Abstract

CoMixité is a story. It's a story about Paris, about education, and about the future. It is a story of how children can be active participants of their own education. It's a story about how we can empower children to make academic learning more hands-on, effective, and fun. CoMixité aims to create an educational cartoons magazine, where the comics are made by children, for children.

The idea behind CoMixité is simple: people process information better when learning with images rather than plain text alone. Visual learning is the new trend in educational systems worldwide. Rather than having children learn from cartoons that we make for them, with CoMixité, children imagine the educational content, create a humorous scenario, and draw the comics themselves. CoMixité lets them express their imagination, creativity and sense of humour.

Since the CoMixité magazine will be distributed to every Parisian middle and primary school student, it will also display the diversity of artistic and educational voices within the city. Moreover, once a year, children will come together at a weekend CoMixathon to make comics in small, diverse student teams that will increase social integration and educational creativity.

Educational, fun, and integrative, CoMixité is a story you want to believe in.

CONTENTS

THE CITY

Examining Parisian Social Diversity

Parisian Populations

The city of Paris is the most densely populated area in France, with an average of 20,169 people per square kilometer. However, population density varies greatly within the urban area. The density differences between the densest arrondissement (11th) and the least dense (12th) are around 32,000 inhabitants per square kilometer[1].
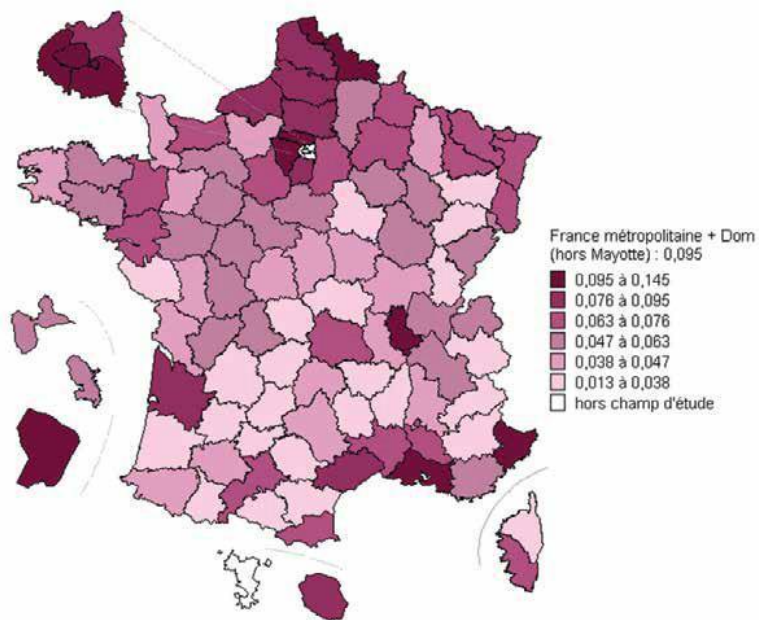
This population is younger, on average, than the rest of France, showing that a higher proportion of children and young people live in the city. Additionally, the population of working mothers is higher in Paris than in other parts of France, with an employment rate of 82% for mothers with two or more children[2]. Therefore, in many families, both parents work and thus have less time to give to their children.

A Melting Pot

Paris' population density is highly divided by the inhabitants' diverse origins. According to the 2011 census, 20.3% of Parisian residents were born outside France. At the 1999 census, 4.2% of the population in Paris metropolitan area were recent immigrants, the majority from Asia and Africa. Nowadays, around 14% of the total population are people whose nationality is not French. There is a great amount of ethnic diversity within the city, much higher than in the suburbs. Some of the many ethnicities that add cultural diversity to Paris include Africans, Cambodians, Chinese, Indians, Japanese, Laotians, and Vietnamese[3].

However, not all these demographics are situated equally within the city. Certain areas, and therefore certain schools, contain more people of a single minority ethnicity than others, which does not promote social mixing and integration.

BACKGROUND

An Overview of the French Education System

Educational Progression

France has multiple tiers to its education system, starting with pre-primary education at the *école maternelle* from ages two to six, with primary education at the *école primare* from ages six to eleven, followed by four years of middle school education from eleven to fifteen at the *collège,* and concluding with three years of secondary education at a *lycée.* After secondary education, some students continue to the university level[4].

Lycèe
15-18 yrs old

Collège
11-15 yrs old

Ecole Primaire
6-11 yrs old

Ecole Maternelle
2-6 yrs old
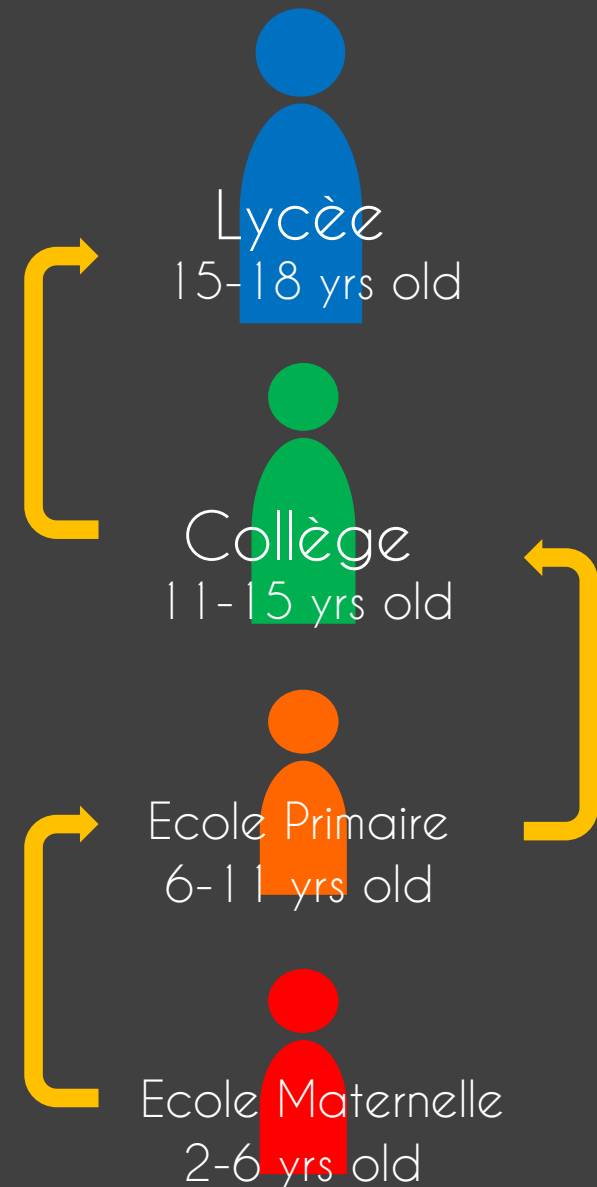
Laying Educational Foundation

According to Unicef research on school readiness and early childhood pre-primary programs, laying a strong academic foundation with pre-primary school preparation at an early level helps promote social awareness and later academic success[5]. As a percentage of GDP, France's expenditure on pre-primary education exceeds the OECD average (0.7% in France versus an average of 0.6%)[6], which indicates a dedication to readying children for later schooling. Education is mandatory starting from the age of six up to the age of sixteen, but the majority of children have contact with some education by the age of three, and some start schooling as early as two years old[7]. More than 90% of children receive early childhood education at an *école maternelle*[8], which has a curriculum emphasizing numeracy, basic literacy, and cultural activities that emphasize arts and creativity[9].

