Analysis of the relationship between traditional sports integration in the digital age: bridging cultural preservation and modern innovation in Inland Papua

Análisis de la relación entre la integración del deporte tradicional en la era digital: conectando la preservación cultural y la innovación moderna en Papúa Interior

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How to cite in APA

- Syamsudin, S., Setyawati, H., Kristiyanto, A., Pramono, H., Wasa, C., & Yambedoan, T. (2025). Analysis of the relationship between traditional sports integration in the digital age: bridging cultural preservation and modern innovation in Inland Papua. *Retos, 70*, 1182–1205. https://doi.org/10.47197/retos.v70.117183

Abstract

Introduction and Objective. This investigation examines the relationship between the preservation of traditional sporting culture and the integration of digital technology as a basis for modern innovation, centered in the context of the interior of Papua.
Methodology. The approach used is quantitative with the support of the software VOSviewer and SmartPLS 4. Data was obtained from the Scopus database for the period 2010-2025, using four main keywords: Preservation of Sports Culture (120 documents), Integration of Digital Technology in Sports (185 documents), Interés de la Generación Joven en el Deporte (51 documents), and Impacto Social del Deporte (1,228 documents). Data visualization is carried out via VOSviewer, while in-depth analysis uses the SEM-PLS method via SmartPLS 4.
Results. The results of the external load analysis showed an improvement in construct validity after the elimination of non-valid indicators. The discriminant validity and reliability of the instrument were also achieved satisfactorily. The global adjustment of the model shows a GoF value of 0.856 which is classified as strong. The R^2 showed that the Integration of Digital Technology was capable of explaining 78.3% of related variables, and the Interés de la Generación Joven was 62.3%. The trayectory coefficient reveals that Cultural Preservation has a significant effect on the Integration of Digital Technology, and digital technology also has an effect on the Interés de la Generación Joven. However, the Innovation in Presentation did not show any significant effect.
Conclusions. The investment concludes that digital technology plays a strategic role as an interactive bridge between culture and new generations. Cultural preservation combined with digital technology is more effective than mere innovation in presentation. The participation of local communities and the adaptation of digital content to cultural values are the keys to the success of cultural transformation in the digital era.

Keywords

Traditional sports, in the digital age, culture; modern innovation in Papua's Interior.

Resumen

Introducción y Objetivo. Esta investigación examina la relación entre la preservación de la cultura deportiva tradicional y la integración de la tecnología digital como puente hacia la innovación moderna, centrándose en el contexto del interior de Papúa.
Metodología. El enfoque utilizado es cuantitativo con el apoyo del software VOSviewer y SmartPLS 4. Los datos se obtuvieron de la base de datos Scopus para el período 2010-2025, utilizando cuatro palabras clave principales: Preservación de la Cultura Deportiva (120 documentos), Integración de la Tecnología Digital en el Deporte (185 documentos), Interés de la Generación Joven en el Deporte (51 documentos), e Impacto Social del Deporte (1.228 documentos). La visualización de los datos se llevó a cabo mediante VOSviewer, mientras que el análisis en profundidad utilizó el método SEM-PLS mediante SmartPLS 4.
Resultados. Los resultados del análisis de carga externa mostraron una mejora de la validez de constructo tras la eliminación de los indicadores no válidos. La validez discriminante y la fiabilidad del instrumento también se alcanzaron satisfactoriamente. El ajuste global del modelo muestra un valor GoF de 0,856 que se clasifica como fuerte. El R^2 mostró que la Integración de la Tecnología Digital era capaz de explicar el 78,3% de las variables relacionadas, y el Interés de la Generación Joven el 62,3%. El coeficiente de trayectoria revela que la Preservación Cultural tiene un efecto significativo en la Integración de la Tecnología Digital, y la tecnología digital también tiene un efecto en el Interés de la Generación Joven. En cambio, la Innovación en la Presentación no mostró ningún efecto significativo.
Conclusiones. La investigación concluye que la tecnología digital desempeña un papel estratégico como puente interactivo entre la cultura y las nuevas generaciones. La preservación cultural combinada con la tecnología digital es más eficaz que la mera innovación en la presentación. La participación de las comunidades locales y la adecuación de los contenidos digitales a los valores culturales son las claves del éxito de la transformación cultural en la era digital.

Palabras clave

Deportes tradicionales en la era digital, cultura; innovación moderna, en el interior de Papúa.

Introduction

Traditional sports are an important part of the nation's cultural heritage, representing local values, togetherness, physical strength, and even spirituality in various regions of Indonesia.(Kogoya et al., 2024), including in the interior of Papua.(Guntoro et al., 2024), traditional sports are not only a means of entertainment or competition, but also function as a social tool that binds communities and transmits ancestral values from generation to generation.(Anindhita et al., 2024)However, amidst the increasingly rapid pace of modernization and globalization, the existence of traditional sports is now on the verge of being left behind, especially due to the lack of documentation, attention from the younger generation, and minimal technological support in their preservation.(Suo et al., 2024)The digital era opens up enormous opportunities to document, disseminate, and revitalize traditional sports in more engaging and accessible formats. Technology has become a new medium for preserving cultural heritage, including sports.(Beato et al., 2024)With the help of the internet, social media, digital applications, and augmented reality technology, heritage such as folk games and traditional sports can be repackaged to reach a wider audience, especially the younger generation who are the main users of technology.(Hughes et al., 2024)However, this integration is not yet evenly distributed throughout Indonesia, especially in remote areas such as the interior of Papua.(Migliaccio et al., 2024)The Papuan interior boasts an extraordinary cultural richness, including traditional sports such as archery, boat racing, outdoor running, and community games passed down through generations. However, limited digital infrastructure(Yang et al., 2024). , geographical isolation, and minimal institutional support make the preservation and development of traditional sports in this region face major challenges.(Chen & Dai, 2024),Digital inequality is one of the main reasons why local culture is less exposed and less developed sustainably amidst the global flow of information.

Transforming sports culture through digitalization is an urgent need. Without adapting to changing times, many traditional sports will lose their relevance in the eyes of the younger generation.(Espinosa et al., 2025)Children and teenagers in the interior of Papua are now increasingly attracted to foreign digital content and entertainment, accessible via smartphones and the internet. Without serious efforts to modernize the presentation of local culture, including sports, this cultural heritage will be increasingly marginalized.(Xu et al., 2025),Therefore, it is important to understand how digital innovation can be integrated with efforts to preserve traditional sports in Papua.(Kedarnath Navandar et al., 2025)Innovation here doesn't mean changing the substance of culture, but rather how traditional sports are packaged, documented, and disseminated using modern technology. Short videos, gaming apps, educational platforms, and even virtual reality can provide new avenues for introducing and preserving unique and meaningful forms of traditional sports.(Wang et al., 2025),In addition to being a preservation tool, digital technology can also be a link between the older generation who still master traditional sports authentically with the younger generation who are more familiar with them.(Aggerholm, 2025), digital devices. This collaboration serves as a bridge that enables the transfer of knowledge and cultural values to take place in a more engaging, relevant, and sustainable way.(Higham & Vada, 2025)Projects such as digital archives, interactive content creation, or online cultural festivals can be a starting point for cultural and technological synergy in remote areas.(Wen et al., 2025)However, digital development of traditional sports cannot be achieved overnight. It requires a participatory approach involving local communities, traditional leaders, youth, and external parties such as the government, NGOs, and technology developers.(Huang et al., 2025)This is important to ensure that the digitalization process does not merely "visualize" traditional sports, but also preserves the cultural values contained within them so that they are not lost in the modernization process.(Chung et al., 2025)Another problem is the lack of written or visual documentation that serves as a reference for the digitalization process.(Yildirim, 2025)Many traditional sports in Papua exist only in practice, without official records, and rely entirely on the collective memory of the community. This situation presents a significant challenge when translating them into digital form.(Ma et al., 2025) .So that conservation efforts are needed, they must start with systematic documentation carried out through field work, interviews, observations, and active participation in the community.

