Reducing Cyber Violence and Fostering Empathy Through VRN4RCV Model: Expert Review

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***Abstract*—Cyber violence has become increasingly prevalent, necessitating innovative intervention strategies. VR technology, with its immersive and empathetic capabilities, provides a unique opportunity for influencing behavioral change among perpetrators of cyber violence. This study proposes a conceptual design model for VR news, aimed at fostering empathy through immersive experiences to reduce cyber violence. The model was validated through three cycles of expert review. Expert feedback highlighted the model's relevance and applicability while offering constructive suggestions for refinement. The findings indicate that this conceptual model provides a practical guide for designing VR news that effectively addresses the issue of cyber violence. Future research will include prototype testing and empirical evaluation to assess the model's impact on behavioral change and empathy enhancement.**

Keywords*—Cyber violence; VR news; empathy; conceptual model; expert review

I. INTRODUCTION

With the rapid development of digital technologies, cyber violence has emerged as a significant global social issue, posing serious threats to individual mental health and societal harmony. Studies have shown that victims of cyber violence often suffer from psychological problems such as anxiety, depression, and low self-esteem, and in more severe cases, may even develop suicidal ideation [1]. The aggressive behavior of cyber violence perpetrators is frequently driven by a lack of emotional empathy and is further amplified by the anonymity afforded by the internet, which exacerbates both the complexity and pervasiveness of this phenomenon [2].

Although a number of intervention strategies have been proposed—such as content filtering mechanisms on social media platforms, legal sanctions, and educational initiatives—these approaches have demonstrated limited effectiveness in fundamentally changing the attitudes and behaviors of perpetrators [3]. At the core of this limitation is a lack of focus on the emotional cognition of aggressors. Traditional educational methods often fail to effectively elicit empathy, making it difficult to achieve deep, lasting behavioral change [4].

Virtual reality (VR) technology, with its high degree of immersion and contextual simulation, offers a promising alternative. Through first-person narratives and the recreation of real-life cases, VR can immerse users in the virtual scenarios of victims, thereby eliciting empathetic responses and enhancing users' awareness of the consequences of cyber-violent behavior [5]. Existing studies indicate that immersive experiences can significantly enhance emotional resonance and promote shifts in social attitudes [6]. However, most current research focuses on VR's potential to increase empathy or social awareness in general [7-8], rather than exploring how VR news—a novel form of immersive storytelling—can be systematically applied to promote attitudes or behavioral change. In particular, little attention has been paid to incorporate Embodied Social Presence (ESP) theory into VR news to trigger situational empathy in cyber violence perpetrators. This represents a clear gap in both theoretical exploration and methodological application.

To address this gap, this study proposes a conceptual design model for VR news aimed at reducing cyber violence, referred to as VRN4RCV (VR News for Reducing Cyber Violence). This model integrates principles of VR news with the theoretical of embodied social presence. It seeks to evoke empathy through first-person embodied experiences that simulate the emotional and psychological realities of victims, thereby encouraging perpetrators to engage in self-reflection at both the emotional and cognitive levels, and ultimately facilitating behavioral change. To ensure the feasibility of the model, a three-cycle expert review process was conducted. The feedback not only confirmed the model's theoretical relevance and practical applicability but also offered constructive suggestions for structural and functional improvement.

To achieve the research objectives, this study first conducted a systematic review of the relevant literature to identify the key elements of VR news and ESP as reflected in existing models. Based on these elements, an initial version of VRN4RCV model was constructed. The model then underwent three cycles of expert evaluation and iterative refinement. Expert feedback confirmed the model's theoretical relevance and practical applicability, while also providing constructive suggestions for structural improvements and element configuration. Upon reaching a high level of consensus among the experts, the final version of VRN4RCV model diagram was completed. This finalized model will serve as the foundational framework for future prototype development and will further advance both the practical application and theoretical exploration of VR technology in cyber violence intervention.

The main contribution of this study lies in the development of a novel conceptual model for designing VR news aimed at reducing cyber violence, combining ESP with immersive narrative components. This work advances the theoretical intersection between VR news and social issue intervention. By systematically constructing and validating the VRN4RCV model, this study provides a structured design model and actionable guidelines for applying VR technology in diverse fields such as education, media, and psychological intervention to influence attitudes and behaviors.

