

# Challenge Based Learning 360 Filmmakers: Perspectives and Advance Positive Action toward the Sustainable Development Goals to Empower Learners as Creators and Changemakers

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**Abstract**—Immersive journalism in the form of virtual reality VR headsets and 360 ° video is becoming increasingly common, the video outperformed those who read the same stories using text with images, not only in results related to presence such as being there, interaction and realism, but also in the source of perceived credibility. These findings have theoretical implications for the psychology of virtual reality and practical applications for immersive journalism in particular and interactive media in general. High School students at PrepaTec Morelia created an immersive 360 narrative video using the camera Samsung Gear 360 Real 360 Degree 4k Vr and Oculus VR headsets. In these 360 videos the students expose the water problem in their city Morelia Michoacán México, using design thinking research matrix and CANVAS model from Digital Promise to generate their proposal. These videos were sent to the United Nations Showcase through Digital Promise's My World 360 °. At the beginning of the project a five question survey on a scale likert from 1 to 5 where, 1 is very satisfactory and 5 unsatisfactory, about water conservation and how much the students felt involved in the water community problem, the same survey was applied at the end of the project. The results obtained at the presurvey were grades of 3.81 with standard deviation of 1.20 and grades of 4.25 with standard deviation of 1.19 at the postsurvey. Through this project we encouraged students to become agents of change within their community and at the same time acquire socioemotional skills, critical thinking, communication and digital literacy.

**Index Terms**—digital storytelling, citizenship, 360 ° videos, media literacy, virtual reality, educational innovation, higher education

## I. INTRODUCTION

By creating 360 ° video stories, students can learn about the production process, develop important skills such as communication, collaboration and perspective taking, and discover new possibilities and professional passions. Authentic projects with a real-world audience can also help increase student motivation, persistence, and pride.[1]

Immersive journalism in the form of virtual reality VR headsets and 360 ° video is becoming increasingly common and is highly touted for inducing a greater presence than traditional text who experienced the stories using VR and 360 °, the video outperformed those who read the same stories using text with images, not only in results related to presence such as being there, interaction and realism, but also in the source of perceived credibility, story shared intention, and feelings of empathy [2]. Furthermore, we found that the senses of being-there, interaction, and realism mediated the relationship between the narrative medium and the reader's perceptions of credibility, memory of the story, and the intention to share the story. These findings have theoretical implications for the psychology of virtual reality and practical applications for immersive journalism in particular and interactive media in general [3].

Authentic projects with a real-world audience can also help increase student motivation, persistence, and pride. Stories are a useful tool for learning, but also for promoting cross-cultural social change, this when the student who is usually the listener is transformed into the speaker and into the active subject when telling stories. It is worth noting that according to the literature reading, writing and telling stories can contribute to the emotional well-being of young people because in each narrative there are characters who with strategies and actions solve problems, relating it to their personal life. [4]

Students often live immersed in their own problems and concerns, within what we sometimes call their bubble, they find themselves oblivious to the problems of their community and their country without realizing that they play a very important role in being able to become agents of change, it is intended that through the methodology teaching based on challenges give the student the tools to become creators of immersive 360 narrative videos of virtual reality in which they expose a problem and shared with other students and the community to advocate for positive causes [5].

Promote citizenship and the socio-emotional and intercultural competencies of students so that they are trained as leaders with a human sense of their community

who can be agents of change in their social environment [6].

The approach to the research problem was addressed by the following question: To what extent does teaching based on challenges through the creation of immersive narrative videos 360, VR Will storytelling on global issues support students to share their perspectives to impact and inspire positive actions on issues of interest focused on the UN's sustainable development goals as well as to develop cross-cutting competencies and their communication skills and civic engagement?

The main objectives of the project is: To promote citizen participation as well as improve the understanding of students PrepaTec Morelia about global problems that affect communities, developing technical production skills through the use of new techniques of immersive 360 video

- Carry out a global campaign through 360 video related to the sustainable objectives of the United Nations
- Participate with the 360 videos created by the students in the annual call of the Digital Promise My World 360 association
- Develop the necessary skills to film, edit and share 360 media that represents community perspectives in an engaging and immersive way.
- Helping students develop the necessary skills to create quality research syntheses is time well spent using design thinking

## II. DEVELOPMENT

The equipment used by the student to develop the project is listed below:

- Samsung Gear 360, 2017 Edition, Real 360 4K VR Camera Code SM-R210NWAXAR
- Samsung Micro Sd Pro + Memory Card 128 Gb
- Gear VR Samsung with Controller Code: SM-R325NZBAMXO
- Samsung Gear 360, EEEkit All in 1 kit for 2017 Edition

The equipment was acquired with a grant obtained from NOVUS at the 2019 call for research proposals. NOVUS is an initiative of the Instituto Tecnológico y de Estudios Superiores de Monterrey that supports the development of innovative ideas in the training process of students in our institution.

