



HAL
open science

Teaching Information and Communication Theories through Arts

Fidelia Ibekwe

► **To cite this version:**

Fidelia Ibekwe. Teaching Information and Communication Theories through Arts. *Journal of Education for Library and Information Science*, 2020, 61 (4), pp.424-451. hal-03195730

HAL Id: hal-03195730

<https://hal.science/hal-03195730>

Submitted on 12 Apr 2021

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

Teaching Information and Communication Theories through Arts

Fidelia Ibekwe

Aix Marseille Univ, CNRS, LPL,
Aix-en-Provence, France
fidelia.ibekwe@univ-amu.fr

Abstract

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 the School of Journalism and Communication Sciences (EJCAM) at Aix-Marseille University in France. After delivering the course content 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 overwhelming 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, creativity in education, innovative pedagogy, scholARTistry, information theory, communication theory, library and information science education.

1. Introduction

Historically, mass higher education has been dominated by the written and oral modes of teaching, thus by a “lecture-based” instruction style. Barrington (2004¹) noted the emphasis of “only two domains of intelligence, the verbal/linguistic and logical/mathematical” and the neglect of the other learning modes (kinesics, visual, embodied and emotional). This leaves

¹ Cited on Arts Pedagogy Research and Innovation Laboratory, <https://www.ualberta.ca/arts/research/arts-pedagogy-research-and-innovation-laboratory/teaching-with-fine-arts>. Accessed 2/08/2019.

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 amongst 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 recognised 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) recalled the historic and theoretical foundations of arts-informed pedagogy and cited numerous handbooks published on Arts Education and Creativity Learning.

Whebi (2014, p. 47) defined arts-informed pedagogy as “interventions, research and teaching that use art as a tool to question, challenge and engage”. Marshall (2014, p. 105) wrote about using “multimodal arts-based learning to enhance comprehension of academic subjects.”

Kraehe & Brown (2011, p. 491) argued that “Art and arts-based inquiries offer a model for aesthetic learning experiences that transcends specific subject matter and materials.” They further stated that “For 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 (Dewey, 1934). (...) 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 affirmed that “Drawings 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”.

Chemi and Du (2017, p. 6) again observed 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 observed that arts can offer a means of communicating ideas or phenomena too complex to describe verbally (p. 35).

Other studies reported on the increasing use of arts to study complex phenomena across several disciplines and scientific traditions. Chemi & Du (2017, pp. 7-8) reported how arts was used in the neurosciences to “reveal the workings of the artistic brain (Levitin 2006) and how emotions are fundamental to learning (Immordino-Yang 2015; Immordino-Yang & Damasio 2007)”; it was used in philosophy to investigate “the possible disruptive benefits that artistic practices can have on the imagination of future educational environments (Lewis 2012)”; 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) observed 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.” (p. 498).

Arts can take different forms including the embodied form or enaction. In their review of studies on embodied learning, Kontra *et al* (2012) reported 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”. 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 we 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.

2. 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 towards 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 organisational communication consultants, public relations officers, social media managers, journalists, media spokesperson, web content publishers, digital project managers, etc. 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, i.e, the fact that theory informs practice and practice can in turn lead to modifying existing theories or propounding new ones, and also the fact that although the theories they were going to learn about were propounded more than sixty 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, both in 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 & communication theories at the master’s 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 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 & communication theories. Students were asked to produce art works that illustrated how chosen information & communication theories operated in plausible, real life or historic contexts.

3. Theoretical background of the arts works: 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 Gropius'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.’ – cited in McCarthy & Bron (2019).

With Hitler's arrival to power in 1933, the Bauhaus movement and its members became *persona non grata* and many fled to other countries. Gropius emigrated to the UK and then to the USA where he gained worldwide recognition and was appointed to the Harvard 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*², Fred Turner gave an account of how, during the second world war, 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 some of whom later founded the field of interpersonal communication (Gregory Bateson, Margaret Mead), sought for ways to guard Americans from descending into fascism which was sweeping through Germany and many European countries. They considered that the use of mass media by the Hitler had contributed to the fabrication of obedient and robotic individuals and thus to nazism because the mass media function in a unidirectional, top-down manner which increases the enrolment and conformity effect. These intellectuals saw in the Bauhaus's ideal

² <https://www.press.uchicago.edu/ucp/books/book/chicago/D/bo10509859.html>.

of total arts, a philosophical grounding and a practical means with 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 which in turn would lead to the formation of democratic individuals. After the end of the second world war, several artistic exhibitions inspired by the Bauhaus philosophy such as *Road to Victory*³ or the *Family of Man*⁴ took place in the United States. During the theoretical part of the course, the students learnt of the influence of the Bauhaus on American intellectuals who sought to “form 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 impact our real life practices, beliefs and ideologies but also that the movement on which their arts exhibitions were based is internationally recognised and discussed a century later.

