotation at the best place on the tree branches. As further enticement, students offered *madeleine* cakes to visitors, a specialty from the towns of Commercy and Liverdun in the Lorraine region of France.

Acquisition of knowledge as a cyclical and cumulative process

Through this exhibit and the interactions it generated with visitors, the students sought to explain how knowledge is acquired in a cyclical and cumulative process by drawing on three information and communication theories.

They first evoked Norbert Wiener's cybernetic theory, which illustrates how our knowledge and actions are influenced by those of our predecessors, through feedback that we receive from our environment. Shannon's Mathematical Theory of Communication (MTC) and in particular his definition of information entropy was evoked to portray the uncertainty and surprise experienced by visitors when they pierced the balloons and discovered the message hidden inside. Visitors then had to decide where best to place this quotation or image on the tree. This generated more surprise and uncertainty, hence more entropy, which led to more interactions between the visitors and the students about where to place the unveiled quotations or images on the tree branches, taking into account the information already on the tree. The tree was thus gradually populated and enriched with knowledge elaborated recursively and cumulatively. Each new visitor incremented their knowledge by reading the information (images and quotations) already placed on the tree by preceding visitors. This process is reminiscent of the cybernetics theory.

Lastly, to characterize the circular communication pattern between the visitors and the exhibit, the students called on Gregory Bateson and the Palo Alto school's axioms on interpersonal communication, which were also inspired by Wiener's cybernetic theory.

Figure 1: ENTROPIA. The Tree of knowledge.

The overall aim of this exhibit was to convey how knowledge is acquired incrementally, over time, through interactions with existing knowledge artefacts and with our environment (people and things).

The Rwandan genocide

This very thoroughly researched multimedia exhibit showcased the role of the mass media in disseminating propaganda and facilitating the orchestration of the genocide of 800,000 Tutsis by their Hutu neighbours in 1994 in less than 100 days. It was designed by a group of six female students, with the project leader being one of the older students who clearly chose the topic and researched most of the archival artefacts on this genocide.

A mise en abyme of the Rwandan genocide

The students achieved a Bauhaus "360° surround" effect by designing the exhibit on three levels (see Figures 2a & 2b). On the first level, signs printed on A4 paper with the words "Before" (*Avant*), "During" (*Pendant*), and "After" (*Après*) were placed in front of three laptops that streamed audio recordings on how the genocide was made possible.

The second level of exhibit featured the students themselves, who were dressed in black and white T-shirts, on the front of which was written "I am . . ." (*Je suis...*) and on the back, the name of an information and communication theorist (Norbert Wiener, E. Bernays, Corneille), of a school of thought (Palo Alto), or of an instrument of the genocide (*Radio Mille Collines* [RMC]). Thus, the students placed themselves as enactors in their own exhibit, at the same time as they were outside it.

At the third level and in the background, the students placed a collage of A4-sized posters on the wall showing a chronological *frise* of the genocide,

archival images, and quotations from analysts, politicians, and the mainstream media. Stark and sombre colours (mostly black, white, and grey) were chosen throughout to underscore the gravity of the subject matter.

The diverse multimedia and multimodal artefacts used by the students (images, audio recordings, signboards, posters, photos, the students themselves) offered visitors diverse trajectories from which to explore this genocide. Some visitors began by reading the background information on the chronological *frise* displayed on the wall. Others first listened to the audio recordings on the laptops in front of the exhibit, while other visitors first engaged with the students themselves who were part of their own exhibit. This created a multimedia "surround" effect in line with what the Committee for National Morale sought to achieve by taking inspiration from the Bauhaus movement. The overall impression conveyed by this exhibit was that of a *mise en abyme*.

The genocide seen through the prism of information and communication theories

In the accompanying booklet to this exhibit, the students analyzed the genocide through the prism of certain information and communication theories. Drawing heavily on Norbert Wiener's cybernetic theory, they illustrated the circular nature of information and communication processes. They explained that the genocide of Tutsis was made possible through the control and privatization of information by the then–Hutu-led government that orchestrated the genocide. Control and privatization being the exact opposite of the free circulation of information and communication defended by Wiener, this created an anti-homeostatic situation which led to an increase in entropy. Recall that for Wiener, entropy was the measure of the degree of disorganization of a system and therefore

Figure 2a: The Rwandan genocide exhibit.