Developing digital sports literacy among Papua's rural communities is also an important prerequisite for preserving technology-based traditional sports.(Ma et al., 2025)Without basic skills in using digital devices and accessing the internet, people will remain spectators, not actors in the process of cultural

preservation.(Bădescu et al., 2022)Therefore, training programs and technological mentoring are an integral part of this strategy to ensure that preservation efforts become shared and sustainable. The success of digitalizing traditional sports also depends heavily on policy and infrastructure support.(Nuriddinov, 2023)Local governments have an important role in facilitating internet access, developing community digital facilities, and empowering local youth in the fields of technology and cultural preservation.(Chidambaram et al., 2022)Without this support, the digitalization of culture will only be a short-term project that will not have a broad impact.(Le Noury et al., 2022)On the other hand, a digital approach to traditional sports can provide new economic value for local communities. Digitized cultural products can be used as educational, entertainment, and even commercial content through digital platforms. This opens up opportunities for a sustainable, local culture-based creative economy while strengthening Papuan identity amidst the homogenizing currents of globalization.(Tai et al., 2023)In an educational context, digital traditional sports can be incorporated into local curriculum content or used as interactive learning media. Schoolchildren in Papua can learn about the history, cultural values, and uniqueness of their region through digital games based on their own culture. This will shape a generation that is not only digitally literate but also possesses a strong cultural awareness.(Luo et al., 2021)This study aims to explain the role of digital technology integration in efforts to preserve traditional sports in the interior of Papua.(Edriss et al., 2024)The main focus is how technology can bridge the gap between almost forgotten cultural heritage and modern innovations that are familiar to the daily lives of the younger generation.(Xiao et al., 2023),By using a scientific approach, this study also analyzes the relationship between variables such as cultural preservation, technology integration, the interests of the younger generation, and innovation in presentation.(Wang et al., 2022)Given the inevitability of technology, it's no longer time to pit traditional culture against digitalization. Instead, the synergy between the two can create a new ecosystem where culture coexists and thrives in the digital space. This is crucial in the context of Papua, a nation rich in culture but lacking modern infrastructure, both a challenge and an opportunity for the younger generation to face the challenges of modern-day sport.

Bibliometric Analysis

Findings from the analysis using VOSviewer. Figure 1 shows a complex network connecting various sports-related concepts. At the center of the network is "sports," which is closely intertwined with elements such as "motivation," "cultural diversity," and "collaborative learning."(Robots, 2024)This reflects that sport is not only influenced by social and cultural factors, but also contributes to collaborative learning and community development.(Zhou & Colomer, 2024)The link between sport and social aspects such as "male" and "adolescents" shows a significant impact on identity development and social interactions among adolescents. Furthermore, the concepts of "cultural diversity" and "cultural landscape" highlight the importance of cultural context in sport practices, serving as a means to celebrate diversity. Elements such as "governance" and "community" indicate that sporting success often depends on existing social support and structures.(Doh et al., 2025)This analysis provides valuable insights into the interaction of various factors in a sporting context and the importance of a multidimensional approach to understanding these dynamics.

Figure 1. The findings of the analysis using VOSviewer show a complex network connecting various sports-related concepts.

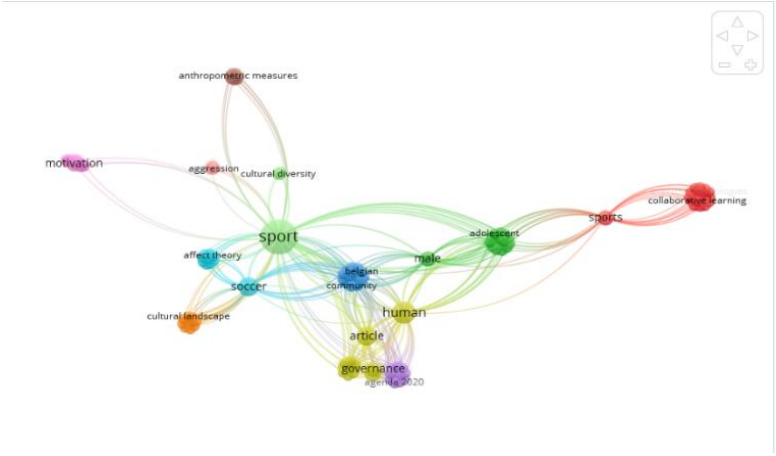


Figure 2. Findings from the analysis using VOSviewer show a dynamic and complex network, with "sports" as the center connecting various important concepts. This network illustrates the close relationship between sports and elements such as "motivation," "cultural diversity," and "collaborative learning."(Cardona-Acevedo et al., 2025)The varying colors show the development of these concepts from 2010 to 2025, indicating that interest and attention in sports continues to grow. The relationship between sports and social aspects such as "male" and "adolescents"(Yustiarini et al., 2025)highlighting the important role of sport in identity formation and social interaction among adolescents. Meanwhile, cultural indicators such as "cultural landscape" reinforce the understanding that sport practices are inseparable from the broader cultural context. Elements such as "governance" and "community"(Paucar Uribe et al., 2025), emphasizes that sporting success is heavily influenced by social support and structures within the community. Overall, this analysis provides in-depth insights into how various factors interact in the sporting context, as well as the importance of a multidimensional approach to understanding the dynamics within the sporting world.

Figure 2. Findings from the analysis using VOSviewer show a dynamic and complex network, with "sports" 2020-2025

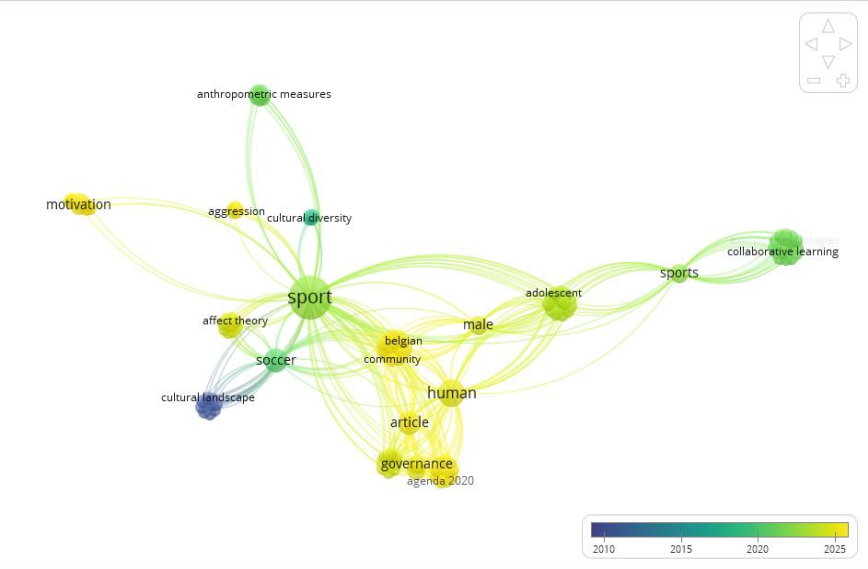


Figure 3. Heatmap analysis. The findings from the analysis using VOSviewer show an interesting concept distribution pattern in the form of a heatmap. On the left side, "soccer" is the main focus, indicating that this topic has significant interest and attention. Related concepts such as "football," "gender," and "discourse analysis"(Sánchez-Sánchez et al., 2024), highlighting how football has become a field for exploring social and gender issues. On the right side, "sport" and "motivation" emerge as highly concentrated areas, demonstrating that motivation is a key factor in the sporting context. Furthermore, "health equity" and "aggression" are also connected, creating a dialogue about how psychological and health factors influence the experience of sport.

Figure 3. Analysis of heat map findings from the analysis using VOSviewer shows an interesting concept distribution pattern in the form of a heat map.

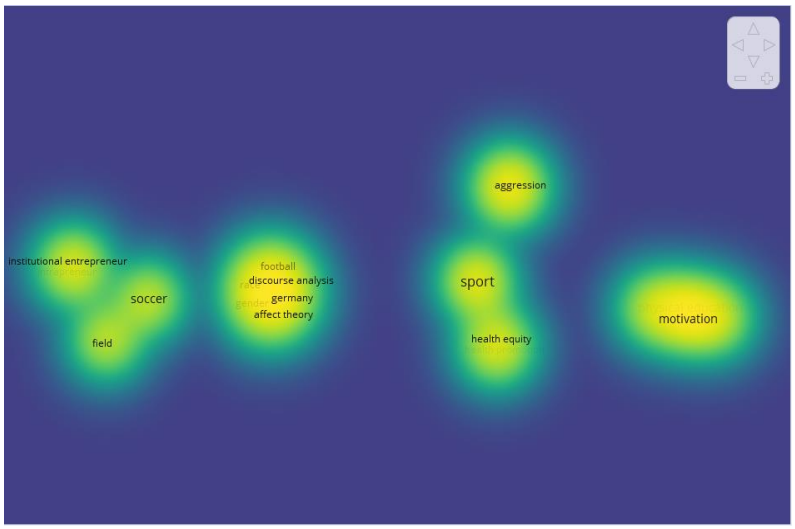


Figure 4 Findings from the analysis using VOSviewer show a complex network with a primary focus on "health," which is connected to various related aspects such as "education," "economic development," and "quality of life."(Sánchez-Sánchez et al., 2024), analysis of findingsThe network is divided into several clusters, with one cluster emphasizing the importance of quality education and infrastructure to support public health.

