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ORIGINAL RESEARCH ARTICLE

The intelligence between the influence of AR technical ideological and political courses on the different characteristics of college students

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ABSTRACT

In the contemporary educational ecosystem, Augmented Reality (AR) technology is marking its prominence across diverse disciplines globally, and China has been an active adopter. By integrating AR, educators, especially those handling ideological and political courses, can elevate their teaching methodologies, rendering them more interactive and engaging. For instance, traditionally static textbook content can be transformed into interactive elements, allowing students a tactile experience, while intricate theoretical constructs can be elucidated through dynamic video demonstrations. Such immersive approaches not only enhance comprehension but also significantly boost students' enthusiasm and classroom involvement. Beyond mere content delivery, AR opens up avenues for innovative classroom exercises and evaluations. Within the framework of ideological and political courses, students, by leveraging AR, can simulate real-world scenarios, ensuring that knowledge transcends theory and is solidified through practical application. The essence of our research underscores the pivotal role of AR in rejuvenating pedagogical strategies, fostering improved learning outcomes, and ensuring a holistic understanding of intricate ideological and political concepts.

Keywords: five major personalities; AR learning system; ideological and political learning analysis

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1. Introduction

New media is an important carrier of information dissemination, interconnection and discourse in modern society. As a brand-new technical means, new media technology can instantly bring people closer to each other across time and space. As a brand-new technical means, new media technology can instantly bring people and people, people and things, as well as people and things closer in space[1], and people, people and things, and people and things in space. In the evolving landscape of education, Augmented Reality (AR) stands at the forefront of technological innovations that are radically transforming pedagogical approaches and methodologies. It's not just the realm of sciences or arts that AR is impacting; it's making discernible inroads into ideological and political courses within higher education institutions. While there's burgeoning interest and literature around the expansive potential of AR, a niche yet significant area remains relatively uncharted: its nuanced influence on the multifaceted characteristics of college students. This manuscript aims to delve into this intricate dynamic. Inspired and refined by astute feedback from academic peers, our study ensures the precision of terminologies, with terms such as "AR" being capitalized for absolute clarity. Additionally, in response to the valuable reviewer insights,

we've meticulously streamlined the coherence and consistency across all sections, figures, and tables. Through rigorous research and analysis, our manuscript endeavors to decode how AR's integration within ideological and political curricula interacts with varying student profiles, characteristics, and backgrounds. The insights derived not only shed light on contemporary educational strategies but also provide pivotal recommendations for educators, technologists, and policymakers, ensuring an optimized and inclusive learning environment for all.

In the field of education, although virtual learning environments based on AR technology are new, some of their features are in line with educational theory. Environment based on AR technology is new, some of its features are in line with some of the ideas in education theory. Some of its features are in line with some views in education theory. For example: (1) Behaviorism believes that learning is a stimulus-response (S-R) association formula, in which a stimulus is followed by a response to complete learning[2]. In the AR virtual learning environment, the learner interacts with the environment and can quickly get the feedback results, and according to the feedback results to decide the next and decide the next step according to the feedback results, establishing a link between knowledge and response; (2) AR virtual learning environments include rich constructive toolkits and performance venues, and emphasize more of the learner's own role. The AR virtual learning environment includes a rich set of construction kits and performance venues, and emphasizes more control by the learners themselves. This is in line with Piaget's vision and practice of "bringing the laboratory into the classroom"[3], as well as the constructivist learning theory of "bringing the laboratory into the classroom"[4].

2. Five personality intelligent analysis and applications

The results point to the importance of considering psychological predictors, rather than the prevalent reliance on traditional predictors of academic performance[2]. The five major personality analysis is a psychological theory, which is based on Jung's personality theory, believing that a person's personality characteristics can be divided into five aspects: inclination, neuroticism, openness, agreeableness and emotional stability. This analysis method can help us understand our own personality characteristics and learning style, so as to better develop learning plans and goals (see **Table 1)**.