II. Related Works

A. Cyber Violence and Empathy

Cyber violence is often characterised by emotionally driven malicious attacks, particularly in the context of controversial events. In [9], the authors have shown that cyber aggressors frequently lack emotional resonance or empathetic capacity, which leads to diminished sensitivity to the victim's suffering and increases the likelihood of engaging in aggressive behavior. Numerous empirical studies have confirmed a significant negative correlation between empathy levels and cyber-violent behaviors. For instance, [10] conducted a study involving 1,318 Spanish adolescents and found that cyber aggressors exhibited greater difficulties in emotional regulation and a lower ability to manage their own emotions, which was closely associated with their aggressive behavior.

Furthermore, cyber perpetrators often rely on digital technologies to inflict harm, which prevents them from directly observing the consequences of their actions on victims, thereby further undermining empathetic awareness [11]. Several intervention programs based on emotional peer mentoring and empathy enhancement have shown notable success in reducing bullying behaviors, highlighting the critical role of empathy in behavioral transformation [12]. These findings also support the propositions of classical models in behavioral psychology—Theory of Planned Behavior (TPB) and Social Cognitive Theory (SCT)—which suggest that individuals' cognitive attitudes, perceived behavioral control, and emotional experiences play a decisive role in shaping behavioral intentions.[13].

In the context of cyber violence intervention, fostering perpetrators' ability to empathize with victims is widely regarded as a key pathway to inducing meaningful behavioral change [14]. However, conventional educational approaches predominantly rely on rational instruction and didactic methods, lacking authentic situational engagement and real-time emotional feedback. As a result, they often fail to elicit sustained emotional resonance or moral cognition. Therefore, it is essential to incorporate highly immersive media technologies to address the limitations of traditional interventions and provide more contextually grounded support for empathy induction.

B. VR News

As an emerging form of digital journalism, VR news offers users immersive, first-person narrative experiences that provide a significantly higher level of emotional engagement and sense of presence compared to traditional media formats [15]. Due to its powerful capacity to evoke emotional responses, VR news has been described as an "empathy machine", capable of simulating users' affective reactions in real-world scenarios and enhancing their emotional resonance with the individuals featured in the stories [16].

Empirical studies have demonstrated that VR news can effectively enhance empathy. For instance, [17] found that the sense of presence, interactivity, and realism embedded in VR narratives significantly improved users' perceived information credibility, their willingness to share the story, and the strength of empathetic responses. Compared to traditional journalism, VR news has been shown to more effectively elicit emotional engagement and stimulate empathy [18]. A representative example is "The Displaced", the first VR news piece produced by The New York Times, which reconstructed the experience of Syrian children displaced by war. Most viewers reported that, in comparison with traditional news formats, the VR experience offered a more realistic sense of space and emotional impact, thereby strengthening their affective identification with the content and increasing their sense of social responsibility [19].

In summary, although VR news has demonstrated strong potential in eliciting users' emotional responses and enhancing their sense of social responsibility, its underlying mechanisms for influencing behavioral intention transformation among perpetrators remain unclear. Therefore, further research is needed to explore how the narrative structure of VR news can be integrated with embodied experience strategies to facilitate the transition from short-term empathic responses to deeper, intention-driven behavioral change.

C. ESP

In VR environments, ESP is regarded as a critical component linking immersive experiences to social and psychological responses. ESP emphasizes the cognitive awareness of "being physically co-located with others in a shared virtual space," established through multimodal sensory input such as visual, auditory, haptic, and kinesthetic cues. Distinct from conventional concepts such as presence or immersion, ESP specifically focuses on users' perception and reaction towards others in the environment, thereby eliciting a sense of social belonging, moral responsibility, and empathic emotion [20][21].

In the context of VR news, ESP is typically activated through a combination of design strategies: first-person immersive perspectives help to construct a sense of self-location; interactive engagement with virtual characters enhances empathic feedback; and spatial audio and character voiceovers reinforce social co-presence. These elements work in tandem to ensure that users not only "see" the news scenario but also "feel" the emotional and psychological states of the individuals involved, thereby fostering stronger affective connections with the narrative subjects. Accordingly, integrating ESP into VR news—such as enabling users to adopt the first-person perspective of victims and directly experience their daily lives, emotional states, or traumatic events—can enhance both immersion and empathic resonance [22].