Figure 2b: Archival images and texts on the Rwandan Genocide exhibit.

an evil to be combatted at all costs. On the other hand, his contemporary Claude Shannon considered entropy to be a positive thing because it is the measure of uncertainty and of surprise associated with a message. The higher the entropy, the more information a message contains (in terms of novelty). Drawing on systemics theory, the students recalled that when elements form a system, the whole becomes superior to the sum of the parts. A system refers to complex phenomena like animals, humans, society, and machines. Thus, individual actors of the massacres (the villagers supporting the Hutu cause) formed a "system" whose concerted aim was to preserve the Hutu power by destroying the human object of their target, the Tutsis.

The students correctly analyzed the role played by the *Radio des Milles Collines* (RMC; literally "Thousand Hills Radio") in the genocide as the archetype of state-controlled media used to enrol the masses into perpetrating atrocious acts. Analysts have since documented the rise in power of this radio in 1993 and during the genocide. As a state-controlled mass media organ functioning in a vertical and unidirectional manner, RMC could not foster free thinking (see above for a discussion of the American intellectuals around the Committee for National Morale) or democracy, and it thus became a tool for propagating this hateful ideology through the use of songs, laughter, and jokes, which encouraged its audience to view their erstwhile Tutsi neighbours and relatives as "cockroaches" and "rodents" that should be crushed to death. In Wiener's cybernetic theory, feedback can be positive

if the receiver amplifies the message they receive, or negative if the receiver causes the sender to correct or adjust their behaviour. The receivers of the propaganda emitted continuously by the RMC, in this case the Hutu militia, responded to its exhortations to "crush the cockroaches," thereby instigating a retroactive loop of positive feedback that amplified the RMC's message. Through the exhibit and the analysis in their booklet, the students demonstrated that they not only understood the subtleties of Wiener's cybernetics theory but also researched other theories that shed more light on the role of the mass media in the Rwandan genocide. For instance, although the students did not encounter Edward Bernays in the lecture part of the course, they researched his pioneering work on public relations and used it to explain the herd mentality shown by the Hutus who helped "accomplish" the work of genocide. Bernays was inspired in his writings by Gustave Le Bon's 1895 book *The Crowd: The Psychology of the Popular Mind*. For Bernays, the masses were "irrational and subject to the herd instinct" and could therefore be controlled by skilled practitioners in a scientific manner. His 1947 essay "The Engineering of Consent" is a classic on public relations management.

The adventures of Maya the bee

This beautifully executed artwork was done by a group of three male and three female students. It showcased the central role that information and communication play in the bees' ecosystem.

The design of the beehive

Using coloured cartons and black wool, students created three larger-than-life bees and a tree containing the beehive. They constructed a storyline with three episodes each illustrating information and communication situations that arise as the bees buzz around to accomplish their daily tasks (see Figures 3a & 3b). A laptop was placed beside the tree on which the students displayed pictures of their exhibits and materials explaining the beehive ecosystem.

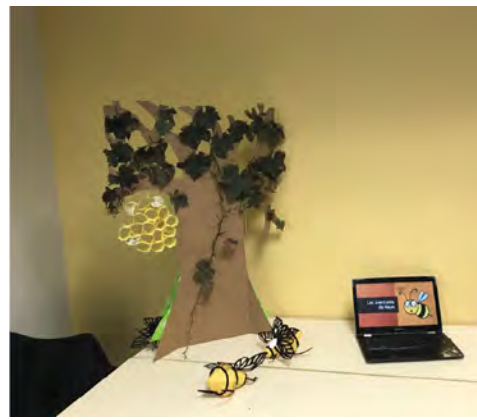

Figure 3a: The beehive ecosystem.

Using the bees as props, the students enacted the three episodes in front of their visitors using storytelling devices (voice, acting, staging). The central character was Maya, a foraging honeybee whose role it was to help the other bees organize their work, find food, and defend the queen and the hive from alien or hostile neighbours.

