

# The Construction and Practice of Digital Inheritance Mode of Traditional Sports Programs

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## ABSTRACT

Inheriting national sports culture plays an important role in promoting national culture and national spirit. The digitization technology's has played a role in promoting the development and dissemination of traditional sports culture. Based on the digitization model of traditional sports and related research materials and audience comments, the article extracts effective data to construct a model of the influence factors of digitization of traditional sports. Trust, cultural confidence, inheritance willingness, perceived usefulness, perceived ease of use, inheritance resistance and technology anxiety are taken as eight latent variables. Relevant hypotheses are proposed for the relationship among the eight variables. Through the questionnaire method, 321 valid data collected were validated and analyzed. Including the use of structural theory model for reliability analysis, correlation analysis, path coefficient test, etc., it is finally concluded that the mediating effect of perceived usefulness and willingness to pass on is obvious, while the mediating effect of perceived ease of use is relatively insignificant, and it cannot play a significant role of acceptance between resistance to passing on to audience acceptance. Trust, cultural confidence, perceived usefulness, perceived ease of use and inheritance willingness are positive feedback relationships to audience acceptance, and inheritance resistance to inheritance willingness and technology anxiety to audience acceptance are negative feedback relationships.

**Keywords:** traditional sports, structural equation modeling, digital inheritance, influencing factors

## 1. Introduction

Ethnic traditional sports culture is the inheritance and record of national memory, which has unique historical and cultural connotations and can effectively unite the national spirit. Ethnic traditional sports culture is the sports culture created by the people in the process of long-term social life and development, and it is also the inheritance bond of the national spirit, with diversified educational value [1-3]. Ethnic traditional sports culture contains the value concept and normative role of human

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movement, which is one of the important expressions of traditional Chinese culture [4-5]. The active development of ethnic traditional sports culture, innovation and inheritance of the inheritance carrier of ethnic culture, and in-depth excavation of the charm of the sports culture of various ethnic groups are conducive to promoting national unity and strength [6-9]. As for the protection and innovation of ethnic traditional sports culture, it is not only necessary to reflect the historical and cultural heritage, but also to do a good job of integrating with the modern society, so as to highlight the adaptability and sustainability of ethnic traditional sports culture in the era of digitalization [10-12].

Digital empowerment has become an emerging research focus, providing new communication pathways for the inheritance, innovation and development of ethnic traditional sports culture [13-14]. On the one hand, preserving and organizing ethnic traditional sports and cultural materials through digital means helps to excavate and display multi-dimensional information such as the historical lineage, spiritual connotation, and technical essentials of traditional sports and culture, and effectively protects these precious contents from the risk of loss and destruction [15-18]. On the other hand, digital technology also provides new vitality for the dissemination and promotion of ethnic traditional sports culture, such as the use of virtual reality, social media and other technologies, so that the ethnic traditional sports culture out of the specimen display, to achieve a wider dissemination and reach a wider audience [19-22].

The research is based on the digital inheritance model of traditional sports as well as data collection, and constructs a theoretical model of the factors influencing the digital inheritance of traditional sports with the goal of promoting the inheritance effect of traditional sports, and puts forward hypotheses based on the relevant variables of the model. Determine the research object, adopt questionnaire survey, use SPSS24.0 to analyze the survey data. The data and hypotheses were verified using the reliability test, correlation analysis, and mediation effect test methods. Then the structural equation model is constructed through the AMOS model, and the model is empirically analyzed to determine the final model of the influencing factors after exploring the path of action between the influencing factors and the mechanism of influence.

## **2. Construction of Digital Inheritance Mode for Traditional Sports Programs**

### *2.1. Digital reproduction of traditional sports*

2.1.1. Demand Analysis for Digital Reproduction of Traditional Sports Programs. The digital reproduction of traditional sports projects first needs to have a clear understanding of the user's desired goals and driving elements in the internal and external environments. Demand is the request made by the target user in order to obtain a certain service or function in a specific scenario, which is the driving force of the project initiation and the ultimate goal to be achieved in the end, while the sources of demand are diverse, and the demand itself is extremely complex, so it is necessary to analyze the demand. The internal and external environments of traditional sports programs are analyzed from the perspective of software development. In software engineering theory, requirement analysis is an important stage in the software development life cycle, and the quality of requirement analysis will have a far-reaching impact and important orientation on the subsequent development process.

2.1.2. Design of Digital Reproduction Architecture for Traditional Sports Programs. Inheritance in the digital era is no longer limited to master and apprentice face-to-face teaching and oral transmission, but to expand the digital audience, dissemination through digital technology, and then the audience into the inheritance of the crowd. The ultimate audience of traditional sports digital technology is the user as the main body of the people, technology applications are also built around the user, digital technology will be the traditional sports project related data content for digital form of transformation, user-centered digital form of traditional sports projects from the collection, storage, display,

promotion to form a closed loop, so that the traditional sports project digital reproduction in the form of benign circle Inheritance.