However, a well-defined conceptual model for systematically incorporating ESP into VR news design is still lacking. Existing VR research predominantly focuses on enhancing audience emotional experience, with limited attention given to how embodied interactions can provoke emotional disruption and moral introspection in potential perpetrators. Thus, it is necessary to develop a conceptual model that integrates ESP into the narrative structure of VR journalism, thereby supporting its application in behavioral intervention and cyber violence prevention.

III. Methodology

This study employed an expert review method as research methodology. It first provides a systematic introduction of the proposed initial conceptual model, followed by a clarification of the criteria for expert selection, as well as the procedures and principles guiding the review process.

A. Description of Proposed Model

The proposed VRN4RCV model comprises two key components: VR news and ESP. To construct the initial framework of the model, it was first necessary to identify the essential elements related to VR news and ESP. This was achieved through content analysis and comparative analysis of existing VR news models and ESP models. The models selected for analysis had all demonstrated successful outcomes in enhancing empathy and perspective-taking.

The number of models included in the analysis was determined according to the principle of saturation—namely, when no new elements could be identified from additional models, it was considered that the listed elements sufficiently covered the existing frameworks and research, and further analysis of new models was deemed unnecessary.

As a result of this process, eight eligible VR news models and five ESP models were selected for inclusion. Based on the criteria of compulsory and recommended components, the fundamental conceptual elements of the VRN4RCV model were ultimately identified (see Tables I and II).

TABLE I. VR NEWS ELEMENT FOR VRN4RCV MODEL

Component	Element	VRN4RCV model
VR News	Visual	Compulsory
	Audio	Compulsory
	Hardware Medium	Compulsory
	Immersion	Compulsory
	Empathy	Compulsory
	Information	Discarded
	Attention	Compulsory
	Perspective	Recommended
	Truth	Compulsory
	Narrative	Compulsory
	Trust	Compulsory
	Education	Discarded
	Privacy	Discarded

TABLE II. ESP ELEMENT FOR VRN4RCV MODEL

Component	Element	VRN4RCV model
ESP	Interaction	Compulsory
	IVE	Compulsory
	Task-Oriented	Discarded
	Rendering	Discarded
	User Imagination	Compulsory
	Avatar	Compulsory
	Embodied perspective-taking	Recommended
	Non-Verbal Behaviour	Compulsory

Based on the identified VR News and ESP elements, the VRN4RCV initial proposed model is shown in Fig. 1. Next, the initial model will be reviewed by experts.

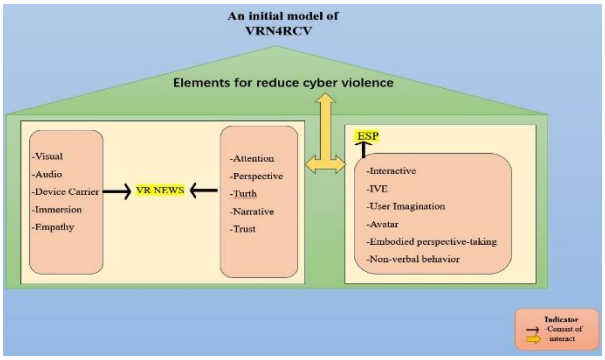

Fig. 1. Initial model of VRN4RCV.

B. Phase I – Experts Identification and Selection

Given that expert review has been proven to be an effective research method for validation purposes [23]. This study employed a two phase expert review process to validate this proposed VRN4RCV model. The first phase involved selecting the expert panel, while the second phase focused on collecting expert feedback.

The primary objective of phase I was to identify and finalise the expert panel. Based on [24], the selection of experts is crucial to the quality of the validation process. The following criteria were established for expert selection:

1) Qualification: A doctoral degree in fields related to journalism, VR technology, or human-computer interaction (HCI).

2) Experience: A minimum of five years' research, professional experience, or academic interest in journalism, VR technology, or HCI-related fields.

Based on these criteria, a final panel of nine experts was selected, and invitations were sent via email. Ultimately, six experts accepted the invitation. This number is considered sufficient, as supported by [25]. Table III shows the statistical distribution of the experts.

TABLE III. DEMOGRAPHIC PROFILES OF EXPERTS

Expert	Gender	Age	Education	Experience (Year)	Area of expertise
A	M	35	PhD	12	VR
B	M	36	PhD	10	VR
C	F	29	PhD	5	HCI
D	M	37	PhD	13	VID
E	M	30	PhD	6	VR
F	M	47	PhD	17	Journalism

C. Phase II – Instrument and Procedures

The objective of phase II was to assess the logical coherence and applicability of the model through expert evaluation.