Graphique C2.1. Taux de préscolarisation à l'âge de quatre ans dans l'enseignement pré-primaire(2005 et 2010)

Effectifs préscolarisés à temps plein et à temps partiel dans des structures publiques et privées d'accueil de la petite enfance
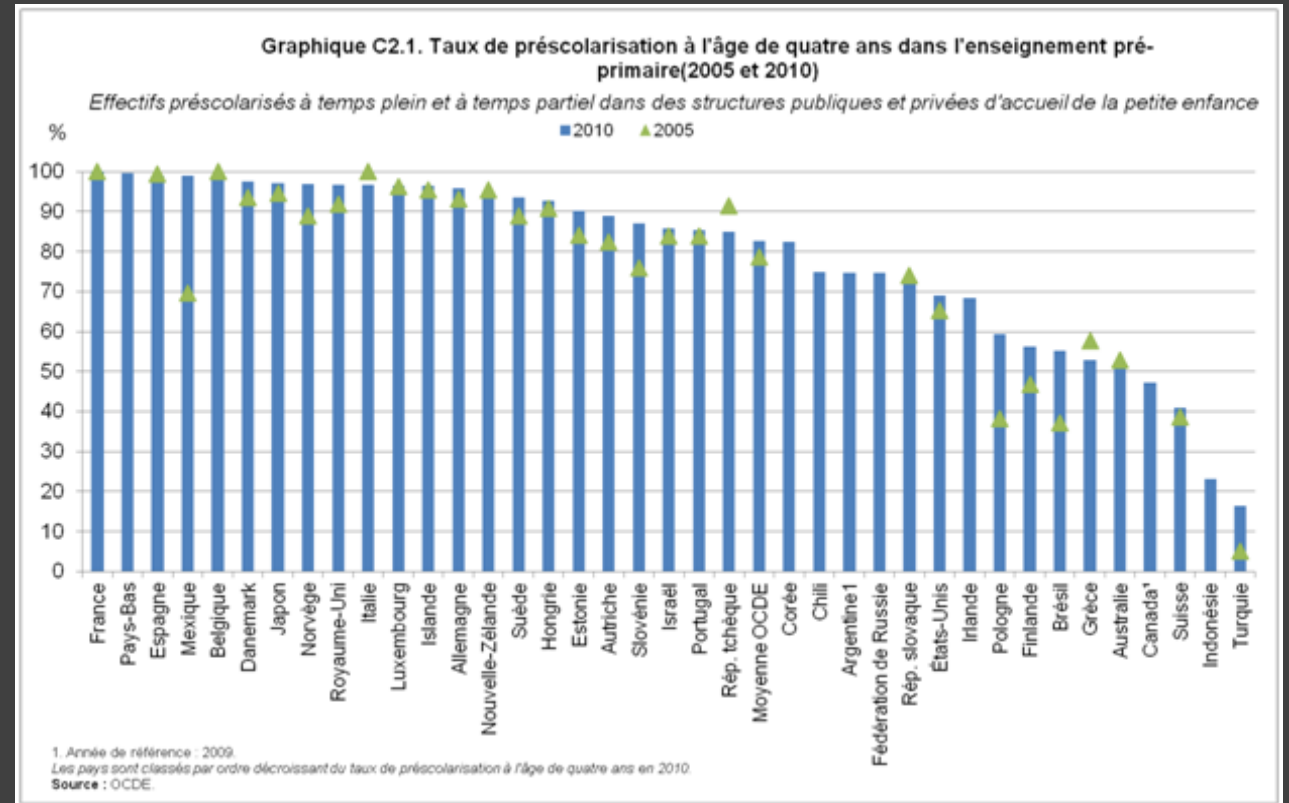
The above figure[10] (in French) shows the percentage of students in pre-school education programs in European countries. As is evident, France has a particularly high rater of children engaged in pre-school programs.

Areas for Improvement

While the French education system has many areas of strength that make it stand out as a well-created system, there remain areas where education could be improved. According to the OECD, French students are performing at just about average, and producing fewer top-performers compared to other Western European counterparts[11].

While education has a clear organization, this hierarchical model makes it difficult for teachers and principals to engage in bottom-up innovative education practices to help improve the system. In response, parents are looking for new alternatives, such as private schools, charter schools, homeschooling, and *montessories* - efforts at public schools, such as "micro-lycées," are highly effective but very small in scale at best[12]. Because of this system's existence in Paris, 55% of Parisian parents indicated that they would remove their children from state-run education if possible[13].

Art in French Education

Before adding CoMixité to the current artistic and creative educational framework in France, it is important to ask what the current role of art is in French schools today. Since France is a country of incredible artistic history and talent, it is no surprise that art is in most school curriculums. While some *écoles maternelles* (pre-primary schools) include educational activities that introduce children to art, primary schools do not regularly provide art classes or emphasize visual creativity. However, in *collège* (middle school), one hour per week of art class becomes part of the curriculum to encourage artistic development over time[14].

Since CoMixité will be implemented at the middle school level, this artistic extracurricular activity will become part of students' lives at the same that arts education begins regularly for them. CoMixité becomes even more important as a form of artistic creativity because after middle school, art in *lycée* only remains a regular part of the curriculum for students interested in taking additional studio art classes who are thus committing fully to artistic studies at a higher, university level in the future[15].

The Impact of Marginalization on Education

In addition to focusing on the Quality Education Sustainable Development Goal, our program aims to combat educational marginalization. According to economics research from Roskilde University in Denmark, the impact of social marginalization and exclusion in European communities leads to subsequent marginalization in education[16]. This means that children from communities that are usually segregated, such as immigrants, often are marginalized within school communities and accordingly have less access to educational resources early on. This early educational marginalization generates negative impacts in the future, where children thus lose out on opportunities to gain higher educational resources in the future as well.

What are the impacts of being marginalized in the classroom? According to the United Nations Educational, Scientific, and Cultural Organization (UNESCO), educational marginalization leads to increased dropout rates and lower literacy[17]. In developing countries, marginalized groups are more prone to dropping out before finishing primary school, which severely impacts the average literacy of the nation[18]. This educational marginalization also negatively impacts people's ability to transition successfully from school to work, making it more likely that educationally marginalized people will earn lower-paying jobs and have a lower quality of life than average[19].

Our Program

In a nutshell, we propose crowdsourcing educational comic page submissions from middle school students to publish for other middle and primary school students to read. Using competition and incentives will motivate students to submit high-quality educational material that is both fun and effective. Moreover, creating these comics empowers students by letting them participate in and improve their educational system. Lastly, sharing the comics across all of Paris and coming together once a year from a weekend long comic festival called a "CoMixathon" encourages a sense of unity within and across schools and communities.

Comics in the Classroom

Since comics are often seen as simply pop culture entertainment, they are not traditionally thought of as educational tools. However, research has shown that comics do teach children effectively. One reason is that comics combine text and visuals, which allows readers to understand information through both forms and is advantageous to students who are visual, rather than textual learners[20]. Comic visuals also allow students who may not read a language adeptly to still learn from images. This image-based learning will provide additional benefits to Paris' immigrant students, who can pair the comics' images with the text to understand and learn more of the French language. Lastly, the use of humor and storytelling in comics leads to greater memory retention of the presented information[21], making comics ideal for teaching topics that students should retain in the long run.

Connecting Diversity

Because the city itself is so ethnically diverse, each middle school reflects the demographic variety of each area of the city. These "areas" are not arrondissements; they are pre-established areas that could include portions of multiple different arrondissements. There is no movement between the middle schools, and so there is no interaction between them, which does not promote social integration between children from very demographically-distinct groups[22].

With our project, one of our key aims is to promote inclusion, social integration, and appreciation of culturally diverse groups within the city itself. By organizing a Paris-wide program, children will have the chance to interact

Target Groups

Our proposal mainly focuses on middle public school students. We plan to work with middle rather than primary students because we think that the project could lead to more effective results if we focus on working with pre-adolescent kids who, unlike most primary school children, should start developing an independence in their own ideas while facing peer pressure and personality changes during preadolescence[23]. As an outlet for self-expression during a time of many changes, middle schoolers could produce quite complex drawings. Furthermore, all Parisian middle schools have a standardized educational curriculum and could thus develop comics around the same contents[24]. Lastly, middle schools are considered a transitional preadolescence stage where kids experience drops in self-confidence in their abilities, become less interested in school, and see a fall in academic performance[25], which are all changes that we hope to address by implementing CoMixité for middle school students to creatively express themselves and effectively learn during a challenging life stage.

Moreover, we intend to implement CoMixité in public middle schools, as our program is focusing on social diversity which is likely to be greater in public schools rather than private or charter schools. While it may be more challenging to implement the program in public schools with busier teachers and administrators, it would have greater impact on a broader social group if implemented there.

Intergenerational Integration

Our goal is to enhance students' personal expression and social interaction within each school and among schools citywide. We envision a university student organization that sends volunteers to Parisian schools to teach children after school in art associations/clubs. In order to accomplish these aims, we will reach out to teachers, local cartoonists and artists, art students, and university students throughout Paris. Teacher volunteers at each school could start these organizations, with university students from the CoMixité organization providing the majority of the association's facilitation and mentoring to lighten the teachers' workload. In addition, local cartoonists and artists would act as guest speakers and mentors on a monthly basis and most importantly during the once-a-year CoMixathon comic hackathon/festival.

Interaction will thus occur laterally among schools and vertically among generations - ranging from primary school students reading comics, middle school students drawing comics, university students mentoring comic-drawing associations, and adult teachers, artists, and officials supporting the collective effort. This intergenerational effort would promote integration between different ages as well as among different demographic groups.

