

METaverse CONCEPT AWARENESS AND APPLICATION LEVELS FOR PEDAGOGICAL PRACTICE AMONG UNIVERSITY LECTURERS IN KWARA STATE

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Abstract

The metaverse represents a transformative shift in digital learning, offering immersive and interactive experiences that enhance pedagogical practices. Despite the emphasis on experiential learning, the Nigerian education system remains largely theoretical, thereby limiting practical skill development and necessitating innovative approaches, such as the metaverse. This study explores University lecturers' awareness and application and usability of metaverse technologies for teaching in Kwara State, Nigeria. A descriptive research design of survey type was adopted using a structured questionnaire. Findings revealed low awareness of metaverse concepts, limited application and usability level. Paired samples t-tests showed significant differences between awareness and application levels ($p = .000$) and between application and usability levels ($p = .000$), suggesting gaps in adoption and ease of use. ANOVA results ($p = .000$) further indicated significant differences in usability perceptions across professional cadres. The study concludes that although lecturers show growing interest in metaverse technologies, usability challenges hinder effective integration. It recommends increased institutional support, targeted training, and improved access to metaverse platforms to enhance adoption and promote innovative teaching practices.

Keywords: Metaverse, Awareness, Application, Pedagogy, University Lecturers, Higher Education

Introduction

Computer scientists and researchers aimed to quickly advance the development of virtual environments. The rapid growth of the Internet and the proliferation of social media applications have made it easier and more affordable to access the necessary hardware and software. This accessibility allows the creation of improved digital content, represented in three-dimensional (3D) virtual environments (MacCallum & Parsons, 2019). The metaverse is a virtual world made up of interactive digital spaces, enhancing the way people communicate and experience learning. It allows many users to engage with each other in real-time, creating dynamic and immersive educational environments (Akour *et al.*, 2022). The metaverse, described as a "successor to the internet" (Ball, 2022), offers immersive, interactive experiences.

Educators are exploring its potential for enhanced engagement, collaboration, and simulation-based learning (Lin *et al.*, 2022). The metaverse is a digital environment that enhances our physical reality. It combines the real world with virtual elements, allowing users to create and interact with various digital versions of the real world—some that exist in reality and others that do not. This space can serve many different purposes, such as socialising, gaming, education, and more (Akour *et al.*, 2022). Jeon (2021) agreed that the metaverse platform is an essential tool for learners to increase their motivation and immersion. They can develop an interest in innovative learning styles and get self-directed learning experiences.

Metaverses have the potential to change the way universities and academic work are commercialised. Previously, university lectures were delivered live to a small audience by a genuine lecturer, a single commodity. The Metaverse will provide students with a more “cyber-physical” academic experience, in which the virtual and physical worlds collide. Students can navigate smoothly between online shops and lecture halls using a single avatar, thanks to metaverses. There’s a chance that the Metaverse will emerge due to some form of standard university teaching. Many students may choose cyber-physical colleges over traditional brick-and-mortar universities. They could learn from virtual experiences from various worldwide universities in the Metaverse (Alawadhi *et al.*, 2022).

Researchers are investigating the Metaverse system’s importance in the educational area due to its recent development (AlHamad *et al.*, 2022). Han & Noh conducted a study to examine the attitudes and needs of higher education instructors regarding metaverse-based education, focusing on its pedagogical relevance. The study’s main goal is to determine how teachers feel about using the Metaverse system in higher education. They conclude that the Metaverse can be employed as a supplement to traditional delivery methods.

Additionally, teachers felt systems and assistance connected to the classroom environment, such as curricular material and teaching practices, where required. Another study looked into the impact of the Metaverse system as an innovative technology in local universities. The Metaverse system has been proposed as a creative solution to the dilemma that professors and students encounter in online learning environments. One of the notable issues that can be resolved is the difficulty that teachers have in transmitting specific classes, and the level of pleasure students have with online learning (Jeon, 2021).

