



# A Guide to Immersive 360-degree Video Storytelling in Career Exploration for Rural Children

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**Abstract.** Widening children's career awareness helps them make better career decisions in the future. IN360, a community-based initiative exposes rural children aged nine to twelve in Indonesia to diverse role models using 360-degree video content. They collaborate with university students as content creators, though varying skill levels lead to uneven content quality. This study aims to enhance IN360 content through an immersive storytelling guideline, designed in three phases: Conceptualization, Story Building, and Production, integrated into a content creation workshop. Therefore, the video production skills of the creators were improved, as were the storytelling and immersion of the content. The video results were delivered to rural children, and the observation showed technical and narrative immersion from the children. They also gave all videos an average score above 4 (scale of 1 to 5), proving their interest. Additionally, the paper discusses the importance of stakeholders' involvement and logistic requirements to ensure smooth implementation.

**Keywords:** 360-degree Video, Immersive Storytelling, Career Exploration, Rural Education.

## 1 INTRODUCTION

Widening children's horizons on the many career possibilities in the world can help them make better career decisions in the future. Learning directly from people in the working world, as role models, could show the relevance of learning, bring a different point of view, break stereotypes, and develop a sense of belonging in the children [1]. However, children who live in rural areas lack exposure to a variety of careers as the livelihood in such areas tends to be homogeneous. In Panglungan Village, Indonesia, for example, most of the residents are farmers (35%), housewives (31%), and merchants (15%) (N. Afifah, personal communication, February 14, 2021). The geographical and infrastructural conditions in these areas also isolate their access to information. IN360, a community-based initiative provides career exploration through 360-degree video content for rural children aged nine to twelve. Through this medium, they would like children in rural areas to learn from the role models, feel their passion, and have a sense of closeness to the working world. By showing the children what “people like

them” can be in their careers, IN360 aims to have the children be more engaged in learning and build more confidence in achieving their goals.

As a part of their content creation program, IN360 involves university students as content creators through workshops to create career exploration content. This workshop is designed to facilitate content creators to produce career exploration content in 360-degree video format. While immersive media like 360-degree video may reintroduce the sense of presence, immediacy, and immersion in distance learning [2], the quality and the storytelling of the video play a significant role in obtaining such benefits. Unfortunately, IN360 content creators come from diverse video production skill levels. While some of them had experience in producing traditional video, most of them never had any experience with 360-degree video production. This led to unequal quality in the narrative and technical immersion of the content. Thus, the quality of information received by the children cannot be guaranteed as well. Therefore, this study aims to enhance IN360 content through an immersive storytelling guideline designed and integrated into a content creation workshop. The guideline is going to be utilized by content creators to create a standardized video that will help children be immersed in the exploration content.

## **2 LITERATURE REVIEW**

### **2.1 Immersive Storytelling in 360-Degree Video**

Immersive storytelling in 360-degree video has emerged as a transformative medium for narrative engagement. Compared to Virtual Reality (VR), 360° video is more accessible, as devices like mobile phones and 3-DoF tools such as Google Cardboard are sufficient for a satisfying experience. Both traditional and 360-degree narrative storytelling is driven by characters, places, or actions that form the narrative [3]. However, crafting educational experiences using 360-degree video requires different techniques than traditional two-dimensional (2D) videos. Former research considered two main dimensions in 360-degree video: the narrative and technical immersion [4,5]. Viewers can control their view as they like and this might lead them to unintentionally lose track of the main storyline when exploring the spherical environment. While viewers can freely control their perspective, this might cause them to unintentionally lose track of the main story while exploring the spherical environment [6]. Nonetheless, if actors engage with the camera as they would with a person, it can create the illusion of interaction [5]. For a captivating central narrative, it's suggested to incorporate well-defined characters and a coherent storyline and to avoid excessively limiting viewers' field of view like traditional videos [5]. Beyond merely narrating, content creators need to recognize their role in shaping the audience's experience within the story.

### **2.2 Career Exploration Content for Children**

At the elementary school level, the suggestion for career development is to focus on inspiring aspiration and expanding perspectives rather than giving career advice [7]. According to Gottfredson, children's aspirations between 9 and 13 years old are

influenced by societal values and then develop into unique personal traits in the subsequent phase [8]. This period presents an opportune time for children to explore careers as a foundational step in their career journey before shaping their distinct identities. Although “career” is closely tied to paid employment, it encompasses an individual's life roles and experiences [9]. Understanding someone's career extends beyond knowing their current job description and involves acknowledging their learning process and progression. To make sure that the story is attractive to children, the narrative should be straightforward, featuring an engaging storyline that involves the removal of elements that do not contribute towards the objective [10].