Benefits

Our project aims for multiple improvements on a cultural, artistic, and educational level. From a personal perspective, comics can help children will be motivated to express their own ideas and concerns artistically. Actively facilitating self-expression through comics would further the personal development of individuals. Moreover, there are also social interaction benefits, both among school institutions and among students. We expect that children's awareness of their personal ideas contributing to the creation of a collaborative process would have a positive impact on the children's social consciousness. Creating comics would also help to develop composition techniques and to make visual-verbal connections, which would strengthen literary and artistic skills. Because these comics will be coming from all over Paris, students would become more acquainted with students from different backgrounds. Therefore, this program will further social inclusion and integration as well.

Benefits

Since children are both the creators and final users of the comics, they benefit cyclically: they learn from reading what they and their peers have produced, which also empowers them to have a say in their own education. Based on the research about comics promoting long-term memory retention and visual-based thinking, and welcoming students with lower written language proficiency[26], we hope that the comics induces educational improvement in Parisian schools. These benefits will be quantitatively and qualitatively analyzed through an assessment plan that we have described later in this presentation.

BIOLOGY

Inspirations from Biological Concepts

Our Biological Inspirations

The nature of our program was inspired by the design of a signal transduction cascade, which is the first of our three biological inspirations. In this cascade process, one signal triggers multiple others, which in turn trigger multiple more, resulting in a "bottom-up" flow that increases the signal strength at each transfer. Likewise, the inspiration and share of artistic comic creation is amplified when transmitted from an individual to another (whether those individuals are cells or children receiving comics). It also allows for effective amplification from bottom-up, rather than merely from the top-down. This mechanism allows for a fast transmission of the information within a population[27].
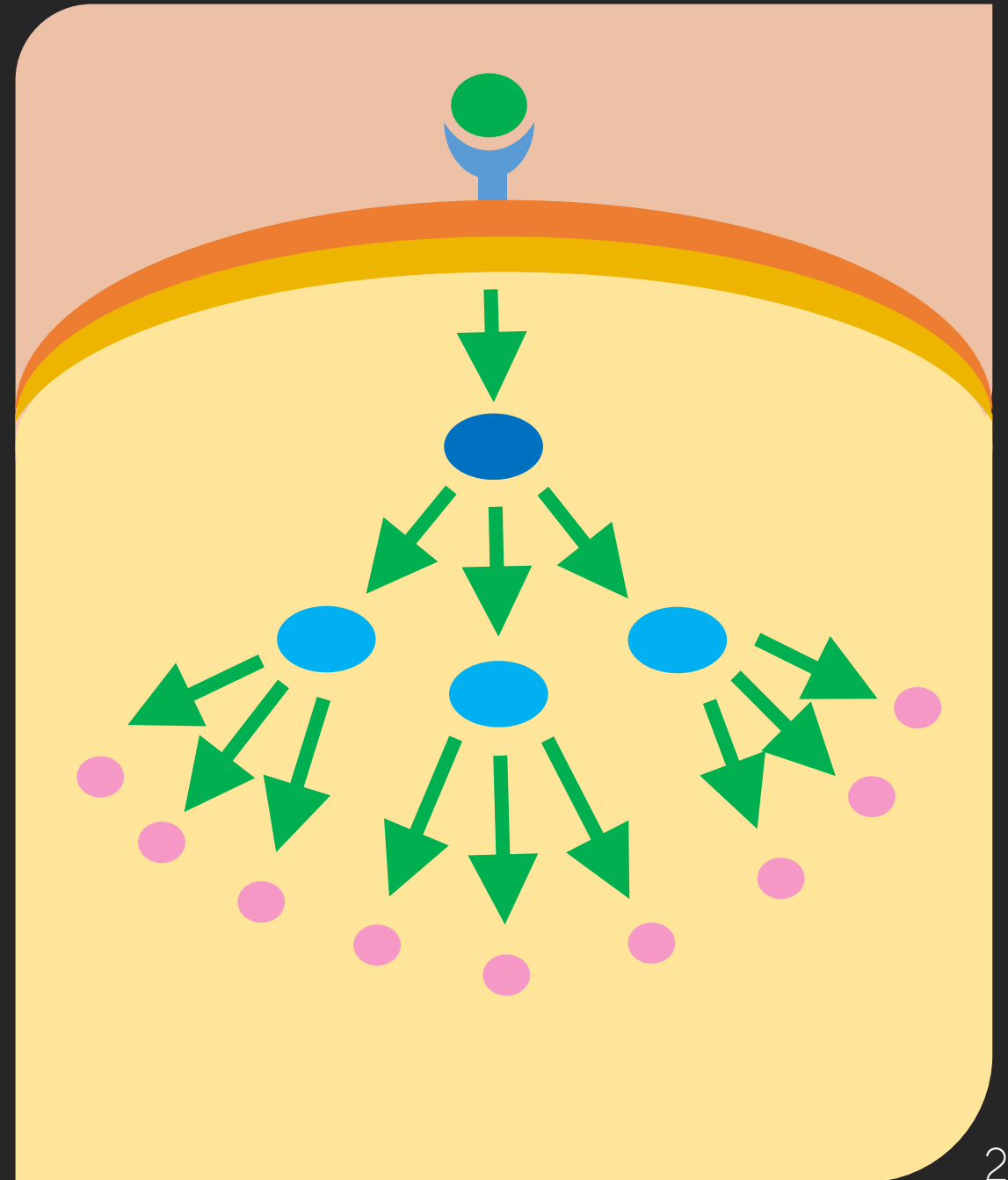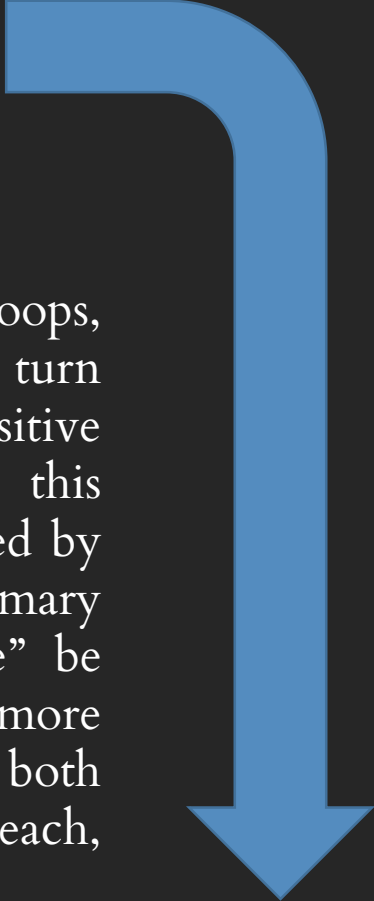
Our Biological Inspirations

Feedback loops are the second biological analogy that lay foundation for our program. From a biological perspective, organisms gain information about their environment. That information is then processed as feedback loops to process the necessary information and regulate their activity. Similarly, in our project, we must make sure that our comic magazine has a direction and a message for the kids reading it, and does not merely consist of "noise" made by too much information without enough processing. To do that, we would have to regulate the content of the magazine with judges, much like neuron cells regulate biological feedback loops[28].

Our Biological Inspirations

Moreover, the analogy of positive feedback loops, where a signal leads to a response that in turn regenerates the original signal, leading to a positive growth cycle of that response. Likewise, in this program, the "signal" will be the comics created by middle schoolers and read by younger primary school students, who will then, in "response" be motivated to create a greater amount of more creative comics in the future, which will both propagate and improve the program's quality, reach, and efficacy in years to come.

Working Toward Sustainable Development

The United Nations Sustainable Development Goal that CoMixité addresses is #4: Quality Education. Based on SDG 4.7's goal of empowering students' cultural literacy and appreciation of culture toward sustainable development, having comics in the classroom will create an effective and engaging learning environment while also giving everyone the opportunity to express their ideas and creativity regardless of their socioeconomic backgrounds that will reflect the diversity and richness of a city, and then of a country[29].
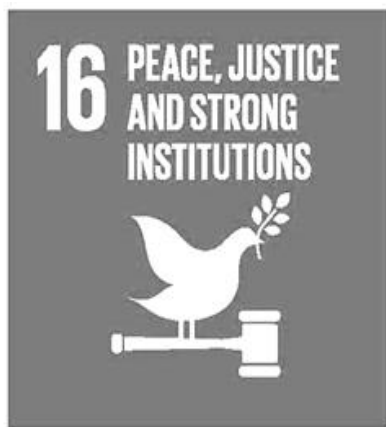
THE PAST

Prior Efforts to Promote Visual Learning in the Classroom

Previous Educational Comics

Before designing CoMixité, we looked deeply into previous, successful examples of using comics and other examples of visual learning in contexts with both child and adult audiences. A selection of those examples, each showing a variety of useful techniques and areas for improvement which we addressed and incorporated into CoMixité, are presented in the following section.