The change of digital architecture further optimizes the logic of digital reproduction of traditional sports projects, and the user-centered idea at the architectural level focuses on how to build a more reasonable product and technology architecture from technical implementation to product form level to give audience and users a better experience.

## *2.2. Digital heritage of traditional sports programs*

2.2.1. Living records of culture and data sharing. Using the advantages of the Internet of Things, cloud computing, big data analysis and other new-generation information technology levels, establish a multi-level, multi-dimensional, multi-party participation digital management platform for traditional sports projects, led by the government and composed of enterprises, social organizations, inheritors, etc., to promote the efficient transmission and sharing of the resource chain, the data chain and the information chain, and to build an application system for the promotion of digital technology to achieve the symbiosis and proliferation of non-heritage in the industrial chain.

2.2.2. Accelerating the deep integration and innovation of digital technologies. Accelerate the in-depth integration of digital technology and the sports industry to form an industrial chain advantage. Establish a new connection with modern life, and use relevant platforms or series of short videos to publicize and show the beauty of the non-heritage of "traditional sports programs". Specifically, the deep integration and innovation of traditional sports programs and video platforms to create a series of short videos + traditional sports programs. Strengthen the digital marketing of traditional sports programs. Digital technology provides a new possibility for the living heritage of traditional sports. Using digital means, traditional sports programs can be presented to the public in a more intuitive and vivid way, attracting the attention and participation of more young people. The use of social media, short videos and other digital platforms for marketing and promotion can enhance the popularity and influence of traditional sports programs.

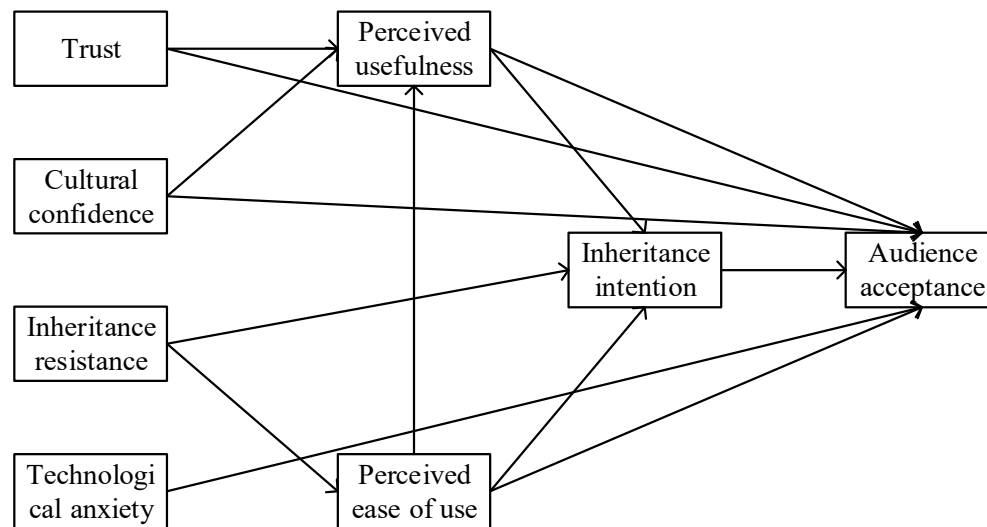
2.2.3. Building a new model of sports program consumption with digital technology. Promote the new development of digital cultural integration, build a new digital cultural ecosystem, and form a new situation of digital cultural consumption. Through the creativity and development of high-quality digital cultural products, injecting "new digital power" into traditional sports programs. Build a digital industrial platform integrating production, sales and promotion, and in the process of industrial development of traditional sports projects, let more beneficiaries really benefit and realize the transformation from "art" to "signboard". Produce digital products and promote digital products. Allow users to experience the charm of traditional sports programs right on the Internet, and develop digital products such as virtual reality (VR) experience and augmented reality (AR) interaction. Build an online platform to promote digital media dissemination and interaction, and realize the compliant presentation of various benefits of the physical industry; establish an online sales platform to promote the products of traditional sports projects to the national or even global market, in order to attract more consumers to pay attention to and purchase them.

## **3. Practical Design of Digital Inheritance Mode of Traditional Sports Programs**

### *3.1. Research Model and Assumptions*

1)Research Model. In order to construct the influencing factor model of digital inheritance of traditional sports programs, the traditional sports program inheritance influencing factor model is constructed mainly by extracting the audience's relevant evaluation of traditional sports programs,

followed by reading a large number of related research materials, from which the influencing factors directly or indirectly on traditional sports programs are extracted. The details are shown in Figure 1.



**Fig. 1.** Traditional sports digital inheritance influence model

2) Research hypotheses. Combining the seven influencing factors of the influencing factor model of the traditional sports program inheritance effect, the relevant research hypotheses are proposed.

H1: Trust has a positive effect on the perceived usefulness of traditional sports program inheritance.

H2: Cultural confidence has a positive effect on the perceived usefulness of traditional sports program inheritance.