### 3 DESIGN CONCEPT

The guideline is designed based on the literature review, previous IN360 video evaluation, and IN360 workshop observation. The guideline should help content creators create straightforward stories that consider narrative and technical immersion dimensions to deliver engaging career information. It is designed in three stages: Conceptualization, Story Building, and Production. The Story Conceptualization stage includes the design of the core experience by understanding the audience. Continued by exploring storytelling elements and video outlines in Story Building. Lastly, plan the filming by considering audience attention, direction, and various video elements like visuals, narration, duration, and gimmicks. Each stage will be supplemented by a worksheet which is designed to guide content creators. The guideline is integrated into the IN360 content creation workshop. The workshop consisted of seven sessions, including two field activities. Each phase of the guideline is arranged following the flow of the workshop as shown in Tab. 1.

**Table 1.** Storytelling guideline integration.

Storytelling phase	Workshop session	Key activities
-	Empathy	
Conceptualization phase	Research and interview	Collecting data from the role model Formulate core experience
Story building phase	Story building	Designing storyline and other storytelling elements
Production phase	Production planning	Organizing visual and audio cues in the storyboard
	Field shooting	Production implementation
-	Post-production	
	Presentation	

#### 3.1 Conceptualization Phase

The video's purpose goes beyond children learning from role models; it also aims to evoke their passion and establish a connection with the working world. For content creators to craft a valuable experience and effectively convey the content's message, they must comprehend both the audience and the central role model in the video. The

story's objective is to center on inspiring aspirations and broadening perspectives rather than offering career advice. To enhance the immersive experience, the video should adopt a child's perspective, with the camera serving as the eyes of children, and the role model should use language that elementary children can understand. Additionally, the story will focus on several components introduced during the story-building phase.

To help content creators gain a deeper understanding of the role models, an Interview Mapping Worksheet has been provided, see Fig. 1. Content creators were given the chance to conduct an in-depth interview with the role model to gain insights into their background, work procedures, and workplace environment. These insights are to be formulated into one key point or core experience that they will deliver in their story. Aside from gaining insight, this process not only involves content creators in the role model's life but also assists them in understanding the shooting location, thereby managing expectations, and preparing for the production process.

### **3.2 Story Building Phase**

Considering the diverse backgrounds of content creators, this phase aimed to provide a comprehensive understanding of storytelling elements. These encompassed crucial aspects like theme, settings, characters, point of view (PoV), and plot. It stressed the need for consistent adherence to these elements during content creation. The video's primary theme was explicitly defined: to create a video inspiring children to explore diverse career options. For settings, the directive was clear: they should feature the workplaces of role models, offering a relatable backdrop. Regarding characters, at a minimum, they must include role models and children, establishing a core dynamic resonating with the audience. Additionally, a first-person point of view (PoV) was recommended to enhance engagement and empathy between role models and children.

To maintain consistency and assist content creators, a story outline worksheet was created, see Fig. 1. It comprises: (1) introduction - providing background info, introducing the role model and virtual world, (2) working process - showcasing tools, skills, and workflow of the role model's profession, (3) values of the job - role model sharing personal motivations for their occupation, and (4) working environment - role model giving a workplace tour, with children as main characters. Pace should allow ample time for understanding and exploration.

### **3.3 Production Phase**

Lastly, the production phase: As mentioned earlier, creating a 360-degree video poses a unique challenge where users can easily lose their sense of direction while exploring, potentially drifting from the main narrative [5]. This emphasizes the need for content creators to not only narrate the story but also understand their role in shaping the audience's experience. Striking a balance is crucial to guide the audience without overly limiting their exploration.

To maintain engagement with the main storyline, several elements can be utilized, including cues and gimmicks. Audio cues like character dialogue, sound effects, music, etc., can capture users' attention for important events. Visual cues encompass character

movement, gaze, text, graphics, lighting, special effects, and camera motion. Additionally, orientation cues direct audiences to follow movements, locate sources of sound or motion, and explore visuals. Gimmicks allow content creators to enhance the experience with enjoyable elements for children. The effectiveness can be gauged by observing children's head movements, reactions, and interactions while watching the video.

During this phase, content creators receive a storyboard template for organized scene-by-scene video planning, see Fig. 1. This template aids in managing camera placement and character movement and simulating the entire production process. Moreover, the storyboard serves to align expectations and perspectives among stakeholders.

