The feeling of 'Being There' in 360° videos increase news credibility

Naveed Ullah Hashmi[1*], Dr. Wajid Zulqarnain[2], Dr Noman Ahmed[3]

[1,3]Riphah Institute of Media Sciences (RIMS), Riphah International Universtiy, Islamabad, Pakistan
[2]Department of Media Sciences, Shaheed Zulifkar Ali Bhutto Institute of Science and Technology (SZABIST) Islamabad, Pakistan
*Corresponding author email address: naveeduhashmi@gmail.com

ABSTRACT
Virtual reality news videos are paving its place in the new journalism. Particularly, in the flood of fake news items the potential use of VR news has been increased as this technology provides more sense of presence than the traditional content. There are few studies that empirically supports that sense of presence has direct effects on news credibility therefore the aim of this study is to explore the relationship between sense of presence and news credibility. For this experimental method was applied in which 360° video was selected from "The New York Times". 154 male and female students of the media department were voluntarily recruited. 2D-video and 360° version of the video were shown to them. Their responses were collected on the pre-structured questionnaires. The results validate the previous findings of the studies that there is a positive and significant relationship between sense of presence and news credibility. This study has theoretical implications as well it could be helpful for the technology developers and policy makers.

INTRODUCTION

For news, the umbrella term 'immersive journalism' is applied for headings that offer first-hand experience of the incidents/stories to the users. It creates a world for the users to play their active role. Driven by high-tech encroachments in 360° Video, Augmented Reality (AR) and Virtual Reality (VR), Immersive Journalism started gaining recognition as a modern genre from 2015(Sagnier, Loup-Escande, Valléry, Understanding, & Changes, 2021).

Principally, Immersive Journalism is a sub-class of journalism. It applies virtual reality (VR) (and other similar technologies) to provide users with a sense of being completely involved in the news reports. Hence allowing consumers to build a direct connection with the story.Latterly, Virtual Reality has arisen from its premature and investigational phase to a more cohesive fraction of many news studios. Concomitantly, technological advances have made the medium obtainable to users.

Virtual reality is hybrid form of journalism called Immersive journalism. It is because it fuses multiple items together such as journalistic languages, cinema, video games and other paraphernalia located at the interface of the social biospheres."VR content if done well is really powerful. It can make you quake with fear, it can make you laugh with joy and it can make you cry", Zillah Watson shared in a 2017 interview. She is the Commissioning Editor for VR at BBC (Watson, 2017).

The emotional reactions of the user play a dominant role in this experience. Immersive journalism has a direct impact on the use of VR (Baía Reis & Coelho, 2018). It is "an experimental approach that allows users to experience, and subsequently be immersed in, stories created not in the real world but in a virtual, augmented, or mixed reality" (Sagnier et al., 2021) and in this case the preliminary expectations are expected to be higher.

DIGITAL JOURNALISM AND FEELING OF "BEING THERE"

"The amalgamation of VR and journalism has steered the advent of 'Immersive Journalism'" (Paino Ambrosio & Rodríguez Fidalgo, 2021), which is defined as "the production of news in a form in which people can gain first-person experiences of the events or situations described in news stories" (Cárdenas, Feria, Palacios, & De la Peña, 2010).

Thus it "immerses users into another reality (the news story), takes over their attention and makes them feel part of it, which leads them to react within that virtual environment as they would do in the physical world" (Paino Ambrosio & Rodríguez Fidalgo, 2021). "The fundamental idea of immersive nonfiction is to allow the audience to actually enter a virtually recreated scenario representing the story" (Cárdenas et al., 2010).

The aforesaid immersion concept or the "suspension of disbelief" may result in drawing assumption that consumers might need to relinquish their control or agency while experiencing the virtual environment (Jacoby, Ferneau, & Humphries, 1994).Undeniably, immersion is "not the prim suspension of disbelief, but its joyous capsizing" (Baía Reis & Coelho, 2018). Henceforth currently, the focus is more on agency and cognition of the consumer: "Rather than immersion being an external factor given to users, immersion is a fluid state that is processed and determined by users" (Shin & Biocca, 2017). With this

impression shows up the inherent partisanship. The subjectivity makes immersion challenging to study and grasp, "I cannot experience your immersion, and you cannot experience mine" (Hassan & Ghaib, 2020).

