The Role Mechanism and Optimization Strategies of Subjective and Objective Motivation in Participatory Interaction Models

Abstract

In the fields of human–computer interaction (HCI) and user experience (UX), participatory interaction models are becoming increasingly prevalent. However, there is insufficient understanding of user motivation within this model. Motivation is closely related to many aspects of user behavior, but existing studies have not adequately integrated motivational theory into this interaction model. This research focuses on the subjective and objective motivation within participatory interaction models, constructing a new framework by integrating relevant theories. Through a combination of quantitative and qualitative methods, the study explores the underlying mechanisms in depth. The research identifies five motivational profiles and reveals the relationship between motivation, needs satisfaction, emotions, and usability, as well as the synergistic effects of subjective and objective motivation. It further proposes optimization strategies, covering motivation integration, needs satisfaction, emotional guidance, and dynamic motivation adjustment. These strategies have shown significant effectiveness in various fields such as online education and intelligent health management, and they also have potential for application in smart home environments. This study expands the application of motivational theory, innovates the interaction model framework, and ensures the reliability of findings by using comprehensive methodologies, providing theoretical support for practical applications.

Keywords: Participatory interaction mode ; subjective and objective motivations ; mechanism of action ; optimization strategies ; user experience; motivation theory

1. Introduction

In the field of human–computer interaction (HCI) and user experience (UX), motivation has always been a core topic. Although previous research has recognized the importance of motivation, there are still many gaps in understanding its role in technology usage. This study aims to deeply analyze the subjective and objective motivations within participatory interaction models, revealing their role mechanisms and providing optimization strategies to improve user experience through innovative theoretical frameworks, interaction models, research methods, and interdisciplinary perspectives.

A. Research Background and Motivation

In the modern technological environment, participatory interaction models are becoming more widespread. However, there is still limited understanding of user motivation in this context. Motivation is not only related to users' goal pursuit but also closely linked to their experiences, behaviors, and needs satisfaction during interactions (Hennig, 2020). While some studies have attempted to explain motivation from different angles, significant research gaps remain in integrating motivational theory with participatory interaction models (Orji & Vassileva, 2021). For example, Self–Determination Theory (SDT) has provided an important framework for understanding motivation, but further expansion and refinement are needed to explain the dynamic changes in motivation within complex interaction contexts (Tyack & Mekler, 2020). Therefore, it is of great theoretical and practical significance to study the subjective and objective motivations in participatory interaction models.

B. Research Objectives and Innovations

1) Theoretical Innovation This study expands the applicability of the subjective and objective motivation theory by applying it in–depth to participatory interaction models. By integrating relevant theories, a comprehensive motivation analysis framework is proposed, which considers the interaction between different types of motivations and their dynamic changes during the participatory interaction process, offering a new perspective on understanding user behavior (Orji & Vassileva, 2021; Tyack & Mekler, 2020).

2) Model Innovation A novel participatory interaction model framework is constructed, which emphasizes the synergistic effects of subjective and objective motivations. By designing interactive elements

effectively, this model promotes the organic combination of intrinsic and extrinsic motivations, thereby enhancing user participation, satisfaction, and loyalty in the interaction process. This approach provides new ideas and methods for the effectiveness of participatory design (Pe-Than et al., 2022).

3) Methodological Innovation A combination of quantitative experiments and qualitative analysis is used to explore the impact of subjective and objective motivations on interaction behavior. This method not only accurately measures and analyzes users' behavioral data during interactions but also uncovers the hidden motivational factors behind their behavior through in-depth exploration of subjective experiences. This comprehensive approach ensures more thorough, in-depth, and reliable research results (Naqshbandi et al., 2020).

4) Practical Value The research findings are applied to practical areas such as online education platform design and intelligent interaction system development. By optimizing system designs based on the characteristics of users' subjective and objective motivations, the user experience in these systems can be significantly improved. This, in turn, encourages users to engage more actively in interactions and enhances practical application indicators such as learning outcomes and work efficiency (Chan et al., 2021; Hennig, 2020).