Figure 4. Findings from the analysis using VOSviewer show a complex network with a main focus on "health,"

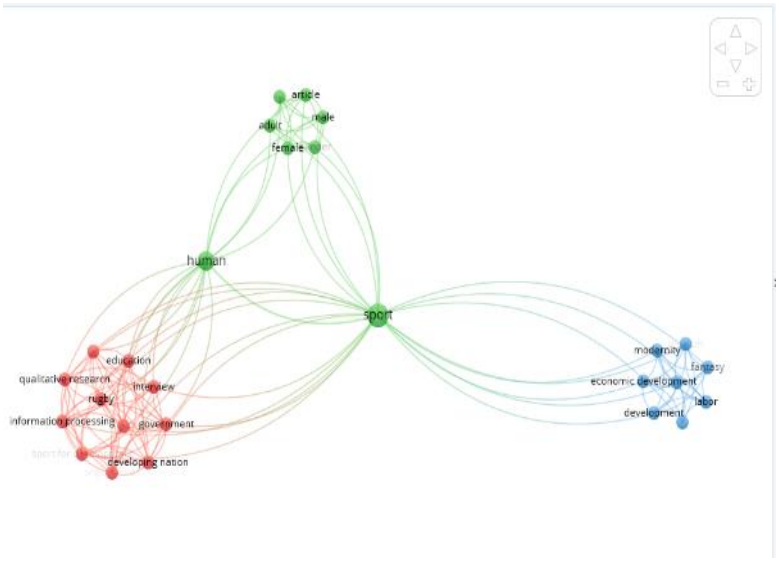


Figure 5. Analysis results using VOSviewer show a structured network with "sport" as the center, which is connected to various important concepts such as "education," "development," and "quality of life."(Doh et al., 2025)The varying colors on the map indicate the development of these themes from 2010 to 2025, demonstrating that sport is increasingly recognized as a crucial factor in the context of education and development. The cluster focused on "education" shows that sport can serve as a tool to improve the quality of education and skills, while the cluster related to "development" highlights the role of sport in community and economic development. The connection between "sport" and "human" illustrates the importance of the social and human aspects of sport practices, demonstrating that sport can improve the well-being of individuals and communities.

Figure 5. Analysis results using VOSviewer show a structured network with "sport" 2010-2025

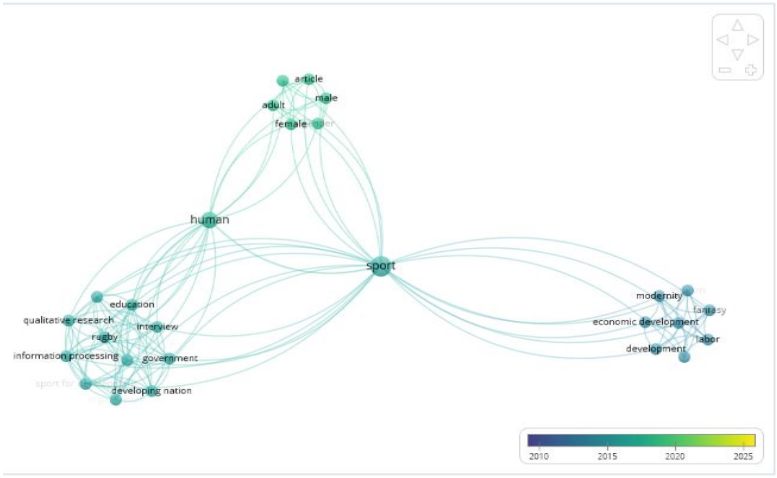
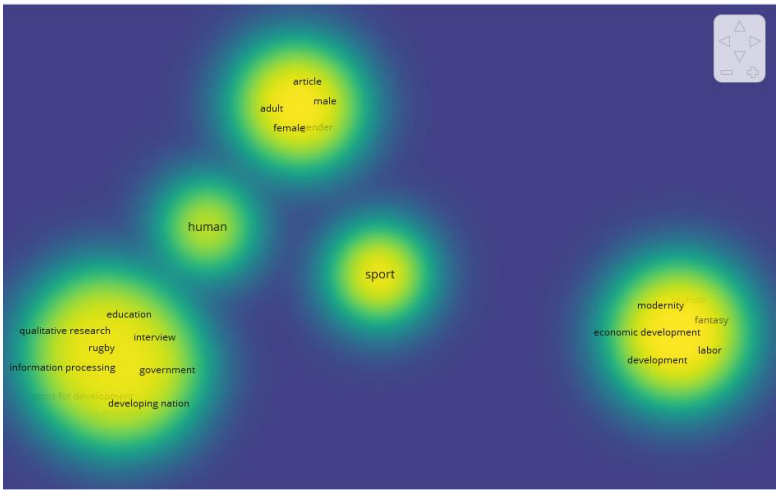


Figure 7 Analysis using VOSviewer shows a heat map illustrating the concentration of concepts related to “sport.” In the center of the map, “sport” dominates, indicating significant attention to this topic.(Al-Zoubi, 2024)The clusters around "human" and "gender" reflect the importance of social and identity dimensions in the context of sport, with a focus on the roles of men and women. On the other hand, concepts such as "education," "economic development," and "developing a nation" demonstrate the relationship between sport and social and economic development. This highlights that sport serves not only as a recreational activity but also as a tool for achieving broader development goals.

Figure 7. Analysis using VOSviewer shows a heat map illustrating the concentration of concepts related to “sport.”



Method

This research method uses a quantitative approach with the support of two software, namely VOSviewer and SmartPLS 4.(Khan et al., 2025). This study analyzed four keywords: one variable with the title*“Sports Culture Preservation*, which resulted in 120 documents being found, then the second keyword with the title variable“*Sports Digital Technology Integration''*with 185, Documents found, and for keywords and title variables:*Young Generation Interest in Sports*, with 51 documents found next with the fourth variable and keywords:*Social Impact of Sports*, with 1,228 documents found from the Scopus database, https://www.scopus.com/ The data was drawn from 2010-2025.(Caroline et al., 2024)Then the data found from the Scopus database is analyzed and visualized using Vosviewer, https://www.vosviewer.com/, after the data has been found, an in-depth analysis is then carried out

using*smartPLS-SEM4*. https://smartpls.com/downloads/

Population and Sample

The study population consisted of approximately 100 samples drawn using simple random sampling techniques to ensure good representation of various subgroups. A sample size of 100 respondents was selected to ensure the reliability and generalizability of the study results.(Orr et al., 2025).

Operational Definition of Variables

Operational Definitions of Variables and components used to research a particular group or sample.(Orr et al., 2025),Data collection was carried out using research instruments, which were then calculated numerically:

Variables and components of the test sample

Table 1. Variables and components of the test sample

NO	Variables	Variable and component code
1	Preservation of Sports Culture	PB1 Documentation of traditional Papuan sports on digital platforms. PB2 Dissemination of information about traditional sports practices. PB3 Online education about Papuan cultural values. PB4 Preparation of teaching materials on traditional Papuan sports in digital format. PB5 Development of mobile applications to promote traditional Papuan sports and culture.
2	Integration of Digital Sports Technology	ITD1 Use of social media to promote traditional sports. ITD2 Use of mobile applications to increase participation. ITD3 Accessibility of traditional sports content online. ITD4 The use of video streaming platforms to broadcast traditional sporting events live. ITD5 Development of an interactive website that provides information and resources about traditional sports.
3	Young Generation's Interest in Sports	MG1 Young generation's interest in traditional sports through digital platforms. MG2 Participation of young people in traditional sporting events. MG3 Youth involvement in digital sports communities. MG4 Use of social media by the younger generation to discuss and share experiences about traditional sports. MG5 Awareness of the younger generation about the cultural values contained in traditional sports.
4	Social Impact of Sports	DS1 Increasing cultural awareness among the younger generation. DS2 Economic impact of traditional sporting events on communities. DS3 Social involvement in traditional sports activities. DS4: The influence of traditional sporting events on strengthening local cultural identity. DS5: Community participation in efforts to preserve traditional sports.