H3: Perceived ease of use has a positive effect on perceived usefulness of traditional sports program inheritance.

H4: Inheritance resistance has a negative effect on the perceived ease of use of traditional sports program inheritance.

H5: Perceived usefulness has a positive effect on inheritance willingness of traditional sports program inheritance.

H6: Inheritance resistance has a negative effect on the inheritance willingness of traditional sports program inheritance.

H7: Perceived ease of use has a positive effect on inheritance willingness of traditional sports program inheritance.

H8: Trust has a positive effect on audience acceptance of traditional sports program inheritance.

H9: Cultural confidence has a positive effect on audience acceptance of traditional sports program heritage.

H10: Technology anxiety has a negative effect on audience acceptance of the heritage of traditional sports programs.

H11: Perceived usefulness has a positive effect on audience acceptance of the heritage of traditional sports programs.

H12: Perceived ease of use has a positive effect on audience acceptance of the heritage of traditional sports programs.

H13: There is a positive effect of inheritance willingness on audience acceptance of traditional sports program inheritance.

### 3.2. Questionnaire distribution and collection

3.2.1. Objects of study. The pre-test questionnaire was distributed in this study through online means. The created electronic questionnaire was sent to the respondents through various means, the

respondents selected for this study were students enrolled in the direction of Physical Education and the audience groups of that scope.

3.2.2. Questionnaire collection. A total of 350 questionnaires were recovered, of which 321 were valid, with an effective rate of 91.7%. The data from these 321 valid questionnaires were then analyzed using SPSS software, which mainly contains correlation analysis, reliability test and mediation test.

### 3.3. Data processing methods

3.3.1. Pearson correlation coefficient. Pearson's correlation coefficient method is a statistically accurate measure of the closeness of the relationship between two variables. For two variables  $x$  and  $y$ , a number of sets of data can be obtained from the experiment, denoted as  $(x_i, y_i)(i = 1, 2, \dots, n)$ . The mathematical expression for the correlation coefficient is:

$$r = \frac{\sum_{i=1}^n (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum_{i=1}^n (x_i - \bar{x})^2 \sum_{i=1}^n (y_i - \bar{y})^2}} \quad (1)$$

In Eq. (1),  $\bar{x}, \bar{y}$  is the mean value of the  $n$  test values respectively. The value of correlation coefficient  $r$  ranges between -1 and +1, i.e.  $|r| \leq 1$ . The closer  $|r|$  is to 1, the higher the degree of linear correlation between  $x$  and  $y$ . If  $r = -1$ , it indicates a perfect negative linear correlation between  $x$  and  $y$ . If  $r = +1$ , there is a perfect positive linear correlation between  $x$  and  $y$ ; if  $r = 0$ , there is no linear correlation.

In general, the value of  $r$  is between (-1, 1), and the degree of correlation can be categorized as follows: when  $|r| \geq 0.8$ , it can be regarded as a high degree of correlation;

When  $0.5 \leq |r| < 0.8$ , it is considered as medium correlation; when  $0.3 \leq |r| < 0.5$ , it is considered as low correlation; when  $|r| < 0.3$ , it means that the degree of correlation between the two variables is very weak and can be considered as non-linear correlation.

The correlation coefficient  $r$  is calculated from the sample data, and its value is affected by the randomness of the sample sampling, the number of samples, etc., so it is necessary to examine the reliability of the sample correlation coefficient, that is, to carry out the significance test [23]. Firstly, the null hypothesis of sample irrelevance inference is  $H_0$ ; secondly, the statistic of the test is calculated, usually the  $t$  distribution test is used, and the calculation formula is:

$$t = |r| \sqrt{\frac{n-2}{1-r^2}} \sim t(n-2) \quad (2)$$

Finally, based on the given significance level  $\alpha$  and degrees of freedom

$d_i = n-2$ , the critical value of  $t_{\alpha/2}(n-2)$  is found using the  $t$  distribution table. If  $|t| > t_{\alpha/2}$ , the original hypothesis  $H_0$  is rejected, indicating a significant linear relationship between the overall two variables.

Since the main focus of the paper is on the analysis of correlation, the significance level  $\alpha$  is not given, but the statistic is calculated from equation (2) and the value of  $\alpha$  that satisfies the rejection  $H_0$  is found by checking the  $t$  distribution table.

3.3.2. PLS-SEM. SEM is a second-generation statistic with two major families, covariance-based structural equation modeling and variance-based structural equation modeling, also called structural equation modeling in principal component form. Partial Least Squares is a typical analytical method for the second type of structural equation modeling, often referred to as PLS-SEM. PLS-SEM consists of

reflective conformers (same as SEM) and formative conformers. Each topic of the reflective indicator is a deformation of each conformation, which can be exchanged and substituted for each other, usually up to 5-7 topics. Formative indicators each topic is a part of formative constructs, cannot be exchanged with each other, there is no limit to the number, in principle, the more the better [24].