Bees' communication seen through information and communication theories

The accompanying booklet provided more in-depth explanation on how the students mobilized information and communication theories to explain the beehive ecosystem. In the first episode, the students explained how bees transmit information through specific dance patterns (rounds or waggle dance) to the rest of the community. Bees in the same colony receive and correctly interpret the information conveyed by each dance pattern and then send the necessary feedback back to the transmitter. The hive was correctly perceived by the students as a complex system in search of auto-regulation through the transmission and reception of messages. By so doing, the students placed the bees' communication within the systemics theory, which also inspired Wiener's cybernetics. According to this theory, isolated acts do not exist and the "self" is constructed through interactions with others, thus reaffirming the intricate web of causality of many phenomena. The students also brought in Shannon's Mathematical Theory of Communication (MTC) to explain that in such a system, the degree of uncertainty of received messages is low, and therefore entropy is also low because the inhabitants of the hive understand one another through the use of common codes and language. A low degree of entropy, which equates with a low degree of surprise and therefore of information, is not considered a good thing in Shannon's MTC; on the contrary, it is a good thing in Wiener's cybernetic theory because a high level of entropy is synonymous with disorganization, chaos, and the disintegration of a system.

In a second episode of the story, Maya's encounter with bees from a foreign tribe created a situation of dysfunctional communication. To explain this situation, the students drew upon Palo Alto's axioms on interpersonal communication, in particular the axiom that posits that "to communicate is to enter into the orchestra" in order to ensure a harmonious communication with others.

In a third episode, Maya and the other bees had to defend the hive from a hostile hornet whose sting can be lethal. To explain how the weaker adversary (the bees and their queen) managed to vanquish a more powerful attacker (the hornet), the students drew once again on Wiener's cybernetics theory to explain that when faced with a new situation, intelligent systems learn from past occurrences (signals, and thus information) emitted by their interlocutor in order to anticipate their future actions and adjust their own actions. Through this cybernetic process, which is inherent in all intelligent auto-adaptive systems, the bees learnt that hornets cannot survive a body heat above a certain temperature. By getting

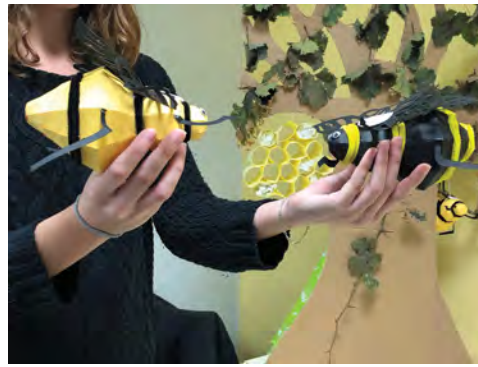

Figure 3b: Bees communicating information through dance.

into a defensive formation and completely surrounding the attacker, the weaker bees were able to suffocate the hornet and thereby save their queen and their ecosystem.

The myth of Icarus and Aristotle's rhetoric

This impressively executed exhibit was designed by a group of five students comprising one male and four female students. The exhibit consisted of two separate artworks, each showcasing a separate theory.

Cybernetics and the dangers of Artificial Intelligence

The first artwork used the myth of Icarus to illustrate the attraction but also the dangers of Wiener's cybernetics and of the resulting Artificial Intelligence (see Figure 4). The artwork itself was composed of a polystyrene carton on which students drew different patterns and images of the main characters: Icarus, alias *Homo Numericus*; Deadalus, alias *Wiener*; the sun, computers, and AI systems. The carton had three levels, each representing a progression of Icarus toward the sun, which symbolized the progression of AI toward the control of humans. The story was designed as a dialogue between Daedalus and his mythical son Icarus. The students set the scene by recalling Wiener's work for the Allies during World War II, where he built the machine "Predictor" with Julian Bigelow. This machine was supposed to provide the Allied armies with an auto-adaptive anti-air defence system against German bomber planes. Wiener's work for the Allies later paved the way for the emergence of cybernetics as a discipline. The first level of the display featured Wiener, his face turned toward the second level as he warns his son *Homo Numericus*, who is fascinated by his father's intelligent machine, of the dangers of flying too close to the sun. At the bottom of this level, the students drew an image of the sea. In the myth of Icarus, his father Daedalus, the creator of the labyrinth, warned his son about the dangers of flying too close to the sun because his wings were made of wax and would melt when in contact with the heat of the sun.

This would result in Icarus being thrown into the sea and therefore to his death. This is an allegorical reference to the dangers of pushing AI to the extreme, and of the automation and simulation of human intelligence and of algorithmic governance.

On the second level, Icarus was depicted flying ever higher toward the third level (the sun). The bottom of this second level featured an image of an electronic motherboard showing the transition of the society toward a digital world and our increasing reliance on more advanced AI. The third and highest level showed the sun (representing AI and intelligent machines), toward which Icarus was flying. At the bottom of the third level, the students represented data mapped in cyberspace. The students also wrote words like "transhumanism," "GAFA," and "governmentality" as further aids to understanding what the scene depicted.