There are a plethora of technology-oriented approaches to immersion, nevertheless, the Cummings and Bailenson (2016) approach seems worth the attention (Cummings & Bailenson, 2016). The researchers of this methodology have presented immersion and the technological quality of media as being objective; while on the contrary, the notion of presence as "a psychological experience of being there" (Cummings & Bailenson, 2016) and hence, subjective.

Alternatively, immersion is "the sense of being in the place depicted by the virtual displays" (Cárdenas et al., 2010). The deliberation on the orientation of immersion is still underway. It is still a question whether immersion is technology-oriented or user-centric concept. This debate indeed is not new. In 1994 there was fright of "placing too strong an emphasis on the technology, as this may only lead us into a dead end" (Jacoby et al., 1994).The best solution is to take both approaches side by side. The theory delivered by the technology is immersion like VR features and it is experienced by consumers as in the sense of presence.

Whereas the notion of presence may be stared as a "two-dimensional construct" (Cummings & Bailenson, 2016), in which "the media users build a mental representation of the space portrayed by the media product (…) [and] position themselves and realized action possibilities within that space" (Wirth et al., 2007). And "much of immersion is related to user subjectivity and the objectivity of the technology" (F. Biocca, Kim, & Levy, 1995); Henceforward, both perspectives have to be considered while studying and generating journalistic content using VR.

In a research, contributors pointed out Virtual Reality stories (aka VR) ominously beaten text-based content in different categories, it proved the feeling to being there and sense of presence to its users. Moreover, it also helped enhance their empathy with the story's characters, shared the Co-Director of the Media Effects Research Laboratory, S. Shyam Sundar. He is also a distinguished Professor of Communications at a University. Also shared that watching 360-degree videos through cardboard, VR user experience was more interesting than viewing with the same videos using computer screens or other mediums (Sundar, Jia, Waddell, & Huang, 2015).

"VR stories provide a better sense of being right in the midst of the story than text with pictures and even 360-degree video on a computer screen," Sundar added. "This is remarkable given that we used two stories from the New York Times Magazine, which were high quality and rich in imagery even in the text version."

Even though Virtual Reality outpaced videos and text, the academics cautioned that depending too much on some of the gaudier design elements of VR may destroy trustworthiness and credibility. It may also cause the users to doubt the story content. The researchers found that inducing a greater sense of "being there" was related with lower credibility rating (For the New York Times).

"What really makes people trust VR more is that it creates a greater sense of realism compared to text and that creates the trustworthiness," said Sundar. "But, if it doesn't give that sense of realism, it can affect credibility. If developers try to gamify it or make it more fantasy-like, for example, people may begin to wonder about the credibility of what they're seeing."

IMPACT ON PRESENCE ON PERCEIVED CREDIBILITY

Numerous researchers attempted to ascertain the association between the feeling of presence and perceived credibility of the content. They found that there exists a correspondence between involvement and the credibility source. It shows that users' feeling of presence might impact the source credibility agreeing to the immersion level they experience when using media (Gunther, 1992).

Audience watching news of a higher image quality via high-definition television transmission are seen to have higher levels of immersion. Also, the probability to take such news stories as more credible also increased (Cheryl Campanella Bracken & Skalski, 2006).

There is also liaison between the size of screen and viewers' perception on the credibility of content source (Cheryl C Bracken, Neuendorf, & Jeffres, 2003). Studies found that the perceived trustworthiness on content source gets influenced by users' sense of presence; and particularly, their immersion experience. The credibility of simulation essentially depends upon realism (Couture, 2004). When the simulation seems real or believable (with real-time settings), it is more probable to be evaluated as more credible and conclusive.

TIM proposes a reasonable clarification of the correlation among presence, animation, and credibility (Green, Brock, & psychology, 2000). The core postulation of the TIM reveals that an intense and comprehensive depiction can take users out of veracity and transmit them into a re-counted world (Green & Brock, 2002). For instance, watchers' attitude toward a news link illustrating a killing changed after reviewing an explosion video via VR (Green et al., 2000). The users' preoccupation in that story was noticed to have increased, and they also became more alacritous to assent the content of that news story.