4. Methodology

The course was organised as a 3-hour per week lecture spread over seven weeks. In the first class, the instructor explained the organisation of the course as having two parts, a lecture part and the art-project part, to students. They were then asked to form groups of 5-6 students and choose information and communication theories discussed in the lecture part of the course to showcase in their art works. Below, we describe in more details the organisation of both parts of the course.

4.1 The lecture-style part of the course

³ <https://www.moma.org/calendar/exhibitions/3038>.

⁴ <https://www.moma.org/calendar/exhibitions/2429>

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

- rhetorics 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 (Weiner 1948),
- Shannon's Mathematical Theory of Communication (Shannon & Weaver 1948),
- Gregory Bateson and the Palo Alto school's axioms on interpersonal communication (Bateson 1972; Watlawick *et al.*, 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 organised 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 illustrate through their artwork. Others had questions about the relevance of their ideas and the scenario they were imagining. In response to these questions, they were

informed that their artwork will 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.

4.2 The arts project design and organisation

The sixth class was organised as a workshop. Sixteen groups had been formed from a class of ninety-three students. The instructor spent time with each group to make sure that their ideas were realisable 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 7th and last class. Students worked with their project groups to design their artwork: finalising 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, etc. To create their artwork, students used materials such as cartons, glue, coloured paper and polystyrene, wool, nails and wood planks. The artwork exhibit was publicised to the administrative staff, Faculty and students enrolled in other courses rest of the school via email invitations.

Students were required to explain their art works 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 website⁵. Along with the artwork, each group was also required to submit an exhibition booklet which documented how the conception, design of their artwork and how it illustrated the workings of the chosen information and communication theories. The sixteen booklets thus collected serve as a memory of the artworks which had to be dismantled after the event. Thus, people who could not attend the exhibit can read about it, see archival photos and videos of it and read how the theories were portrayed through arts.

⁵ More details can be found here <https://www.fideliaibekwe.info/total-arts-exhibition.html>.

4.3 Course assessment modalities

The assessment of students was also done into 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.

5. 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 arts work, engage with the students as they explained how their total art exhibits reflected the functioning of chosen information and communication theories. The students visited their peers' arts exhibits and interacted with them. In table 1 below, we provide a short description of each 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

		<p>1994 in less than 100 days by the Hutus, their ethnic neighbours.</p> <p>Theories showcased include Norbert Wiener's cybernetics, Ludwig von Bertalanffy's systemics, and Edward Bernays' engineering of consent.</p>
3	Maya the bee	<p>This exhibit showcased the central role information and communication played in the bees' ecosystem. The theories evoked were Shannon's MTC, the systemics theory which also inspired Wiener's cybernetics.</p>
4	The myth of Icarus	<p>This exhibit is made up 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 and his ambivalence with automation and his fears that his inventions will take control of humans. The second exhibit illustrated how people's emotions are manipulated by showcasing Aristotle's treatise on rhetorics as an art of persuasion.</p>
5	Doctor consultation	<p>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.</p>
6	Communication molecules	<p>This exhibit showcased Gregory Bateson and Paul Watzlawick's 5 axioms of interpersonal communication, the two key figures of the Palo Alto school. At another level, this exhibit is a metaphor expressing the fact that without communication, we cannot function harmoniously as a society.</p>
7	DATA'ART	<p>This exhibit sought to create the Bauhaus 360° effect by visually</p>

		representing the exploitation of personal data by the GAFAM. Data was 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 Palo Alto school's double bind theory which is characteristic of schizophrenic communication situations.
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 scenario, 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 the 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 comics using as theoretical lens, Wiener’s definition of feedback, Palo Alto school’s axiom that « we cannot not communicate » and Aristotle’s rhetorics.
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 Palo Alto school’s axiom that one cannot not communicate, Paul Lazarsfeld’s middle range theory (2-step flow of communication) on how the mass media affects 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 relation 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.
--	--	---

In the sections below, we describe in more details five of the most impressive artwork produced by the students. We will first describe the physical design of each artwork and then underline how they showcased chosen information and communication theories based on the students' booklets.