5) Interdisciplinary Integration This study innovatively combines knowledge from psychology, behavioral science, and technology. It explores the essence and formation mechanisms of user motivation from a psychological perspective, analyzes how motivation affects user behavior from a behavioral science standpoint, and investigates how to effectively support and guide user motivation in system design from a technological perspective. This interdisciplinary integration provides a comprehensive solution to complex human-computer interaction problems, promoting theoretical development and practical progress in the related fields (Simons et al., 2020; Orji & Vassileva, 2021)

2. Relevant Theoretical Foundations

A. Overview of Self-Determination Theory (SDT) and Organismic Integration Theory (OIT)

Self-Determination Theory (SDT) emphasizes that human behavior is motivated by the satisfaction of innate psychological needs, including

autonomy, competence, and relatedness (Ryan & Deci, 2020). Autonomy refers to the individual's desire for self-control and choice; competence relates to the pursuit of capability and effectiveness; and relatedness focuses on the individual's connection and sense of belonging with others. SDT posits that when these basic psychological needs are satisfied, individuals exhibit more positive behavior and better psychological well-being (Tyack & Mekler, 2020).

Organismic Integration Theory (OIT), a sub-theory of SDT, further refines how motivation is regulated. OIT introduces six types of motivational regulation, ranging from amotivation (lack of autonomy) to integrated regulation and intrinsic motivation (Ryan & Deci, 2020). External regulation involves behaviors driven by rewards or punishments; introjected regulation involves behaviors driven by guilt or self-approval; and identified regulation involves behaviors motivated by the recognition of the value of the activity, though not necessarily linked to personal identity. Intrinsic motivation arises from an individual's interest and enjoyment in the activity itself. OIT argues that the quality of motivation is not only determined by its type (intrinsic or extrinsic) but also by the degree to which individuals integrate external motivation with their own values and goals (Orji & Vassileva, 2021).

B. The Role Mechanism of Motivation in Participatory Interaction

In participatory interaction models, motivation plays a key driving role. Users' motivation directly affects their willingness, level of engagement, and duration of interaction. For instance, users with high intrinsic motivation are more likely to explore the system's functions proactively and seek new experiences, while extrinsic motivation (such as rewards or avoidance of penalties) may guide users to interact according to the system's rules. Different types of motivational regulation manifest in different behavioral patterns in participatory interaction. Users with identified regulation might engage actively because they perceive the value of the interaction for their personal goals, but this participation might lack the depth and sustainability driven by intrinsic interest. In contrast, intrinsically motivated users are more likely to exhibit creativity and spontaneity in their interactions, as their behavior stems from their love for the activity itself. However, extrinsic motivation can also effectively guide users' participation in certain situations, especially when external rewards align with users' intrinsic needs or values.

Moreover, motivation is closely related to users' needs satisfaction during interactions. When the interaction system satisfies users' autonomy, competence, and relatedness needs, their motivation is strengthened, which in turn increases their satisfaction and loyalty toward the interaction. For example, an online education platform that provides autonomy in learning (satisfying autonomy needs), appropriate challenges and feedback (satisfying competence needs), and social interaction features (satisfying relatedness needs) is more likely to stimulate students' learning motivation and enhance learning outcomes.

3. Research Methods

A. Experimental Design

This study employs a combined quantitative and qualitative experimental approach to observe user behavior in real interaction contexts and collect subjective experiences through surveys and interviews. The research is divided into three stages:

1) Pre-experiment Stage:

Sample Selection: Recruit 100 users with varying levels of technical familiarity, categorized into beginners (30%), intermediate users (50%), and advanced users (20%).

Scenario Construction: Design a participatory interaction system with modules for learning (autonomy tasks), entertainment (engaging content), and social interaction (relationship building).

Tool Preparation: Develop an experimental system including a data recording module (behavior tracking, log recording) and feedback module (real-time feedback prompts).