The project was carried out in an interdisciplinary way in the subjects of Matter and the Environment, Ethics and Citizenship and Computer Logical Thinking with the 18 students enrolled in fourth semester at the multicultural program of PrepaTec Morelia.

As a first step the students used design thinking to generate the Proposal of the video using a research matrix and the CANVAS model from Digital Promise (Fig. 1). They also chose to promote one of the 17 sustainable development goals of the United Nations [6]. For this project the students focused on the problem of water in their city Morelia Michoacán, working with the sustainable development objectives # 6 Clean Water and

Sanitation and # 12 Responsible Production and Consumption.

The Essential Question for the project was: How can you make a difference in the responsible consumption of water and water sanitation in our communities using 360 media?

The Challenge was to make an impact in our communities on a water issue with 360° media.

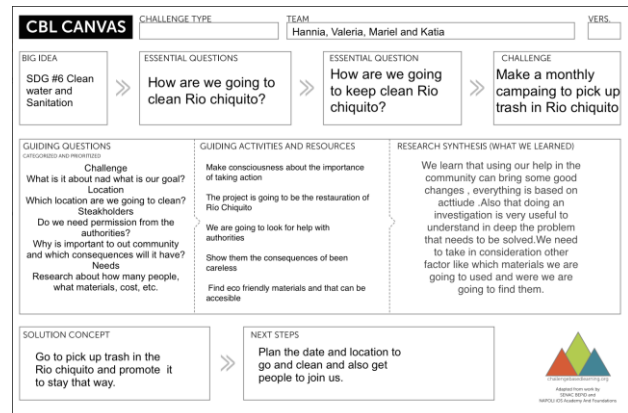


Figure 1. Example of CANVAS Digital Promise Matrix with preliminary ideas from the students.

The third step was to work on a Mini-Film so that the students became familiar with the Gear 360 equipment, for this an excursion was made to the center of ecotourism at the Yunuen island that is 30 minutos by car from Morelia. Yunuen Island is located in Lake Pázcuaro, Michoacán México inhabited by a Purépecha indigenous population. [7]

The island's community organization operates the ecotourism center that has built absorption wells for water treatment, a reforestation project and the production of compost for growing vegetables [7].

Once on the Island the students filmed their video and got acquainted with the 360 video camera and had the chance to see the community efforts to keep the water of the island and the lake clean.

The fourth step was to create the production guide, the information of the production guide was taken from the My World 360 Digital Promise page to ensure that the product meets the specifications in order to participate in the initiative <https://global.digitalpromise.org/360-storylab/my-world-360/program-guide/>

The guide was worked on in three stages:

- Initiation and Personalization of Project Development of ideas Experience a 360° experience. Make a 360° photo essay or a mini film (see Image 3)
- Pre-production 360° script creation Storyboard production team Production Plan
- Production Recording Editing

Once the videos were ready, they were sent to the United Nations Showcase through Digital Promise's My World 360 °

At the end of the semester each student made an individual video reflection using Flipgrid a free video discusion application answering the following questions:

- How does Water scarcity, poor water quality and inadequate sanitation negatively impact food security, livelihood choices and educational opportunities in your community Morelia?
- How does your project can help to reach the UN sustainable goals #6 Clean water and sanitation and #14 Life below water?
- Do you think this project helps you to be more aware of the problems Morelia face concerning water quality and inadequate sanitation? Explained

### III. OUTCOME AND EVALUATION

A survey about water conservation was generated with self-report statements for the initial set of items, all of which were written to allow for subject responses using a 5-point Likert format, ranging from 1 = "Strongly disagree" 2 = "Disagree", 3 = "Neither agree nor disagree", 4 = "Agree", a 5 = "Strongly agree".

The survey was applied before the strtuents started the project, the results obtained were a grade of 3.81 with

standard deviation of 1.2. (Table I and Fig. 2) Ones the students finish the project the same survey was applied, the results obtained for the post-survey were a grade of 4.25 with standar deviation of 1.9 (Table II and Fig. 3) results were compared to see if there was a significant change.

### IV. CONCLUSIONS

The use of virtual reality to advocate a community problem can have several ethical implications, since students are integrating their own ideas and their perception that can also integrate stereotypes, fears, perceptions, among others.