The TIM and theories of 'being there' are founded on analogous assumptions (W. F. J. I. Bracken, 2005). Both postulate that viewers are transmitted into an umpired realm. Moreover, they also say that this transmission can interrupt their prevailing beliefs about the actual world.The TIM offers a predominantly beneficial framework for the investigation of watchers' insights on news chunks (Cheryl Campanella Bracken & Skalski, 2006). It elucidates the application of sensational and sizzling animations illustrate vividly real-time crime scenes and it can offer audience with a sense of eye witnessing the

delinquency as their first-hand experience (Lo & Cheng, 2017).

Consequently, it is argued that the application of buoyant characters, sound effects, and dialogues in broadcast journalism heightens watchers' sense of presence and consequently, their valuation of news credibility also increases. The offered model is established in harmony with the aforementioned discoveries and relative evidence with the research.The sense of presence in news reporting is sculpted as mediator for the association between the application of dramatic animation and perceived credibility.

Unambiguously, it is hypothesized that in news reports, the application of tools like melodramatic animation enhances reviewers' feeling of presence and hence, it increases their chances to take the presented news as more credible.Since immersion leads to more presence, the viewer's sense of "being there" in the virtual environment also increases. This is a psychological phenomenon and this psychological 'sense of being there' can be taken as an embryonic property of an IVE. It is imperative to cognize the aspects that add to this, and contribute to the means of enumerating the perception of presence itself.

Hence, the precise definition of Virtual Reality includes the notion of presence: "A virtual reality is defined as a real or simulated environment in which a perceiver experiences telepresence." (Steuer, 1992).While presence is interchangeably defined as the "real-time feeling," "on spot engagement," "perception," "current action," and "real-time sensation." Notwithstanding from the issue of what is or sensed, engaged with, acted upon, being felt, perceived – all these definitions make it profusely clear that the interrogation on how users comprehend the phenomena of presence. As a result, and the given definitions further validate that researchers have established differing and coinciding delineations of presence.

As they analyze the different aspects or classes of presence with and without labels including subjective, co-presence, corporeal, virtual, telepresence, social, immersive, spatial, environmental, and perceived presence – the conceptual ambiguity burgeons.

There have been six different dimensions of presence identified. All these are taken from miscellaneous literature sources and found out that the feeling of 'being there' in a computer-generated environment is not identical with the consciousness. However, as consciousness it is a universal percept adhering from engagement. And it is the action of the sensorimotor system with stimuli, intention, and motor action (Lombard & Ditton, 1997).

As presence, from the start is being thought of as multi-dimensional and it deals with a wide-ranging and integrated nature of spatial VR experience. And the social involvement (social presence) of other seemingly intelligent entities interceded humans or agents are also there (F. J. J. o. c.-m. c. Biocca, 1997; Heeter & Environments, 1992; Held, Durlach, & Environments, 1992)

"Terminological and other confusions about what comprises presence, and what does not, have impeded progress in the field. At the current time, no unifying theory of presence is possible, because the word 'presence' is being used differently by different researchers" (Waterworth, Waterworth, Riva, & Mantovani, 2015).

Over a decade ago, the research statements (and echoed by numerous 'presence' academics) seems proved: "researchers in the area agree that there is something important conveyed by the term, but differ widely on exactly what that something is" (Riva & Waterworth, 2003).

THE TELEPRESENCE THEORY & ROLE OF IMMERSIVE JOURNALISM

This given theory reviews telepresence in Virtual Reality through the human involvement perspective that goes beyond technology. Since Virtual Reality refers to an interceded experience of human beings, the locus of Virtual Reality then, moves from hardware to the discernments of individual users. The Telepresence theory advocates that Virtual Reality investigations analyze discrete experiences, their differences, and perceptual procedures in defining its nature and impact (Steuer, 1992).

As mind controls thoughts and perceptions. So, the cognitive system of human beings elucidates perceptual contrivances in real-time communication. In the intermediated environment when telepresence experience is there, users can interrelate and experience sensory stimuli engaged within the environment. Therefore, telepresence essentially involves both, perceiver and technology (Held et al., 1992).