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Types and Methods of Data Collection

The data collection process in this study was carried out through the following steps:

1) Survey Delivery: Data was collected by sending an online survey, where respondents were asked to fill out a questionnaire containing questions related to the research variables.
2) In-depth Interviews: In addition to the survey, in-depth interviews were also conducted to obtain richer and more detailed information from respondents. These interviews aimed to explore respondents' perceptions and experiences regarding mental health, nutrition, and physical exercise.
3) Data Processing: After the data were collected from the survey and interviews, the analysis process was carried out using SmartPLS 4. This software is used to analyze the relationship between variables through the Structural Equation Modeling (SEM) approach, which allows researchers to deploy the built model and test the established hypotheses.
4) Measurement scale: The scale used as the basis for measurement is the Likert scale which consists of five categories of answer choices:

- Strongly Agree (SS)
- Agree (S)
- Neutral (N)
- Disagree (TS)
- Strongly Disagree (STS)

This questionnaire is designed to measure the Relationship Between Traditional Sports Integration, in the Digital Era: Bridging Cultural Preservation, and Modern Innovation, in the Interior of Papua

Data analysis

VOSviewer is used to search and analyze findings from the Scopus database. The results of the VOSviewer visualization can provide a clear picture of the relationship between, Integration of Traditional Sports, in the Digital Era: Bridging Cultural Preservation, and Modern Innovation, in the Interior of Papua, With this visualization, researchers can identify patterns, trends, and relationships between the variables studied.(Hammouti et al., 2025).

SmartPLS 4

SmartPLS 4 was used for data analysis using the Structural Equation Modeling (SEM) approach.(Nurhidayati et al., 2025a), this software allows researchers to test and validate the relationships between constructs in a more complex way, as well as highlight the relationships and various factors, Integration of Traditional Sports, in the Digital Era: Bridging Cultural Preservation, and Modern Innovation, in the Interior of Papua

Reliability Test

The consistency test aims to assess the internal consistency of the instruments used in the research.(Gorai et al., 2024)An instrument is considered to have good reliability if its Cronbach's Alpha value exceeds 0.70. Here's a further explanation:

Alpha Scale

- Cronbach's Alpha values range from 0 (zero) to 70 (seventy). The higher the alpha value, the stronger the internal consistency between items in the instrument.

Reliability Testing Criteria

- IfRT≥Rr_t \geq rRT≥Rtable, then the instrument is considered reliable.
- If RT<Rr_t < rRT<Rtable, then the instrument is considered unreliable.

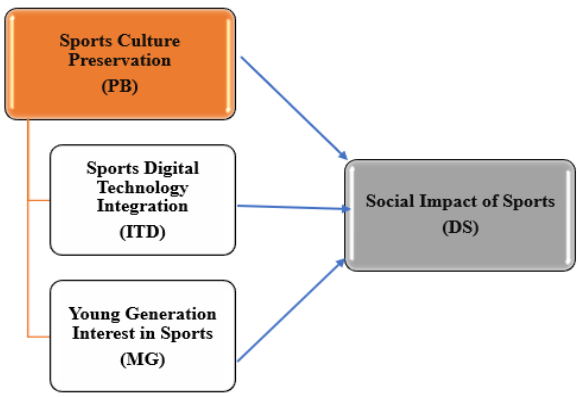
Value Range

- Ralpha's *R* value above 0.70 to 0.80 is classified as reliable or has good consistency.
- Values above 0.80 to close to 1.00 indicate that the instrument is very reliable or has a very high level of reliability.

Results

Data Analysis with Smart PLS-SEM

Figure 8. Research Framework

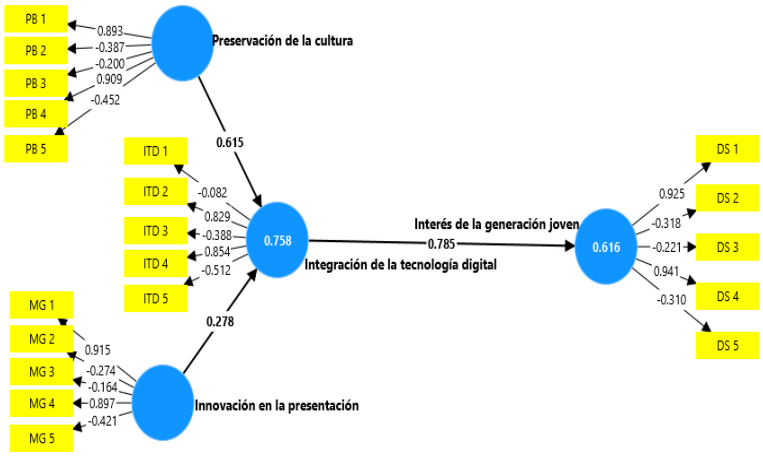


Outer Model

The outer model in this study refers to the relationship between the measurement variables (indicators) and the constructs that are the focus of the research.(Putu Gede Subhaktiyasa, 2024)This model is important to cover the extent to which the selected indicators can reflect the variables studied, such as critical thinking skills and understanding of statistical concepts. The goal is to ensure that the measuring instruments used are valid and reliable, the research results will be more reliable, providing accurate information regarding the effects of problem-based learning interventions. Each variable in this study has specific indicators designed to cover various aspects of the construct being measured. For example, indicators for critical thinking skills cover students' ability to analyze and disseminate information, while indicators for understanding mathematical concepts assess the application of concepts in real situations. Testing the outer validity of the model is done through factor analysis, where the factor loading of each indicator is evaluated.(Sugiarto et al., 2025)Indicators with factor loadings above 0.5 are considered valid, and reliability tests such as Cronbach's Alpha ensure the consistency of the indicators. With this test, the outer model provides assurance that the collected data truly reflects the variables studied, as can be seen in Figure 9. The results of the Outer Loading Test are as follows.

Outer Loading Convergent Validity Test Stage 1.

Figure 9. Outer Loading Test Convergent Validity Test Stage 1



The results of the Outer Loading test show the factor loading values for each indicator in this study. For the Cultural Preservation variable, indicators PB1 and PB2 have high factor loadings of 0.837 and 0.839, respectively, indicating their validity. However, indicator PB3 with a factor loading of 0.452 is considered invalid. Furthermore, for the Digital Technology Integration variable, indicators ITD1 and ITD2 also show adequate results with factor loadings of 0.615 and 0.728, respectively, while ITD3 with a factor loading of 0.278 does not meet the validity criteria. Indicators ITD4 and ITD5 show strong factor loadings of 0.915 and 0.804, respectively. For the Innovation in Presentation variable, all indicators show excellent results, with factor loadings of IP1 of 0.849, IP2 of 0.938, and IP3 of 0.915. Overall, indicators with factor loadings above 0.5 are considered valid, while PB3 and ITD3 need further evaluation due to their low results. In stage 1, the results of the Outer Loading Test and Convergent Validity Test can be seen in the Outer Loading Test stage 1, which can be seen in Table 2 as follows.

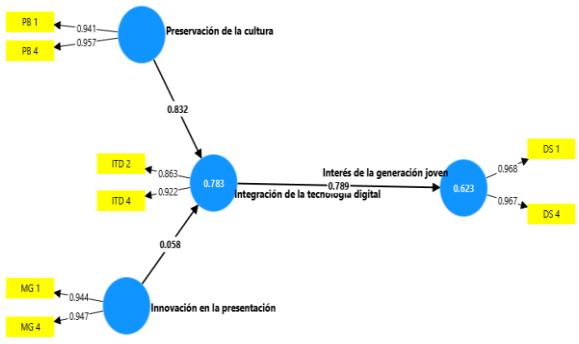
Table 2. Outer Loading Test Convergent Validity Test Stage 1

Variables	Innovation in presentation	Integration of digital technology	Interest of the younger generation	Preservation of culture	Information
PB 1				0.893	Valid
PB 2				-0.387	Invalid
PB 3				-0.200	Invalid
PB 4				0.909	Valid
PB 5				-0.452	Invalid
ITD 1		-0.082			Invalid
ITD 2		0.829			Valid
ITD 3		-0.388			Invalid
ITD 4		0.854			Valid
ITD 5		-0.512			Invalid
MG 1	0.915				Valid
MG 2	-0.274				Invalid
MG 3	-0.164				Invalid
MG 4	0.897				Valid
MG 5	-0.421				Invalid
DS 1			0.925		Valid
DS 2			-0.318		Invalid
DS 3			-0.221		Invalid
DS 4			0.941		Valid
DS 5			-0.310		Invalid