For the purpose of model validation, a questionnaire was designed as the review tool. The questionnaire consisted of three sections: 1) the comprehensibility of the terminology used in the VRN4RCV model, 2) the relevance of the key components included in the VRN4RCV model, and 3) experts' comments and further insights on the VRN4RCV model. Additionally,

experts were asked to provide demographic information, such as work experience and research fields. Experts were also encouraged to add any additional comments, particularly suggestions related to the overall model.

The review process was conducted in two rounds. The first round focused on the experts' preliminary evaluation of the general aspects and structure of the VRN4RCV model, including the primary components and elements. During the preliminary evaluation, all expert opinions and suggestions were recorded. The model was then revised based on the valid feedback provided. Once revisions were made, the model entered the second round of review. The revised VRN4RCV model was sent back to the experts to obtain further comments and feedback until they were satisfied with the final version.

Given that some of the experts were from different regions and industries, the reviews were conducted via email or online meetings. Experts were given a two-week period to complete the model evaluation and the questionnaire. Finally, the feedback was analysed to assess the practical application value of the model in reducing cyber violence and enhancing empathy.

IV. Results and Analysis

The review process consisted of three cycles. The first cycle primarily involved an initial assessment by experts of the overall structure and components of the VRN4RCV model, including its main elements and framework. During this preliminary evaluation, all expert comments and suggestions were carefully documented. Subsequently, the model was revised in accordance with the constructive feedback received. The revised version of the VRN4RCV model was then sent back to the experts for a second cycle of review, aimed at gathering further input and recommendations. This iterative process continued until consensus was reached on the final version. By the third cycle, all experts agreed that the model was both comprehensible and feasible, thereby concluding the review process. The review process is shown in the Fig. 2.

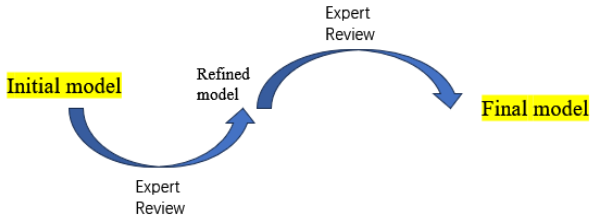

Fig. 2. Review process.

A. Cycle One

The first expert review aimed to assess the structure, content and applicability of the model and to make recommendations for improvement. The review process was organized through online meeting, which was divided into three stages: introduction, analysis and summary.

In the introduction stage, experts were introduced to the developed model and provided with an overview of its objectives, target audience, and intended use scenarios. The researchers elaborated on the application of the model in VR news, particularly its potential role in reducing cyber violence by enhancing user empathy. Experts were given the opportunity to ask questions during this stage to gain a deeper understanding of the model's background and design rationale.

In the analysis stage, experts conducted an in-depth examination and discussion of the model. They raised several critical issues related to the structure and content of the model, with a focus on how it facilitates changes in users' thoughts or behaviors through immersive news experiences. The evaluation concentrated on the following aspects: the smoothness of the user experience, the logical coherence and interconnectivity of the model's components, and its practicality and guidance for design. Through discussions and inquiries, the experts provided detailed suggestions and practical recommendations for improving the model.

In the summary stage, the experts' feedback and recommendations were compiled and reviewed to ensure that all comments were thoroughly documented.

The key recommendations provided by the experts for improving the model are as follows: 1) The model should incorporate the actual structure of news to enable designers and developers to developed a VR news specifically aimed at reducing cyber violence. 2) The model should include a VR system component. 3) The relationships between the various elements of the model need to be clarified. 4) The logical coherence and interconnectivity of the model's components need to be clearly defined.

In response to the first recommendation, this study referred to existing literature on the structure of news structure. According to the literature, the structure of news typically follows a three-part structure: Opening, Content, and Ending [26]. The opening, also referred to as the leading, usually includes the 5W1H elements (who, what, when, where, why, and how), providing a concise introduction to the news. The content section further elaborates on the news story by providing additional details. The ending serves to summarize and elevate the theme of the news. Also, news reporting should adhere to principles such as accuracy, precision, and credibility [27]. This structure helps capture the audience's attention and effectively convey the perspectives of the news creators [28]. Understanding this structure is crucial for VR news designers and developers, as illustrated in Fig. 3.