PLS successively performs principal component estimation and regression solution for the measurement model and structural model to compose the parameter estimation of the whole model. The relationship between observed variables and latent variables becomes the measurement model in SEM and is called the external model in PLS, and the relationship between latent variables and potential variables is called the structural model in SEM and the internal model in PLS [25].

In the external model (measurement model) part, based on different assumptions about the causal relationship between the observed variables and the latent variables, PLS has two forms of setting up, the first one assumes that the variation of the observed variables is determined by the latent variables, which is called the reflective model.

The second form of external modeling assumes that the variation in the number of latent variables is determined by the observed variables and is called formative modeling:

$$\xi = \Pi x + v \quad (3)$$

Among them.

$\xi$  = Exogenous latent variables.

$x$  = Vector of exogenous observed variables.

$\Pi = x$  The weight matrix for  $\xi$ .

$v$  = Measurement error vector.

The specific calculation steps are as follows:

- 1) Standardize the values of all observed variables (  $\xi$  for exogenous latent variables,  $\eta$  for endogenous latent variables)

$$x_{ij} = \frac{x_{ij} - \bar{x}_j}{\sqrt{\text{var } x_j}} \quad (4)$$

$$y_{ij} = \frac{y_{ij} - \bar{y}_j}{\sqrt{\text{var } y_j}} \quad (5)$$

Where,

$i$  = Sample size of observations.

$j$  = Number of observed variables.

$\bar{x}_j = \xi$  Potential variables  $\bar{j}$  Mean of observed variables.

$\bar{y}_j = \eta$  Potential variable  $\bar{j}$  Mean of the observed variable.

$\text{var } x_j = \xi$  Potential variable  $j$  Variance of the observed variable.

$\text{var } y_i = \eta$  Potential variables  $j$  Variance of observed variables.

- 2) Principal Component Analysis using regression approach

$$t_1 = E_0 w_1 \quad (6)$$

$$u_1 = F_0 c_1 \quad (7)$$

Where,

$t_1 = \xi$  Extracted principal components.

$u_1 = \eta$  Extracted principal components.

$E_0$  = Observed variables  $x_{ij}$  Standardized matrix.

$F_0$  = Observed variables  $y_{ij}$  Normalized matrix.

$w_1$  = unit vector,  $E_0$  the first axis,  $\|w_1\|=1$ .

$u_1$  = Unit vector,  $F_0$  of the first axis,  $\|u_1\|=1$ .

The requirements for extracting the principal components are as follows:

First, they need to be maximized to include the information in their respective observed variables.

$$\text{var}(t_1) \rightarrow \max \quad (8)$$

$$\text{var}(u_1) \rightarrow \max \quad (9)$$

Second, the correlation between the two principal components is maximized.

$$r(t_1, u_1) \rightarrow \max \quad (10)$$

Repeat the above steps for a  $m$  rd round of component extraction of the information remaining after  $\xi$  is explained by  $t_1$ , until the marginal contribution of the extracted component  $t_m$  to the predictive effect of the model is not significant.

3) Iterative analysis. Since the parameter estimation of PLS-SEM is based on the objective of maximizing the explanation of the residuals of the endogenous latent variables, the values fitted to the two sets of observed variables,  $X1$ ,  $X2$ ,  $X3$ ,  $Y1$ ,  $Y2$ , and  $Y3$ , need to be maximized to achieve the degree of  $\xi$  vs.  $\eta$  explanation.

(1) External approximation: factor scores for the latent variables are calculated using regression (sent to convergence). Assign the variables the same initial weights, calculate new weights by treating the latent variable variance as unit variance, and then iteratively bring in the estimated weights to obtain variance explanatory power with higher explanatory power.

(2) Internal approximation: calculations with similar latent variables as proxies are still performed with regression (iterating until convergence). A new estimate of the latent variable can be obtained, and then the correlation coefficient (reflective model when measuring the model) regression coefficient (formative model when measuring the model) corresponding to the new latent variable and each observed variable is computed; this regression result is the weight of the external approximation in the next round of iterations, and the computation is stopped when  $|w^j - w^{j+1}| < 10^{-5}$  or  $|(w^j - w^{j+1}) / w^j| < 10^{-5}$ .

3.3.3. Mediated effects test. The mediated model with moderation proposed by Preacher was analyzed using SPSS 26.0 and the mediated effects as well as the mediated effects with moderation were tested using the Process Bootstrap procedure proposed by Hayes. The number of bootstrap samples was set to be 5,000, and the test was conducted with 95% confidence intervals. The specific model set is as follows:

$$Y = cX + \mu_1 \quad (11)$$

$$Me = \alpha X + \mu_2 \quad (12)$$

$$Y = c'X + \beta Me + \gamma Mo + \delta Me * Mo + \mu_3 \quad (13)$$

Where:  $X$  is the independent variable,  $Y$  is the dependent variable,  $Me$  denotes the mediator variable, and  $Mo$  denotes the moderator variable;  $\alpha, \beta, c, c', \gamma$  and  $\delta$  are the coefficients to be estimated; and  $\mu_1, \mu_2$  and  $\mu_3$  are the random error terms.