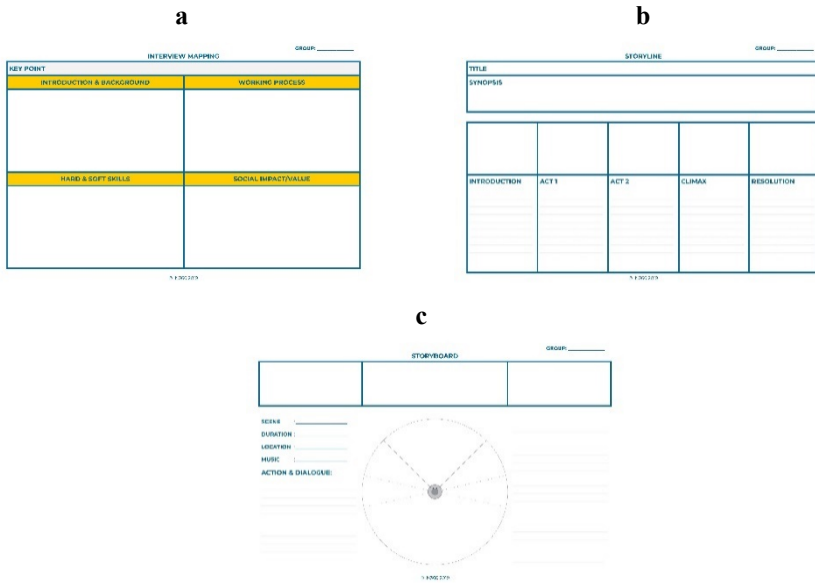


Fig. 1. (a) Interview mapping worksheet; (b) Storyline worksheet; (c) Storyboard template.

## 4 Implementation

The guideline is designed to help IN360 content creators produce career exploration content for children aged nine to twelve in a 360-degree format. It was embedded in a content creation workshop involving content creators and role models. The content produced from the workshop was then delivered to the children over a career exploration corner installed in the rural area.

### 4.1 Content Creation Workshop

A total of three content creation workshops with various formats were conducted. The duration of each workshop varied depending on the format, see Tab. 2. The first one was an in-person workshop in 2019, involving four content creators with only

conventional video production experience. This workshop was conducted for five days in conjunction with a summer school activity conducted by the home university of the participants. They spent around three to four hours every day in the workshop. The second one was a remote asynchronous workshop in the same year with eight creators who had previous 360-degree video production experience. They arranged their schedule within six weeks and produced the video independently with the role models. Lastly, another in-person workshop in 2022 with ten participants who do not have any video-making experience at all. The workshop was conducted at their home university and lasted for six days with three to four hours duration each day.

**Table 2.** Workshops time allocation.

Participant skill level	Workshop format	Workshop duration
Experience in conventional video	In-person	16 hours in 5 days
Experience in 360-degree video	Remote asynchronous	Self-phased in 6 weeks
No experience	In-person	18 hours in 6 days

Participation in the workshop was voluntary. Before the workshop, all participants were questioned about their 360-degree video production skills and then organized into groups of two to four people. This arrangement ensured that each team began with relatively equal experience and ability levels. Throughout the workshop, each group collaborated with a working individual who served as a role model in the video production. The involvement of these role models was also voluntary, and they were briefed about the project before the workshop commenced to ensure their understanding of the video production's purpose. The process of recruiting role models was carried out through two approaches: one involved reaching out to the role models before seeking permission from their company, and the other involved directly contacting the respective company or institution where they were employed.

To facilitate production, each group was provided with a 360-degree camera, two batteries, a micro-SD, a microphone set, and a camera stand. They were also given the same 360-degree video viewing set children would use to enjoy the content. Additionally, each group was asked to use their computer installed with Adobe Premiere Pro CC for editing purposes. Finally, when conducted in person, a classroom equipped with a display and internet connection was also required.

## 4.2 Career Exploration Corner

To evaluate the immersion of the content from the target user's perspective, nine video contents that were created with the guideline (guided) and four videos from previous IN360 contents (non-guided) that fulfill or close to the guideline standard were delivered to the children, see Tab. 3. The experimentation was conducted for two weeks, four days per week and two hours each, at the Career Exploration Corner that IN360 installed in Panglungan Village, located at the slope of Anjasmara Mountain, East Java. The video content was delivered as a part of the Experience component from the Career Exploration program by IN360 [11]. However, in this study, the evaluation is focused

on the interaction between children and the content from the technical and narrative immersion perspective.