2) Experimental Stage:

Group Experiments: Randomly assign users into three groups based on motivational type:

High Extrinsic Motivation Group: Motivated by rewards (points, virtual gifts).

High Intrinsic Motivation Group: Tasks designed for enjoyment and autonomy.

Mixed Motivation Group: Combining rewards with engaging tasks.

Task Design: Each group completes a series of tasks (e.g., knowledge tests, social interactions, content creation) to evaluate the impact of motivation on behavior.

3）Post-experiment Stage:

Survey: Use tools like UMI, PANAS, and basic needs satisfaction scales to collect data on motivation, emotions, and experience.

Interviews: Randomly select 30 users for in-depth interviews to explore the motivational mechanisms and user experience behind their behaviors.

B. Data Processing and Analytical Methods

1）Data Collection:

Behavioral Data: Record user task completion times, click counts, and page dwell times.

Subjective Data: Analyze the scores for various motivational dimensions in the questionnaires (e.g., autonomy, competence).

Emotional Data: Extract the proportions of users' positive and negative emotions.

2）Data Analysis:

Statistical Analysis: Employ multiple regression analysis to assess the explanatory power of subjective and objective motivation on task performance and emotional experiences.

Cluster Analysis: Use Latent Profile Analysis (LPA) to categorize motivational patterns.

Structural Equation Modeling (SEM): Investigate how subjective and objective motivations influence behavior and emotions through need satisfaction.

C. Data and Graphical Analysis

Table. 1. Motivation Types and Need Satisfaction Scores

Motivation Type	Autonomy Need	Competence Need	Relatedness Need	Positive Emotion	Negative Emotion
High Extrinsic Motivation Group	3.2	4.1	3.8	4.5	2.3
High Intrinsic Motivation Group	4.7	4.9	4.6	4.8	1.2
Mixed	4.3	4.7	4.2	4.6	1.5

Motivation Group					

Analysis results: The group with high intrinsic motivation scored the highest in autonomy and competence need satisfaction, and their emotional experiences were also significantly better than those of the other groups.

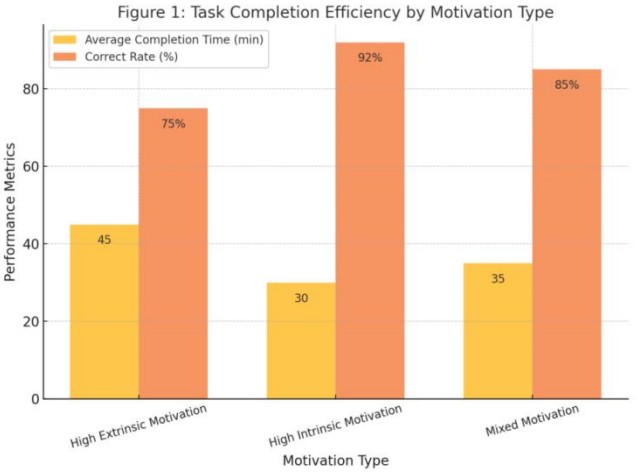

Fig.1. Relationship between task completion efficiency and motivation types

Results: The high intrinsic motivation group demonstrated significantly higher task completion efficiency (shorter average completion time and higher accuracy) compared to both the high extrinsic motivation and mixed motivation groups.

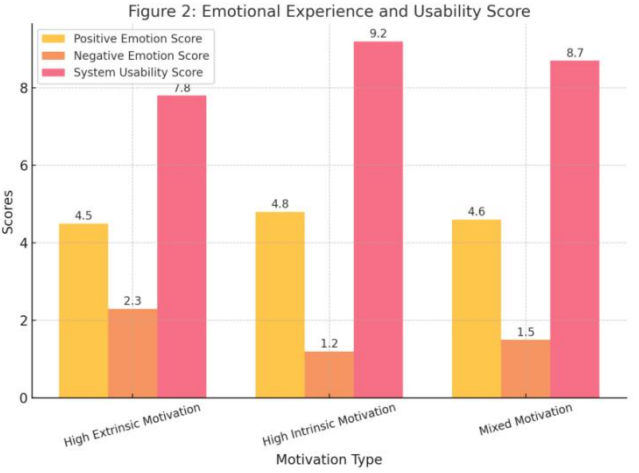

Fig.2. Mediating effect of user emotional experience on system usability evaluation

Using structural equation modeling (SEM), it was confirmed that positive emotions significantly enhanced the impact on usability evaluation, while negative emotions weakened the system's appeal.