Another study by Díaz *et al.* (2020) investigated the implementation of a virtual or metaverse system in an educational environment, focusing on the flexibility of access to synchronous and asynchronous information. The study paves the way for real teaching experiences where students and teachers can communicate by using library resources, visiting a museum, holding a meeting, *et cetera*. They implemented a quasi-experimental research design for a group of students. The tool was a questionnaire that was distributed to investigate the degree of students' satisfaction with the virtual world. Though the research focused on developing pedagogical strategies through emerging technologies, the study was limited to the teaching of mathematics at the University of Cundinamarca. In this sense, other types of theoretically based courses may reflect variant students' perceptions. Students’ perceptions and degrees of satisfaction may differ among courses depending on the nature of the course. The effectiveness of the metaverse lies in its interactive features and personalised user experience. Therefore, researchers take advantage of these two factors in the teaching and learning environments (Gaafar, 2021; Ng *et al.*, 2021).

Awareness of the Metaverse among educators has gained attention in emerging educational research, with studies showing that while educators have a general understanding of digital tools, the Metaverse as a concept remains relatively unfamiliar (Choi *et al.*, 2023). Moreover, while lecturers recognise the potential of digital tools in enhancing engagement, they may not be fully aware of how the Metaverse can provide structured, immersive learning experiences that go beyond traditional classroom settings (Kim *et al.*, 2023). Awareness levels vary widely across disciplines and depend on multiple factors, including institutional support, individual technological fluency, and prior exposure to virtual environments. Studies have found that lecturers from technology-intensive fields such as engineering and health sciences tend to have higher awareness levels due to their familiarity with simulation tools and virtual labs that share similarities with Metaverse applications (Lee *et al.*, 2022).

Dwivedi *et al.* (2022) posited that knowledge of the faculties concerning new digital technologies, as research demonstrated that many higher education professionals are poorly acquainted with the metaverse applications and do not have adequate training in it. Therefore, Park and Lee (2023) advocate clear structures of training programs to raise digital literacy and facilitate the adoption of metaverse tools in teaching. Conversely, lecturers in fields with less emphasis on digital interaction may be less aware or hesitant to explore Metaverse technologies.

Furthermore, institutional initiatives play a critical role in increasing awareness. Universities that provide training sessions and resources on immersive technologies are more likely to see higher levels of understanding and interest in Metaverse applications among faculty (Garcia & Ruiz, 2023).

This institutional support often translates into a more robust knowledge base, helping lecturers see the Metaverse not just as a technological innovation but as a viable pedagogical tool. Additionally, educators frequently express concerns about accessibility and technical challenges, which may hinder motivation to learn about and adopt the Metaverse (Wang *et al.*, 2022).

Positively-minded educators believe that the metaverse has enormous educational potential, providing immersive and interactive learning opportunities that can improve student comprehension and engagement. Some educators might take a neutral position, appreciating the metaverse's promise but needing more information or education to properly comprehend its effects on instruction. Some people doubted the metaverse's ability to improve educational outcomes when compared to traditional teaching techniques, viewing it as a novelty or diversion (Moorthi, 2024). Additionally, research by Tural and Koçak (2022) assessed the levels of awareness of social studies pre-service teachers with regard to the use of the metaverse. In this research, varying awareness and application trends could be seen among participants, which indicated a gap in the understanding and practical application of metaverse concepts.

Moreover, technologically savvy or early-adopting teachers welcomed the metaverse with great enthusiasm, seeing it as a chance to use cutting-edge technology for teaching. Others voiced cautious excitement about the metaverse but also voiced worries about compatibility problems, bugs in the system, or the necessity for strong technical assistance. Some educators are so opposed to the metaverse's entrance that they raise issues with its complexity, accessibility issues, or the possibility of technical malfunctions interfering with instruction (Moorthi, 2024). Panda *et al.* (2024) indicated that, while the metaverse retains immense promises for higher education, its applied scope so far is quite limited. The present research highlighted the following challenges: technological constraints, lack of familiarity amongst educators, and the need for effective integration strategies as the major barriers to wider adoption. Furthermore, the authors stressed the need for frameworks for comprehensive guidelines for mobilising metaverse technologies in education.

In addition, the metaverse offers immersive learning opportunities that suit a variety of learning preferences and styles. Some educators view it as a tool for advancing equity and inclusion. While acknowledging the potential advantages of the metaverse for inclusivity, some maintained a neutral position while voicing worries about accessibility issues or the possibility of exacerbating already-existing inequalities in technological access. Some believed that the metaverse would worsen inequality, especially if it necessitated costly technology or fast internet connections, which not all students could afford (Moorthi, 2024).