## 4. Practical Analysis of Digital Inheritance Mode of Traditional Sports Programs

### 4.1. Reliability and validity analysis

4.1.1. Reliability analysis. Before the empirical analysis, the data in the required scale is analyzed for reliability, the reliability analysis is mainly through the reliability and authenticity of the measured scale to reflect the stability of the test results, the level of the reliability results also indicates the size of the stability of the measured scale, it is generally believed that the Cronbach coefficient is greater than 0.7 indicates a good degree of reliability. This paper uses Cronbach's reliability coefficient to test the degree of consistency of the variables in the questionnaire study on each measurement item, and the measurement results are shown in Table 1.

The analysis of the measurement data shows that the reliability coefficients of the eight variables of this paper's study, trust, cultural confidence, inheritance willingness, perceived usefulness, perceived ease of use, inheritance resistance, technology anxiety, and audience acceptance, are 0.854, 0.793, 0.825, 0.957, 0.858, 0.849, 0.895, 0.811, respectively, which are greater than the standard of 0.7, indicating that the variables have good internal consistency reliability.



**Table 1.** Reliability analysis of each scale

| Measurement dimension  | Item | CITC  | Cloning Bach alpha after deletion | Alpha |
|------------------------|------|-------|-----------------------------------|-------|
| Trust                  | A1   | 0.644 | 0.743                             | 0.854 |
|                        | A2   | 0.613 | 0.775                             |       |
|                        | A3   | 0.707 | 0.674                             |       |
| Cultural confidence    | B1   | 0.729 | 0.765                             | 0.793 |
|                        | B2   | 0.754 | 0.738                             |       |
|                        | B3   | 0.655 | 0.838                             |       |
| Inheritance will       | C1   | 0.724 | 0.721                             | 0.825 |
|                        | C2   | 0.639 | 0.81                              |       |
|                        | C3   | 0.697 | 0.746                             |       |
| Perceptual usefulness  | D1   | 0.697 | 0.852                             | 0.957 |
|                        | D2   | 0.722 | 0.845                             |       |
|                        | D3   | 0.686 | 0.856                             |       |
|                        | D4   | 0.667 | 0.859                             |       |
|                        | D5   | 0.754 | 0.838                             |       |
| Perceptual ease of use | E1   | 0.699 | 0.745                             | 0.858 |
|                        | E2   | 0.692 | 0.757                             |       |
|                        | E3   | 0.673 | 0.772                             |       |
| Passing resistance     | F1   | 0.742 | 1.018                             | 0.849 |
|                        | F2   | 0.742 | 1.018                             |       |
| Technical anxiety      | G1   | 0.787 | 0.854                             | 0.895 |
|                        | G2   | 0.773 | 0.867                             |       |
|                        | G3   | 0.82  | 0.825                             |       |
| Audience acceptance    | H1   | 0.711 | 0.712                             | 0.811 |
|                        | H2   | 0.622 | 0.804                             |       |
|                        | H3   | 0.697 | 0.728                             |       |

4.1.2. Exploratory factor analysis. Validity analysis is an important element in empirical research, validity refers to whether the measured results can reflect the content to be examined, the more the measurement results match with the content that needs to be examined, the higher the validity. KMO value represents the validity, the KMO is more than 0.8 means high validity, 0.7-0.8 means good validity, 0.6-0.7 means the validity is acceptable, and less than 0.6 means poor validity. The whole scale in the questionnaire was firstly tested and the results are shown in Table 2, the KMO value is 0.870 and the Bartlett's's spherical test value is significant (Sig.<0.05), which indicates that the validity of the overall sample data of the scale collected is good.

**Table 2.** Inspection table of overall scale KMO and Bartlett's test

|                                                                  |                  |         |
|------------------------------------------------------------------|------------------|---------|
| Measure of the optimal degree of treatment of kaiser-meyer-olkin |                  | 0.865   |
| Bartlett's spherical test                                        | Approximate card | 4578.25 |
|                                                                  | df               | 386     |
|                                                                  | Sig.             | 0.000   |

The total variance explained results of each factor are shown in Table 3, from which it can be seen that the total variance explained results of a total of 8 factors with an explanatory power of 13.913%, 11.481%, 10.672%, 12.334%, 7.364%, 8.473%, 7.563%, and 9.664%, respectively, and the total explanatory power reached 81.943%, which is more than 70%, which indicates that the that the eight factors screened are well represented.