Despite his father's repeated warnings and filled with hubris, *Homo Numericus*, like Icarus, flew much too high and too close to the sun, with the result that his wings were singed and began to be consumed. This echoes the anxiety felt by Wiener in the later part of his life that the machines he had helped build might wrest control from humans and send society into a technological armaggedon. The continuous aspect of the burning wings in the display was intended to convey the fact that we do not yet know the end of the story: will humans ultimately be controlled by the machines they built? The future will tell.

Aristotle's rhetoric and the manipulation of people's emotions

The second artwork was composed of a wooden construction on which the students depicted the central figure of Aristotle and his *Art of Rhetoric*, which dates from the fourth century BCE and is generally regarded as one of the the most important works to have been written on persuasion (see Figure 5). For Aristotle, rhetoric was concerned with "the faculty of observing in any given case, the available means of persuasion." The message the students sought to convey was that communication is often used

Figure 4: The myth of Icarus (*Homo Numericus*) or the dangers of AI.

Figure 5: The *art of rhetorics* and the manipulation of the masses.

to seduce one's audience by playing on the different rhetorical devices (pathos, ethos, and logos) to elicit certain reactions. They conveyed this by surrounding this central figure of Aristotle with images of the different emotions that messages can elicit from humans (joy, fear, anger, sadness, happiness, etc.).

Doctor consultation scenario seen through Palo Alto's five axioms of interpersonal communication

This very beautifully executed artwork was designed by a group of four students, one of whom was male. It showed miniature characters set within five scenes depicting a doctor consultation scenario (see Figure 6). Communication problems between a doctor and his patient were illustrated through the prism of the five interpersonal communication axioms developed by Gregory Bateson (1972) and by Paul Watzlawick et al. (1967) at the Mental Research Institute in Palo Alto.

The first scene staged axiom 1, "One cannot not communicate," which posits that all behaviour is communication, even the absence of speech, because there can be no "anti-behaviour." Everything, from the way in which the doctor speaks to his patient, to his body posture, tone, and facial gestures, is interpreted by his patient, and this will punctuate the sequence of their future exchanges and determine the nature of their communication and relationship. The second axiom, "Every communication has a content and relationship aspect such that the latter classifies the former

and is therefore a meta-communication," depicted in the second scene, expresses the idea that in any human communication, the relationship and the context determine the outcome more than the verbal content of the communication. The third axiom, "The nature of a relationship is dependent on the punctuation of the partners' communication procedures," emphasizes the circular nature of human interaction: one type of behaviour elicits a certain response from the interlocutor and amplifies it such that both parties are engaged in a circular chain of action–reaction, which ultimately determines the nature of their relationship. This was depicted in the third scene, where the doctor faces a difficult patient. At each consultation, their interactions amplify their difficult relationship because each implicitly blames the other as being the cause of the difficult relationship, and their individual perception in turn amplifies the defensive posture each of them adopts *vis-à-vis* the other.

Axiom four, "Human communication involves both digital and analog modalities," highlights the fact that humans communicate through different means: digital (words, gestures) and analog (we associate meaning to things that are otherwise different; i.e., every gesture or facial expression is assigned a meaning by the parties involved—for instance, frowning often is interpreted as displeasure, disagreement, or anger). These two modes co-exist and complement each other. In the fourth scene, the doctor arrived late and therefore felt guilty, but he came in smiling without uttering a verbal apology. However, his non-verbal communication (the smile) communicated his desire to disarm his patient, who was showing

Figure 6: The five communication axioms at work in a doctor-patient consultation situation.

signs of irritation and impatience. Although no words were uttered, the two communicated their feelings to each other through non-verbal communication. Axiom five, "Inter-human communication procedures are either symmetric or complementary, depending on whether the relationship of the partners is based on differences or equality," reflects the power dynamics that are at play in all human relations. According to the Palo Alto school, communication can either be symmetrical (between people of equal power) or asymmetrical (between unequal partners where one submits to the other or tempers down their response in order to maintain harmony). Here the doctor is in a superior position *vis-à-vis* his patient, over whom he asserts his authority and knowledge. The patient has to submit to the doctor's diagnosis and recommendations.

Analyzing students' feedback on the arts project

Students completed an online survey via a Google form two months after the course ended, in order to provide feedback on the arts-informed pedagogy. A time limit of one month was given for them to respond. Of the 93 students enrolled in the course, 66 completed the survey, giving a high recall rate of 70%. The survey contained eight questions, seven of which were binary- or multiple-choice questions, with the eighth being an open-ended question.