5.1 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 reaches deep into the earth. Its trunk represents the interdisciplinary nature of information and communication theories which were propounded 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.

5.1.1 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 Fig. 1 hereafter).

To facilitate the participation of visitors, students prepared a bag filled with balloons inside which they had inserted pieces of paper with writings 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.

5.1.2. Acquisition of knowledge as a cyclic and cumulative process

Through this exhibit and the interactions it generated with visitors, the students sought to explain how knowledge is acquired in a cyclic 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 incrementing 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 characterise 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.

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).



Fig. 1. ENTROPIA. The Tree of knowledge.

5.2 The Rwandan Genocide

This very profoundly researched multimedia exhibit showcased 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 their Hutu neighbours. 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.

5.2.1 A 'mise en abyme of the Rwandan genocide

The students achieved a Bauhaus "360° surround" effect by designing the exhibit on three levels. 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), or 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, 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, 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*.



Fig. 2a. The Rwandan genocide exhibit.



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

5.2.1 The genocide seen through the prism of information and communication theories

In the accompanying booklet to this exhibit, the students analysed 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 privatisation of information by the then Hutu-led government which orchestrated the genocide. Control and privatisation 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 disorganisation of a system and therefore an evil to be combated 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 analysed the role played by the *Radio des Mille Collines*⁶ (RMC) in the genocide as the archetype of state-controlled media used to enrol the masses into perpetrating atrocious acts. Analysts have since document the rise in power of this radio in 1993 and during the genocide. As a state-controlled mass media functioning in a vertical and unidirectional manner, RMC could not foster free thinking (see section §2 for a discussion of the American intellectuals around the Committee for National Moral), and democracy and thus became a tool for propagating this hateful ideology through the use of songs, laughter and jokes that 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

⁶ Literally, « The thousand hills radio ».

theory, feedback can be positive if the receiver amplifies the message s/he receives, or negative if the receiver causes the sender to correct or adjust his or her 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 they 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 Bernays⁷ 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 can therefore be controlled by skilled practitioners in a scientific manner. His 1947 essay ‘*The Engineering of consent*’ is a classic on public relations management.

5.3 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 information and communication played in the bees’ ecosystem.

5.3.1. *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

⁷ See https://en.wikipedia.org/wiki/Edward_Bernays for more details.

information and communication situations that arise as the bees buzz around to accomplish their daily tasks (see Fig. 3 hereafter). A laptop was placed besides the tree on which the students displayed pictures of their exhibits and materials explaining the beehive ecosystem.



Fig. 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 organise their work, find food, defend the queen and the hive from alien or hostile neighbours.

5.3.1 Bees communication seen through information and communication theories

The accompanying booklet provided more in-depth explanation on how the students mobilised 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, but on the contrary, it is a good thing in Wiener's cybernetic theory because a high level of entropy is synonymous with disorganisation, 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 from Wiener's cybernetics theory to explain that when faced with a new situation, intelligent systems learn from past occurrences (signals, 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 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.



Fig. 3b. Bees communicating information through dance.

5.4 The myth of Icarus and Aristotle's rhetorics

This impressively executed exhibit was designed by a group of five students comprising four female and 1 male student. The exhibit consisted of two separate art works, each showcasing a separate theory.

5.4.1 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. The artwork itself was made of up a polystyrene carton on which students drew different patterns and images of the main characters: Icarus alias *Homo Numericus*, Daedalus alias *Wiener*, the sun, computers and AI systems. The carton had three levels, each representing a progression of Icarus towards the sun which symbolised the progression of AI towards the control of humans. The story was designed as a dialogue between Daedalus (Wiener) and his mythical son Icarus (*Homo*

Numericus). The students set the scene by recalling Wiener's work for the Allies during world war two 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 towards 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 are made of wax and will melt when in contact with the heat of the sun. This would result in Icarus being precipitated into the sea and therefore to his death. This is an allegoric reference to the dangers of pushing to the extreme, the automation and simulation of human intelligence and of algorithmic governance.