The results of the Outer Loading test and the Convergent Validity test stage 1 show the performance of the indicators for the variables studied. For the Cultural Preservation (PB) variable, indicators PB1 and PB4 have valid factor loadings of 0.893 and 0.909, respectively. However, indicators PB2, PB3, and PB5 show negative factor loadings and are declared invalid. In the Digital Technology Integration (ITD) variable, only indicators ITD2 and ITD4 are valid with factor loadings of 0.829 and 0.854, respectively, while indicators ITD1, ITD3, and ITD5 are invalid because they contain negative factors. For the Young Generation Interest (MG) variable, indicators MG1 and MG4 are declared valid with factor loadings of 0.915 and 0.897, respectively. However, indicators MG2, MG3, and MG5 are invalid. Finally, for the variable Interests de la generación joven (DS), indicators DS1 and DS4 are valid with loading factors of 0.925 and 0.941, while DS2, DS3, and DS5 are invalid. Overall, these results indicate that a number of indicators need to be revised or replaced to ensure better construct validity in this study. so that this research data needs to be tested for Outer Loading Test Convergent Validity Stage 2.

Outer Loading Convergent Validity Test Stage 2

Figure 10. Outer Loading Test Convergent Validity Test Stage 2



The results of the Outer Loading and Convergent Validity tests in stage 2 showed an increase in the validity of the measured indicators. For the Cultural Preservation (PB) variable, indicators PB1 and PB4 had excellent factor loadings of 0.941 and 0.957, respectively, indicating that they were valid and able to reflect the construct well. For the Digital Technology Integration (ITD) variable, indicators ITD2 and ITD4 also showed positive results, with factor loadings of 0.832 and 0.683, respectively. Although ITD4 had a slightly lower value, it remained valid. Indicator ITD3, which was previously invalid in the first stage, is no longer displayed, indicating that adjustments may have been made. For the Innovation in

Presentation (MG) variable, indicator MG1 showed a factor loading of 0.947, clearly indicating its validity. The other indicators are not displayed, which may indicate that the focus of the analysis shifted to more relevant indicators. Finally, in the Interests of young generation (DS) variable, the DS1 and DS4 indicators show excellent factor loadings of 0.968 and 0.623, respectively, which indicate their validity. These results indicate that changes and improvements to the indicators in this second stage have successfully increased the validity of the construct under study, providing a stronger basis for further analysis. The results of the Outer Loading Test and Convergent Validity Test can be seen in Table 3 for outer loading stage 2 as follows.

Table 3. Outer Loading Test Convergent Validity Test Stage 2

Variables	Innovation in presentation	Integration of digital technology	Interest of the younger generation	Preservation of culture	Information
PB 1				0.941	Valid
PB 4				0.957	Valid
ITD 2		0.863			Valid
ITD 4		0.922			Valid
MG 1	0.944				Valid
MG 4	0.947				Valid
DS 1			0.968		Valid
DS 4			0.967		Valid

The results of the Outer Loading and Convergent Validity tests in stage 2 showed a significant increase in the validity of the measured indicators. For the Cultural Preservation (PB) variable, indicators PB1 and PB4 had excellent factor loadings of 0.941 and 0.957, respectively, indicating that these two indicators are valid and effective in reflecting the construct. Then In the Digital Technology Integration (ITD) variable, the ITD2 and ITD4 indicators also showed good results with factor loadings of 0.863 and 0.922, respectively, which stated that both were valid in the context of this study. For the Innovation in Presentation (MG) variable, the MG1 and MG4 indicators showed high factor loadings, respectively 0.944 and 0.947, so both could be declared valid. Finally, in the Interestes de la generación joven (DS) variable, the DS1 and DS4 indicators also showed very good factor loadings, namely 0.968 and 0.967, which ensured the validity of both. Overall, these results illustrate that the indicators tested in this second stage succeeded in showing strong validity, providing a more solid basis for further analysis in this study.

Average Variance Extracted (AVE)

Average Variance Extracted (AVE).(Balu & Rathnasabapathy, 2025), is a measure used in measurement model analysis to assess how well the indicators in a construct can explain the variance of the construct. AVE is calculated by summing the squares of the factor loadings of all indicators related to the construct, then dividing by the number of indicators used.(Rouf & Akhtaruddin, 2018)The main function of AVE is to enable convergent validity, which indicates the extent to which the indicators used truly represent the construct being measured. An AVE value greater than 0.5 is considered good, because it indicates that more than 50% of the construct variance can be explained by these indicators. In addition, AVE is often used in conjunction with reliability values, such as Composite Reliability (CR), to provide a comprehensive picture of the quality of the measurement model. Thus, AVE is an important tool in data analysis to ensure that the construct being examined is measured well through relevant and valid indicators. The results of the Average Variance Extracted (AVE) analysis can be seen in table 4 as follows.

Table 4. Results of the Average Variance Extracted (AVE) Test

Variables	Average variance extracted (AVE)	Information
Innovation in presentation	0.894	Valid
Integration of digital technology	0.798	Valid
Interest of the younger generation	0.936	Valid
Preservation of culture	0.901	Valid

The Average Variance Extracted (AVE) test results show significant values for each of the variables studied. For the Innovation in Presentation variable, the AVE value of 0.894 indicates that the indicators

used are valid and able to explain the construct variance well. Similarly, the Digital Technology Integration variable has an AVE of 0.798, which is also considered valid, although slightly lower compared to other variables. Furthermore, the Young Generation Interest variable recorded a very high AVE value of 0.936, indicating that the indicators are very effective in representing the construct. Finally, the Cultural Preservation variable showed an AVE of 0.901, which indicates strong validity. Overall, all variables in this study showed valid AVE values, which means that more than 50% of the variance of each construct can be explained by the existing indicators. These results strengthen the measurement model used in the study.

Cross loading Discriminant Validity Test Results

Cross loading.(Greer et al., 2025), is a method used to test discriminant validity in measurement model analysis. This test aims to ensure that each indicator is more related to its own construct compared to other constructs. In this analysis, each indicator is evaluated based on its factor loading value against all existing constructs. If an indicator has a higher loading value on the construct it is supposed to have compared to other constructs, then the indicator is considered valid for that construct. Conversely, if an indicator shows a high loading on another construct, this may indicate that the indicator is invalid or irrelevant to the intended construct. Cross loading test.(Broadbridge et al., 2025),helps researchers identify problems in the measurement model, such as indicators that need to be revised or removed. Good results from this analysis will increase confidence in the model used, because it shows that the indicators can differentiate between different constructs effectively. For the results of the cross-loading test, can be seen in Table 5 as follows.

Table 5. Cross loading of Discriminant Validity Test Results

Variables	Innovation in presentation	Integration of digital technology	Interest of the younger generation	Preservation of culture	Information
PB 1	0.939	0.772	0.971	0.941	Valid
PB 4	0.802	0.899	0.796	0.957	Valid
ITD 2	0.637	0.863	0.583	0.696	Valid
ITD 4	0.804	0.922	0.803	0.868	Valid
MG 1	0.944	0.762	0.875	0.774	Valid
MG 4	0.947	0.780	0.940	0.947	Valid
DS 1	0.922	0.768	0.968	0.844	Valid
DS 4	0.935	0.759	0.967	0.943	Valid

The results of the cross-loading analysis for the discriminant validity test indicate that all indicators used in this study are valid. Indicators from the Innovation in Presentation (PB) variable show high loading values, with PB 1 reaching 0.939 and PB 4 at 0.802, both of which remain higher on their own constructs compared to other constructs. The Digital Technology Integration (ITD) variable also shows strong loadings, with ITD 2 and ITD 4 valued at 0.863 and 0.922, respectively, and lower values on other constructs. Furthermore, the Young Generation Interest (MG) variable has MG 1 and MG 4 indicators with very good loadings, namely 0.944 and 0.947, which indicates a strong relationship with their constructs. Finally, the Cultural Preservation (DS) variable shows DS 1 and DS 4 indicators with valid loadings of 0.922 and 0.935, respectively. Overall, all indicators showed higher factor loadings on their respective constructs, confirming the validity and certainty of the measurement model used in the study.