Table 1. Main factors and subfactors of the five-factor model.

Personality characteristics	Main factors, and subfactors
Neuroticism (E)	Group sex, confidence, activity, enthusiasm, excitement seeking, positive emotions
Pleeableness (A)	Forthright, altruistic, compliant, modest, gentle and trusting
Responsibility (C)	Ability, order, responsibility, achievement, hard work, self-restraint
Emotional (N)	Anxiety, angry hostility, depression, self-awareness, impulsivity, susceptibility
Openness (O)	Fantasy, aesthetic, feeling, action, thought, value

At the same time, the "big five" personality analysis can also help us understand the emotional changes and emotional expression of ourselves and others. This also has an important reference value for individual communication and emotional communication.

3. Comparative analysis of the analytical data and communication

AR technology, also known as augmented reality technology, appeared in the 1980s.It appeared in the 1980s, and after slow development, it developed rapidly and gradually became mature in the 21st century.AR technology is a technology that enhances the perception of the real world through the information provided by the computer system, and it is a technology that can be used to enhance the perception of the real world.AR technology is a "multi-source information fusion simulation composed of

interactive computers, which enhances the perception of the real world through the information provided by the computer system. It is "a multi-source information fusion simulation system composed of interactive computers, capable of sensing the user's real behavior of the user, replacing or augmenting one or more sensory feedbacks, thereby immersed in, or present in, a realistic three-dimensional virtual world"[5]. With the objective of understanding the interplay between the "Big Five" personality traits and the utilization of Augmented Reality (AR) systems in the context of ideological and political courses, we embarked on a comprehensive questionnaire survey. Details of this survey, along with comparisons to traditional teaching methodologies, are elaborated in our paper, "Research on Traditional Teaching of Ideological and Political Course and AR Technology Teaching in China". The survey covered foundational elements such as the baseline and usage patterns of the AR system, along with a deep dive into the Big Five personality metrics. Our data, presented in the subsequent table, accentuates palpable differences in the five personality metrics before and after the deployment of AR in these courses. Notably, there were marked reductions in scores for traits like inclination, emotion, openness, agreeableness, and neuroticism post the AR intervention. These results highlight AR's potential to elevate the effectiveness of ideological and political courses and holistically nurture students. However, a significant observation was the subdued academic performance and classroom participation of participants prior to AR exposure. This could be attributed to the data-intensive nature of AR, potentially impacting student focus and learning pace. It's also noteworthy that while AR had a transformative impact on some, altering their learning zeal, others remained relatively unchanged. This underlines the uniqueness of individual learning styles and capacities; AR isn't a one-size-fits-all solution. In conclusion, while integrating personality assessments and tailored AR training can undoubtedly enhance pedagogical outcomes in ideological and political courses, a nuanced, student-centric approach, acknowledging individual variances, is imperative for its optimized success.

4. Analyze the study basis

Analysis of variance studies the difference between X (classification) and Y (quantitative), such as the difference relationship between different personalities after learning using AR technology. First: analyze whether there is significant between X and Y (*p* value is less than 0.05 or 0.01); second: if it is significant; describe the specific difference by comparing the average size; third: if there is no significant; explain that there is no difference in Y under different groups of X; fourth: summarize the analysis.

5. Study subjects and methods

5.1. Study subjects

From March 1 to March 15, 2023, a total of 58 questionnaires were sent to freshman undergraduate students of Guangzhou Industrial and Commercial College, among which 57 were valid, accounting for 98%. Among the survey, 48 male college students, accounting for 83%, 10 female college students 17%, 28 urban students 48%, 30 rural students 52%, 12 only children, 20%, and 46 non-only children, accounting for 80% (see for **Figures 1** and **2**).

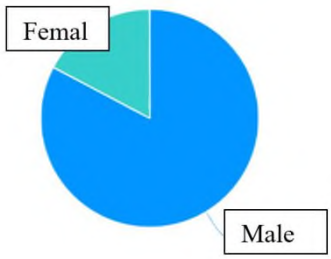

Figure 1. Ratio.