The usability study examined metaverse learning environments and discovered that interface design and navigation, together with technical support systems, represent the most essential elements for lecturer usability. The study, "Metaverse-Based Learning Environments: A Usability Study of Lecturers' Perspectives" highlighted the importance of improving the user interface and providing technical support (Lee *et al.*, 2022). The usability of metaverse technology for pedagogical practice was found to be significantly influenced by technical expertise, institutional support, and perceived usability. Specifically, Lecturers' Usability Experience with Metaverse Technology for Pedagogical Practice revealed that lecturers' attitudes towards metaverse-based learning were shaped by these factors (Sharma *et al.*, 2023). Research on lecturers' acceptance of metaverse technology found that perceived usefulness, ease of use, and social norms significantly impacted their attitudes (Ball, 2022).

Park and Kim (2022), explored usability challenges in metaverse-based learning environments and found that, despite high application rates, educators and students struggle with usability issues related to interface design, accessibility, and technical barriers. "Exploring Lecturers' Usability and Acceptance of Metaverse Technology for Teaching and Learning" emphasised the need for strategies promoting lecturers' acceptance and use of metaverse technology (Ball, 2022). An evaluation of metaverse-based learning platforms identified navigation, accessibility, and technical issues as major challenges. Usability and Accessibility of Metaverse-Based Learning Platforms for Lecturers recommended improving platform design and providing technical support (Žilak *et al.*, 2025). A study on lecturers' perceptions of metaverse usability found that attitudes significantly influenced teaching practices (Muhammad *et al.*, 2023).

Çalışkan and Maya (2024) looked into the opinions and expectations of instructors about metaverse applications in higher education. In general, educators think that the metaverse has great potential; however, they believe that there are many significant challenges to using this technology, including technical problems associated with equipment, a lack of training, and insufficient infrastructure. This indicates the kind of support and resources necessary to improve the practical usability of metaverse technologies in education. Tlili *et al.* (2023) found that different educational professionals view the usability of the metaverse for teaching in varying ways. The outcome proves that the effectiveness of metaverse integration relies on the technological competency and different professional roles of the educators. Besides, it was also found that prior exposure to digital teaching tools made such professionals perceive the metaverse as more usable, whereas traditional teachers viewed the metaverse as less usable.

Statement of the problem

The purpose of 21st-century education extends beyond traditional academic knowledge, aiming to equip students with skills and competencies that align with real-world demands. In the contemporary fast-evolving global landscape, education must foster critical thinking, adaptability, and problem-solving abilities, enabling students to navigate complex challenges in diverse fields (Thornhill-Miller *et al.*, 2023). By integrating real-life experiences into the curriculum, educators can bridge the gap between theoretical knowledge and practical application, preparing students to address societal issues, engage in civic responsibilities, and thrive in the workforce (Smeplass, 2023). Experiential learning models, such as project-based learning and internships, support students in developing communication, collaboration, and resilience skills highly valued in modern workplaces (Jackson *et al.*, 2023). These real-life connections enhance student engagement, as learners see the relevance of studies to personal goals and career aspirations, ultimately promoting lifelong learning (Mebert *et al.*, 2020). Building on the foundational goal of 21st-century education to connect learning with real-life experiences, the metaverse provides an innovative platform.

The metaverse offers transformative opportunities for teaching and learning, fostering immersive, interactive educational experiences that extend beyond traditional classroom boundaries. In the metaverse, educators can design virtual spaces where students actively engage with content, allowing for experiential learning through simulations, 3D models, and collaborative tasks. Such environments enhance student motivation and engagement by enabling them to visualise and interact with abstract concepts (Singh *et al.*, 2024). For instance, a biology class in the metaverse could allow students to explore human anatomy virtually, offering a deeper understanding than textbook illustrations alone. Additionally, the metaverse supports social learning, where students from diverse locations collaborate in real-time, sharing ideas and perspectives that enrich the learning experience (Haryo & Makmur, 2024). Research shows that students in immersive environments often exhibit higher retention rates and improved problem-solving skills, as these settings promote active participation and critical thinking (Kazu & Kuvvetli, 2023). However, implementing the metaverse in education also requires addressing challenges such as digital equity and effective teacher training, ensuring all students benefit from this technological innovation (Matovic *et al.*, 2025).