Since this telepresence concept exams human insights through interceded experiences, and the contributing factors for this are interactions and vividness. Watchers of Virtual Reality can expect sensorial abundance (vividness) in the mediated settings. They may also execute their control over a virtual environment for instance, range, experience mapping (interactivity), and speed (Steuer, 1992).

The outcomes of Virtual Reality news experience in this aspect could vary. It mainly depending on the layout used by individual experiences and how they feel about those moments. User experiences more approachability to the mediated material and low openness to the unmediated data. This leads to higher valuation of their experience (Kim & Biocca, 1997; Mahood & Hanus, 2017)

As the Virtual Reality environment is more likely to offer higher telepresence compared to the 2d static photos and video shots; this experience can increase the acceptability of communication. As a result, VR produces a captivating sense of telepresence. It is because the environment offers, breadth, proximity, richness of mediation, and spatial presence (Suh & Lee, 2005). Via telepresence through which the empirical sensory stimuli are carried, Virtual Reality permits viewers to grab the story concept.

TELEPRESENCE & VIRTUAL REALITY NEWS CREDIBILITY

Since credibility refers to the extent of confidence that news viewers have on news organizations, media, and news resources.Furthermore, the resources and news content also include in this. And credibility can also be impacted by the technology chosen.

Then, there are also other questions on immersive Virtual Reality news that it can affect the news credibility and wane its ability to present facts to the users. Watchers weigh news quality using objectivity, preference, and representativeness. In customary journalism, news values accentuate the satisfaction for audience via the three aforementioned aspects: preference, representativeness, and objectivity.

The drive of immersive journalism is not merely to offer facts. It is rather more than this. It gives an opportunity to experience facts to the users. Their experimental experiences discern that immersive Virtual Reality news having higher level of telepresence will have more credibility, and the user feedback experience that used Virtual Reality interface devices are proficient of triggering a greater level of immersion and thus, designating a better level of trust in the news content.

Likewise, Nielsen and Sheets demanded that VR can put considerable value to the conventional news products that can potentially boost trust and user engagement. The news credibility can be demarcated quantitatively; for instance, Meyer, projected a particular 'credibility scale' for measuring this facet of the immersive Virtual Reality news product (Cárdenas et al., 2010).

This research examines the extent to which Virtual Reality news offers telepresence while comparing with other news sources. If this experience can impact the news credibility evaluation or not. One of the other researches explains that the characters of telepresence are equated with the news credibility among different formats of Virtual Reality news.Previous studies proposed that virtual reality video provide the distinct telepresence experience than a conventional video (Coleman & Ross, 2010; Suh & Lee, 2005).

Indeed, various researches show that the telepresence experience impacts the positive analysis of news credibility. In four different experimental states including Virtual Reality news video clip with head mounted device, 360° Virtual Reality news clip, 2d news video, and controlled group (no exposure to VR news), participants in this research analyzed different aspects of telepresence and news credibility.In the end, the following research model and hypotheses are proposed to structure data collection and analysis:
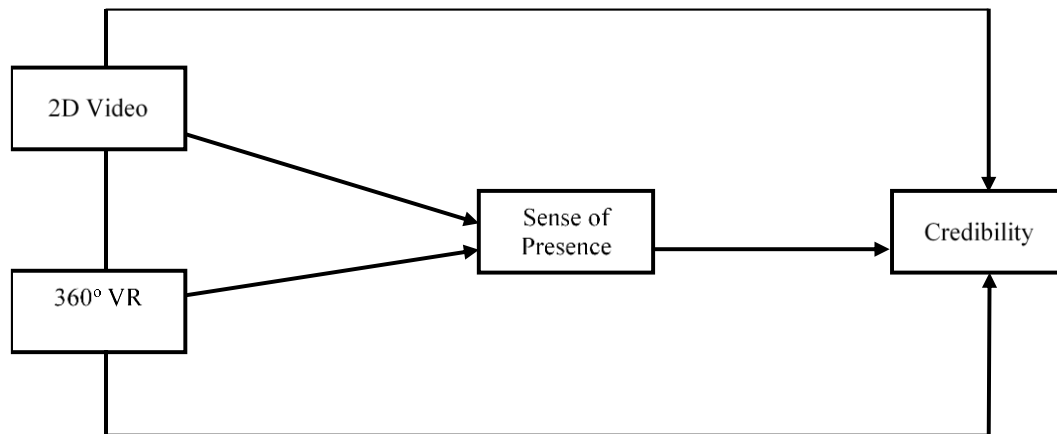
Research Model