Korean Educational Comics

Korea's incredibly popular comics provided the inspirational spark for our program. Dasan comics, a notable example of Korean educational comics, has published comic books regarding science, languages, history, and art that have been used internationally in the United States and Russia, as well as in Korea as a popular children's cultural educational medium[30]. Certain New Jersey schools have used these comics as a curriculum supplement in history classes, where "The Barack Obama Story" and "The Bill Clinton Story" comics are used to learn the history of these presidents' terms and important events[31]. These comics have also been used as a bilingual learning tool, with Korean language classes in America used these to help learn Korean through the visual and text-based combined format[32], and with Korean children using the comics to learn Chinese script. For example, the picture that serves as the background of this slide involves Korean comic panels that are teaching Chinese characters through an engaging narrative format.

While a few instances of formally using Korean comics in the classroom exist, most of these comics are not formally tied to any particular curriculum or based on any curriculum and are merely extracurricular forms of learning. Their advantages lie in being incredibly popular among Korean children, yet because they are not free or formally tied to any curricula, they do not reach every student who could benefit from them.

Scientoons

An Indian cartoon series that a scientist originally created to explain his science not to children, but to adults in science to provide an engaging method of scientific communication at scientific conferences[33]. It is now being used as an accessible communicative tool for adults who want to learn about new discoveries in scientific research in an accessible manner. The advantage of this format is that it uses satire and high-level humor for deeper interaction, but these Scientoons are not aimed at children the way we aim for our comics to be in this program.

Murderous Maths & Co

Murderous Maths, Horrible Science, and Horrible History are a series of illustrated, cartoon-like books that teach about different historical, scientific, and mathematical approaches. They are sold in the UK and India by Scholastic.

Since they use an informative, series-based format, they keep kids engaged extracurricularly in visual learning over the long term. Since Scholastic is a major publishing house, the publisher makes the books broadly available as a form of extracurricular learning. However, their disadvantage lies in that they targets children who are already interested in learning and, unlike Korean comics, are not very mainstream, meaning that children who are not engaged in learning already would not easily encounter or be drawn to these books.

Doodle 4 Google

Doodle 4 Google is an art competition for children to create Google logos inspired by a particular theme. One of the strengths of this program is that it judges based on age range/grade range and leaves the contest open to all ages K–12. The prizes include college scholarships, educational funding for their schools, trips to Google headquarters, and national recognition[34]. As a strong point, it provides a competitive approach to blending art and education. However, this competition may be inherently stilted in favor of children from more supportive, well-off backgrounds, which is a situation that we would like to avoid in our program's competition.

Sesame Street

This educational children's television series aims to use television characters to provide preschool age children, especially those who are usually underserved, namely those from low-income, minority populations, with literacy practice and cultural exposure. A compilation of multiple psychological studies in 24 countries showing *Sesame Street* revealed that it had positive effects on literacy and social attitudes worldwide[35]. Unlike our program, Sesame Street works with not just images and words, but also with sound and continuous narrative plot devices because it focuses on TV instead of comics. This program is also limited because its content lies outside of school curricula. Lastly, the television medium restricts widespread access to the show, as not all children have TV in their homes.

Building on Past Efforts

In summary, past attempts at integrative, cartoon-based education have involved egalitarian competitions with effective reward systems, humor, mass-published cartoons, and effective educational impacts. Our project builds upon the ideas of competition, image-based learning, and widespread distribution while cohesively integrating those components together. Moreover, previous approaches often impose a prohibitive cost, such as money spent on buying Horrible Science books or investing in a TV to watch Sesame Street, often do not actively reach out to children from underserved populations, and are not inspired by school curriculum and therefore do not reinforce what is taught at school. Our project addresses these shortcomings using free cartoons inspired by the school curriculum, designed by children for children, that are open to any student.

IMPLEMENTATION

Putting Our Program Into Action

Our Solution's Implementation

Our solution is an artistic competition between middle school students who draw comics for other middle school students and for primary school students that will published in a free magazine every two months for the entirety of Paris to read. Paris will be divided into zones based on school zoning maps and four winners will be selected from each zone for each of four subjects: math, science, history, and French literature.

Dividing the city into zones and selecting winning comics from each of the zone promotes an equal display of artistic talent from every part of Paris. Moreover, the four subject categories are purposefully broad to promote comics that include diversity of subtopics within each subject. For example, under the science category, one student's comic may focus on different types of chemical bonds, while another student's comics might focus on the properties of different planets in the solar system.

Our Solution's Implementation

As the academic curriculum is fairly dense, teachers in France cover quite a bit of information in a short number of days. Therefore, since implementing the project during class hours could be quite complicated for a first step, we imagine CoMixité will occur as an afterschool club in each school

As a general rule, teachers could begin the clubs and CoMixité volunteers, who are university students, could help guide and mentor that children in their creation process. Nevertheless, we think each club should keep its own independence in organizing their activities, even though the central hub of our program consists of a university student organization.

School

An Implementation Overview

Teacher

One teacher in charge per school to at least begin the comic clubs/associations

Volunteers

University student/Service Civique Volunteers who help run the club on a day to day basis and serve as mentors to children
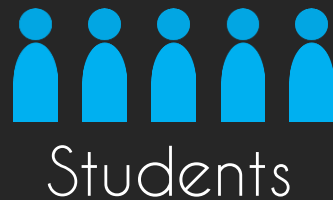
Students

Students in each association/club come together to create the comics that

Who Is In Charge?

We have conceived CoMixité to be a bottom-up process that truly originates from each school's contributions, meaning that each school has a different teacher who starts the comic-drawing association and the individual students involved have a great deal of freedom in choosing the style and subject of their comics. This organization form allows for students and teachers to feel autonomous and empowered in a hierarchical educational system. Moreover, once this program gains momentum and enough comics are acquired over time, teachers may have to bear less burden from the curriculum, which can serve as a medium/long-term incentive for teachers to volunteer.

However, the program needs a head to coordinate the different submissions, select the judges, organize the events and manage the relationships with publishers and sponsors.

We envision that this organization will be run by volunteers, which will likely be many university students and Service Civique volunteers.

Distribution & Finances

For creating the physical magazines, large educational publishers will be asked to publish copies of the comics. Such publishers would be incentivized to publish these magazines free of charge in return for positive publicity and a reputation for being a company that is invested in children's education and giving back to Paris. Previous publishing company donations and programs, such as the Book Donation Initiative, in which the American Association of Publishers donates books to non-profit organizations[36], suggest that publishing houses would be willing to engage with CoMixité to make the magazine a reality.

In addition to the physical publications, our project hopes to keep an online blog publication of the comics such that the comics can be archived for future use and be easily accessible to anyone.

If such a publisher cannot be found, publication costs as well as costs for building rentals for special events, bringing in mentors/judges, prizes, and other administrative costs are expected to be covered such financial sources as the City of Paris's Budget Participatif[37]. While the Budget Participatif will not be a long-term funding solution as per its guidelines, it can serve to set up the foundational infrastructure of the program (such as publicity, mentor-searching, etc.), other, more sustainable source of funding may come in forms of donors - who can be mentioned and thanked in the magazine itself - and revenue from advertisements in the magazine.

Credits for Comics

We believe university students would be interested in running the program, which would be quite useful for the program's mentoring capabilities, ability to connect to students, and bottom-up approach.

Having university student participation would bring an intergenerational and mentoring aspect to CoMixité, as these students will bring their educational experience, artistic background, and service-oriented motivation to middle school students. In these mentoring roles, they would learn about the power of teaching, mentorship, and visual learning. Moreover, since university students are younger than teachers or other adults who could run CoMixité, they will be more in touch with the middle school generation and therefore connect to them on a more personal level. Lastly, teaching middle schoolers will empower university students to improve and give back to the education system which they grew up within, and will also inspire middle school students, who see university students with power over education, to feel empowered to have a voice in education as well in the future.

Moreover, Parisian universities deeply encourage their students to be involved in extracurricular activities. A project of law is currently being examined by the French Parliament that will make it mandatory for universities to reward students with extracurricular responsibilities with academic credits[38]. This sort of law would make it favorable for university students to participate in running CoMixité.

Thus, we are firmly convinced that motivated students willing to manage a program like CoMixité can be found easily and will add the additional richness of intergenerational mentoring to our program.