**Table 3.** List of video content based on the job title.

Non-guided videos	Guided videos
Game illustrator	Animator
Professor	Biotechnologist
Restaurant owner	Coffee quality control
Video designer	Coffee roaster
	Creative director
	Creative manager
	Fashion designer
	Production administrator
	Production manager

A total of 43 children aged between ten to twelve joined the experiment voluntarily. They were also given a choice to return to watch a different video in the second week. To support their watching experience, two sets of 360-video viewing tools, each consisting of a smartphone, cardboard viewer, and a headphone were provided. Ideally, the corner should be provided with an internet connection. But for prevention measures, the videos that were uploaded to the online platform were downloaded and played in offline mode.

## 5 FINDINGS AND DISCUSSIONS

To examine the effectiveness of the guideline, the validation looked at the application of an actual content creation process and the response of children to the completed content. Observation, survey, and output analysis methods were used to evaluate the implementation of the guideline by content creators. For the asynchronous workshop, the interview was conducted instead of observation. On the other hand, real-time combined with video camera observation and post-activity survey was used to evaluate the interaction between children and the contents. Below is the result of the evaluation.

### 5.1 Conceptualization Phase

During empathizing and brainstorming, participants considered audience traits and the overall video direction. Beyond the guidelines given, content creators generated ideas about how they can introduce jobs to children. “Showcasing job enjoyment”, “adopting a ‘day in the life of’ approach”, and “delivering motivation” were some that they came up with. Through the interview, content creators gained both job details and the personal significance of the job for the role model. Conversations with role models also spurred content creators' career reflections. The interview gave content creators deeper information about the job, but they were often overwhelmed with data. The interview

mapping worksheet helped them to organize the information and distill the key points. These points became the videos' central messages, and it's evident in the outcomes. For instance, the coffee quality control video prioritized environmental awareness, the production manager video encouraged novel experiences, and the creative director video underscored the value of playfulness and creativity.

## 5.2 Story Building Phase

Compared to the previous IN360 workshops, this time the content creators were given space between the research and production time to process the information that they gathered and build a comprehensive storyline suitable for the target audience. Looking at the video results, all groups treated the audience as the main characters of the story, and some even included additional characters other than the role models to emphasize the message or the narrative of the experience. In the coffee roaster, they added a mom character who picked up her kid (the viewer) after exploring the coffee roasting site. Another example could be seen from the fashion designer video where they added a client character who ordered a fashion item from the designer.

Most videos were presented using vibrant and child-friendly language. However, the Biotechnologist video included numerous scientific terms during the role model's explanation of their work. Content creators attributed this to the lack of script preparation due to difficulties in arranging schedules with role models, resulting in unexpected changes in plans. The solution to this could involve creating a well-prepared script or rephrasing the explanation in narration during post-production.

## 5.3 Production Phase

During the production phase, content creators effectively utilized space and incorporated visual and audio cues in their videos. They accurately portrayed the camera as the viewer's eyes, evident in their storyboards, see Fig. 2. This was further demonstrated through camera placement and interactions with role models within the videos. Participant self-assessment, particularly from the third workshop, indicated substantial enhancement in storytelling and 360-degree video production skills. One participant even expressed confidence in teaching others about 360-degree video production.

To ensure smooth production, in addition to the provided storyboard template, one group created an additional production plan document shared with the role model. This approach effectively aligned content creators and role models. Observations revealed that teams conducting interviews on-site with role models streamlined their shooting preparation, whereas those using video conferencing required more time on the day. Role models' active support significantly improved content creators' decision-making during shooting. This support encompassed suggesting technical improvements and adding entertaining elements to the narrative. Content creators expressed overall satisfaction with their concepts, feeling they were well-represented. However, some noted potential enhancements in lighting, sound, and editing quality, when given more time.



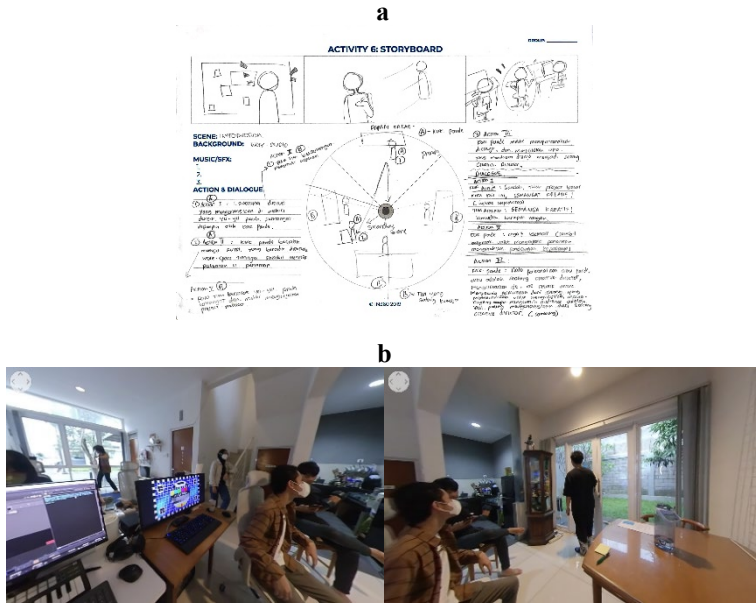


Fig. 2. (a) Video storyboard; (b) Video result.