Figure 1. Research Model

Research Hypotheses
H₁. Watching 2D video will create sense of presence
H₂. Watching 360° VR will create sense of presence
H₃. Watching 2D video will create credibility
H₄. Watching 360° VR will create credibility
H₅. Watching 360° VR will create more sense of presence as compare to 2D Video
H₆. Watching 360° VR will create more credibility as compare to 2D Video
H₇. Sense of presence has a positive association with credibility
H₈. Sense of presence mediates the relationship between watching 2D Video and credibility
H₉. Sense of presence mediates the relationship between watching 360° VR and credibility

METHODOLOGY

An experimental designed is used to investigate the sense of presence and news credibility. A purposeful 360° video was selected from the website "The New York Times" named "Carbon-Neutral Dream Eludes Oasis City Near Abu Dhabi" about the driverless car and world's first carbon free city. Duration of the video was 1 minute and 35 seconds. Total 154 participants were selected for the experiments who exposed on 2D-video and 360° video of the same news content. All the participants were university students. The participants used the computer led screen to view the content and Oculus Quest 2 head mounted device for the 360° VR Video.

MEASURES

According to the research model two main elements need to be measure i.e. sense of presence and credibility.

SENSE OF PRESENCE

Igroup Presence Questionnaire (IPQ) was adapted to measure the sense "of being there"(Schubert, Friedmann, Regenbrecht, & Environments, 2001). Total 8-item IPQ was derived on the bases of research model to analyses the sense of presence. 7-point Likert scale was used. The post-questionnaire was asked from the viewers about the selected video Carbon-Neutral Dream Eludes Oasis City Near Abu Dhabi by using head mounted devices as well as LED. (α = .870).

CREDIBILITY

To measure the news credibility, McGrath & Gaziano (1986) scale was used. 9-items were adapted out of 12-itmes out (Gaziano & McGrath, 1986). The responses were evaluated in 7-point Likert scale. The value of Cronbach's Alpha for credibility scale was α = 0.923.

RESULTS AND FINDINGS

Table 1:   Gender

	Frequency	Percent	Valid Percent	Cumulative Percent
Male	82	53.2	53.2	53.2
Female	72	46.8	46.8	100.0
Total	154	100.0	100.0	

Table 1 shows the gender-based spreading. Code 1 was assigned to male participants and code 2 was assigned to female. Out of 154 responses 53% were male and 47% were female participants, which show that male participants are 6% higher than female.

Table 2: Education

	Frequency	Percent	Valid Percent	Cumulative Percent
UG	110	71.4	71.4	71.4
PG	44	28.6	28.6	100.0
Total	154	100.0	100.0	

Table 2 depicts the educational background of the participants. Code 1 was assigned to undergraduate students and code 2 was assigned to postgraduate students. Results shows that 71% of the students were from undergraduates and 29% of the students were from postgraduate.

Table 3:   Scale Reliability Analysis

S.#	Reliability	Cronbach's Alpha α	Interpretation	Number of Items
	Sense of Presence	.870	Excellent	
	Credibility	.923	Excellent	
	2D Video	.797	Good	
	360° VR	.795	Good	

The table 3 shows the reliability of the instrument. The Cronbach's alphas for all the variables are above 0.70, shows that the instrument used for the current study was reliable for the data collection of the variables.

CORRELATION

Table 4:   Correlation

	Sense of Presence	Credibility	360o VR	2D- Video
Sense of Presence	1			
Credibility	.781**	1		
360o VR	.738**	.856**	1	
2D- Video	.398**	.473**	.391**	1

**. Correlation is significant at the 0.01 level (2-tailed).

Table 4 shows the correlation results to analysis the strength and direction between different variables. of The Pearson's correlation analysis was performed to measure the analysis.The sense of presence has strong and positive correlation with credibility (r=.738, p<.01), which shows that increase in sense of presence will lead to increase in credibility. Sense of Presence has a positive and strong relationship with 360º Videos. The result shows the high relationship between sense of presence and 360º videos. Whereas the relationship between sense of presence and 2D-Video has positive and moderate relationship.