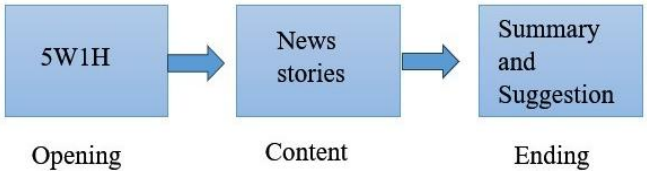

Fig. 3. Structure of news.

The second recommendation involves adopting a standardised VR design model to guide the development of VR news. Based on a comprehensive analysis of existing research, the design model must incorporate core components of the development process. The introduction of such a model aims to provide developers with clear guidance, enabling them to create immersive VR news capable of effectively reducing cyber violence. After analysing several previous studies, this research has selected the system design model proposed by [29], which

encompasses three aspects that influence immersive news production.

Following the identification of the input and output technologies for VR, the key devices related to VR news, particularly visual and audio functionalities, were determined. The most common visual output device in VR is the head-mounted display (HMD), which delivers an immersive visual experience. Complementing this is the use of headphones, which provide high-quality audio output. Consequently, HMD and headphone are the primary output devices for visual and auditory interaction.

Additionally, considering the field of news reporting, which caters to a broad audience base, devices that are simple, user-friendly, and cost-effective are preferred, input devices such as joysticks or VR controllers can be considered, which can also be employed for navigation, option selection, or interaction with virtual objects.

Lastly, in response to expert feedback concerning the causal relationships between various elements and the recommendations for improving the flow and structure of the initial model, the design of the model was rearranged to ensure an optimal arrangement of its components and elements. This process involved identifying the interrelationships between components and clarifying their connections to enhance clarity and coherence. Fig. 4 presents the revised version of VRN4RCV model updated based on reviews from the first evaluation cycle.

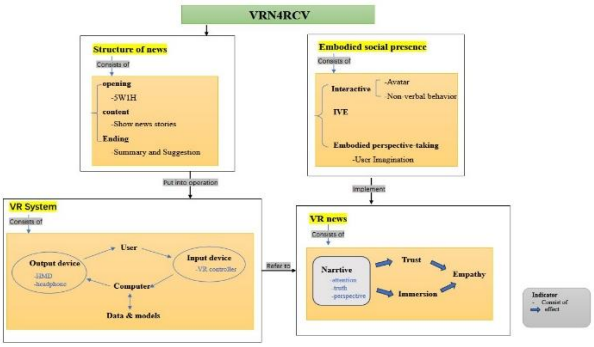

Fig. 4. Frist refined model.

As illustrated in Fig. 4, the proposed model consists of four key components. The first component is the structure, this component defines the structure of VR news aimed at reducing cyberbullying. It comprises three sections: opening, content, and ending, which represent the standard structure for news production in the field. This structure is designed to capture the user's attention quickly and effectively communicate the news information.

The second component is VR system, this component emphasizes user interaction, wherein participants explore the virtual environment using input and output devices such as HMD and audio systems. The interaction between users and the VR system is facilitated through visual, auditory, and interactive elements, maximizing engagement and fostering resonance.

The third component is ESP, this component includes the essential elements required to enhance social interaction and the sense of connection within the virtual reality environment.

The fourth component is VR News, this component delineates the elements and relationships within VR news, illustrated with arrows to demonstrate their connections. These elements are designed to immerse users fully in the VR experience, creating a strong sense of "being there" and evoking empathy by encouraging users to establish an emotional connection with the cyber violence narrative. This aligns with the study's goal of implementing the ESP model and fostering thought or behavioral change through immersive VR news.

B. Cycle Two

After the first cycle of expert evaluation, the improved model was re-evaluated by experts in the second cycle. The purpose of this re-evaluation was to further identify potential issues within the model and propose enhancements to ensure that it more effectively achieves the research objectives. The second cycle was conducted face-to-face.

During the discussion, the researchers presented the improved model in detail through multimedia presentations and interactive discussions. The experts raised questions regarding the model's design, logic, and practical application, with a particular focus on the design and logical structure of the model. Throughout the discussion, the experts concentrated on the model's key components, the logical relationships between elements, and the feasibility and effectiveness of the model in practical scenarios. Based on these discussions, several suggestions for improvement were proposed (see Table IV).