On the second level, Icarus (*Homo-Numericus*) was depicted flying ever higher towards the third level (the sun). The bottom of this second level featured an image of an electronic motherboard showing the transition of the society towards a digital world and our increasing reliance on more advanced AI. The third and highest level showed the sun (representing AI and intelligent machines) towards which Icarus (*Homo-Numericus*) was flying. At the bottom of the third level, the students represented data mapped in the cyberspace. The students also wrote words like "transhumanism, GAFA, governmentality" as further aid to understand 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 may wrest control from humans and precipitate the society

into a technological armageddon. 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.



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

5.4.2 Aristotle's rhetorics and the manipulation of people's emotions

The second artwork was made up of a wooden construction on which the students depicted the central figure of Aristotle and his *Art of Rhetoric* which dates from the 4th century BCE and is generally regarded as the "the most important single work on persuasion ever written"⁸. For Aristotle, rhetorics 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 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.).

⁸ [https://en.wikipedia.org/wiki/Rhetoric_\(Aristotle\)](https://en.wikipedia.org/wiki/Rhetoric_(Aristotle)).



Fig. 5. The *art of rhetorics* and the manipulation of the masses.

5.5. Doctor consultation scenario seen through Palo Alto's 5 axioms of interpersonal communication

This very beautifully executed artwork was designed by a group of four students comprising one male student. It showed miniature characters set within five scenes depicting a doctor consultation scenario.

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'. From the way the doctor speaks to his patient, his body posture, the tone, facial gestures, everything

is interpreted by his patient and this will punctuate the sequence of their future exchanges and determine the nature of their communication and relation. 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 relation 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*' emphasises 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 and this ultimately determines the nature of their relation. 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 which 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) has communicated his desire to disarm his patient who was showing 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 his or her 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.





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

6. Analysing students' feedback on the arts project

Students completed an online survey via Google form two months after the course ended, in order to gather feedback on the arts-informed pedagogy. A time limit of one month was given to them to respond. Of the ninety-three students enrolled in the course, sixty six completed the survey, thus a high recall rate of 70%. The survey contained eight questions of which seven were binary choice questions and the eighth 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.

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. Master's track of students	Event Communication (COMED A)	Communication and digital media (COMED B)	Data, information and digital devices	Data, information and digital project	Communication and public health (COSAN)

	(15,2%)	(13,6%)	(DICOD A (25,8%)	management (DICOD B) (34,8%)	(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 appropriation	Totally agree (77,3%)	Moderately agree (18,2%)	A bit (3%)	Not at all (1,4%)	

of the course contents.					
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 organisation of the arts project	16 suggestions received				

Table 2. Responses to the survey distributed to students.

The responses to the first two questions showed the vast majority of students were female (74,2%) and that most students were between 21-25 years old (89,4%). The third question required the students to indicate the master's tracks in which they were enrolled as the school offers five masters tracks or specialties¹⁰.

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. 65,2% of the students

¹⁰ A description of the different tracks can be found at <https://ejcam.univ-amu.fr/en>.

declared 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 appropriate the contents 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 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.

The last open-ended question asking students for suggestions to improve the organisation 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.

7. Discussion

The overwhelmingly positive feedback received from students is an encouragement to continue exploring arts-oriented pedagogy as a complimentary mode of course delivery in higher education not only in the iFields but in other fields. Indeed, arts-based pedagogy has been successfully deployed in other fields like education, medicine or 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 learnt as much from the students during the artwork project as they learnt from the instructor in the lecture-part of the course. Kraehe & Brown (2011, p. 505) made 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 we turn now. 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 balk 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* which will be on public display and therefore open to criticism, mockery, 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:

“Despite 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% of the students responded in the negative and 16,7% were indifferent (Table 2 above).

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, if not 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 is not felt 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 nor 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 may not produce anything meaningful or worthy of display. Tudor (2008) summarised 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 (1985: 63-82) 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) observed:

“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 mainly levelled 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”. (Andrews 2017, pp. 15-16).