Table 5: Regression

Hy	IV	DV	R Square	F	B	t	Sig.
H1	2D - Video	Sense of Presence	.559	95.709	0.112	2.208	.000
H2	360º VR				0.808	11.710	.000
H3	2D - Video	Credibility	.755	232.881	0.155	3.736	.000
H4	360º VR				1.016	18.106	.000

The results of data analysis for hypothesis 1and hypothesis 2 shows that 55.9% variation (R2 = .559, F=95.709, p <0.1) in sense of presence is being predicted by the 2D-Video and 360º VR. The 2D video coefficient (β = 0.112, p<.01) indicates that will one unit change in 2D video will change the sense of presence 0.112. Similarly, the 360º VR coefficient (β = 0.808, p<.01) indicates that will one unit change in 360º VR will change the sense of presence 0.808.

Hypothesis 3 and hypothesis 4 shows that 75.5% variation (R2 = .755, F=232.881, p <0.1) in credibility is prophesied by 2D-Video and 360º VR. Coefficient (β = 0.155, p<.01) of 2D Video indicates that will one unit change in 2D video will change the credibility 0.155, and coefficient (β = 1.016, p<.01) of 360º VR indicates that one unit of 360º VR will change the 1.016 in credibility.

Table 6: Comparative analysis of sense of presence using 2D Video and HMD

Device Used	B	t	Sig.
2D - Video	.112	2.208	.029
360º VR	.808	11.710	.000

Table 6 shows the comparative analysis of sense of presence while using 2D Video and 360º VR. The value of coefficient while using 2D video (β = .112, p<.01) is low as compare to the value of coefficient which using 360º VR (β = .808, p<.01), shows that sense of presence is high in 360º VR.

Table 7: Results of Indirect Hypothesis

	Effect	SE			LLCI	ULCI
Total effect of X on Y	0.4474	.0676	6.6171	0.0000	0.3138	0.5810
Direct effect of X on Y	0.1820	.0503	3.6204	0.0004	0.0827	0.2814
	Effect			BootSE	LLCI	ULCI
Indirect effect of X on Y	0.2654			0.0689	0.1414	0.4153

By using the bootstrapping method suggested by Hayes (2009), the indirect hypotheses of the study were tested (Preacher & Hayes, 2009). The results of table 7 show the total, direct and indirect effect of 2D-video on credibility through sense of presence. The estimates show that video positively effects on credibility β=.4474, p<0.001, 95% CI [0.3138, 0.5810]. The video directly positive impacts on credibility β=.1820, p<0.001, 95% CI [0.0827, 0.2814], showing that with one unit increase in video will be change 0.182 unit change in the credibility. The estimates also indicate the at the indirect effect of video on credibility through sense of presence is significant β=.2654, p<0.001, 95% CI [0.1414, 0.4153], which shows that sense of presence positively mediates the relationship between 2D-video and credibility. The results show the strong support for the hypothesis showing that 2D-video promote the sense of presence, moreover positive affect in credibility positively.

Table 8: Results of Indirect Hypothesis

	Effect	SE			LLCI	ULCI
Total effect of X on Y	1.0978	.0538	20.4036	0.0000	0.9915	1.2041

Direct effect of X on Y	0.7874	.0723	10.8873	0.0000	0.6445	0.9303
	Effect			BootSE	LLCI	ULCI
Indirect effect of X on Y	0.3105			0.0903	0.1603	0.5165
Normal theory test for indirect effect						

The results of table 8 show the total, direct and indirect effect of 360° VR video on credibility through sense of presence. The estimates show that video positively effects on credibility β=1.0978, p<0.001, 95% CI [0.9915, 1.2041]. The video directly positive impacts on credibility β=.7874, p<0.001, 95% CI [0.6445, 0.9303], showing that with one unit increase in 360° VR video will be change 0.787 unit change in the credibility. The estimates also indicate the at the indirect effect of video on credibility through sense of presence is significant β=.3105, p<0.001, 95% CI [0.1603, 0.5165], which shows that sense of presence positively mediates the relationship between 360° VR video and credibility. The results show the strong support for the hypothesis showing that 360° VR video promote the sense of presence, moreover positive affect in credibility positively.