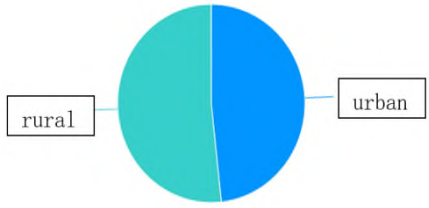

Figure 2. The proportion of cities and villages.

5.2. Study methods

Our research questionnaire on the five personality factors is an amalgamation of pre-existing research frameworks on the topic. Drawing inspiration from Zhou Hui and colleagues, we've tailored a foreign five-factor personality questionnaire to better suit the unique characteristics of Chinese youth. This revised instrument encompasses five distinct dimensions: neuroticism, emotionality, responsibility, openness, and agreeableness. Each dimension is clearly defined, with a total of 60 detailed items, allowing respondents to answer based on their personal experiences. Respondents indicate their agreement with each statement on a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). Here, a higher score implies better adaptability to their current state. Our specialized questionnaire for the ideological and political course evaluation is grounded in the core curriculum of these courses. It holistically captures essential details and broader themes. To analyze the effectiveness of AR in teaching, we administered two tests, designated Test 1 and Test 2, resulting in Grade 1 (pre-AR intervention) and Grade 2 (post-AR intervention) scores, respectively.

We processed and analyzed our collected data using the SPSS software suite. The key metrics under consideration were the five personality traits: neurological, emotional, responsible, open, and agreeable. Furthermore, our primary analytical methodologies encompassed variance analysis, paired *t*-tests, and cross-tabulation techniques, among others.

6. Situation analysis

6.1. Comparative analysis of the overall students before and after the use of AR ideological and political courses

Paired *t*-test for scores 1 and 2, and the results are shown in **Table 1**. The 0.01 level of significance between scores 1 and 2 ($t = -6.288$, $p = 0.000$), and the specific difference, showed that the mean of score 1 (38.33) was significantly lower than the mean of score 2 (56.14). A total of 1 pair data will show differences. The specific difference lies in the significant improvement before and after the use of AR technology, and their difference is −17.81. From the results, it can be seen that the application of AR technology in ideological and political courses plays a certain role.

6.2. Results were analyzed by the paired t-test

Since the above data show significant differences ($p < 0.05$), in order to further verify the accuracy and effect of the data, the specific differences are analyzed by the comparison of the data average for in-depth analysis of the difference of effect size (Effect size). The analysis steps and results are as follows:

First: analyze the reasons for using Cohen's *d*. Cohen's *d* value represents the effect size (difference magnitude), the larger the value, the greater the difference;

Second: the sample for Cohen's *d* value calculation, the formula is the absolute value/standard deviation of the difference;

Third: compare the test results, as shown in **Figure 2**. The paired sample t-test used Cohen's *d* value to indicate large effect size, the effect size is small, medium and large differentiation point: 0.20, 0.50 and 0.80

respectively, Cohen's *d* value of 0.833 indicates a large effect (large difference), this test plays a considerable role, prove that the AR ideological course is specific good effect (see **Table 2** for specific paired *t*-test analysis results, **Table 3**. In-depth analysis-effect size indicator, **Table 4**. Paired *t*-test analysis results-detailed format).

Table 2. Specific paired *t*-test analysis results.

Name	**Paired pairs (mean value ± standard deviation)**		**Difference (pairing 1-pair 2)**	***t***	***p***
	Paired 1	**Pair 2**			
Grcore 1 paired score 2	38.33 ±7.34	56.14 ± 21.02	−17.81	−6.288	0.000**

* $p < 0.05$ ** $p < 0.01$.

Table 3. In-depth analysis-effect size indicator.