**Table 3.** Explanation of total varianc

| Total variance interpretation |                    |                               |                 |                                 |                               |                 |                         |                               |                 |
|-------------------------------|--------------------|-------------------------------|-----------------|---------------------------------|-------------------------------|-----------------|-------------------------|-------------------------------|-----------------|
| Constitue<br>nt               | Initial eigenvalue |                               |                 | Extracting the load of the load |                               |                 | Rotational load squared |                               |                 |
|                               | Tota<br>l          | Percenta<br>ge of<br>variance | Cumulation<br>% | Tota<br>l                       | Percenta<br>ge of<br>variance | Cumulation<br>% | Tota<br>l               | Percenta<br>ge of<br>variance | Cumulation<br>% |
| 1                             | 6.87<br>2          | 21.432                        | 21.594          | 6.58<br>7                       | 21.377                        | 21.681          | 4.58<br>6               | 13.913                        | 13.872          |
| 2                             | 3.97<br>3          | 12.374                        | 33.953          | 3.89<br>2                       | 12.563                        | 33.641          | 3.04                    | 11.481                        | 25.701          |
| 3                             | 3.29<br>7          | 10.26                         | 44.199          | 3.00<br>7                       | 10.05                         | 44.119          | 3.54<br>9               | 10.672                        | 37.231          |
| 4                             | 2.91<br>7          | 9.072                         | 53.257          | 2.65<br>1                       | 8.71                          | 52.651          | 3.75                    | 12.334                        | 48.114          |
| 5                             | 2.57<br>2          | 7.996                         | 61.24           | 2.28<br>1                       | 8.186                         | 61.093          | 2.80<br>7               | 7.364                         | 58.412          |
| 6                             | 2.52<br>1          | 7.833                         | 69.058          | 2.43<br>1                       | 7.813                         | 69.406          | 3.16<br>1               | 8.473                         | 67.702          |
| 7                             | 1.99<br>8          | 6.202                         | 75.247          | 2.30<br>8                       | 6.185                         | 75.704          | 2.55<br>5               | 7.563                         | 75.075          |
| 8                             | 0.53<br>4          | 1.584                         | 76.817          | 2.78<br>3                       | 8.253                         | 78.625          | 2.81<br>4               | 9.664                         | 81.943          |
| 9                             | 0.49<br>8          | 1.494                         | 78.293          |                                 |                               |                 |                         |                               |                 |
| 10                            | 0.47<br>8          | 1.452                         | 79.731          |                                 |                               |                 |                         |                               |                 |
| 11                            | 0.46<br>8          | 1.422                         | 81.139          |                                 |                               |                 |                         |                               |                 |
| 12                            | 0.43<br>2          | 1.309                         | 82.434          |                                 |                               |                 |                         |                               |                 |
| 13                            | 0.41<br>6          | 1.257                         | 83.676          |                                 |                               |                 |                         |                               |                 |
| 14                            | 0.40<br>7          | 1.23                          | 84.892          |                                 |                               |                 |                         |                               |                 |
| 15                            | 0.39<br>5          | 1.178                         | 86.057          |                                 |                               |                 |                         |                               |                 |
| 16                            | 0.38<br>1          | 1.144                         | 87.186          |                                 |                               |                 |                         |                               |                 |
| 17                            | 0.36<br>9          | 1.111                         | 88.284          |                                 |                               |                 |                         |                               |                 |
| 18                            | 0.35<br>5          | 1.068                         | 89.338          |                                 |                               |                 |                         |                               |                 |
| 19                            | 0.33<br>9          | 1.018                         | 90.341          |                                 |                               |                 |                         |                               |                 |
| 20                            | 0.33<br>5          | 1.005                         | 91.333          |                                 |                               |                 |                         |                               |                 |
| 21                            | 0.32<br>5          | 0.975                         | 92.293          |                                 |                               |                 |                         |                               |                 |

|    |           |       |        |  |  |  |  |  |  |
|----|-----------|-------|--------|--|--|--|--|--|--|
| 22 | 0.31<br>7 | 0.949 | 93.228 |  |  |  |  |  |  |
| 23 | 0.29<br>5 | 0.888 | 94.094 |  |  |  |  |  |  |
| 24 | 0.27<br>8 | 0.826 | 94.906 |  |  |  |  |  |  |
| 25 | 0.26<br>5 | 0.787 | 95.679 |  |  |  |  |  |  |
| 26 | 0.25<br>6 | 0.757 | 96.423 |  |  |  |  |  |  |
| 27 | 0.24<br>5 | 0.725 | 97.133 |  |  |  |  |  |  |
| 28 | 0.24<br>3 | 0.716 | 97.835 |  |  |  |  |  |  |
| 29 | 0.23<br>2 | 0.682 | 98.503 |  |  |  |  |  |  |
| 30 | 0.22<br>1 | 0.649 | 99.138 |  |  |  |  |  |  |
| 31 | 0.19<br>8 | 0.577 | 99.7   |  |  |  |  |  |  |

#### 4.2. Correlation analysis

In this paper, the mean values of each latent variable were calculated and tested by Pearson correlation coefficient using SPSS26.0, and the test results are shown in Table 4. The data in the table show that there are different degrees of correlation between each latent variable in the research hypotheses, in which the inheritance resistance and perceived ease of use, inheritance resistance and inheritance willingness and technology anxiety and audience acceptance are not significant, and there is a negative correlation, the other hypotheses are all positively correlated at the level of 0.12, i.e., the hypotheses have been preliminarily verified.