Latent Variable Correlation

Latent variable correlation Refers to the relationship between latent variables in a statistical model.(Xiong et al., 2025)Latent variables are constructs that cannot be measured directly but are expressed through measured indicators. Understanding the correlation between latent variables is important, because it provides insight into the relationships and interactions between the various aspects studied. In statistical analysis, these correlations are often calculated using techniques such as Structural Equation Modeling (SEM), which allows researchers to test and model complex relationships between latent variables and their indicators. Correlation values range from -1 to 1, where values close to 1 indicate a strong positive relationship, values close to -1 indicate a strong negative relationship, and values around 0 indicate no significant relationship.(Waldorp & Marsman, 2022)The results of the correlation analysis can be used to improve understanding of the dynamics between the variables in the study as well as to recommend relevant recommendations or policies based on the findings of the study. The results of the latent variable correlation can be seen in table 6 as follows.

Table 6. Results of the Latent Variable Correlation (AVE) and Square Root Test (√AVE)

Variables	(AVE)	√(AVE)	Information
Innovation in presentation	0.894	0.944	Valid
Integration of digital technology	0.798	0.894	Valid
Interest of the younger generation	0.936	0.968	Valid
Preservation of culture	0.901	0.95	Valid

The results of the latent variable correlation test show that all variables in this study have valid Average Variance Extracted (AVE) and square root (√AVE) values. For the Innovation in Presentation variable, the AVE value is 0.894 and √AVE reaches 0.944, indicating that the indicators are able to explain the construct variance well. The Integration of Digital Technology Variable shows an AVE value of 0.798 and √AVE of 0.894, which is also considered valid although slightly lower compared to other variables. Furthermore, the Young Generation Interest variable has a high AVE value, namely 0.936, and √AVE of 0.968, indicating that the indicators are very effective in representing the construct. Finally, the Cultural Preservation variable recorded an AVE value of 0.901 and √AVE of 0.95, which indicates strong validity. Overall, these results reinforce that all variables in this study are valid, with good ability to explain the variance of the measured constructs.

Fornell-Larcker

Fornell-Larcker is a method used to test discriminant validity in measurement model analysis, particularly in the context of Structural Equation Modeling (SEM). This method aims to ensure that each construct in the model can be clearly distinguished from the other constructs.(Sarpong & PraiseGod Zungu, 2025)The Fornell-Larcker criterion states that the square root of the Average Variance Extracted (√AVE) of each construct must be greater than the correlation between that construct and other constructs. If this criterion is met, it indicates that the indicators used for a construct truly represent that construct without being tied to other constructs. For example, if the √AVE of construct A is greater than the correlation with construct B, this indicates good discriminant validity. However, if it is not met, there may be significant overlap between the constructs. Although this method is useful, researchers also need to consider other approaches to discriminant validity, such as cross-loading analysis, to gain a more comprehensive understanding of the relationships between constructs. The results of the Fornell-Larcker test can be seen in Table 7 as follows.

Table 7. Fornell-Larcker test results

Variables	Innovation in presentation	Integration of digital technology	Interest of the younger generation	Preservation of culture	Information
Innovación en la presentación	0.945				Valid
Integración de la tecnología digital	0.816	0.893			Valid
Interés de la generación joven	0.960	0.789	0.967		Valid
Preservación de la cultura	0.911	0.885	0.923	0.949	Valid

The Fornell-Larcker test results indicate that all variables in this study meet the criteria for discriminant validity. For the Innovation in Presentation variable, the √AVE value is 0.945, which is higher than the correlation value with other variables, indicating good validity. The Digital Technology Integration variable shows a √AVE value of 0.893, and also meets the criteria with a lower correlation value with other constructs. Furthermore, the Young Generation Interest variable has a √AVE value of 0.967 which is higher than the correlation with other variables, indicating strong validity. Finally, the Cultural Preservation variable recorded a √AVE value of 0.949, meeting the criteria for discriminant validity well. Overall, these results indicate that all variables in this study are valid and can be significantly distinguished from each other.

Cronbach's alpha Reliability

Cronbach's alpha is an important method for measuring the reliability of research instruments, particularly in the context of the composite measurement used in this study.(Liu et al., 2025),Referring to the novelty of the research, the use of Cronbach's alpha helps ensure that the items used to measure various

constructs, such as innovation in presentation, integration of digital technology, youth interest, and cultural preservation, have good internal consistency. A high alpha value indicates that the items aggregate with each other and can aggregate to represent the same construct. This is important for the validity and reliability of the research results, because the more consistent the items are, the more accurate the results obtained. Although this tool is useful, researchers also need to be aware of its limitations, such as the potential for redundancy between items and the effect of the number of items on the alpha value.(Tang et al., 2025),Thus, the application of Cronbach's alpha in this study not only increases the accuracy of the measurement instrument, but also contributes to the novelty and strength of the findings obtained. The results of the Cronbach's alpha Reliability test can be seen in Table 8 as follows.

Table 8. Test Results. Cronbach's alpha Reliability

Variables	Cronbach's alpha	Information
Innovation in presentation	0.881	Reliable
Integration of digital technology	0.750	Reliable
Interest of the younger generation	0.931	Reliable
Preservation of culture	0.890	Reliable

The Cronbach's alpha test results indicate that all variables in this study have a good level of reliability. For the Innovation in Presentation variable, the Cronbach's alpha value reached 0.881, indicating that this instrument is highly reliable. The Digital Technology Integration variable recorded a value of 0.750, also classified as reliable although slightly lower. Furthermore, the Young Generation Interest variable showed a very high value, namely 0.931, indicating excellent internal consistency. Finally, the Cultural Preservation variable had a value of 0.890, which also indicates strong reliability.

Rho_c

Rho_c, or Composite Reliability (CR), is a measure used to assess construct reliability in research, particularly in the context of Structural Equation Modeling (SEM). Rho_c reflects how well the indicators in a construct collectively represent that construct. Its value ranges from 0 to 1, with higher values indicating better reliability; generally, values above 0.70 are considered good, while values above 0.60 are also acceptable in certain contexts. Rho_c is calculated based on the variance explained by the indicators and the total variance of the construct, involving the estimation of the factor loading of each indicator. The use of Rho_c in research is important to ensure that the measured construct has good internal consistency, which directly impacts the validity and quality of the research results. Although Cronbach's alpha also measures reliability, Rho_c is often considered more accurate because it considers the loading factors of each indicator, making it an important tool in assessing the construct of reliability and ensuring the effectiveness of the indicators used for the Composite Reliability (CR) test results, which can be seen in table 9 as follows.

Table 9. Composite Reliability (CR) test results

Variables	Composite reliability(rho_c)	Information
Innovation in presentation	0.944	Reliable
Integration of digital technology	0.887	Reliable
Interest of the younger generation	0.967	Reliable
Preservation of culture	0.948	Reliable

The results of the Composite Reliability (CR) test indicate that all variables in this study have an excellent composite fitness level. For the Innovation in Presentation variable, the Rho_c value reached 0.944, indicating that this instrument is highly reliable. The Digital Technology Integration variable recorded a value of 0.887, which is also considered reliable. Furthermore, the Young Generation Interest variable showed a very high value, namely 0.967, indicating extraordinary internal consistency. Finally, the Cultural Preservation variable had a value of 0.948, which also indicates high reliability.

Fit test

A fit test is an evaluation process used to assess how well a statistical model, particularly in the context of Structural Equation Modeling (SEM), fits the observed data. This process is crucial because it ensures

that the submitted model accurately represents the relationships between variables. Some key components of a fit test include the Goodness of Fit Index (GFI), which measures the proportion of variance in the data that can be explained by the model; a GFI value close to 1 indicates a good fit. The Comparative Fit Index (CFI) compares the proposed model with an independent model, with values above 0.90 considered to indicate a good fit. The Root Mean Square Error of Approximation (RMSEA) measures how well the model approximates the data, with values below 0.08 indicating a good fit and below 0.05 indicating an excellent fit. The Tucker-Lewis Index (TLI) also assesses the model's fit, with values above 0.90 indicating a good fit. Finally, the Chi-Square Test measures the difference between the expected and observed covariance matrices; A p-value greater than 0.05 indicates that the model is acceptable. The results of the fit test provide an overview of the reliability of the proposed model, and if the model has a good fit, this indicates that the analysis conducted can provide valid insights into the relationships between variables in the study. The results of the fit test can be seen in Table 10 as follows.