Table 2 gives a summary of the answers received to each question. The charts generated by the responses are included in the Appendix.

The responses to the first two questions showed that the vast majority of students were female (74.2%) and that most students were between 21 and 25 years old (89.4%). The third question required the students to indicate the Masters tracks in which they were enrolled, as the school offers five Masters tracks or specialties.[3]

Question 4 sought to determine students' prior knowledge of information and communication theories before taking this course. More than half of the respondents (57.6%) declared that they had prior knowledge of information and communication theories, while 42.4% said they had no prior knowledge of these theories. Question 5 sought to determine if students had had a prior experience of arts-informed pedagogy before taking this course. Some 65.2% of the students declared that they had no prior experience of arts-oriented pedagogy, and 34.8% declared the opposite. This tends to indicate that the verbal "lecture-style" model remains the predominant modality for course delivery in most French universities.

Responses to questions 6 and 7 showed that students overwhelmingly liked the arts-informed dimension of the course, with 77.3% declaring that it enabled them to better learn the content of the course and 71.2% saying that they would like to see it used in the teaching practices of other courses whenever possible. It is noteworthy, however, that 10.6% declared that they would not like to see the arts approach extended to other courses and 16.7% were indifferent. This reticence to arts-oriented pedagogy will be discussed in the next section.

Table 2: Responses to the survey distributed to students.

Questions	Modalities and responses				
Q1. Gender	Female (74.2%)	Male (25.8%)			
Q2. Age group	18–20 (1.6%)	21–25 (89.4%)	26–30 (4.5%)	31–35 (0%)	> 35 (4.5%)
Q3. Masters track of students	Event Communication (COMED A) (15.2%)	Communication and digital media (COMED B) (13.6%)	Data, information and digital devices (DICOD A (25.8%)	Data, information and digital project management (DICOD B) (34.8%)	Communication and public health (COSAN) (10.6%)
Q4. Knowledge of the information and communication theories or of the authors prior to taking this class	Yes (57.6%)	No (42.4%)			
Q5. Prior experience of arts-oriented pedagogy before this class	Yes (34.8%)	No (65.2%)			
Q6. Agreement on whether the arts-based approach enhanced learning of the course content.	Totally agree (77.3%)	Moderately agree (18.2%)	A bit (3%)	Not at all (1.4%)	
Q7. Agreement on whether to extend arts-based approach to other courses when possible.	Totally agree (1.5%)	Yes (71.2%)	No (10.6%)	Indifferent (16.7%)	
Q8. Suggestions to improve the organization of the arts project	16 suggestions received				

The last open-ended question asking students for suggestions to improve the organization of the arts-informed part of the course generated a lower response rate, with only sixteen responses (24%). Most of the suggestions centred on the little time given to them to create their artwork and the fact that the exhibit was not allowed to remain on display over a longer period for others to see them, as they had to be dismantled the same day, after the time allotted to the course.

Discussion

The overwhelmingly positive feedback received from students is an encouragement to continue exploring arts-oriented pedagogy as a complementary mode of course delivery in higher education, not only in the iFields but in other fields as well. Indeed, arts-based pedagogy has been successfully deployed in other fields, such as education, medicine, and psychology. Through arts, students were able to illustrate the relevance of abstract ideas in real-life situations, in ways that written essays would not have enabled them to do. The arts project also shone a light on students' hidden talents and creative capabilities that would have otherwise gone unnoticed. Allowing students to express their understanding of information and communication theories through multimedia arts also fostered a more horizontal mode of interaction and a co-construction of knowledge between the instructor and the learners. The instructor learned as much from the students during the artwork project as they learned from the instructor in the lecture part of the course. Kraehe & Brown (2011, p. 505) make a similar observation: "The recursive, collaborative, arts-based learning opportunities in the course enabled students to develop co-constructed understandings about the socially unjust nature of schools and teaching."