In Nigeria, the education system faces significant challenges, particularly in bridging the gap between theoretical knowledge and practical, real-life applications. Much of the curriculum remains focused on rote learning and abstract concepts rather than skills acquisition, leaving students with limited opportunities to engage meaningfully with their communities and apply their knowledge practically (Abdulganeey *et al.*, 2025). Consequently, graduates often enter the workforce without essential skills such as critical thinking, problem-solving, and adaptability, which are critical for navigating complex societal and economic challenges (Rewane, 2019). This lack of alignment between academic content and practical needs stems from outdated teaching methods and inadequate integration of experiential learning models, such as internships or project-based learning, that would otherwise prepare students for active roles in their communities. Additionally, limited resources and infrastructural deficits hamper efforts to adopt more interactive, skill-oriented teaching approaches, further stalling the progress towards an immersive education that is responsive to real-world demands (Adeoye *et al.*, 2023).

The educational challenges in Nigeria, particularly the disconnect between theoretical learning and real-life skills application, underscore the importance of innovative approaches like the metaverse in addressing these gaps. As outlined, Nigerian education relies heavily on rote learning and abstract teaching, which limits students' practical engagement with their communities and does not sufficiently prepare them for real-world challenges. This study aims to investigate the potential of the metaverse to mitigate these issues by exploring the awareness and application levels of metaverse concepts among university lecturers in Kwara State. Specifically, it examines how well lecturers understand the metaverse, how they currently use it, and its usability for pedagogical practices. By assessing these factors, the study seeks to determine whether the metaverse could serve as a practical tool for fostering experiential learning, helping to bridge the gap between academic theory and real-life application, thus equipping students with critical skills for the workforce.

Purpose of the Study

The main purpose of this study was to explore the awareness and application levels of metaverse concepts for pedagogical practices by university lecturers in Kwara State. Hence, the specific purposes examined:

1. the awareness level of university lecturers on the metaverse concept in Kwara State;
2. the application level of metaverse by lecturers in universities in Kwara State;
3. the usability of the metaverse for pedagogical practices by university lecturers in Kwara State;
4. the significant difference between awareness and application levels of the metaverse concept among university lecturers in Kwara State;
5. the significant difference between application level and usability of the metaverse for pedagogical practices among university lecturers in Kwara State; and
6. the significant difference between professional cadres on the usability of the metaverse for pedagogical practices by universities in Kwara State.

Research Questions

The following research questions were raised from the descriptive specific purposes of this study:

1. What is the awareness level of university lecturers on metaverse concepts in Kwara State?
2. What is the application level of the metaverse by university lecturers in Kwara State?
3. What is the usability level of the metaverse for pedagogical practices in universities in Kwara State?

Research Hypotheses

H₀₁: There is no significant difference between awareness and application levels of the metaverse concept among university lecturers in Kwara State.

H₀₂: There is no significant difference between the application level of usability of the metaverse for pedagogical practices among university lecturers in Kwara State.

H₀₃: There is no significant difference between professional cadres on the usability of the metaverse for pedagogical practices by lecturers in universities in Kwara State.

Methodology

This study adopts a positivist research approach aligned with a descriptive research design to systematically examine university lecturers' awareness and usability of metaverse technology for pedagogical practices in Kwara State, Nigeria. The population of this study consists of university lecturers from eight selected universities in Kwara State, Nigeria. Using purposive sampling, a non-probabilistic method, the researcher identified 240 lecturers who were chosen based on their availability

and relevance to the study's objectives. The research instrument is a structured questionnaire divided into four sections. Section A gathers demographic details, such as university affiliation, ownership, professional rank, and years of teaching experience, to provide context for the analysis. Section B assesses lecturers' awareness of the metaverse and related technologies, utilising a scale from "Highly aware" (HA) to "Not aware" (NA) to capture different familiarity levels. Section C evaluates the applicability of metaverse tools in teaching, with items focusing on immersive environments and student engagement, also rated from "Highly applicable" (HA) to "Not applicable" (NA). Section D examines the usability of the metaverse for pedagogical purposes, covering virtual lectures, simulations, and personalised learning, with responses from "Highly usable" (HU) to "Not usable" (NU). Mean was used to analyse research questions 1 to 3, while the t-test was used to answer research hypotheses 1 and 2, and the ANOVA was used to answer research hypothesis 3.