**Table 4.** Hypothesis testing based on correlation analysis

| Research hypothesis | Correlation variable                                                | Correlation coefficient |
|---------------------|---------------------------------------------------------------------|-------------------------|
| H1                  | Trust $\leftrightarrow$ Perceptual usefulness                       | .236**                  |
| H2                  | Cultural confidence $\leftrightarrow$ Perceptual usefulness         | .347**                  |
| H3                  | Perceptual ease of use $\leftrightarrow$ Perceptual usefulness      | .274**                  |
| H4                  | Passing resistance $\leftrightarrow$ Perceptual ease of use         | -.158*                  |
| H5                  | Perceptual usefulness $\leftrightarrow$ Inheritance will            | .574**                  |
| H6                  | Passing resistance $\leftrightarrow$ Inheritance will               | -.077*                  |
| H7                  | Perceptual ease of use $\leftrightarrow$ Inheritance will           | .411**                  |
| H8                  | Trust $\leftrightarrow$ Audience acceptance                         | .315**                  |
| H9                  | Cultural confidence passed on $\leftrightarrow$ Audience acceptance | .401**                  |
| H10                 | Technical anxiety $\leftrightarrow$ Audience acceptance             | -.083                   |
| H11                 | Perceptual usefulness $\leftrightarrow$ Audience acceptance         | .422**                  |
| H12                 | Perceptual ease of use $\leftrightarrow$ Audience acceptance        | .317**                  |
| H13                 | Inheritance will $\leftrightarrow$ Audience acceptance              | .451**                  |

Note: \*= $P < 0.05$ , \*\*= $P < 0.01$

### 4.3. Analysis of Factors Influencing the Effect of Digital Inheritance of Traditional Sports Programs

4.3.1. Model validation. This study used structural equation modeling for model testing. According to the relationship hypotheses summarized above, the structural equation model of the influencing factors of the digital inheritance effect of traditional sports programs has a total of 8 variables, including 4 independent variables of trust, cultural confidence, inheritance resistance, and technological anxiety, and 3 mediating variables of perceived usefulness, perceived ease of use, and inheritance willingness, as well as the dependent variable which is the acceptance of the audience. There are a total of 25 observational variables corresponding to the 8 variables, which are examined by using the AMOS24 The structural equation model to draw the influencing factors of digital heritage of traditional sports is shown in Figure 2.