In-depth analysis-effect size indicator					
Name	Mean difference	Difference value of 95% CI	*df*	Difference standard deviation	The Cohen's *d* value
Grcore 1 paired score 2	−17.81	−23.480 ~ −12.134	56	21.381	0.833

Table 4. Paired *t*-test analysis results-detailed format.

Paired *t*-test analysis results-detailed format						
Paired number	Item	Average value	Standard deviation	Mean difference	*t*	*p*
Paired 1	Achievement 1	38.33	7.34	−17.81	−6.288	0.000**
	Achievement 2	56.14	21.02			

* $p < 0.05$ ** $p < 0.01$.

Comparative Analysis of AR's Impact on Ideological and Political Courses Across Varied Student Personalities

From the preliminary insights, it's evident that AR technology holds potential in augmenting the effectiveness of ideological and political instruction. However, it's imperative to note that students possess a spectrum of personalities, which might influence their receptiveness to AR-driven teaching methods. Recognizing this heterogeneity, our study sought to evaluate the effects of AR-integrated ideological and political courses across the backdrop of the five-factor personality model.

To achieve a granular understanding of the nuances between different personality types and their responses to AR, we employed a one-way Analysis of Variance (ANOVA). This enabled us to discern variations in the impacts of AR instruction among the five personality categories. As **Table 5** illustrates, no significant variations emerged across diverse personality samples before and after the introduction of AR (with $p > 0.05$). This suggests a uniform influence of AR-enhanced teaching across all personality types, indicating a congruent direction in the learning outcomes regardless of individual personality differences.

Table 5. Personality (mean value ± SD).

Achievements	**Personality (mean value ± SD)**					***F***	***p***
	1.0 (*n* = 8)	**2.0 (*n* = 17)**	**3.0 (*n* = 20)**	**4.0 (*n* = 4) *F***	**5.0 (*n* = 8) *p***		
Achievement 1	35.63 ± 9.43	40.29 ± 8.00	38.00 ± 5.71	41.25 ± 10.31	36.25 ± 5.82	0.898	0.472
Achievement 2	51.25 ± 16.42	68.24 ± 20.99	51.00 ± 17.14	57.50 ± 22.17	47.50 ± 26.59	2.366	0.065

* $p < 0.05$ ** $p < 0.01$.

To bolster the integrity of our findings and thoroughly evaluate the noted significance, a deeper analytical dive became imperative. While the ANOVA analysis revealed significant results ($p < 0.05$), we

deemed it necessary to further assess specific differences relative to the mean value. To this end, we incorporated the metric of Effect Size, which provides a quantitative measure of the magnitude of observed differences.

Our analytical approach was multi-pronged:

We employed the partial Eta squared statistic to denote the effect size, where a larger value signifies a more pronounced difference.

For our ANOVA, the critical benchmarks for small, medium, and large effect sizes, as defined by the partial Eta squared values, are set at 0.01, 0.06, and 0.14, respectively.

The formula to compute the partial Eta squared value is given by SSB/SST.

Additionally, to represent the effect size in our ANOVA, we utilized Cohen's *f*. Its calculation is derived from Sqrt (Eta/(1-Eta)). The thresholds for small, medium, and large effect sizes for Cohen's *f* are 0.10, 0.25, and 0.40, respectively.

Our findings revealed that the Cohen's *f* value for score 1 was 0.263, which is moderately substantial. However, for score 2, Cohen's *f* reached 0.427, indicative of a more pronounced difference in performance, as detailed in **Table 6**.

Table 6. In-depth analysis-effect size indicator.

Analysis items	**SSB (difference between groups)**	**SST (total deviation)**	**Partial Eta square (Partial η^2)**	**The Cohen's *f* value**
Achievement 1	195.012	3016.667	0.065	0.263
Achievement 2	3811.318	24750.877	0.154	0.427

Comparative analysis before and after the use of AR ideological and political courses by urban and rural students, as detailed in **Table 7**.

Table 7. Results of ANOVA before and after AR ideological and political courses.