Results and Discussions

Research Question 1: Awareness level of university lecturers on metaverse concepts

Table 1: *Awareness level of university lecturers on metaverse concepts*

SN	Items	Mean
1	How aware are you of the general concept of the metaverse?	1.81
2	To what extent are you familiar with the technologies (e.g., VR, AR) that underpin the metaverse?	1.80
3	How aware are you of the potential applications of the metaverse in education and teaching?	1.81
4	To what degree are you aware of any existing metaverse platforms (e.g., Decentraland, Roblox, etc.)?	1.13
5	How familiar are you with discussions or academic research related to the metaverse within your field?	1.56
Average mean		1.62

Table 1 indicates a generally low level of awareness among university lecturers regarding metaverse concepts, with an average mean score of 1.62 on a scale where higher values denote greater awareness. This suggests that lecturers are not highly familiar with the metaverse, its underlying technologies, or its potential applications in education. The findings align with Dwivedi et al. (2022) regarding the knowledge of the faculties concerning new digital technologies, as research demonstrated that many higher education professionals are poorly acquainted with the metaverse applications and do not have adequate training in it.

Research Question 2: Application level of the metaverse by university lecturers

Table 2: *Application level of the metaverse by university lecturers*

SN	Item	Mean
1	How applicable is the use of the metaverse in your current teaching practices?	1.99
2	To what extent do you find the metaverse applicable for creating immersive learning environments?	2.02
3	How applicable is the metaverse in facilitating virtual collaboration among students in your courses?	2.21
4	To what degree do you consider the metaverse applicable in enhancing student engagement and interaction?	2.12

5	How applicable is the metaverse in supporting distance or online learning initiatives in your university?	2.56
Average mean		2.18

Table 2 reveals that university lecturers perceive a relatively low applicability of metaverse technologies in their teaching practices, with an average mean score of 2.18 on a scale where higher values indicate greater applicability. This suggests that lecturers currently find limited use for the metaverse in areas such as immersive learning environments, virtual collaboration, student engagement, and support for online learning. These findings correspond with the findings of Panda et al. (2024) which indicated that, while the metaverse retains immense promises for higher education, its applied scope so far is quite limited. The present research highlighted the following challenges: technological constraints, lack of familiarity amongst educators, and the need for effective integration strategies as the major barriers to wider adoption.

Research Question 3: Usability of metaverse for pedagogical practices

Table 3: *Usability of metaverse for pedagogical practices*

SN	Item	Mean
1	How usable do you find the metaverse for delivering lectures in a virtual environment?	1.58
2	To what extent is the metaverse usable for facilitating hands-on activities and simulations in your courses?	1.71
3	How usable is the metaverse for supporting individualised learning experiences in your classroom?	1.91
4	To what degree do you find the metaverse usable for conducting assessments and evaluations?	1.91
5	How usable is the metaverse for fostering collaborative projects between students in your courses?	1.70
Average mean		1.76

Table 3 indicates that university lecturers perceive the metaverse as having limited usability for various pedagogical practices, with an average mean score of 1.76 on a scale where higher values denote greater usability. This suggests that lecturers currently find the metaverse less practical for activities such as delivering virtual lectures, facilitating hands-on simulations, supporting individualised learning, conducting assessments, and fostering student collaboration. This supports the findings of Çalışkan and Maya (2024), which looked into the opinions and expectations of instructors about metaverse applications in higher education. In general, educators think that the metaverse has great potential; however, they believe that there are many significant challenges to using this technology, including technical problems associated with equipment, a lack of training, and insufficient infrastructure.

Research Hypothesis 1: There is no significant difference between awareness and application levels of metaverse concept among university lecturers in Kwara State.