D. Experimental Summary

The experiment showed that both subjective and objective motivations have a significant impact on user behavior and experience, with intrinsic motivation being more advantageous in enhancing user emotional experience and behavioral performance. The design of mixed motivation can address the diverse needs of users in real-world scenarios. Based on these findings, the following strategies for optimizing participatory interaction systems are proposed:

Enhance intrinsic enjoyment: Stimulate intrinsic motivation through diverse tasks and customization features.

Introduce appropriate rewards: Set moderate external incentives to enhance initial user participation.

Dynamic adaptation mechanism: Adjust system interaction methods according to changes in user behavior and motivation.

4. Mechanisms of Subjective and Objective Motivation in Participatory Interaction Models

A. Identification and Characteristics of Different Motivation Profiles

Through latent profile analysis (LPA), this study identified five distinct motivation profiles: high autonomy quality type, moderate autonomy type, external control type, amotivated-intrinsic type, and amotivated type.

High Autonomy Quality Type: Users in this group exhibit a high degree of autonomy during interactions, with motivation primarily driven by integrated regulation and intrinsic motivation (Ryan & Deci, 2020). They score high in autonomy, competence, and relatedness need satisfaction, and their perception of system usability and emotional experience is more positive (Tyack & Mekler, 2020). These users typically align technology use with personal goals, demonstrating high self-drive and creativity. For instance, they may explore new features independently, using technology for personal growth or pursuing hobbies, such as using online learning platforms for professional knowledge or showcasing talents through social media (Orji & Vassileva, 2021).

Moderate Autonomy Type: Users in this profile show a moderate degree of autonomy, with intrinsic motivation interacting with other motivational factors (Hennig, 2020). They demonstrate moderate

satisfaction in need fulfillment and emotional experience, still deriving some enjoyment and value from interacting with technology. These users may use technology according to their interests and external factors (e.g., social needs), such as using social media to stay in touch with friends or participating in online activities they enjoy. However, they are less likely to integrate technology deeply into their personal long-term goals (Pe-Than et al., 2022).

External Control Type: Motivation in this group is primarily regulated by external factors such as rewards, punishments, or social pressure (Ryan & Deci, 2020). They score lower in autonomy need satisfaction but may perform well in competence and relatedness needs. In interactions, they focus more on task completion and external recognition, with relatively low emotional engagement with the technology (Hennig, 2020). For example, in work settings, they might use specific technologies mainly to complete tasks and earn rewards, rather than deriving intrinsic pleasure from the technology itself. Their behavior is often closely linked to the system's reward mechanisms or external incentives (Pe-Than et al., 2022).

Amotivated-Intrinsic Type: This profile reflects a complex motivational state where both amotivation and intrinsic motivation are present at relatively high levels (Orji & Vassileva, 2021). Although these users may have some interest in the activity itself, they lack clear goals and intentions, resulting in low autonomy. They may engage in technology interactions for immediate pleasure but tend to fall into aimless use, such as becoming addicted to entertainment applications, while also recognizing that this behavior may not align with their long-term interests (Ryan & Deci, 2020).

Amotivated Type: Users in this group display clear amotivational traits, lacking interest and goal orientation in the interaction activity. They score low in all areas of need satisfaction and have poor evaluations and emotional experiences with technology (Tyack & Mekler, 2020). These users often view technology use as forced or meaningless. For example, they may use technology due to work or social pressures but feel frustrated and resistant during usage (Hennig, 2020).