Table 10. Fit Test Results

Parameter	Rule of Thumb	Parameter Values	Information
SRMR	Smaller than > 0.05	0.085	Fit
d-ULS	> 0.05	0.758	Fit
dG	χ^2 statistic ≤ χ^2 table	0.871	Fit
Chi^2	-	60,956	Fit
NFI	Approaching the value 1	0.806	Fit
GoF	0.1 (small), 0.25 (moderate), ≥0.36 (strong)	0.856	Fit
Q^2	Have predictive relevance	0.716	Fit
	Lacks predictive relevance: 0.15 Strong: > 0.35	0.883	Fit

The fit test results indicate that the model proposed in this study meets several important suitability criteria. For the SRMR parameter, the value obtained is 0.085, which indicates that the model has a good fit, although slightly higher than the expected threshold (<0.05). The d-ULS parameter recorded a value of 0.758, which also indicates a good fit, in accordance with the criteria (>0.05). The dG value is 0.871, which meets the criteria where the χ^2 statistic is not greater than the χ^2 table. The Chi^2 result shows a value of 60.956, which also indicates a good fit. Meanwhile, the NFI value is 0.806, close to the value of 1, which indicates a good model fit. For GoF, the value obtained is 0.856, which is in the strong category (≥ 0.36). Finally, the Q^2 value is 0.883, indicating that the model has good predictive relevance, where values above 0.35 are considered strong. Overall, these results indicate that the model proposed in this study has a good fit and is reliable for further analysis.

R Square (R^2)

R Square (R^2) is a statistical measure used to indicate the proportion of variation in a dependent variable that can be explained by one or more independent variables in a regression model. R^2 values range from 0 to 1, where values closer to 1 indicate that the model is able to explain most of the variation in the data, while values closer to 0 indicate that the model does not explain the variation well. For example, if R^2 is 0.75, this means that 75% of the variation in the dependent variable can be explained by the independent variables in the model, while the remaining 25% is influenced by other factors not included in the model. Although R^2 is a useful tool, it has several limitations, such as the inability to distinguish between strong and weak relationships and the possibility of increasing the R^2 value by adding more independent variables, even if the variables are not statistically significant. The results of the R Square (R^2) test can be seen in table 11 as follows.

Table 11. Results of the R Square (R^2) test

Variables	R-square	Adjusted R-square
Integration of digital technology	0.783	0.779
Interest of the younger generation	0.623	0.619

The R Square (R^2) test results indicate how well the independent variables explain the variation in the dependent variable. For the Integration of digital technology variable, the R^2 value is 0.783, meaning 78.3% of the variation in the dependent variable can be explained by this variable, while the Adjusted

R^2 of 0.779 indicates that after considering the number of variables used, the model still has a good fit. Meanwhile, for the Interactions of young generations variable, the R^2 value is 0.623, indicating that 62.3% of the variation in the dependent variable can be explained by this variable. The Adjusted R^2 for this variable is 0.619, indicating that although this model is also good, there is a slight penalty for model complexity. Overall, these results indicate that both variables have a significant contribution in explaining the variation in the data, with Integration of digital technology having a better fit compared to Interactions of young generations

Path coefficient test

The path coefficient test, or path coefficient, is an analytical method used in Structural Equation Modeling (SEM) to assess the strength and direction of the relationship between variables in a model. The path coefficient indicates how much influence one variable has on another, limited by a number that reflects the direct effect. A larger path coefficient value indicates a stronger influence of the independent variable on the dependent variable; for example, if the path coefficient between variables A and B is 0.5, this means that a one-unit increase in A will be associated with a 0.5-unit increase in B. To determine the significance of the path coefficient, statistical tests such as the t-test or z-test are usually performed, where a p-value less than 0.05 indicates that the relationship is significant. In the context of SEM, path coefficients are used to build and test models that describe interactions between variables, providing deeper insight into the dynamics of the data. However, it is important to remember that these coefficients only reflect correlational relationships, not causation, so conclusions about causality should be drawn with caution. Overall, the line coefficient test is an important tool in complex data analysis, helping researchers understand and interpret the relationship between variables in the model in depth. The results of the path coefficient test can be seen in table 12 as follows.

Table 12. Results of the path coefficient test

Variables	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values	Information
Innovation in presentation -> Integration of digital technology	0.058	0.068	0.233	0.250	0.802	Rejected
Integration of digital technology -> Interest of the younger generation	0.789	0.790	0.058	13,494	0.000	Accepted
Preservation of culture -> Integration of digital technology	0.832	0.824	0.217	3,835	0.000	Accepted

The results of the path coefficient test show the interaction between the variables in the analyzed model. For the relationship between Innovación en la presentación and Integración de la tecnología digital, the coefficient value obtained is 0.058, with a sample mean of 0.068 and a standard deviation of 0.233. The resulting t statistic is 0.250, with a p value of 0.802, indicating that this relationship is rejected and not statistically significant. In contrast, the relationship between Integración de la tecnología digital and Interés de la generación joven shows a path coefficient of 0.789, with a sample mean of 0.790 and a standard deviation of 0.058. The t statistic for this relationship reaches 13.494, and a p value of 0.000, indicating that the relationship is accepted and significant. In addition, the relationship between Preservación de la culture and Integración de la tecnología digital shows a line coefficient of 0.832, with a sample mean of 0.824 and a standard deviation of 0.217. The t statistic is 3.835, with a p value of 0.000, which also indicates that this relationship is accepted and significant. Overall, these results indicate that the two relationships between Integration of digital technology with Interés de la generación joven , as well as Preservation of culture with Integration of digital technology are significant, while the first relationship does not show a significant influence.

Effect size test (f^2)

The effect size (f^2) test is a statistical measure used to assess the extent to which an independent variable influences a dependent variable in regression analysis or Structural Equation Modeling (SEM). Effect size provides an overview not only of the statistical significance of the relationship, but also of its magnitude. Effect size (f^2) is calculated using the formula $f^2 = R^2 / (1 - R^2)$, where R^2 is the coefficient of

determination, indicating the proportion of variation in the dependent variable that can be explained by the independent variable. The f^2 value can be categorized as small (0.02), medium (0.15), and large (0.35), with higher values indicating a more significant effect. This test is often used in research to provide additional information about the strength of the relationship between variables, allowing researchers to understand the practical impact of the independent variable on the dependent variable. However, it is important to remember that while the f^2 provides insight into the strength of the effect, this measure cannot be used to determine causality, and the f^2 value can vary depending on the context and type of data being analyzed. Overall, the effect size (f^2) test is a useful tool in data analysis, helping researchers to highlight how much influence the independent variable has on the dependent variable and providing a more comprehensive picture of the research results.The effect size test (f^2) can be seen in table 13 as follows.

Table 13. Effect size (f^2) test results

Variables	Innovation in presentation	Integration of digital technology	Interest of the younger generation	Preservation of culture	Information
Innovation in presentation		0.003			Small Effect
Integration of digital technology			1,650		Big Effect
Interest of the younger generation					Big Effect
Preservation of culture		0.543			Big Effect

The results of the effect size (f^2) test show the influence of the variables in the analyzed model. For the Innovation and Presentation variables, the f^2 value is 0.003, which indicates that its influence on other variables is very small. In contrast, the Integration of digital technology variable has an f^2 value of 1.650, which indicates a large influence on the analyzed dependent variable. In addition, Interests of young generation also shows a large influence, then the Preservation of culture variable, the f^2 value is 0.543, which also shows a large influence. Overall, these results indicate that most variables have a significant impact, with Integration of digital technology, Interés de la generación joven, and Preservación de la culture having a large influence in the context of the results of the research analysis.