However, arts-informed pedagogy is not without limitations, to which I now turn. Previous studies have underscored the fact that creativity is not an inherent skill possessed by everyone in equal measures and that the artistic mode of learning can constitute a barrier for some learners. Some students may simply baulk at the idea of stepping out of their comfort zone or experience a crisis of confidence when called to embrace an unfamiliar and more liberal artistic environment without training. The idea of creating an artwork *ex nihilo*, one that will be on public display and therefore open to criticism, mockery, or ridicule by their peers or by members of the public, can be extremely daunting for some. The prospect may cause fear, distress, and anxiety. In an arts-informed course on how student teachers can be made aware of their role in not perpetuating racial, class, and gender stereotypes in their future classes, Kraehe & Brown (2011, pp. 506–7) reported that,

> [d]espite the pleasure that accompanied the creative process, some students experienced distress when deciding how to bring their work to life in the context of sociocultural factors, particularly race (...) This process, while at times pleasurable, does invoke

> anxiety, fear, and a sense of danger in students, as the aesthetic can (and very often seeks to) disrupt normalized ways of thinking about self and the world.

While cases of distress or fear were not encountered in this arts-informed project, the possibility that there was an element of anxiety or resistance to this mode of expression cannot be ruled out. Indeed, the response to the open-ended question on whether students would like to see an extension of the arts-based approach to other courses showed that 10.6% responded in the negative and 16.7% were indifferent (see Table 2).

Instructors wishing to engage in the arts-based approach to teaching therefore have to devote extra time and energy to coax some learners to embrace modes of learning with which they may not be culturally familiar or are simply too afraid to explore. Tudor (2008) summed up this situation thus:

> What such students struggle to develop is the free, conscious and "felt" awareness of, and belief in their own personal potential to "be" independently creative. Poor self-esteem presents a formidable emotional barrier that creates a psychological shortfall, which contributes to ongoing technical or conceptual weakness. This sort of situation is common. It invokes feelings of embarrassment linked to fear of failure. Physical awkwardness and self-consciousness are very often compounded in the company of fellow students who seem more *blasé* or innately talented or creatively confident and therefore professionally capable.

To reduce anxiety and stress, the instructor gave repeated assurances to the students during the preparation of the art project that they were not being judged on the art work *per se*, as the instructor knew next to nothing about art (only as a naive contemplator of artworks in museums), and that the focus was on how students used arts to illustrate the functioning of specific theories in realistic situations. Encouraging words to "surprise the instructor" acted as appeals to students' self-esteem, which brought spectacular results that far exceeded the instructor's expectations. Another factor that lessened the fear of being judged and of failure was that the main audience of the exhibits were fellow students either enrolled in the same course (thus doing the same project) or in different courses at the same school. Hence, there existed already a spirit of camaraderie between the students and their audience, who tended to be very appreciative of what their fellow students had created.

It must also be underscored that anxiety and fear of failure are felt not only by the learners. Instructors may also experience anxiety about not being able to "pull off" the project. The instructor of this course experienced a fair amount of anxiety and apprehension about integrating a full-fledged art project into the course design and assessment modality. Without any training in design or in creative arts, the instructor was aware that she would not be able to assist the students should they lack

inspiration or require technical assistance in creating their exhibits. This created a feeling of vulnerability and of going out on a limb and putting herself on the line, with the real possibility that the experience could fail and students might not produce anything meaningful or worthy of display. Tudor (2008) summarizes the mental and psychological states of the teachers and learners who embark on arts-informed pedagogy:

> This cooperation needs to be sufficient to elicit from each individual student the necessary trust and attitudinal "leap of faith" required to set off on a creative journey into unknown territory with design deadlines pending.
>
> This predicament calls for what Schon . . . described as a "willing suspension of disbelief." Before students can begin to design, teachers must first model collaborative teaching and learning strategies that are markedly different from the didactic approaches generally used in traditional classrooms at school, college and university. Design teachers in higher education make direct and immediate appeal to the hands, hearts and minds of learners. They must also apply creative attitudes and demonstrate professional design behaviours in order to lead students to a position where they can begin to "envisage" something different, something creative. In many cases, students need to be convinced, cajoled, coaxed and in some cases coerced to step beyond the *status quo* if they are to discover and devise creative options that capture the interest and imagination and spark the enthusiasm of the client or broader community.

Another challenge for instructors seeking to integrate artistic and embodied expressions of knowledge is the amount of time and energy needed to manage and supervise all the arts projects, to ensure that they can be accomplished within the logistic and organisational constraints of a university setting with limited material means.