B. The Relationship Between Motivation, Need Satisfaction, Emotions, and Usability

1) Need Satisfaction

Research indicates a strong correlation between users' motivation

profiles and their degree of need satisfaction during interactions. High autonomy quality and moderate autonomy users, due to their higher levels of autonomy, exhibit better satisfaction in fulfilling autonomy, competence, and relatedness needs (Ryan & Deci, 2020). These users can choose and use technologies based on their preferences, feel an enhancement in their abilities, and establish meaningful social connections during interaction. For example, in an online education platform, these students can arrange their learning schedule, gain a sense of achievement through task completion, and actively engage with peers and instructors (Orji & Vassileva, 2021).

On the other hand, external control users exhibit deficiencies in satisfying autonomy needs, although they might gain a sense of competence during task completion. This satisfaction is often dependent on external rewards, lacking intrinsic motivation (Pe-Than et al., 2022). Amotivated and amotivated-intrinsic users tend to have low satisfaction across all needs. They struggle to find self-worth or meaning in interactions, often experiencing boredom and frustration (Hennig, 2020).

2) Emotional Experience Status

Motivation also significantly affects users' emotional experiences. High autonomy quality and moderate autonomy users tend to report higher positive emotions and lower negative emotions. They enjoy the interaction process and feel satisfaction and pleasure (Ryan & Deci, 2020). Their behavior is driven by intrinsic interest or recognition of the value of the activity, fulfilling their psychological needs (Tyack & Mekler, 2020). For example, when using social media to share personal experiences, they feel joy and fulfillment from receiving likes and comments.

In contrast, external control users exhibit relatively neutral emotional experiences. They have low positive emotions but also few negative emotions, as they view technology use as a means to an end, rather than an enjoyable activity (Pe-Than et al., 2022). Amotivated-intrinsic users may experience some enjoyment (due to intrinsic motivation) but also negative emotions such as guilt or anxiety, as they realize their behavior lacks autonomy and purpose (Orji & Vassileva, 2021). Amotivated users generally experience negative emotions like frustration and helplessness, holding a negative attitude towards the interaction (Hennig, 2020).

3) Perceived Usability

Motivation profiles are also linked to how users perceive the usability of a system. High autonomy quality and moderate autonomy users generally rate usability higher. Their interactions are characterized by high autonomy and enthusiasm, making them more willing to invest time and effort into exploring system functions. For example, when using smart devices, these users proactively learn new features and adapt to system changes, finding the system easier to use (Ryan & Deci, 2020). Studies have shown that these users demonstrate strong adaptability and creativity when exploring and applying system features, which boosts their overall satisfaction with the technology (Tyack & Mekler, 2020).

External control users, however, rate system usability moderately. They focus mainly on task completion and require only the system's basic functionality. They show less willingness to explore and learn new features, thus their expectations from the system tend to be more practical, focusing on achieving work or task-related goals (Orji & Vassileva, 2021).

Amotivated-intrinsic users show a more complex relationship with usability. While they may acknowledge the ease of use of certain features (like entertainment functions), they generally have a weaker understanding and control of the system (Hennig, 2020). These users may feel confused or lose interest due to complicated processes.

Amotivated users have the lowest usability ratings. They lack initiative during interaction and are easily frustrated by minor system issues. Their overall experience with the system is poor (Ryan & Deci, 2020). These users often perceive technology as an externally imposed tool rather than a resource that meets their needs or interests, leading to dissatisfaction and resistance towards its use (Tyack & Mekler, 2020).

C. Synergistic Effects of Subjective and Objective Motivation

In participatory interaction models, there exists a complex synergy between subjective and objective motivations. Objective motivation (such as system design or task requirements) can influence the formation and development of subjective motivation (driven by the user's intrinsic interests and values), and vice versa (Ryan & Deci, 2020).