Results of ANOVA				
-	**Urban and rural hukou (mean value ± standard deviation)**		***F***	***p***
	1.0 (*n* =28)	**2.0 (*n* =30)**		
Achievement 1	38.57 ± 7.92	38.10 ± 6.87	0.057	0.812
Achievement 2	59.29 ± 23.40	53.10 ± 18.34	1.237	0.271

* $p < 0.05$ ** $p < 0.01$.

From the above table, using the analysis of variance analysis (all known as one-way variance analysis) to study the urban and rural hukou for achievement 1, Grade 2 a total of 2 differences, as can be seen from the table: different urban and rural hukou samples for Grade 1, Grade 2 all are not significant ($p > 0.05$), means different urban and rural hukou samples for Grade 1, 2 all show consistency, all of AR course show the direction of improvement.

Urban hukou (analysis sample 1) improves AR ideological and political courses more significantly than rural hukou (analysis sample 2). The main reasons may be as follows:

1) Environmental factors: Compared with rural families, urban families are more likely to have access to new technological products and information. Urban children will be exposed to more electronic products when they grow up, which gives them a higher understanding and acceptance of electronic products.

2) Educational factors: Educational resources in cities are relatively rich, and more schools and teachers will use electronic products for teaching, which makes urban children more acceptance of electronic products.

3) Living habits: Urban children's lifestyle and habits are more related to electronic products, etc. They prefer to use electronic products for entertainment, study, socialize, etc., which makes them more acceptance of electronic products.

4) Economic strength: Compared with rural families, urban families have more economic strength and can buy more electronic products, which makes it easier for urban children to have access to and use electronic products, thus improving their acceptance of electronic products.

Comparative analysis before and after the use of AR ideological and political courses for students of different genders, as detailed in **Table 8**.

Table 8. Different genders results of ANOVA.

Achievements	**Gender (mean value ± SD)**		***F***	***p***
	1.0 (*n* = 47)	**2.0 (*n* = 10)**		
Achievement 1	38.51 ± 6.83	37.50 ± 9.79	0.154	0.696
Achievement 2	54.89 ± 20.42	62.00 ± 23.94	0.941	0.336

* $p < 0.05$ ** $p < 0.01$.

We employed one-way variance analysis to examine the distinctions between gender concerning scores in Grade 1 and Grade 2. From the aforementioned table, it's evident that for both Grade 1 and Grade 2, different gender samples did not manifest any significant differences ($p > 0.05$). This suggests a consistent performance elevation across genders in both grades. Several reasons might underpin these outcomes:

Aesthetic Acuity: Females often have a heightened sensitivity to detail and beauty. The immersive and visually-rich interface offered by AR aligns seamlessly with this inherent aesthetic inclination.

Communication Prowess: AR-driven pedagogies demand efficient communication and collaboration. Given that females often excel in these arenas, it becomes more intuitive for them to embrace and master AR mechanisms.

Practical and Innovative: The multifaceted applications of AR, spanning sectors like education and healthcare, resonate with the female inclination towards innovation coupled with practicality.

Precision and Sensitivity: The intricate processes and operations integral to AR can be daunting. However, females, often characterized by their meticulousness, navigate these with relative ease.

Adaptability and Openness: Being an emergent technology, AR necessitates continuous learning and adjustment. The inherent adaptability and receptiveness of females make them prime candidates for swiftly acclimatizing to, and mastering, this novel technology.

In essence, while both genders displayed an uptrend in performance, the intrinsic characteristics of females make them particularly suited to harnessing the full potential of AR.

6.3. Integrate the above research and analysis

For students with neurotic characteristics, the average before AR was 35.63, while the average after AR was 51.25, and the difference was 15.62. The difference proves that AR technology has improved students' academic performance. Students with neurotic personality characteristics showed a significant improvement in performance after using AR ideological and political courses. Students with this personality type usually have anxiety, depression and susceptibility, and are vulnerable to external influence. In AR ideological and political courses, the more interactive teaching methods can stimulate students' interest, so as to make them more focused on learning. At the same time, AR technology can also provide students with a more intuitive and vivid teaching experience, and help them to better understand and remember the course content.