While acknowledging the foundation of this fear of reducing teaching to a theatrical performance in order to hold learners’ attention, the risk is minimised in the present case because the instructor did not “theatralise” 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 contents through other means than the textual mode.

The above criticisms coupled with the fear or resistance some learners may have about “doing arts” is another reason why artistic and embodied modes of learning should not be used alone but should be combined with the classical 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 has taken 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 website¹¹. The 2020 and third edition of Bauhaus total art project is currently under way, with two major themes proposed to students to work on: the handling of the response to Covid19 pandemic and systemic racism which the brutal murder of George Floyd in the US has placed centre stage.

We 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, “Creative modes of learning in design and the arts deal not so much with ‘what is’ but with ‘what-might-be’. Arts opens up more possibilities for expressing ideas and phenomena that the verbal and written modalities do not offer.

¹¹ <https://www.fideliabekwe.info/arts-informed-pedagogy.html>

A limitation of our study is that the framework in which this study was done did not enable us to follow the same students over a long period of time in order to evaluate the learning outcomes, i.e., evaluate if the use of arts-based pedagogy enhanced their appropriation of the course contents 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.

References

1. Andrews K. (2017). Artistry in Teaching: A Choreographic Approach to Studying the Performative Dimensions of Teaching. In Tatiana Chemi and Xiangyun Du (Ed.), *Arts-Based Methods in Education Around the World*. Denmark: River Publishers Series in Innovation and Change in Education. Retrieved from https://www.riverpublishers.com/pdf/ebook/RP_E9788793609372.pdf on 2/08/2019.
2. Barrington, E. (2004). Teaching to student diversity in higher education: how Multiple Intelligence Theory can help. *Teaching in Higher Education*, 9(4), 421–434. doi:10.1080/1356251042000252363.
3. Bateson G. (1972). Steps to an Ecology of Mind. Collected essays in Anthropology, Pyschiatry, Evolution, and Epistemology, John Aaronson Inc., NJ. Accessible online at: <http://ejc.orfaleacenter.ucsb.edu/wp-content/uploads/2017/06/1972.-Gregory-Bateson-Steps-to-an-Ecology-of-Mind.pdf>
4. Marshall, J. (2014). Transdisciplinarity and Art Integration: Toward a New Understanding of Art-Based Learning across the Curriculum. *Studies in Art Education*, 55:2, 104-127. <http://dx.doi.org/10.1080/00393541.2014.11518922>
5. Kraehe A. M., & Brown K. D. (2011). Awakening Teachers' Capacities for Social Justice With/In Arts-Based Inquiries. *Equity & Excellence in Education*, 44:4, 488-511. DOI: 10.1080/10665684.2011.610682.
6. Chemi, T., & Du X. (Ed.) (2017). *Arts-Based Methods in Education Around the World*. Denmark: River Publishers Series in Innovation and Change in Education. Retrieved from https://www.riverpublishers.com/pdf/ebook/RP_E9788793609372.pdf on 2/08/2019.
7. Ibekwe-SanJuan F., (2018). Combining an arts-informed and textual approach to teaching information and communication theories. *Education for Information*, 34 :1, 39 – 53.
8. Ibekwe-SanJuan F., (2017). The journey of information. How students perceive information in France using the draw and write technique. *Information Research*, March, 22:1. <http://www.informationr.net/ir/22-1/colis/colis1634.html>.
9. McCarthy (Writer), F., & Bron, E. (Reader) (2019). [Walter Gropius: Visionary Founder of the Bauhaus. Episode 3 of 5]. In Rowntree J. (Executive Director), *The First World War*. London, UK: BBC Radio 4. Retrieved from <https://www.bbc.co.uk/programmes/m0002zdm> 7th March 2019.
10. Kontra, C., Goldin-Meadow, S., & Beilock S.L., (2012). Embodied Learning Across the Life Span. TOPICS. *Topics in Cognitive Science*, 4:4, 731-739. Accessible online at: <https://onlinelibrary.wiley.com/doi/full/10.1111/j.1756-8765.2012.01221.x>.
11. Shannon C.E., Weaver W., (1949). *The Mathematical Theory of Communication*. Urbana, Illinois: The University of Illinois Press, 1949. Accessible online at:

https://monoskop.org/images/b/be/Shannon_Claude_E_Weaver_Warren_The_Mathematical_Theory_of_Communication_1963.pdf