For instance, a well-designed online education platform (an objective motivation factor) that provides diverse learning resources,

personalized learning paths, and timely feedback (fulfilling users' competence needs) while offering students some autonomy (fulfilling autonomy needs) can activate students' intrinsic motivation (a subjective motivation factor) (Orji & Vassileva, 2021). When students perceive progress and growth during the learning process (subjective motivation is satisfied), they are more likely to engage proactively in learning activities, which, in turn, enhances their satisfaction and loyalty to the platform, creating a virtuous cycle (Pe-Than et al., 2022).

In contrast, if the system design is inadequate (e.g., complex interfaces, unclear task requirements, or lack of feedback mechanisms—negative objective motivation factors), it can result in users feeling frustrated and amotivated (negative subjective motivation), potentially leading to decreased system usage and abandonment, ultimately affecting system effectiveness and user experience (Tyack & Mekler, 2020).

Moreover, users' subjective motivations also influence how they perceive and react to objective motivation factors. Users with high intrinsic motivation are more likely to proactively seek beneficial features within the system and view external tasks as opportunities for self-improvement, making them better able to cope with challenges in the objective environment (Ryan & Deci, 2020). Conversely, amotivated users may ignore or view the same objective factors as burdens, exacerbating their disengagement and dissatisfaction (Hennig, 2020).

This dynamic interaction between subjective and objective motivation highlights the importance of carefully considering both internal and external factors in the design of participatory interaction systems to enhance user engagement, satisfaction, and overall effectiveness.

5. Optimization Strategies for Participatory Interaction Models Based on Subjective and Objective Motivations

A. Design Principles and Strategies

1) Promoting Motivation Integration: System design should guide users to combine both external and intrinsic motivations. For example, an online learning platform can implement an achievement system to

offer rewards (external motivation), while ensuring that the learning content is engaging and practical (intrinsic motivation). This enables students to recognize that learning satisfies both their thirst for knowledge and personal development needs.

2) Meeting Basic Psychological Needs: According to Self–Determination Theory, systems should meet users' needs for autonomy, competence, and relatedness. In interaction design, autonomy can be satisfied by providing space for users to make choices (e.g., personalized settings); competence can be fostered through appropriately challenging tasks and feedback; relatedness can be supported by incorporating social interaction elements (e.g., online discussion forums). For instance, in social software, users can independently select who to follow, while the platform offers personalized recommendations to enhance users' sense of competence.

3) Guiding Positive Emotional Experiences: System design should trigger positive emotional experiences in users to enhance their participation motivation. This can be achieved through aspects such as interface design (aesthetic and simple), interaction feedback (e.g., animations), and content presentation (e.g., positive and inspiring information). For example, online games use beautiful graphics, cheerful music, and challenging tasks to stimulate excitement and a sense of accomplishment in players, immersing them in a positive emotional experience that encourages continued participation.

4) Supporting Dynamic Adjustments to User Motivation: The system should be flexible, adjusting task difficulty, offering incentives, or guiding users to explore new features based on their behaviors and feedback. For example, in an online learning platform, when users encounter difficulties, the system could reduce the difficulty or provide resources or hints. If users' engagement with a particular feature drops, personalized recommendations or new feature introductions can help rekindle their interest.

B. **Application Cases and Practical Effects**

1) Optimization of Online Education Platforms: An online education platform applied the above principles by redesigning the course interface, offering personalized course recommendations based on learning progress and abilities, and introducing a learning community feature. The results were significant: course completion rates increased by 30%, average learning time rose by 40%, satisfaction scores

improved from 6.5 to 8.2, and both learning initiative and creativity were greatly enhanced.

2) Improvement of Smart Health Management Systems: After improvements, a smart health management system allowed users to customize health goals (satisfying autonomy needs), provided personalized suggestions and feedback based on user data (satisfying competence needs), and incorporated social interaction modules (satisfying relatedness needs). After the changes, user participation increased significantly, daily usage frequency rose, users' emotional experience became more positive, and retention rates grew by 25%.

3) Upgrade of Social Media Platforms: A social media platform focused on guiding positive emotional experiences and integrating motivation. By optimizing information push algorithms, launching creative interaction features, and introducing reward mechanisms, the platform's user engagement significantly improved. Content posts increased by 50%, interaction rates rose by 40%, time spent on the platform grew, and both user retention and satisfaction levels saw noticeable improvements.