Therefore, for students with this personality type, teachers can consider the use of AR, VR and other interactive teaching methods to improve their learning effect.

Students with emotional personality characteristics had the average of 40.29 before using AR ideological courses, compared with the average of 68.24 and the difference of 27.95. Visible the personality characteristics of students in AR education courses after the effect is more significant, such students` personality characteristics is anxiety, anger, depression, hostility, self-consciousness, impulse, susceptibility, obviously susceptible to the outside world, so most from the AR course, teachers teach the type of character students can consider more using AR, VR interactive strong teaching methods. Students with emotional personality traits showed the most significant improvement after using AR ideological and political courses. Students of this personality type are usually characterized by anxiety, hostility, depression, impulse and so on, and are vulnerable to external influence. In AR ideological and political courses, more interactive teaching methods can help them to better control their emotions, so as to focus more on learning. At the same time, AR technology can also provide them with a more intuitive and vivid teaching experience, and help them to better understand and remember the course content. Therefore, for students with this personality type, teachers can consider the use of AR, VR and other interactive teaching methods to improve their learning effect.

Conscientious Personality Characteristics of Students: Prior to the integration of AR in ideological courses, students possessing conscientious personality traits had an average score of 38.00. Post the AR introduction, their average surged to 51.00, marking a difference of 13.00. Notably, when compared to students with agreeable personality traits, the influence of AR on conscientious students was relatively muted. This suggests that AR's impact was not as pronounced on these students. Typically, conscientious individuals exhibit traits such as capability, orderliness, responsibility, achievement, diligence, and self-discipline. Their inherent drive and self-discipline mean they're predisposed to rigorous study even without the leverage of AR technology. When instructing students of this personality type, educators might benefit from guiding them towards a deeper understanding and analysis of pivotal knowledge.

Open Personality Characteristics of Students: Before AR's assimilation into educational courses, open personality students posted an average score of 41.25. This figure escalated to 57.50 post-AR, highlighting a difference of 16.25. This leap, more significant than that observed in neurotic personality students, underscores the considerable influence of AR on open personality students. Openness in personality typically correlates with a proclivity for imagination, aesthetic appreciation, emotional range, adventurousness, liberal values, and curiosity. The immersive and dynamic features of AR can effectively stimulate these students' inherent enthusiasm for imaginative and creative endeavors. Consequently, they witness a noticeable upswing in performance when exposed to AR-enriched courses. Pedagogically, when catering to students exhibiting open personality traits, the employment of graphically rich teaching methodologies and immersive virtual elements can be particularly effective, enhancing their overall learning experience (refer to **Figure 3**).

Students with pleasant personality characteristics. The mean before the AR was 36.25, while the average after the AR was 47.50 with a difference of 11.25. This type of personality has the smallest difference among the five personality types, proving that the AR technology did not influence too much on them, so the performance was not significant after using the AR ideological and political course. The character type students' character is forthright, altruism, compliance, modest, gentle, trust, temperament is relatively stable, makes the type character students have a smooth learning mentality, therefore, in AR ideological courses gains least, teachers teach the type character students can taste other teaching methods to improve learning effect.

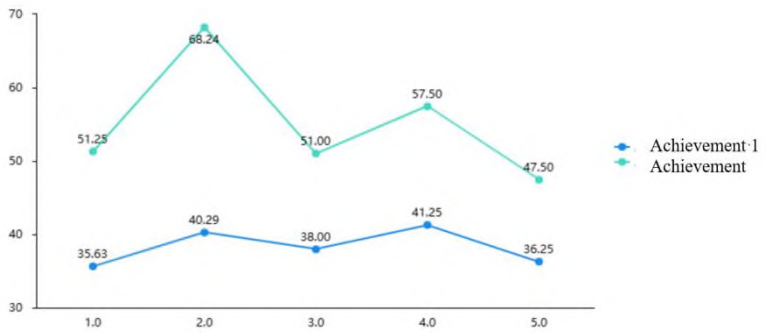

Figure 3. AR ideological course average.