Other authors have highlighted yet another pitfall, that of turning teaching into a performance, which can obfuscate the serious exposition and study of complex ideas and phenomena that may best be done through the lecture-style mode. As Andrews (2017, pp. 15–16) observes,

> Teaching is a performing art in the sense that it is both temporal and spatial. The classroom is the stage, and the teacher performs or enacts their curriculum in front of a student audience. . . . One of the major critiques of focusing on the performance of teaching in education is that it runs the risk of becoming "edutainment," or information presented in an entertaining way that lacks true substance.

This criticism was levelled mainly at publications in the field of education that sought "to develop the performance styles of teachers . . . with prescriptive advice about how to use humour, dramatic readings, and role-playing to boost enthusiasm in the classroom," which can reduce "the role of performance in teaching to that of a cheerleader."

While acknowledging the foundation of this fear of reducing teaching to a theatrical performance in order to hold learners' attention, the risk was minimized in the present case because the instructor did not "theatricalize" the lecture part of the course, which was delivered in a traditional fashion and took up three quarters of the course time. Thus *gravitas* was preserved. This was then followed by an arts project, which put students centre stage and offered them the opportunity to demonstrate their understanding of the course content through other means than the textual mode.

The above criticisms, coupled with the fear or resistance that some learners may have about "doing arts," are another reason that artistic and embodied modes of learning should not be used alone but should be combined with the traditional verbal/written modes of course delivery. While some students may forget some of the theoretical terms and explanations offered by the instructor during the lectures, they are more likely to remember their own artistic and embodied representations of those theories.

Since the writing of this paper, the second edition of the Bauhaus total-arts exhibition for this course took place in the autumn of 2019 with even more spectacular results. The suggestions made by students in the 2018 survey for more time were taken into account in planning the arts-informed part of the course in the fall of 2019, where students were given two weeks between the workshop and the exhibition day. The 2019 edition of the Bauhaus exhibits are currently being published on the instructor's personal website.[4] The 2020 and third edition of Bauhaus total art project is currently under way, with two major themes proposed for students to work on: the handling of the response to the COVID-19 pandemic; and systemic racism, which the cold-blooded murder of George Floyd in the United States has placed centre stage.

I will continue to explore arts-informed pedagogy as a complementary form to the verbal lecture-style teaching and continue to investigate its strengths and limitations. As Tudor (2008) observed, "[c]reative modes of learning in design and the arts deal not so much with 'what is' but with 'what-might-be.'" Arts open up more possibilities for expressing ideas and phenomena that the verbal and written modalities do not offer.

A limitation of my study is that the framework in which this study was done did not enable me to follow the same students over a long period of time in order to evaluate the learning outcomes—in other words, to evaluate if the use of arts-based pedagogy enhanced their appropriation of the course content in a better way than the lecture style mode of teaching alone or another mode of teaching. This will be a matter for future study.

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Notes

1. See https://www.moma.org/calendar/exhibitions/3038 and https://www.moma.org/calendar/exhibitions/2429.
2. More details can be found here: https://www.fideliaibekwe.info/total-arts-exhibition.html.
3. A description of the different tracks can be found at https://ejcam.univ-amu.fr/en.
4. https://www.fideliaibekwe.info/arts-informed-pedagogy.html

Appendix

Charts of the responses to the different questions posed to students in the survey

Figure A1: Answers to questions 1–3. Socio-demographics of respondents.

Figure A2: Answers to questions 4 and 5 on students' prior knowledge of information-communication theories and of arts-oriented pedagogy.

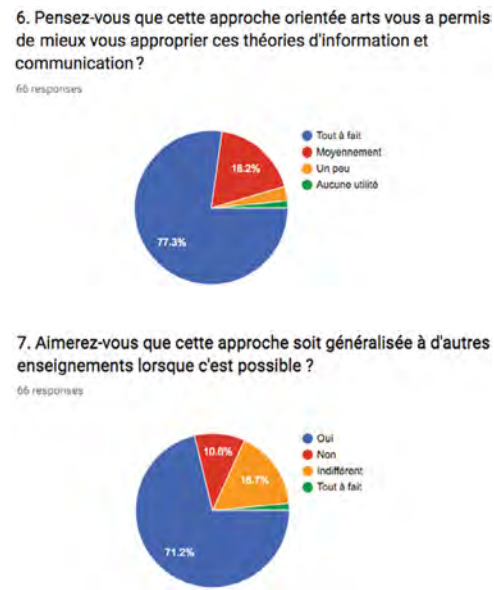

Figure A3: Responses to question 6 and question 7 on the usefulness of arts-informed pedagogy in appropriating course contents and desire to it see it extended to other courses.