### 5.4 Children's Technical and Narrative Immersion with The Content

Effective utilization of space and audio-visual cues in video content was also evident in the career exploration corner, where the children interacted with the video by turning their heads around. They also commented on how “the room is beautiful” and “someone is dancing in the video”. The children were asked to rate their interaction with the video from a scale of 0=not at all to 3=completely, and mostly enjoyed the interaction (n=49), see Fig. 3. They were also asked to rate the videos from 1 to 5 stars based on preference. The guided videos got an average of 4 stars or higher. Meanwhile, two of the non-guided videos got above 4 stars, while the game illustrator and the professor videos got 3.8 and 3.4 stars respectively. The former two videos include gimmicks in the video to emphasize the experience. A few children noted the game illustrator video's distant tone. However, specific impact points remain unidentifiable in the data.

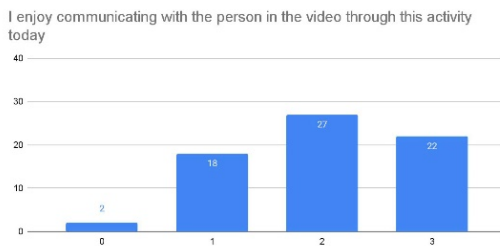


Fig. 3. Children survey result (n=69).

The children also understood the message that the role model wanted to deliver. For example, in the production manager video, whose message is to “always try new things”, the student commented that “I should learn to make my creation”. Some of them were also inspired to pursue similar paths, saying “I want to be a professor” and “I want to be a video maker” in their comments.

## **5.5 Workshop Implementation**

Beyond the guideline, additional factors influenced workshop implementation and video outcomes. Notably, stakeholder comprehension of objectives and scheduling played pivotal roles. Successful guideline execution hinged on shared understanding among workshop facilitators, content creators, and role models. Being on the same page accelerated the production process, as evident in role models’ active idea contributions. However, role models’ busy schedules posed challenges in finding suitable times. In the first workshop, content creators compressed three phases into a day due to the summer camp schedule change. The second workshop saw a group rushing editing due to last-minute role model scheduling issues. In the last workshop, one role model had to be replaced due to a schedule clash with their business trip. Another business trip forced the interview to be done through a video conference platform, with the role model providing the content creators with some pictures of their office. The shooting time was also delayed for a day, resulting in a short time for editing. It was necessary to be flexible and figure out another method to achieve the objective.

## **5.6 Equipment and Facility Requirements**

The basic equipment and facilities for implementation were provided for both the content creation workshop and the career exploration corner. However, some challenges related to the quality of the equipment occurred. One of the groups received defective batteries that could not be charged, so it expanded the production time, taking more of the role model’s time. Rechecking all the equipment before field shooting is crucial in ensuring smooth production. On the other hand, the internet quality during the content exploration was unpredictable as predicted before. Thankfully the decision to download all contents in a high quality beforehand helped the running of the exploration.

# **6 CONCLUSIONS**

This research explored the design of an immersive storytelling guideline to create career exploration content in a 360-degree video environment. The guideline was designed by focusing on the technical and narrative immersion of the video and categorized into three phases. The implementation of the guideline through content creation workshops enabled content creators to produce videos that met the expected standard by IN360 and were enjoyable for children. In-person workshops were suitable for content creators with minimum experience, while those with prior experience could manage remote activity. Also, a more flexible workshop arrangement to accommodate the busy schedule

of the role models can be arranged in the future for more robust video production. Stakeholder's understanding of the goal, better schedule coordination with them, and supporting equipment are some of the additional factors that could assist production, as well as the delivery of the contents to the target users.

Children demonstrated promising immersion from the technical and narrative perspectives. However, more data on the specific parts of the video that are of interest to the children could give better suggestions for future content production. Replicating the workshop with more diverse content creators and role models and reaching other rural areas in Indonesia could increase the validity of the result. Note that this research mainly focused on rural Indonesian children's career exploration. The needs of career exploration for children may vary, so adjustments would be needed when applying this guideline for content creation in different regions.

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