Using Civic Service Resources

Civic service is an opportunity given to every volunteer young French person of the ages 16 and 25 to work for 6 months or one year for the general interest of the society. Proposed missions have to deal with one of the nine identified sectors among which is education. In 2015, 70 000 young people completed a civic service and the trend is increasing. 80% of them worked for NGOs and non-profit associations. However, the number of candidates is more than four times higher than the number of missions offered. Each year, there are thousands of young candidates willing to work for the general interest but cannot find any[39].

We would like to attract these motivated people to work for CoMixité. It would be a great opportunity for them to gain work experience in the education sector and be part of a fun and lively program.

Moreover, civic service volunteers have expressed their motivation to improve the work we live in and their wish to be useful for the society[40]. Thus, we are firmly convinced that it would be great for the children to be managed by such people, especially as middle school students have regular classes about citizenship.

Incentives for Teachers and Judges

Along with the opportunity to explore different educational methods and a greater diversity of teaching materials, we hope to also provide more tangible incentives for participating sponsor teachers. This may come in form of financial reimbursement for their extra commitment or additional merit during the teacher evaluation process for their extra commitment to students.

These extra financial incentives could come from such sources as the aforementioned private donations and advertising revenue. Another possible source of revenue is allowing the publisher to license some comics (with the students' approval) for use in other educational products that the publisher produces.

Incentives other than directly financial ones may come from opportunity for professional development and experience. Each year, teachers are inspected and graded for their pedagogy, which is linked to their promotion and salary increase[41]. CoMixité could become recognized as a program that enriches teaching experience and positively influences the inspection process.

The Competition Process

1. Paris will be zoned according to the Bassins (Marais-Bastille, Quartier Latin-Gobelins, Luxembourg-Montsouris, Invalides-Vaugirard, Monceau-Batignolles, Montmartre-Europe, Villette-Magenta, Gambetta-Republique)[42].
2. There will be four winners - one for each subject (Math, Science, French Literature, History) from each zone chosen by the panel of judges.
3. The panel will consist of an academic from each subject and illustrator(s).
4. The chosen winners will be published on a bi-monthly magazine to be distributed to middle/primary schools for free.
5. The juries reserves the right to disqualify any submissions without prior notice. Submissions that plagiarize previous comics or artists, or are not the sole work of the students, will be disqualified.

Rules Explanation

One of the problems that needed to be addressed when operating a competition was the disparities in the help and resources available to students according to their school location and socioeconomic background. Students from higher income backgrounds tend to have access to digital media, extra art classes, and other resources that give them an advantage that makes this contest inherently unequal if we do not somehow address this issue using two approaches:

1) Zone Parisian schools according to their socioeconomic states and have competitions among schools within their zones for a more level playing field

2) Limit the allowed materials to widely available and traditional ones such that disparities in available physical resources (such as electronics, drawing tablets, etc.) is not exacerbated. By allowing students to only draw using traditional artistic materials, students without access to high-tech digital media will not be disadvantaged against their more privileged peers.

Submission Details

1. Each team may consist of one (1) to three (3) middle school students from schools of the same zone
2. Submission must be based on school curriculum on the subject of a) Math b) History c) Science or d) French Literature
3. Students may not create comics based on the ideas of adults or other students. All ideas must be original.
4. Humour and content must be appropriate for middle/primary school audiences (under the discretion of the panel)
5. The comic must be under a page long. The number of panels is up to the teams, but content must be legible.
6. The only materials that may be used for the submission are white paper, colored pencils, graphite pencils, and pen. Comics may not be digitally created or edited. All work must be hand-drawn by the students alone. They may not receive artistic help from others.
7. No team may win the zone competition more than two consecutive times.

Choosing Winning Comics

These comics will then be examined by a panel of judges that includes government officials in charge of education, illustrators or art students, and one teacher/expert with academic expertise in each of the four subjects. Their judging will look at the quality of the educational content, artistic creativity, and engaging humor. These comics will be anonymized so that no information about the artist, other than their CoMixité zone, will be visible to judges, which allows for the fairest judging process possible. Having winners from each zone promotes artistic variety and social inclusivity by representing art from schools all over Paris.

After the panel of judges has chosen the winning comics from each CoMixité zone, a group of student judges will choose one overall winner that will be displayed on the first page of the magazine. These student judges would be chosen by random lottery among the previous rounds' winners. The group of winning comics will be completely anonymized, with not even the CoMixité zone, to allow students to choose winners without any bias. Having students select the final winner allows them to voice their own opinions about their education, empowers them with a sense of agency, and lets them interact on equal ground with the adult judges, many of whom have a hand in running these students' education.

The Judging Process

First Round of Judging:
Adult judges select the winning comics in each of four categories

Parisian Artists

Education Officials

Teachers

One winner per category from each CoMixité zone

Maths Winners

History Winners

Science Winners

French Literature Winners

Second Round of Judging:
Student judges select one overall winner from among the adult-selected pool

Students

Overall Winner
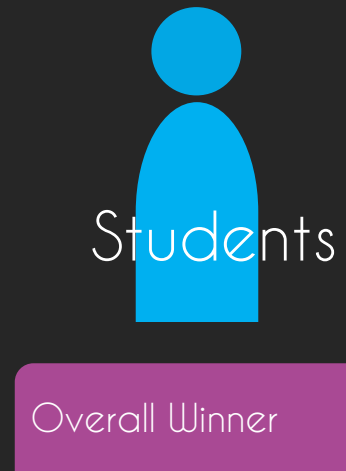
CoMixathon

One of this project's main goals is the integration of Parisian children of different backgrounds. To further this goal, we hope to hold a hackathon-style event - called Comixathon - twice a year in addition to the bi-monthly comic magazine publication. Young illustrators from all over Paris would be invited to attend the Comixathon, hosted at an appropriate venue, where students have the option of picking one partner, with which they are randomly paired with another partner set to be a team of four that works together to create an educational comic strip over a period of 24 to 48 hours, after which the winners are chosen and awarded. This spontaneity would foster a sense of teamwork and bring together youths who would not have otherwise interacted with each other. A partnership with the comic festival Le Salond de Bande Dessinee (SoBD)[43] would allow talented illustrators attending the festival to privde student teams at the Comixathon with help and guidance as well as serve as a source of inspiration.

The CoMixathon
Forging Teamwork, Forging Integration

Another Student Pair ➕ One Student Pair ➡️ Intermixed Student Team

Randomizing the team-making process promotes the integration that is so necessary in Parisian education, all while developing students' teamwork skills, quick-thinking, and artistic creativity.

FEEDBACK

Assessing the Program's Results

The Prototype

To initially test our program's design on a small scale, we will implement a program prototype consisting of twelve schools, four each from the low, middle, and higher income areas of Paris. We chose income as the key variable to distinguish schools because OECD data indicates that in France, more so than other nations, students' academic performance is highly correlated with familial income level[44]. The small number of schools involved in the prototype makes it more straightforward to implement CoMixité student associations and the magazine itself on a smaller scale. Two school from each income bracket will become part of the initial comic program, while the remaining schools will not implement the comic program at first, effectively creating an experimental and control group of schools. After six months, we will quantitatively and qualitatively compare the schools' academic performance changes and satisfaction with the program.

Our Prototype Model

A simple visual showing our prototype model. In the control and comic group, two schools from each income level will be observed for the six month prototype session.

Control Group

Comics Group

Higher Income Schools

Middle Income Schools

Lower Income Schools

Higher Income Schools

Middle Income Schools

Lower Income Schools

51

Our Hypothesis

While assessing the prototype, we hypothesize that the program would enhance the academic results of the schools that are part of the program (in comparison to schools from the control group) and that it would reduce the academic inequalities between schools from different social background that benefit from the program.

This hypothesis is based on the previously-discussed research that visually-based teaching, like with comics, results in effective learning.

Quantitative Tests

To quantitatively assess the prototype program, we will examine the academic test results and marks of both the experimental and control groups of students before and after the prototype program's six months.