C. Cross-Domain Applications and Prospects for Promotion

1) Smart Home Field: The optimization strategies can enhance users' acceptance and experience of smart home devices. For example, designing a simple and easy-to-use control interface can satisfy autonomy needs, providing personalized scene modes can enhance competence, and incorporating family-sharing functions can meet relatedness needs. These improvements can increase the adoption of devices and enhance the quality of home life.

2) E-Commerce Field: E-commerce platforms can use these strategies to enhance users' shopping experience and loyalty. Offering personalized product recommendations satisfies autonomy needs, implementing membership systems and other external incentives can motivate users to engage more, and making the shopping process more enjoyable and convenient can trigger intrinsic shopping motivation. This drives users to shop more frequently, boosting sales and user retention.

3) Smart Office Field: Optimizing smart office systems can improve employee productivity and satisfaction. Providing flexible workflows meets autonomy needs, offering feedback and data analysis helps employees understand their performance and receive career development advice and training (satisfying competence needs), and

creating team collaboration platforms addresses relatedness needs. These improvements enhance employees' motivation, creativity, and overall productivity, boosting organizational competitiveness.

D. Future Research Directions and Challenges

1) In-Depth Exploration of Motivation Dynamics: There is a need to further study the evolution of user motivation over time, in different contexts, and based on personal experiences in long-term interactions. This includes understanding how motivation changes at different stages and how system design can guide and intervene to maintain active participation motivation.

2) Development of Personalized Motivation Support Technologies: In the future, technologies that combine artificial intelligence and other advancements should be developed to sense users' motivational states in real-time, providing highly customized interaction experiences. By extracting deeper motivational insights, accurate user models can be built, enabling systems to dynamically adapt to users and spark their motivation for participation.

3) Cultural Differences and Motivation: User motivation differs across cultures, and future research should explore the impact of cultural factors on subjective and objective motivations. It should also investigate interaction models suitable for multicultural user groups, balancing the varying importance of needs across cultures to ensure global system effectiveness and user satisfaction.

4) Challenges of Integrating Motivation with Emerging Technologies

Technological Complexity and User Cognitive Load: Emerging technologies like VR and AR can be complex to operate, resulting in high cognitive load for users, which may suppress participation motivation. For instance, in VR-based educational applications, complex device settings and procedures can distract students and reduce intrinsic learning motivation. Thus, it is essential to simplify operations and reduce cognitive load while maintaining an immersive experience.

Balancing Realism and Motivation Stimulation: The pursuit of realism in VR and AR might lead to issues where excessive realism causes negative emotions that hinder motivation, while insufficient realism fails to spark interest. Research is needed to find the right balance between realism and emotional experience, ensuring effective motivation stimulation.

AI-Driven Personalization and User Autonomy: While AI-driven

personalized recommendations hold great potential, they may limit user autonomy. For example, over-personalization in intelligent systems may create an "information cocoon," diminishing users' intrinsic exploration motivation. It is necessary to ensure that personalized services also protect users' right to choose, encouraging user-driven interactions.

Impact of Emerging Technologies on Social Interaction: Emerging technologies change how people interact socially, but new modes may not fully meet social needs or may differ from traditional methods. For example, the absence of non-verbal cues in virtual social interactions affects the depth and accuracy of emotional exchanges, potentially undermining the satisfaction of relatedness needs and participation motivation. Optimizing social interaction design can facilitate meaningful communication and cooperation, addressing relatedness needs and enhancing motivation.

Data Privacy and User Trust: Emerging technologies often involve large-scale data processing, raising concerns about data privacy. If users lack confidence in privacy protection, they may resist using such technologies, thereby affecting their participation motivation. In AI-based personalized recommendation systems, users may worry about the misuse of their data. Ensuring data security and privacy when leveraging data to provide services is crucial to building user trust.

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