7. Conclusions

Today's ideological and political theory course teachers and college student counsellors are mostly composed of people with liberal arts backgrounds, and it is necessary to absorb and introduce a group of talents with engineering backgrounds appropriately, focusing on tapping talents with both engineering backgrounds, such as computers, and liberal arts learning experiences, such as Marxist theory, as tutors in colleges and universities[6]. Before and after the use of AR ideological and political courses, there are differences in the use of the Big Five personality and AR system. Before the use of AR ideological and political courses, the tested students' academic performance and classroom participation were not high. This may be because traditional teaching methods require students to do a large amount of text reading, data analysis and processing, which may have an impact on their learning efficiency and attention. Before and after the use, the extroversion, neuroticism, openness, agreeableness and neuroticism scores were improved to varying degrees, indicating that the use of AR system can improve students' learning efficiency and initiative and stimulate their learning interest. Some students showed higher learning enthusiasm and enthusiasm after using the AR system, while others showed less change. This may be because everyone has their own different personality characteristics, learning style and ability level, and the use of AR system cannot completely change their learning style and ability level.

The use of AR technology is evident in political and ideological discourse. AR technology can help pupils learn and recall abstract ideological and political concepts by visualizing them. In order to increase the effectiveness and efficiency of learning, students can more effectively investigate and study the information points in ideological and political courses by employing AR technology. The use of augmented reality (AR) technology can help increase students' interest in learning, allowing them to engage more actively in the ideological and political course teaching process and so better comprehend and master the course material. Moreover, we found that the recent use of the AR system did not completely change the students' personality traits.

AR technology has different effects on students with different personality types. When teaching students with different personality types, teachers can choose different teaching methods according to their characteristics to improve their learning effect. In addition, the introduction of AR technology can also provide students with a more intuitive and vivid teaching experience, help them to better understand and remember the course content, and improve the learning effect. Therefore, the application of AR technology in ideological and political courses has a broad prospect.

It can be seen that, compared to research on traditional, more mature technologies in education, the overall research on the use of AR technology in education is still in its early stages. Many studies are at the stage of developing, simplifying and initially implementing AR tools. Moreover, empirical research on the use of AR in education is still in a relatively simple, short-term, small-sample exploration. The empirical research on AR in education is still in the stage of relatively simple, short-term, small-sample exploratory

design. Some studies are in the early stages of development. Some studies in the early stages of development have relied on learners' self-reported usability, preferences, and efficiency to evaluate learning outcomes. Some studies in the early stages of development have relied on learners' self-reported availability, preferences, and efficiency to evaluate learning outcomes. Examples include the ARSC study[7], the Construct 3D study[8], and the ARSC study, 3D[9], etc. In addition, the methods used in current research are mainly based on design studies[10] and case studies[11−13], and only a few have used quasi-experimental designs, e.g., 3D physics experiments using augmented reality[14], augmented reality algebraic geometry education, augmented reality adult science education practices[15], and language listening and learning environments[16]. Therefore, there is a need for more evidence of the educational value of AR, and further controlled and comprehensive evaluations are needed, including large samples and validated evaluations. evaluation, including large samples and validated instruments.

Author contributions

Conceptualization, ZZ, NGW and SBS; methodology, NGW; software, ZZ; validation, ZZ, NGW and SBS; formal analysis, ZZ; investigation, ZZ and SBS; resources, ZZ; data collation, ZZ; writing—original draft preparation, ZZ, NGW and SBS; writing—review and editing, NGW and SBS; visualization, ZZ; supervision, SBS; project management, ZZ. All authors have read and agreed to the published version of the manuscript.

Conflict of interest

The authors declare no conflict of interest.

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