Since the prototype sample size is purposefully small to control for extraneous variables, the quantitative analysis will not be reflective of the entire student population. However, comparing the academic testing results in schools before and after the program's implementation will provide a general idea of how students in these schools performed after the implementation of CoMixité. Such academic results will provide a general basis for judging the educational merits of the program.
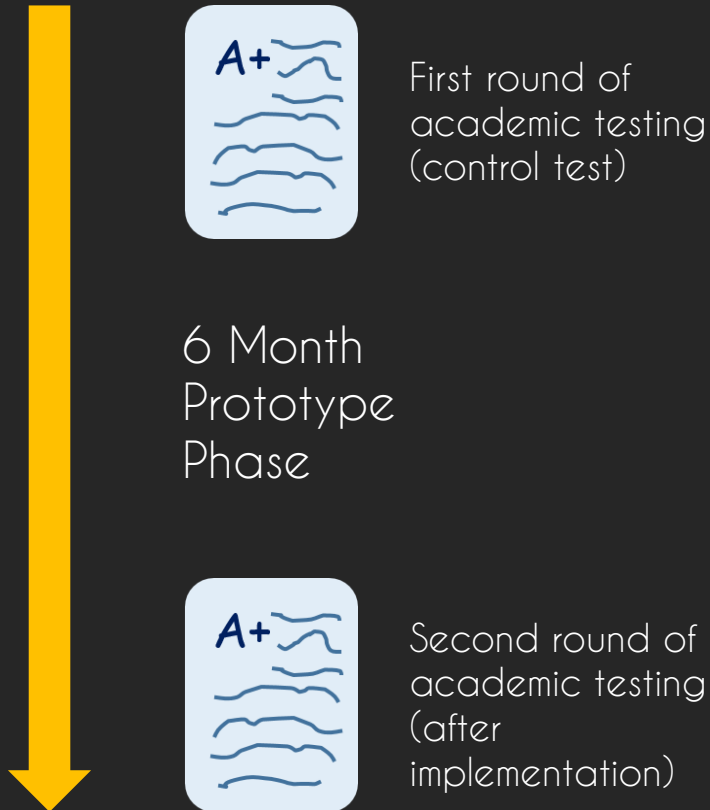
Qualitative Tests

While quantitative testing provides less general information with such a small sample size, in this small prototype environment, qualitative results become extremely valuable. Such results would involve speaking with teachers and children to get their insights and suggestions about how the program proceeded over the course of six months.

We would solicit information in the form of anonymous student and teacher feedback forms, with such surveys asking about artistic benefit, educational use, program inclusiveness and efficiency. All the surveys would be prefaced with the phrase, "Do you strongly disagree, agree, strongly agree, with the following statements?" so that the survey questions could provide ways for students and teachers to provide a gradation of feedback on various topics.

In addition to feedback in the form of surveys, it would be additionally helpful to have an open, online feedback form where students who submit their comics, students who read the comics, and the teachers facilitating could all provide longer written feedback of their own volition.

Quantitative Testing

A+ First round of academic testing (control test)

6 Month Prototype Phase

A+ Second round of academic testing (after implementation)

Qualitative Testing

6 Month Prototype Phase

Project Beginning

Student Survey

Teacher Survey
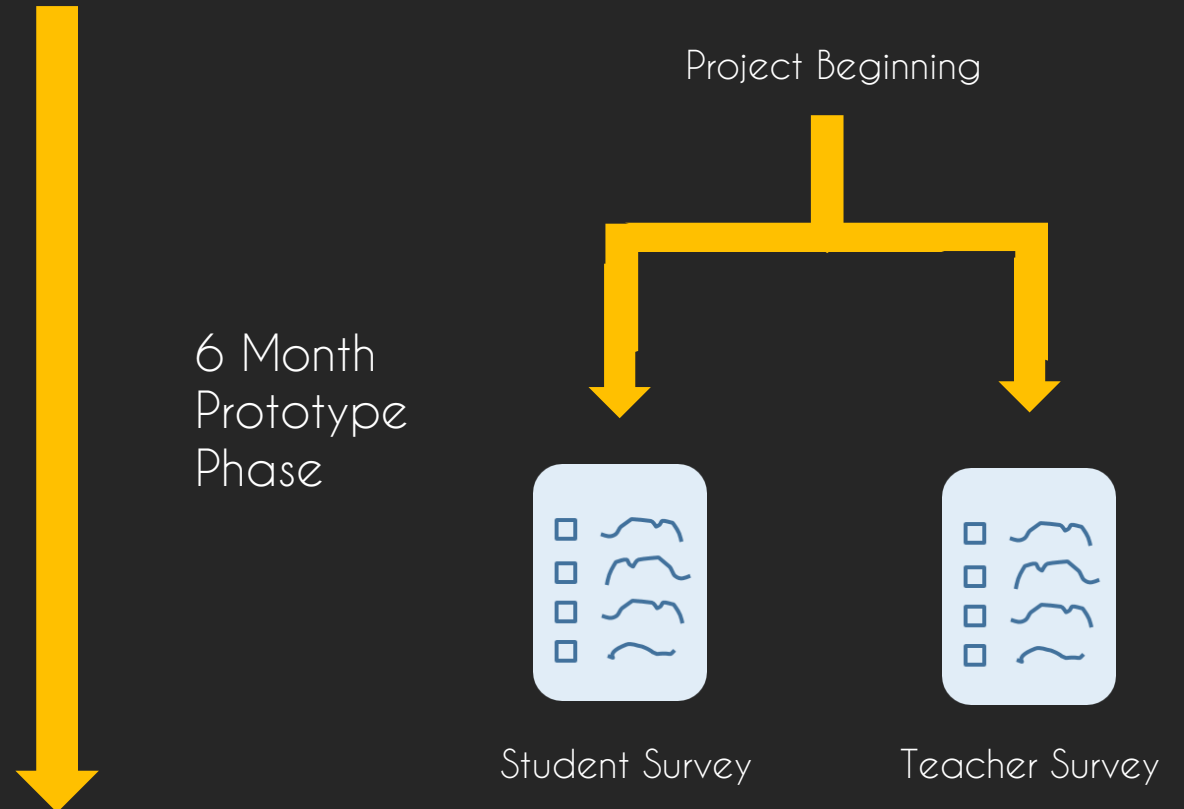
Example Student Surveys

Students would be given surveys at the end of the six months to judge how they felt about the program overall. In addition, students who submit their comics could be given an online link for them to submit additional, anonymous, voluntary feedback over the program's course about how they would like to see the program change and improve in the future.

Some example questions to ask for children's feedback during the survey at the end of the six months include:
- I learnt something throughout this program
- I learnt somethings by reading the comics
- I'm better at writing
- I'm better at drawing
- I got to know my classmates better
- I got to know students from other schools

Example Teacher and Volunteers Surveys

Since both teachers and volunteers from universities and Service Civique will be involved in running the clubs, their feedback is critical to the program's development and important so that we can best optimize their time while gaining the most effective outcome for children's education. Some example questions to ask teachers for feedback include:

- My students learnt something throughout this program
- Comics were complementary to the academic curriculum
- Comics were useful for my students
- The club helped in developing social interaction between different students
- The club helped in developing social interaction between different schools

Modifying & Extending the Program

We intend to modify the program based on the feedback we receive from the prototype phase. Such modifications could include focused training for volunteers, greater connection between comics and the curriculum, or any other changes that are suggested by the teachers, students, and volunteers involved in this program.

Questions we would look at to modify the program: What made some schools participate more than others? How did successful schools managed to get students' attention/participation/interest? Could the clubs be self-managed by the students without teachers' interventions? Were the incentives attractive enough to encourage participation?

After examining the feedback and the questions we have defined for ourselves, we envision that the program will be implemented on a wider scale within the city of Paris.

Communication & Publicizing

Important communication should be made around the program during the year to get students and teachers' interests and to get enough content for the magazine

Moreover, communication would also inform other schools of Paris about the program so that they can start think about being part of it the next year.

A lot of communication should also be made on the results to show the program's benefits for the schools. With this transparency, it would be possible for students and teachers involved with prototype schools to see how their feedback was taken into account during the broader implementation.

TIMELINE

Our Step-By-Step Implementation Timescale

Prototype Phase Timeline

Analysis and assessment of the prototype's results. Communication of the results.

Throughout the year: the Communication around the program and discussions with schools that may be interested in joining the program

End of the II session and selection of the winners.

III issue of the magazine distribution

Distribution of the surveys for the qualitative assessment

End of the II round and selection of the winners. Distribution of the II issue of the magazine Start of the III round.