When making journalistic videos for awareness campaigns, we as teachers and students have a great moral responsibility that the information generated in these videos is reliable and adheres as closely as possible to the truth, avoiding bias and manipulation of any kind. In short, the moral responsibility of our life is transferred to the sphere of the creation of 360 journalistic videos.

Comparing the results of the pre-survey and the post-survey shows that the students after having done this project felt that they know more in depth the problems of their community regarding the issue of water sanitation and its responsible consumption.

TABLE I. PRE SURVEY RESULTS

Student	How interested are you in the topic of water conservation in your community?	Do you know what are the main problems related to water conservation in your community?	Do you know or feel interested about what your community is doing to conserve water resources?	Do you know what your community is doing to conserve water?	Do you know what is your community's primary and secondary water source?	Do you feel responsible for taking actions to conserve water in your community?
1	5	4	4	3	2	5
2	5	4	4	3	3	5
3	5	3	4	2	2	5
4	3	1	3	1	1	3
5	5	4	3	3	4	5
6	3	5	3	5	4	5
7	3	3	4	2	4	5
8	5	4	5	5	3	4
9	4	5	5	5	5	4
10	4	3	4	1	1	4
11	1	5	3	2	4	5
12	4	4	5	2	1	5
13	4	3	2	3	4	3
14	5	4	5	3	2	4
15	5	4	5	4	4	4
16	4	5	2	3	5	4
17	5	5	5	4	5	5
18	5	5	5	5	5	5

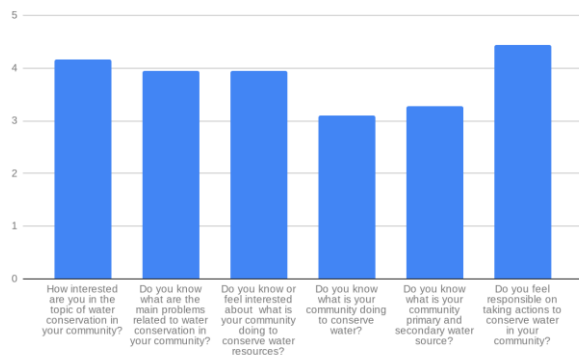


Figure 2. Pre survey graph results.

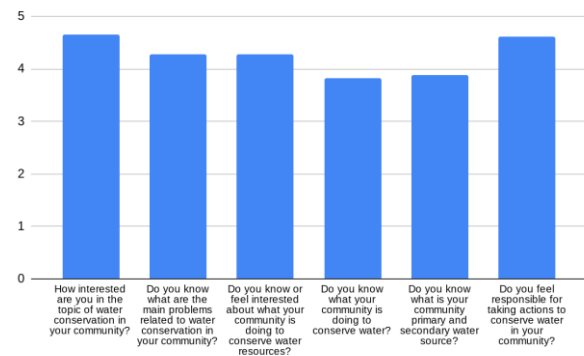


Figure 3. Postsurvey graph results.

TABLE II. POST SURVEY RESULTS

Student	How interested are you in the topic of water conservation in your community?	Do you know what are the main problems related to water conservation in your community?	Do you know or feel interested about what your community is doing to conserve water resources?	Do you know what your community is doing to conserve water?	Do you know what is your community's primary and secondary water source?	Do you feel responsible for taking actions to conserve water in your community?
1	5	3	5	1	3	5
2	5	4	5	4	4	5
3	4	3	5	2	3	3
4	4	4	3	5	4	3
5	4	5	3	2	4	3
6	5	5	5	5	4	5
7	5	5	5	5	5	5
8	4	2	1	1	1	4
9	5	5	5	5	5	5
10	5	5	5	5	5	5
11	5	5	5	5	5	5
12	4	4	4	4	2	5
13	5	5	5	4	5	5
14	5	5	5	5	4	5
15	5	5	5	5	5	5
16	4	2	1	1	1	5
17	5	5	5	5	5	5
18	5	5	5	5	5	5

TABLE III. PRE SURVEY AND POST SURVEY RESULTS

	Grade	Standard Deviation
Pre-Survey	3.81	1.2
Post-Survey	4.25	1.9

Students mentioned that they felt more interested and committed after the experience. This is shown by the increase of the grade between the resurvey and the post-survey increasing from 3.81 to 4.25 (Table III).

The objectives of promoting citizen participation as well as improving understanding was achieved by the

students as well as the students understanding of global problems that affect their community and other communities, by developing technical production skills through the use of new video 360 °immersive techniques.

#### CONFLICT OF INTEREST

The author declares no conflict of interest.

#### AUTHOR CONTRIBUTIONS

In the whole process, the author herself collects, organizes, thinks, revises and finally completes this article.

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