In response to the recommendation, the study made adjustments to the model, particularly the role of ESP and empathy in the model is emphasized. According to previous research [30] [31], ESP is a critical factor in VR environments, enabling users to perceive others' presence and interact with them. Therefore, ESP was positioned as a vital component in implementing immersion within VR news, with its specific mechanism for reducing cyber violence clearly articulated. In parallel, empathy—widely recognised as a key factor in mitigating cyber violence [32]—was given increased prominence within the model.

To enhance conceptual clarity, the overall structure of the model was reorganised by explicitly identifying and illustrating the logical relationships between components. This reconfiguration improved both the coherence and the flow of the model.

Finally, based on expert feedback, individual elements of the model were refined by adding or deleting certain elements or sub-elements. For instance, "Immersion" and "Narrative" were integrated into a single construct termed "Immersive narrative", sub-elements "Attention" was repositioned under the ESP component as a design consideration, and new sub-elements such as "Video" and "Audio" were added under the IVE component. Additionally, concise definitions were provided for each terminology to enhance clarity and facilitate practical implementation.

TABLE IV. EXPERTS REVIEW

Experts	Comments
A	1) The model should more prominently emphasise the core role of ESP, particularly how ESP within VR environments can reduce cyber violence by enhancing users' sense of presence; 2) The model's process and structure require further optimisation to ensure clearer logical relationships between components. 3) More detailed explanations are required for both the terminology and the flow.
B	1) The flow diagram should be more refined, logically structured, and visually appealing. 2) Each process line within the model must include clear labels and corresponding explanations. 3) The elements "Immersion" and "Narrative" in the VR news component can be integrated, and the logical coherence among these elements should be thoroughly re-evaluated.
C	1) The overall logic of the model is currently weak and requires restructuring. 2) The terms "trust" and "truth" serve a similar function in the context of news and should not be redundantly presented. 3) The term "attention" can be repositioned under the ESP component as a design reminder for prototype developers.
D	1) Each terminology within the model should be explicitly defined and elaborated. 2) The "Structure of News" comprises three key elements, and each should be clearly explained. For example, the purpose of the "opening" should be specified to guide designers in understanding the intent during the production phase.
E	1) "Empathy" is a critical element in the model; since the function of ESP is to evoke empathy, this should be explicitly articulated within the model. 2) Every component and element must be accompanied by corresponding explain. 3) The connections between components and elements, as well as between components themselves, must be clearly illustrated with appropriate linkage lines.
F	1) The elements and sequencing within the "VR System" component should be re-evaluated and reorganised. 2) Each element within the ESP framework should be described in greater detail. For instance, the IVE (Immersive Virtual Environment) component could be further expanded by including sub-elements such as "video" and "audio."

Fig. 5 illustrates the proposed model as revised in the second cycle of the assessment based on expert suggestion.

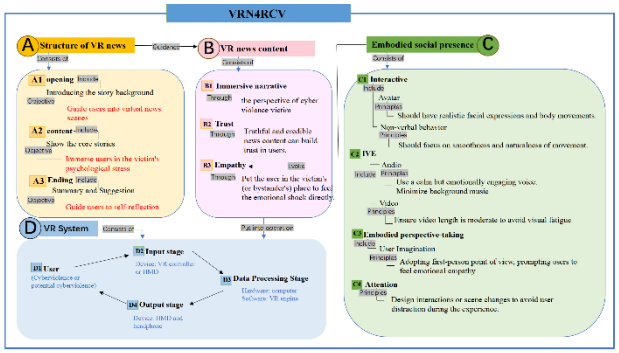

Fig. 5. Second refined model.

C. Cycle Three

In this cycle, the second refined model will undergo further evaluation by expert. As in the previous cycle, the purpose of the evaluation is to identify shortcomings in the proposed model and improve it.

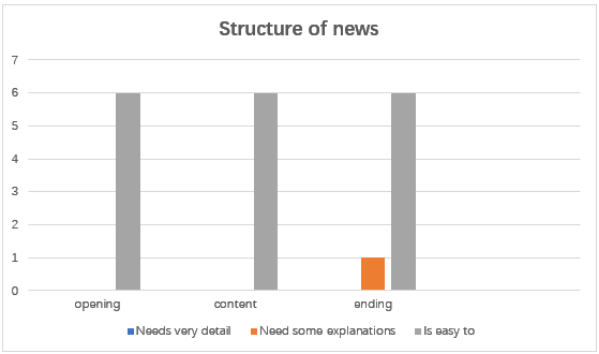

Fig. 6. Clarity of terminology (Structure of news).