DISCUSSION

The study was designed to evaluate the sense of presence and credibility in the news video content. The news content was compared with 2D-Video clip and 360° virtual reality video clip. As previous research explained that 360° VR news are more useful as compare to 2D news (Kang, O'Brien, Villarreal, Lee, & Mahood, 2019). Results indicate the immersion of audience in the environment while using 360° VR (Kim & Biocca, 1997). The results of hypothesis 1 and 2 present the high level of sense of presence in video content while using the head mounted device as compare to the normal 2D-video. The experiment lead that the video content creates a new environment for its viewers and feel the sense of presence. The comparison show that participants feel more sense of presence while using 360° virtual reality.

Study suggested that there is high level of significant difference in news credibility while watching 2D news and 360° VR using head mounted devices (Kang et al., 2019). The results of hypothesis 3 and 4 are formulated to investigate the credibility in the content. The hypothesis show that the content is more credible while using 360° VR Video. The sense of presence in the 2D-Video and 360° VR video lead to the credibility of the content. Results show that 360° VR video seems more credibility as compare to 2D-Video. The comparative results of show that the sense of presence in 360° VR is higher than 2D-Video Therefore, the 360° VR content has the potential tool for the engaging its audience and creating more credible content for the news industry.

CONCLUSION

Virtual reality has been becoming a real reality in the news world. With the impressive notion of sound, motion, graphics, text and above all a very effective feeling of "being there" this technology has very novel ways of reporting and storytelling. The sense of presence not only increases the understanding of the news content but also it gives the audience experience of first-hand perspective. The audience of VR videos can easily differentiate the fake and true content in addition to that this technology make the content ever memorable.

CREDIT AUTHOR STATEMENT

Naveed Ullah Hashmi: Visualization, Data curation, Software, Writing- Original draft preparation, **Dr. Wajid Zulqarnain:** Conceptualization, Methodology, Data curation, Writing- Reviewing and Editing, Supervision **Dr. Noman Ahmed:**, Investigation, Software, Validation

COMPLIANCE WITH ETHICAL STANDARDS:

It is declare that all authors don't have any conflict of interest. Furthermore, informed consent was obtained from all individual participants included in the study.

REFRENCES

Baía Reis, A., & Coelho, A. F. V. C. C. J. D. J. (2018). Virtual Reality and Journalism: A gateway to conceptualizing immersive journalism. *6*(8), 1090-1100.

Biocca, F., Kim, T., & Levy, M. R. J. C. i. t. a. o. v. r. (1995). The vision of virtual reality. 3-14.

Biocca, F. J. J. o. c.-m. c. (1997). The cyborg's dilemma: Progressive embodiment in virtual environments. *3*(2), JCMC324.

Bracken, C. C., Neuendorf, K. A., & Jeffres, L. W. (2003). *Screen size, source credibility, and presence: Audience reactions to the televised 2000 presidential debates.* Paper presented at the Communication Theory and Methodology Division at the annual conference of the Association for Education in Journalism and Mass Communication, Kansas City, July.

Bracken, C. C., & Skalski, P. (2006). *Presence and video games: The impact of image quality and skill level.* Paper presented at the Proceedings of the ninth annual international workshop on presence.

Bracken, W. F. J. I. (2005). Is there a puzzle about how authentic dasein can act?: A critique of dreyfus and rubin on being and time, division II. *48*(6), 533-552.

Cárdenas, E. M., Feria, M., Palacios, L., & De la Peña, F. J. M. I. N. d. P. R. d. l. F. y. S. d. S. (2010). Guía clínica para los trastornos de ansiedad en niños y adolescentes.

Coleman, S., & Ross, K. (2010). *The media and the public:" them" and" us" in media discourse* (Vol. 9): John Wiley & Sons.

Couture, M. J. J. o. C. A. L. (2004). Realism in the design process and credibility of a simulation-based virtual laboratory. *20*(1), 40-49.

Cummings, J. J., & Bailenson, J. N. J. M. P. (2016). How immersive is enough? A meta-analysis of the effect of immersive technology on user presence. *19*(2), 272-309.