Table 4: *Paired Sample t test difference between awareness and application levels of metaverse concept*

	Mean	N	t	df	Sig (2-tailed)
Awareness	8.1033	242	-9.617	241	.000
Application	10.9008	242			

As stated in the results of the paired sample t-test, the mean scores for the level of awareness and application of the metaverse concept are documented as follows: awareness=8.1033 versus application=10.9008, with a total sample size of 242. The t-statistic is -9.617, and the two-tailed significance (p-value) is .000. Since the p-value is much lower than the commonly adopted alpha level of 0.05, we reject the null hypothesis, which indicates that there is a statistically significant difference between levels of awareness and application. Specifically, the mean value of the application is significantly higher, suggesting that the application tends to report higher operation than awareness of the metaverse concept. This is in line to research by Tural and Koçak (2022), which assessed the levels of awareness of social studies pre-service teachers with regard to the use of the metaverse. In this research, varying awareness and application trends could be seen among participants, which indicated a gap in the understanding and practical application of metaverse concepts.

Research Hypothesis 2: There is no significant difference between the application level and usability level of the metaverse for pedagogical practices among university lecturers in Kwara State.

Table 5: Paired Sample t-test significant difference between the application level and usability level of the metaverse for pedagogical practices

	Mean	N	t	df	Sig (2-tailed)
Application	10.9008	242	7.718	241	.000
Usability	8.8182	242			

The results of a paired samples t-test reveal mean scores of 10.9008 and 8.8182 for application and usability levels of metaverse in pedagogical practices with 242 participants. The t value shows a value of 7.718 with 241 degrees of freedom, and the two-tailed significance (p-value) is .000. Since the p-value is less than the common alpha level of 0.05, we reject the null hypothesis. This indicates that there is a significant difference between the application and usability levels of the metaverse for pedagogical practices from the perspective of the participant. This finding aligns with research by Park and Kim (2022), who explored usability challenges in metaverse-based learning environments and found that despite high application rates, educators and students struggle with usability issues related to interface design, accessibility, and technical barriers.

Research Hypothesis 3: There is no significant difference between professional cadres on the usability of the metaverse for pedagogical practices by lecturers in universities in Kwara State.

Table 6: ANOVA showing a significant difference between professional cadres on the usability of the metaverse for pedagogical practices

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	50.578	6	8.430	29.953	.000
Within Groups	66.136	235	.281		
Total	116.715	241			

The usability of the metaverse for pedagogical practices may differ significantly among professional cadres, as indicated by the ANOVA results. Between-groups sum of squares = 50.578; mean square = 8.430; within-groups sum of squares = 66.136; mean square = 0.281. The F-statistic of 29.953 and the corresponding significance value (p = 0.000) imply statistically significant differences between the professional cadres. Since the p-value is less than the general level of significance, 0.05, the null hypothesis that there is no difference in usability perception among professional cadres is rejected. This validates that professionals working from different points of view differ in their perception of metaverse usability in terms of pedagogical purposes. This is supported by the study of Tlili et al. (2023), different educational professionals view the usability of the metaverse for teaching in varying ways. The outcome proves that the effectiveness of metaverse integration relies on the

technological competency and different professional roles of the educators. Besides, it was also found that prior exposure to digital teaching tools made such professionals perceive the metaverse as more usable, whereas traditional teachers viewed the metaverse as less usable.

Conclusion

The study's conclusions show a notable discrepancy between the metaverse's application and usability levels for teaching methods. Despite the fact that teachers are actively utilising metaverse technology in the classroom, usability issues continue to be a significant obstacle to successful integration. The paired samples t-test ($t = 7.718$, $p = 0.000$) revealed a statistically significant difference, indicating that although interest in the metaverse is growing, problems with user experience, accessibility, and interface design prevent it from reaching its full educational potential.

Recommendations

1. University management should organise targeted awareness programmes, workshops, and seminars to improve lecturers' understanding of metaverse concepts
2. University administrators should invest in improving the usability of metaverse platforms by ensuring user-friendly interfaces, reliable technical support, and accessible infrastructure to overcome the usability challenges
3. Institutional policies should be developed to integrate metaverse technologies into the curriculum, providing clear guidelines and resources to support consistent adoption across all professional cadres.
4. Education policymakers should allocate funding for digital infrastructure and metaverse resources to support the adoption of immersive technologies
5. National Universities Commission should incorporate metaverse literacy into accreditation standards for teacher education programmes
6. Universities should partner with technology developers to customise metaverse platforms that align with local educational contexts

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Exploring metaverse concept awareness and application levels for pedagogical practice among university lecturers in Kwara state

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