The results of the expert review are presented visually in Fig. 6, Fig. 7, Fig. 8, and Fig. 9. As indicated by the charts of expert review results, the majority of experts endorsed the proposed conceptual design model. Most experts found the elements of the model easy to understand, and the connections and flow between the components to be logically sound. However, from Fig. 8 and 9, it can still be found that the presentation of terminology is not very clear, and a final refinement needs to be made. They also affirmed that the components of the model were relevant, the model was readable, applicable to prototype development, and useful for reducing cyber violence, show in Fig. 10.

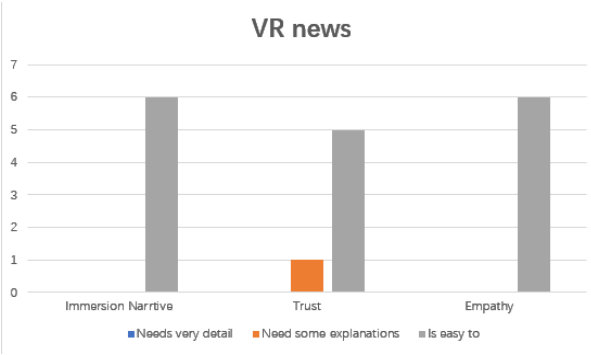

Fig. 7. Clarity of terminology (VR news).

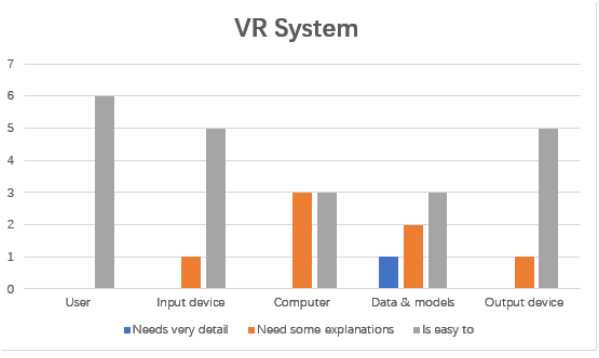

Fig. 8. Clarity of terminology (VR system).

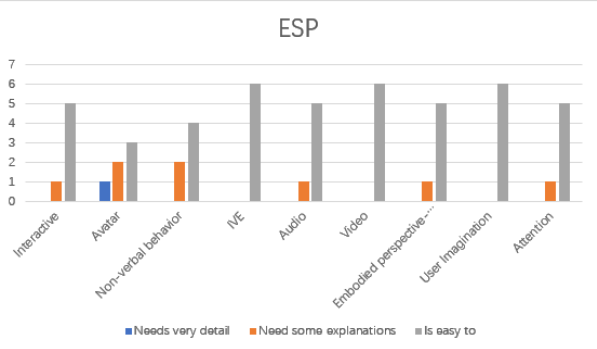

Fig. 9. Clarity of terminology (ESP).

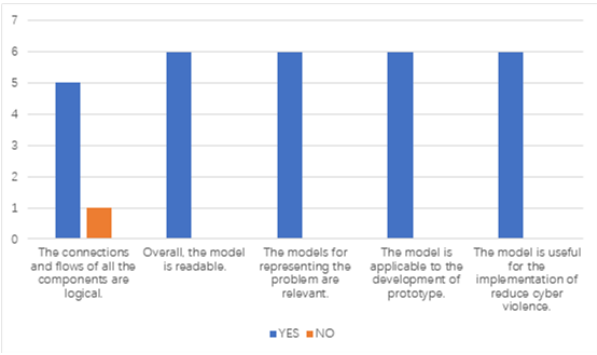

Fig. 10. The flow, readability, relevant, applicable and usefulness of the model.

In addition, six experts were asked to respond to four open-ended questions in the survey: 1) Would you suggest adding any relevant main components or sub-components or elements to this model? 2) Would you suggest removing any sub-phases, tasks, or activities? 3) Could the model be made more applicable for prototype development? 4 ） Do you have other recommendations? Please write them down.

As presented in Table IV, the majority of experts unanimously agreed that the VRN4RCV model demonstrates considerable practical value and holds strong application potential in enhancing empathy and reducing the intention to engage in cyber violence. Nevertheless, they also recommended further refinement and optimisation of the model. The suggested revisions can be summarised as follows: 1) clearly specify the type of device intended for user viewing; 2) reconsider and refine the sub-elements under “Interactive” by introducing more precise and well-defined terminology; 3) replace the term “Trust” with “truthful Story,” as the latter is perceived to be more intuitive and clearly aligned with the objectives of the model.