Gaziano, C., & McGrath, K. J. J. q. (1986). Measuring the concept of credibility. *63*(3), 451-462.

Green, M. C., & Brock, T. C. (2002). In the mind's eye: Transportation-imagery model of narrative persuasion.

Green, M. C., Brock, T. C. J. J. o. p., & psychology, s. (2000). The role of transportation in the persuasiveness of public narratives. *79*(5), 701.

Gunther, A. C. J. P. o. q. (1992). Biased press or biased public? Attitudes toward media coverage of social groups. *56*(2), 147-167.

Hassan, A. F. A., & Ghaib, N. H. J. J. o. B. C. o. D. (2020). The impact of various staining substances and immersion time on the stainability of bonded sapphire brackets with three kinds of light cure orthodontic adhesives (An in-vitro study). *32*(3), 1-7.

Heeter, C. J. P. T., & Environments, V. (1992). Being there: The subjective experience of presence. *1*(2), 262-271.

Held, R. M., Durlach, N. I. J. P. T., & Environments, V. (1992). Telepresence. *1*(1), 109-112.

Jacoby, R. H., Ferneau, M., & Humphries, J. (1994). *Gestural interaction in a virtual environment.* Paper presented at the Stereoscopic Displays and Virtual Reality Systems.

Kang, S., O'Brien, E., Villarreal, A., Lee, W., & Mahood, C. J. D. j. (2019). Immersive Journalism and Telepresence: Does virtual reality news use affect news credibility? *, 7*(2), 294-313.

Kim, T., & Biocca, F. J. J. o. c.-m. c. (1997). Telepresence via television: Two dimensions of telepresence may have different connections to memory and persuasion. *3*(2), JCMC325.

Lo, W. H., & Cheng, B. K. L. J. J. S. (2017). The use of melodramatic animation in news, presence and news credibility: a path model. *18*(6), 787-805.

Lombard, M., & Ditton, T. J. J. o. c.-m. c. (1997). At the heart of it all: The concept of presence. *3*(2), JCMC321.

Mahood, C., & Hanus, M. J. P. o. P. M. C. (2017). Role-playing video games and emotion: How transportation into the narrative mediates the relationship between immoral actions and feelings of guilt. *6*(1), 61.

Paino Ambrosio, A., & Rodríguez Fidalgo, M. I. J. J. (2021). Proposal for a new communicative model in immersive journalism. *22*(10), 2600-2617.

Preacher, K., & Hayes, A. (2009). SPSS and SAS macro for bootstrapping specific indirect effects in multiple mediation models. In: Retrieved.

Riva, G., & Waterworth, J. A. J. P. c. (2003). Presence and the Self: A cognitive neuroscience approach. *3*(3).

Sagnier, C., Loup-Escande, É., Valléry, G. J. D. T. i. t. C. o. A., Understanding, W., & Changes, S. T. (2021). Virtual Reality: Definitions, Characteristics and Applications in the Workplace. *3*, 31-44.

Schubert, T., Friedmann, F., Regenbrecht, H. J. P. T., & Environments, V. (2001). The experience of presence: Factor analytic insights. *10*(3), 266-281.

Shin, D.-H., & Biocca, F. J. I. R. (2017). Explicating user behavior toward multi-screen adoption and diffusion: User experience in the multi-screen media ecology.

Steuer, J. J. J. o. c. (1992). Defining virtual reality: Dimensions determining telepresence. *42*(4), 73-93.

Suh, K.-S., & Lee, Y. E. J. M. Q. (2005). The effects of virtual reality on consumer learning: An empirical investigation. 673-697.

Sundar, S. S., Jia, H., Waddell, T. F., & Huang, Y. (2015). Toward a theory of interactive media effects (TIME): Four models for explaining how interface features affect user psychology.

Waterworth, J. A., Waterworth, E. L., Riva, G., & Mantovani, F. (2015). Presence: Form, content and consciousness. In *Immersed in Media* (pp. 35-58): Springer.

Watson, Z. (2017). VR for news: The new reality?

Wirth, W., Hartmann, T., Böcking, S., Vorderer, P., Klimmt, C., Schramm, H., . . . Gouveia, F. R. J. M. p. (2007). A process model of the formation of spatial presence experiences. *9*(3), 493-525.