Formation of the Team Staff: University students and Civic Service Volunteers

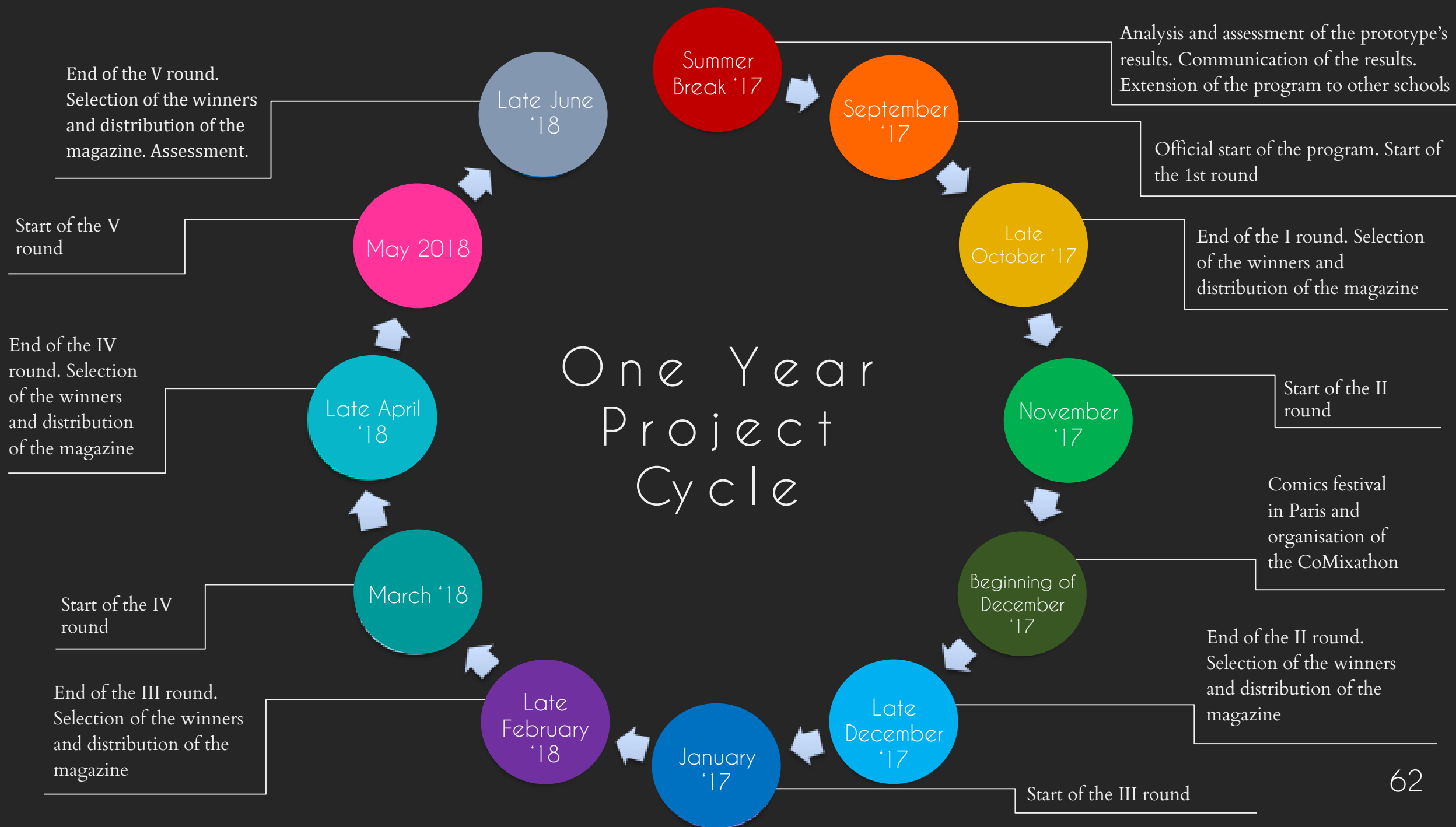Communication of the project: Looking for volunteer schools and judges for the prototype

Selection of the actors for the prototype (schools and judges)

Official start of the prototype: I round

End of the I session and competition results

First edition and distribution of the magazine. Start of the II round

September '16

October '16

November '16

Early January '17

March '17

April '17

Late June '17

July '17

Summer Break '17

One Year Project Cycle

Summer Break '17

September '17 — Analysis and assessment of the prototype's results. Communication of the results. Extension of the program to other schools

September '17 — Official start of the program. Start of the 1st round

Late October '17 — End of the I round. Selection of the winners and distribution of the magazine

November '17 — Start of the II round

Beginning of December '17 — Comics festival in Paris and organisation of the CoMixathon

Late December '17 — End of the II round. Selection of the winners and distribution of the magazine

January '17 — Start of the III round

Late February '18 — End of the III round. Selection of the winners and distribution of the magazine

March '18 — Start of the IV round

Late April '18 — End of the IV round. Selection of the winners and distribution of the magazine

May 2018 — Start of the V round

Late June '18 — End of the V round. Selection of the winners and distribution of the magazine. Assessment.

Educational.
Integrative.
Fun.

This is

COMIXITÉ

Made by children, for children.

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References

Sources:

1. *Demographics : A Cosmopolitan City*. Report. Mairie De Paris. Accessed July 11, 2016. http://next.paris.fr/english/presentation-of-the-city/demographics-a-cosmopolitan-city/rub_8125_stand_29896_port_18748.
2. Ibid
3. Ibid
4. "Education in France." The French Education System. Accessed July 23, 2016. http://about-france.com/primary-secondary-schools.htm.
5. School Readiness: A Conceptual Framework. Report. UNICEF. April 2012. Accessed July 23, 2016. http://www.unicef.org/education/files/Chil2Child_ConceptualFramework_FINAL(1).pdf.
6. Education at a Glance 2014: France. Report. OECD. http://www.oecd.org/edu/France-EAG2014-Country-Note.pdf
7. "A Guide to French Education." Gateway. June 2015. Accessed July 23, 2016. http://www.expatica.com/fr/education/Education-in-France_101147.html.
8. "Les 5 Statistiques Positives De L'école Française." L'éducation Déchiffrée. July 22, 2013. Accessed July 23, 2016. http://educationdechiffree.blog.lemonde.fr/2013/07/22/les-5-statistiques-positives-de-lecole-francaise/.
9. Gateway, "A Guide to French Education."
10. L'éducation Déchiffrée, "Les 5 Statistiques Positives De L'école Française."
11. R*esultats Du PISA 2012: France.* Report. PISA, OECD. 2012. Accessed July 11, 2016. https://www.oecd.org/pisa/keyfindings/PISA-2012-results-france.pdf.
12. Gumbel, Peter. "The Stranglehold on French Education." New York Times: The Opinion Pages. September 11, 2015. Accessed July 7, 2016. http://www.nytimes.com/2015/09/12/opinion/the-stranglehold-on-french-schools.html.
13. Ibid
14. "International schools in Paris." Gateway. September 2015. Accessed July 23, 2016. http://www.expatica.com/fr/education/International-schools-in-France_106620.html.
15. Ibid
16. Andersen, John, and Peder Hjort-Madsen. "Reflections on Exclusion Dynamics in Education and Training in the Danish Context: Democratic Egalitarian Orientation versus Meritocratic Elitist Orientation." (2008).
17. Pastore, Franesco. Marginalization of Young People in Education and Work: Findings from the School-to-Work Transition Surveys. Report. EFAGMR, UNESCO. 2012. Accessed July 24, 2016. http://unesdoc.unesco.org/images/0021/002178/217886E.pdf.
18. Ibid
19. Ibid
20. Haines, Jennifer. "Why Teach with Comics?" Reading With Pictures RSS. Accessed July 8, 2016. http://www.readingwithpictures.org/2012/04/why-teach-with-comics/.