In response to their feedback, the conceptual model was subsequently revised and improved until the experts expressed full satisfaction with the final version.

The appendix (Fig. 11) shows the revised conceptual model following the experts’ suggestions. After reviewing the revised model, all experts unanimously agreed that it is not only easier to understand but also offers more practical and actionable guidance for implementation. It can therefore serve as a useful model for producers aiming to develop VR news prototypes designed to reduce cyber violence. Accordingly, it is adopted as the final model of this study. The next step will involve using this model to guide the production team in developing the VR news prototype, followed by further validation of the model’s feasibility and effectiveness. These outcomes will be documented in subsequent research publications.

V. Conclusion and Future Work

This study, grounded in VR technology and empathy theory, proposes a conceptual model for VR news—VRN4RCV—aimed at reducing cyber violence. The model systematically integrates key components, design elements, and guiding principles essential to the development process, with the objective of enhancing users’ immersive emotional experiences and empathetic responses, thereby offering an innovative media-based approach to cyber violence intervention. Through three cycles of expert review, the majority of experts agreed that the model's structure is well-organized, its internal logic is coherent, and it holds considerable potential for practical application. In addition, expert feedback provided constructive suggestions for further improvement, contributing to the ongoing refinement of the model.

Nevertheless, several limitations of this study should be acknowledged. First, the model’s validation was limited to expert-based subjective evaluation, without empirical testing involving real users. As such, its actual effectiveness in evoking empathy and influencing behavioral intentions among cyber violence perpetrators remains to be verified. Second, this research focused primarily on conceptual design and theoretical development, without fully considering the adaptability of the model across different cultural contexts, technological platforms, or content genres.

Therefore, although the VRN4RCV model demonstrates initial theoretical validity and expert consensus, it should be regarded as an open and extensible research framework. Future studies should aim to develop a functional VR news prototype based on this model and empirically assess its effectiveness in enhancing user empathy and reducing cyber violence intentions.

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APPENDIX

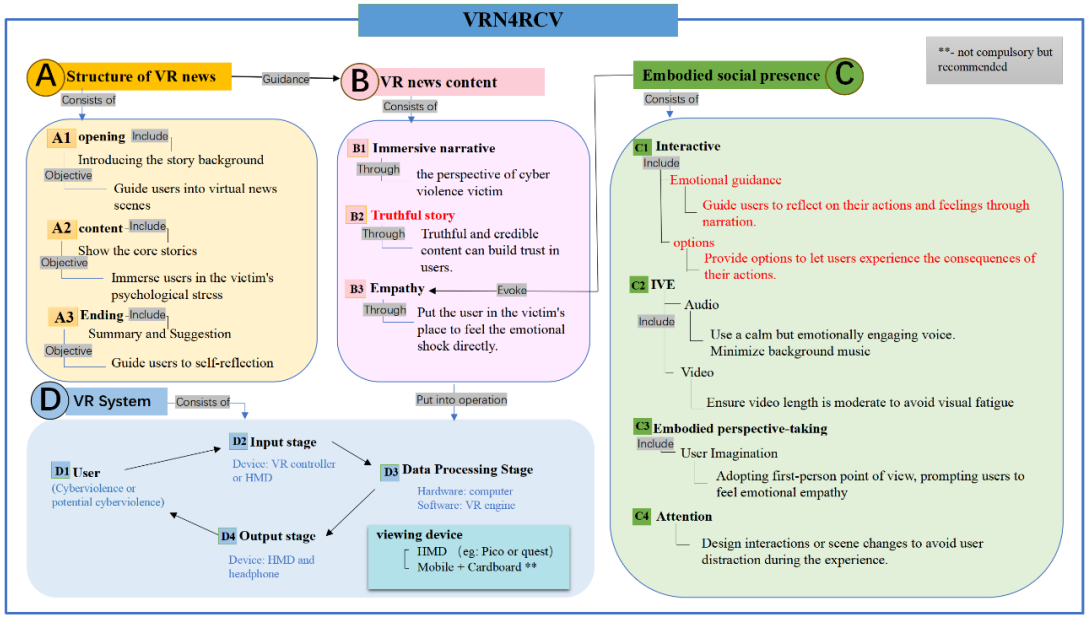

Fig. 11. Revised conceptual model.