12. Tudor, R. (2008). The Pedagogy of Creativity: Understanding higher order capability development in design and arts education. Proceedings of the 4th International Barcelona Conference on Higher Education, Vol. 4. Higher education, arts and creativity. Barcelona: GUNI. Retrieved from <http://www.guni-rmies.net>.
13. Watzlawick, P., Beavin-Bavelas, J., & Jackson, D. 1967. Some Tentative Axioms of Communication. In *Pragmatics of Human Communication - A Study of Interactional Patterns, Pathologies and Paradoxes*. W. W. Norton, New York. See also <http://www.wanterfall.com/Communication-Watzlawick's-Axioms.htm>.
14. Weber S. J., & Mitchell, C. (1995). *That's Funny You Don't Look Like A Teacher!: Interrogating Images, Identity in popular culture*. The Falmer Press.
15. Wehbi, S. (2015). Arts-informed teaching practice: Examples from a graduate anti-oppression classroom. *Social Work Education*, 34(1), 46-59. Doi:10.1080/02615479.2014.937417.
16. Norbert Wiener (1948). *Cybernetics or Control and Communication in the Animal and the Machine*, Cambridge Massachusettes, MIT Press. Accessible online at: https://uberty.org/wp-content/uploads/2015/07/Norbert_Wiener_Cybernetics.pdf

Appendix

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



1. Fig. 1. Answers to questions 1-3. Socio-demographics of respondents.

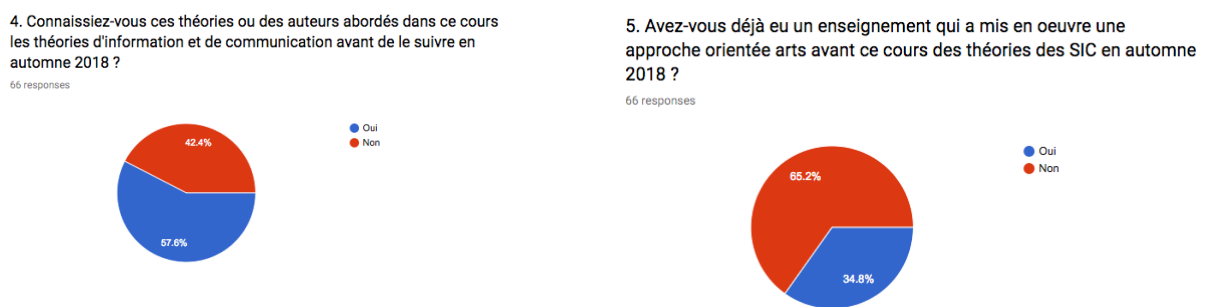


Fig. 2. Answers to questions 4 and 5 on students' prior knowledge of information-communication theories and of arts-oriented pedagogy.

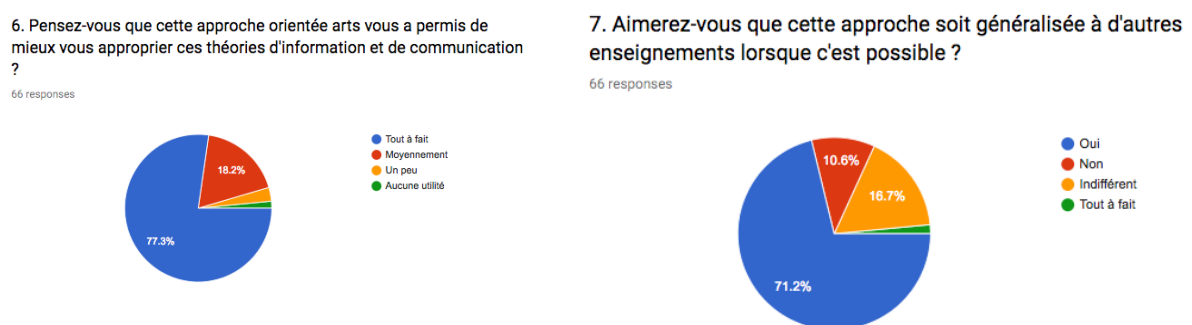


Fig. 3. Responses to question 6 and question 7 on the usefulness of arts-informed pedagogy in appropriating course contents and desire to it see it extended to other courses.