21. Tatalovic, M. "Science comics as tools for science education and communication: a brief, exploratory study." Jcom 8, no. 4 (2009): A02.
22. "Collèges." Paris.fr. Accessed July 14, 2016. http://www.paris.fr/services-et-infos-pratiques/famille-et-education/scolaire/colleges-2090.
23. "Peer Pressure." Encyclopedia of Children's Health. Accessed July 27, 2016. http://www.healthofchildren.com/P/Peer-Pressure.html.
24. The French Education System, "Education in France."
25. Ibid
26. Tatalovic, "Science comics as tools for science education and communication: a brief, exploratory study."
27. Lue, Robert, Personal Conversation. 1 July 2016.
28. Ibid
29. "Sustainable Development Goals : Sustainable Development Knowledge Platform." Sustainable Development Goals: Sustainable Development Knowledge Platform. Accessed July 11, 2016. https://sustainabledevelopment.un.org/?menu=1300.
30. Chung, Ah-young. "Comic Books Hailed as New Education Tools." Culture. March 19, 2010. Accessed July 1, 2016. http://www.koreatimes.co.kr/www/news/art/2010/03/135_62659.html.
31. Ibid
32. Ibid
33. Tatalovic, "Science comics as tools for science education and communication: a brief, exploratory study."
34. "Google Doodles." Google Doodles. 2013. Accessed July 2, 2016. https://www.google.com/doodles/about.
35. Fisch, Shalom M., Rosemarie T. Truglio, and Charlotte F. Cole. "The impact of Sesame Street on preschool children: A review and synthesis of 30 years' research." *Media Psychology* 1, no. 2 (1999): 165-190.
36. "Book Donation Initiative." Association of American Publishers. Accessed July 25, 2016. http://publishers.org/our-markets/trade/book-donation-initiative.
37. "Le Budget Participatif ? - Budget Participatif - Paris." Le Budget Participatif ? - Budget Participatif - Paris. Accessed July 25, 2016. https://budgetparticipatif.paris.fr/bp/le-budget-participatif-.html.
38. Valls, Manuel, Patrick Kanner, Emmanuelle Cosse, and Ericka Bareigts. "Le Projet De Loi "Égalité Et Citoyenneté"" Gouvernement.fr. Accessed July 25, 2016. http://www.gouvernement.fr/action/le-projet-de-loi-egalite-et-citoyennete.
39. Serafini, Tonino, Lilian Alemagna, and Amandine Caihol. "Service Civique : Les Jeunes Désignés Volontaires." Libération.fr. January 01, 2016. Accessed July 25, 2016. http://www.liberation.fr/france/2016/01/01/service-civique-les-jeunes-designes-volontaires_1423952.
40. Ibid
41. "Notations Des Personnels Enseignants." Ministère De L'Éducation Nationale, De L'Enseignement Supérieur Et De La Recherche. Accessed July 25, 2016. http://www.education.gouv.fr/cid58632/notations-des-personnels-enseignants.html.
42. "Académie De Paris - Etablissements - Rechercher Un établissement." Académie De Paris - Etablissements - Rechercher Un établissement. Accessed July 12, 2016. https://www.ac-paris.fr/portail/jcms/p1_588804/portail-repertoire-des-etablissements.
43. "Le Salon De La BD à Paris - SOBD 2015." SoBD 2016 RSS2. Accessed July 25, 2016. http://www.sobd2016.com/.
44. Pisa, OECD, *Resultats Du PISA 2012: France.*

References

Images:
- Gornet, Jean-François. Paris Skyline. January 15, 2014. Paris. In Paris Skylines. January 15, 2014. Accessed July 23, 2016. https://www.flickr.com/photos/43896901@N00/12247630416.
- Talon Sampieri, Sarah. Team Caricature. July 25, 2016. Paris.
- Children raising hands in a classroom. Digital image. Mathematica Policy Research. December 15, 2015. Accessed July 14, 2016. https://www.mathematica-mpr.com/our-focus-areas/education.
- "La Ségrégation Sociale Est plus Forte Dans Les Départements Urbains." Digital image. Renforcer La Mixité Sociale Dans Les Collèges. November 2015. Accessed July 11, 2016. http://www.education.gouv.fr/cid95191/renforcer-la-mixite-sociale-dans-les-colleges.html.
- "Périmètres Des Colleges, 18ème Arrondissement, Anée Scolaire 2015-2016." Digital image. Mixité Sociale. Accessed July 13, 2016. http://www.neoprofs.org/t95969p100-mixite-sociale-najat-vallaud-belkacem-envisage-de-redessiner-la-carte-scolaire.
- Children of diverse backgrounds sitting. Digital image. Accessed July 14, 2016. http://www.cdc.gov/spanish/especialescdc/mesabusoinfantil/.
- Math on Chalkboard. Digital image. East of Center. February 15, 2011. Accessed July 14, 2016. http://eastofcenter.tol.org/2011/02/the-czech-republics-other-education-problem/.
- Foule Floue. In UNE IMAGE PAR JOUR ; CROQUIS, DESSINS, PHOTOS, PEINTURES. Accessed July 25, 2016. http://uneimageparjour.blogspot.fr/2009/01/foule-floue.html.
- Contreras, Ralph. "Drawing a Robot." Digital image. Comic Book Video Tutorials. April 5, 2014. Accessed July 14, 2016. http://comicbookgraphicdesign.com/tag/comic-book-video-tutorials/.
- Collection of comic books. Digital image. WideWalls. Accessed July 13, 2016. http://www.widewalls.ch/comic-book-art/.
- "Paris, France • 360° Aerial Panoramas." Digital image. 360 Panoramas. October 2, 2012. Accessed July 14, 2016. http://www.airpano.com/360Degree-VirtualTour.php?3D=paris-france.
- Children Laughing. In Local District Northeast: Elementary Science. Accessed July 26, 2016. http://achieve.lausd.net/Page/8303.
- Box of pastels. Digital image. Indigo Blue Melancholia. Accessed July 14, 2016. http://my-forgotten-ultramarine.tumblr.com/post/77269799278.
- Neural network. Digital image. Thoughts on Mirror Neurons – Why We Feel Empathy. Accessed July 14, 2016. http://cristivlad.com/mirror-neurons-empathy/.
- UN SDG: Quality Education. Digital image. Sustainable Development Goals. Accessed July 12, 2016. https://sustainabledevelopment.un.org/?menu=1300.

- Korean comic translation. Digital image. 영어로 읽는 마법천자문 1 - Wind. Accessed July 1, 2016. http://us.aladin.co.kr/shop/common/wbook_talktalk.aspx?ISBN=8950923009&CommunityType=MyReview.
- Tatalovic, M. "Science comics as tools for science education and communication: a brief, exploratory study." *Jcom* 8, no. 4 (2009): A02.
- Murderous Math collection. Digital image. The Murderous Maths Series. Accessed July 14, 2016. http://www.kjartan.co.uk/books/books.htm.
- "Google Doodles." Digital image. Doodle 4 Google. 2015. Accessed July 14, 2016. https://www.google.com/doodle4google/gallery.html.
- Sesame Street. Digital image. First Sesame Street Season On HBO Airs January 16th. November 25, 2015. Accessed July 15, 2016. http://www.ubergizmo.com/2015/11/first-sesame-street-season-on-hbo-airs-january-16th/.
- Residential School. In An Inside Look at Canada's Program to Strip Indigenous Kids of Their Culture. Accessed July 26, 2016. http://www.vice.com/en_ca/read/an-inside-look-at-canadas-program-to-strip-indigenous-kids-of-their-culture.
- Boy reading by the window. Digital image. Ashley Jensen's Blog. Accessed July 15, 2016. https://www.goodreads.com/author_blog_posts/8708354-you-pay-your-kid-to-read.
- Stack of Paper. In Zelf Aanleveren. Accessed July 26, 2016. http://vlkgroep.nl/papierrecycling/zelfaanleveren/.
- Maxppp. Service Civique. In A Votre Bon Service.... Accessed July 26, 2016. http://www.franceinfo.fr/emission/c-etait-comment/2014-2015/votre-bon-service-09-03-2015-19-55.
- Schmuck, Ragnar. Teacher for Students. Accessed July 25, 2016. http://www.nydailynews.com/new-york/pol-argues-resolution-1294-school-principals-hire-best-teachers-not-cheapest-article-1.1076360.
- Hand drawing comic. Digital image. About This Workshop. Accessed July 15, 2016. https://www.skillshare.com/workshops/128?coupon=BFRIDAY15&utm_source=Skillshare&utm_medium=newsletter&utm_term=session-christine-fleming&utm_content=free-members&utm_campaign=2015-11-24-rec-email&via=newsletter.
- Salon Du Livre. In Pau : Instants Découverte Au Salon Du Livre. Accessed July 26, 2016. http://www.larepubliquedespyrenees.fr/2012/11/24/pau-instants-decouverte-au-salon-du-livre,1107217.php.
- Idea Plan Action. Digital image. 5 Reasons Why You Need a Plan to Make Your Ideas Fly. Accessed July 15, 2016. http://brigittecobb.co.uk/5-reasons-why-you-need-a-plan-to-make-your-ideas-fly/.
- Lightbulb on the blackboard. Digital image. Home. Accessed July 15, 2016. http://www.bravopower.org/.
- Quantitative analysis. Digital image. Quantitative Analysis. Accessed July 15, 2016. http://www.thenatureofmarkets.com/quantitative-analysis/.
- Thumb down thumb up. Digital image. So Things Aren't Working Out? Stop Wallowing and Start Learning Read More at Http://women2.com/2014/11/16/things-arent-working-get/#AvOE1IJ6zwXzboMQ.99. Accessed July 15, 2016. http://women2.com/2014/11/16/things-arent-working-get/.
- Boy struggling in class. Digital image. Parents Et Professeurs Se Mobilisent Pour être Force De Proposition. Accessed July 15, 2016. http://franchementbien.fr/2015/04/parents-et-professeurs-se-mobilisent-pour-etre-force-de-proposition/.
- Daly, Robert. Teacher in class. Digital image. Huffington Post Blog. Accessed July 15, 2016. http://www.huffingtonpost.com/mary-e-graham/what-your-middle-school-teacher-wants-you-to-know_b_5760224.html.