Discussion

This research refers to the topicAnalysis of the Relationship Between Traditional Sports Integration in the Digital Era: Bridging Cultural Preservation and Modern Innovation in the Interior of Papua, the data was taken from Vosviwer, the results of references and research topics were found, then in-depth research was conducted on the topics and results found, then the results of data processing were carried out using smartpls 4. Which includes several stages of analysis, including, The results of the first stage of outer loading analysis show that not all indicators meet the convergent validity requirements. This is evident in several indicators of the variables Cultural Preservation (PB), Digital Technology Integration (ITD), Young Generation Interest (MG), and Innovation in Presentation (DS) which have negative loading values or below the threshold of 0.5. This condition indicates that some items have not been able to reflect the intended construct well, and model improvements need to be made so that the data obtained can represent the phenomenon being studied accurately. In the second stage of the outer loading test, a significant increase in construct validity was seen. Previously invalid indicators were eliminated, leaving only those with loading values above 0.6 to 0.9. This change reflects the successful refinement of the instrument, ensuring that only items that truly represent the construct remain in use. Convergent validity was also better achieved, improving the quality of the measurement model. Discriminant validity was tested using two approaches: cross-loading and Fornell-Larcker, and both yielded consistent results. Each construct in the model demonstrated strong differentiation from one another. This means that despite the relationship between variables, such as digital technology and youth interests, the indicators used still clearly differentiated one construct from another, a sign of a good model. Furthermore, the results of the instrument reliability test using Cronbach's Alpha and Composite Reliability (CR), all variables showed high values above the minimum standard of 0.7. This indicates that internal consistency between indicators within each construct is very good. This means that respondents' answers

tended to be stable and reliable, supporting the reliability of the measurement instrument used in this study. In terms of overall model fit, the results of testing several model fit parameters, such as SRMR, d-ULS, dG, Chi-square, GoF, NFI, and Q^2, indicate that the model meets the criteria for good model fit. In particular, the GoF value of 0.856, which is considered strong, provides greater confidence in the model structure used to explain the integration of culture and digital technology in the Papuan interior.The R Square (R^2) analysis shows that Digital Technology Integration has a predictive power of 78.3% on the dependent variable, and Interés de la generación joven (young generation interest) is explained by 62.3%. These figures indicate that most of the variation of these two important variables can be explained by the constructs in the model, showing a substantial and relevant relationship between the research variables. From the results of the path coefficient test, it was found that the relationship between Cultural Preservation and Digital Technology Integration was statistically significant. A similar thing was also found in the relationship between Digital Technology Integration and Young Generation Interest. However, the relationship between Innovation in Presentation and Digital Technology Integration was not significant, which means that innovation in presentation has not played a significant role in influencing the level of digitalization in the context of this study. Furthermore, the results of the effect size (f^2) test reinforce previous findings by showing that the contribution of Innovation in Presentation to the model is very small ($f^2 = 0.003$), while the contributions of Cultural Preservation and Digital Technology Integration are quite large, at 0.543 and 1.650, respectively. Thus, the main focus in encouraging youth involvement in culture should be directed at strengthening the aspects of preservation and technology integration, not just the innovative aspect of presentation. From these findings, it is clear that Digital Technology Integration has a very strategic role in bridging cultural preservation and youth participation. The role of technology here is not only as a tool for cultural documentation, but also as an interactive bridge to introduce culture to a wider audience, especially the younger generation who are familiar with the digital world. The significant correlation between Cultural Preservation and Digital Technology Integration confirms that the higher the community's commitment to preserving local culture, the greater the opportunity to utilize technology as a means of such preservation. In this context, cultural preservation strategies should include digitalization and the use of interactive media that align with local cultural values. Conversely, the absence of a significant impact of Innovation in Presentation on digitalization indicates that the innovations implemented are not fully relevant or do not address fundamental aspects of the culture being conveyed. This may be due to a lack of local community involvement in the innovation process or a lack of continuity between cultural content and its digitally developed presentation. The younger generation is a crucial actor in cultural transformation through digital media.These figures indicate that most of the variation in these two important variables can be explained by the constructs in the model, demonstrating a substantial and relevant relationship between the research variables. The path coefficient test found that the relationship between Cultural Preservation and Digital Technology Integration was statistically significant. A similar finding was found for the relationship between Digital Technology Integration and Youth Interest. However, the relationship between Innovation in Presentation and Digital Technology Integration was not significant, indicating that innovation in presentation has not played a significant role in influencing the level of digitalization in the context of this study. Furthermore, the effect size (f^2) test results reinforced previous findings by showing that Innovation in Presentation contributed very little to the model ($f^2 = 0.003$), while the contributions from Cultural Preservation and Digital Technology Integration were substantial, at 0.543 and 1.650, respectively. Therefore, the primary focus in encouraging youth engagement in culture should be directed at strengthening the aspects of preservation and technology integration, rather than simply the innovative aspect of presentation. From these findings, it is clear that Digital Technology Integration plays a very strategic role in bridging cultural preservation and youth participation. Technology's role here is not only as a tool for cultural documentation, but also as an interactive bridge to introduce culture to a wider audience, especially the younger generation who are familiar with the digital world. The significant correlation between Cultural Preservation and Digital Technology Integration confirms that the higher the community's commitment to preserving local culture, the greater the opportunity to utilize technology as a means of preservation. In this context, cultural preservation strategies should include digitalization and the use of interactive media that align with local cultural values. Conversely, the absence of a significant effect of Innovation in Presentation on digitalization indicates that the innovation implemented is not fully relevant or does not address fundamental aspects of the culture being conveyed. This may be due to a lack of local community involvement in the innovation process or a lack of continuity between cultural content and its digitally developed presentation. The

younger generation is a crucial actor in cultural transformation through digital media.These figures indicate that most of the variation in these two important variables can be explained by the constructs in the model, demonstrating a substantial and relevant relationship between the research variables. The path coefficient test found that the relationship between Cultural Preservation and Digital Technology Integration was statistically significant. A similar finding was found for the relationship between Digital Technology Integration and Youth Interest. However, the relationship between Innovation in Presentation and Digital Technology Integration was not significant, indicating that innovation in presentation has not played a significant role in influencing the level of digitalization in the context of this study. Furthermore, the effect size (f^2) test results reinforced previous findings by showing that Innovation in Presentation contributed very little to the model (f^2 = 0.003), while the contributions from Cultural Preservation and Digital Technology Integration were substantial, at 0.543 and 1.650, respectively. Therefore, the primary focus in encouraging youth engagement in culture should be directed at strengthening the aspects of preservation and technology integration, rather than simply the innovative aspect of presentation. From these findings, it is clear that Digital Technology Integration plays a very strategic role in bridging cultural preservation and youth participation. Technology's role here is not only as a tool for cultural documentation, but also as an interactive bridge to introduce culture to a wider audience, especially the younger generation who are familiar with the digital world. The significant correlation between Cultural Preservation and Digital Technology Integration confirms that the higher the community's commitment to preserving local culture, the greater the opportunity to utilize technology as a means of preservation. In this context, cultural preservation strategies should include digitalization and the use of interactive media that align with local cultural values. Conversely, the absence of a significant effect of Innovation in Presentation on digitalization indicates that the innovation implemented is not fully relevant or does not address fundamental aspects of the culture being conveyed. This may be due to a lack of local community involvement in the innovation process or a lack of continuity between cultural content and its digitally developed presentation. The younger generation is a crucial actor in cultural transformation through digital media.A similar finding was found in the relationship between Digital Technology Integration and Youth Interest. However, the relationship between Innovation in Presentation and Digital Technology Integration was not significant, indicating that innovation in presentation has not played a significant role in influencing the level of digitalization in the context of this study. Furthermore, the results of the effect size (f^2) test reinforce previous findings by showing that Innovation in Presentation contributed very little to the model (f^2 = 0.003), while the contributions of Cultural Preservation and Digital Technology Integration were quite large, at 0.543 and 1.650, respectively. Thus, the main focus in encouraging youth involvement in culture should be directed at strengthening the aspects of preservation and technology integration, not just the innovative aspect of presentation. 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Ethics Committee Statement

The publication ethics used in this research refer to The Committee on Publication Ethics (COPE) and Regulation of the Head of LIPI Number 5 of 2014 concerning the Code of Ethics for Scientific Publications, Regulation of the Minister of Research, Technology and Higher Education of the Republic of Indonesia Number 9 of 2018 concerning Accreditation of Scientific Journals.

Conflict of Interest Statement

The authors declare no conflict of interest related to this article.

Funding

This research was funded by Education Fund Management Institute (LPDP), https://lpdp.kemenkeu.go.id/.

Data Availability Statement

The data is available upon request from the corresponding author, as this is specific information about sport culture in Papua, adolescents in Papua, and sporting achievements in Papua.

Acknowledgements

The Author would like to express my deepest gratitude to the Education Fund Management Institute (LPDP) for their tremendous support throughout my educational journey. LPDP not only gave me the opportunity to continue my studies, but also allowed me to explore new insights in the fields of education and research. And thank you also to the founders of sports culture in Papua, youth in Papua, and sports achievements in Papua, and this assistance has opened up many opportunities for my self-development, and I hope to contribute to a better Indonesian education. Thanks also go to the supervisor Prof. Dr. Heny Setyawati, M.Si., Prof. Dr. Agus Kristiyanto, M.Pd., and Prof. Dr. Harry Pramono, M.Si.

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