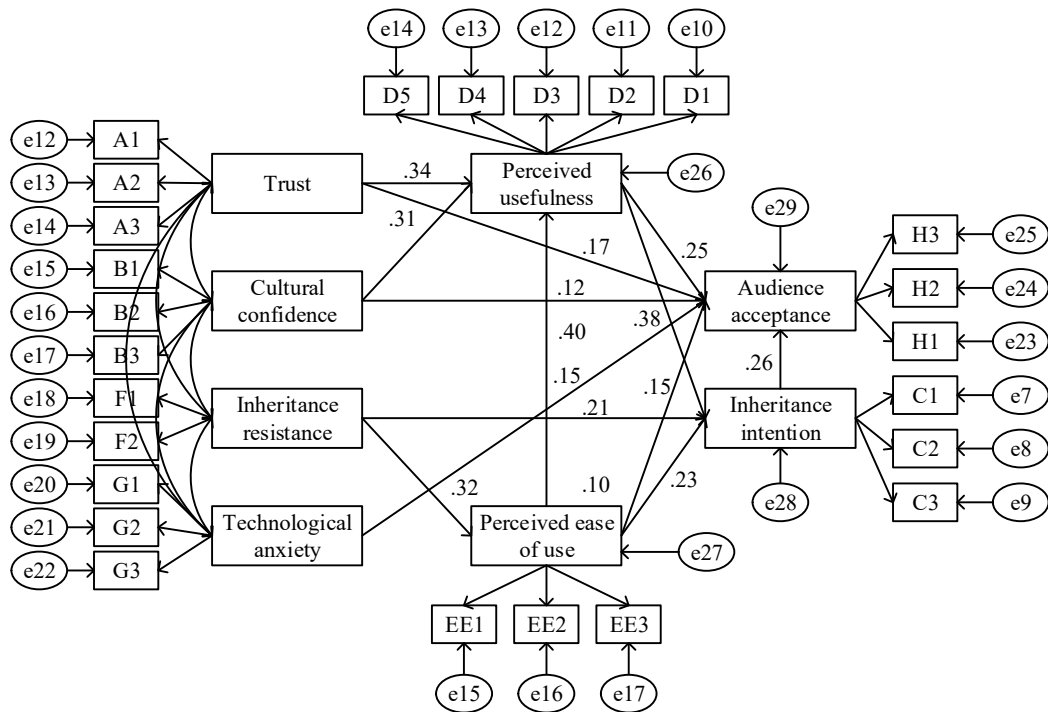


Fig. 2. Structural equation model

SEM commonly used indicators are the ratio of chi-square degrees of freedom ( $\chi^2/\text{df}$ ), root mean square of approximation error (RMSEA), comparative fit index (CFI), relative fit index (TLI) and other seven indicators. Among them, the smaller  $\chi^2/\text{df}$  is, the higher the model fit is, usually the value is less than 3, which indicates ideal fit, and the RMSEA is less than 0.08, which indicates ideal fit. Other indicators such as CFI, TLI and other indicators closer to 1 indicates that the model fit is better, and more than 0.9 indicates that the fit is better. The results of the parameters of the model fit obtained by the great likelihood method are shown in Table 5, and the  $\chi^2/\text{df}$  of the model is 1.747 less than 3; the RMSEA is 0.045, which is less than 0.08, and the indicators of CFI, TLI, and GFI are all more than 0.9, which means that the model fit is better in general.

Table 5. Structural model fitting index

| Fitting index      | $\chi^2/\text{df}$ | RMSEA | GFI   | AGFI  | IFI   | IFI   | CFI   |
|--------------------|--------------------|-------|-------|-------|-------|-------|-------|
| Reference standard | <3                 | <0.08 | >0.9  | >0.85 | >0.9  | >0.9  | >0.9  |
| Results            | 1.747              | 0.045 | 0.899 | 0.861 | 0.934 | 0.925 | 0.947 |

4.3.2. Path factor. The analysis of the unstandardized regression coefficients and their significance tests through structural equation modeling are shown in Table 6. Among them, the positive effect of trust on perceived usefulness is significant ( $B=0.431, p<0.001$ ); the positive effect of cultural self-confidence on perceived usefulness is significant ( $B=0.297, p<0.001$ ); the positive effect of perceived ease of use on perceived usefulness is significant ( $B=0.407, p<0.001$ ); the negative effect of inheritance resistance on perceived ease of use is significant ( $B=-0.218, p<0.01$ ); the positive effect of perceived usefulness on willingness to pass on is significant ( $B=0.257, p<0.01$ ); the negative effect of transmission resistance on willingness to pass on is significant ( $B=-0.198, p<0.05$ ); the positive effect of perceived ease of use on willingness to pass on is significant ( $B=0.215, p<0.001$ ); the positive effect of trust on audience acceptance is was significant ( $B=0.151, p<0.05$ ); cultural self-confidence had no significant effect on audience acceptance; technology anxiety had a significant negative effect on audience acceptance ( $B=-0.175, p<0.05$ ); perceived usefulness had a significant positive effect on audience acceptance ( $B=0.289, p<0.001$ ); and perceived ease of use had a significant positive effect on audience acceptance ( $B=0.231, p<0.001$ ); and the positive effect of willingness to pass on was significant on audience acceptance ( $B=0.197, p<0.001$ ).

**Table 6.** The model path test of the structural equation

| Hypothesize | Path                                         | Estimated value | Standardized path ( $\beta$ ) | Standard error | T value | P value | Results        |
|-------------|----------------------------------------------|-----------------|-------------------------------|----------------|---------|---------|----------------|
| H1          | Trust→Perceptual usefulness                  | 0.364           | 0.431                         | 0.071          | 6.441   | ***     | Prominence     |
| H2          | Cultural confidence→Perceptual usefulness    | -0.187          | 0.297                         | 0.062          | -4.519  | ***     | Prominence     |
| H3          | Perceptual ease of use→Perceptual usefulness | 0.489           | 0.407                         | 0.104          | 5.455   | ***     | Prominence     |
| H4          | Passing resistance→Perceptual ease of use    | -0.122          | -0.218                        | 0.061          | -3.145  | 0.001   | Prominence     |
| H5          | Perceptual usefulness→Inheritance will       | 0.263           | 0.257                         | 0.094          | 3.257   | 0.001   | Prominence     |
| H6          | Passing resistance→Inheritance will          | 0.191           | -0.198                        | 0.089          | 2.465   | 0.013   | Prominence     |
| H7          | Perceptual ease of use→Inheritance will      | 0.229           | 0.215                         | 0.077          | 1.898   | ***     | Prominence     |
| H8          | Trust→Audience acceptance                    | -0.076          | 0.151                         | 0.052          | -2.573  | 0.007   | Prominence     |
| H9          | Cultural confidence→Audience acceptance      | 0.299           | 0.273                         | 0.121          | 2.766   | 0.055   | Insignificance |
| H10         | Technical anxiety→Audience acceptance        | 0.163           | -0.175                        | 0.088          | 2.088   | 0.046   | Prominence     |
| H11         | Perceptual usefulness→Audience acceptance    | 0.258           | 0.289                         | 0.086          | 3.528   | ***     | Prominence     |
| H12         | Perceptual ease of use→Audience acceptance   | 0.364           | 0.231                         | 0.071          | 6.441   | ***     | Prominence     |
| H13         | Inheritance will→Audience acceptance         | -0.187          | 0.197                         | 0.062          | -4.519  | ***     | Prominence     |

Note:  $P < 0.05$ , \*,  $P$  less than 0.01, \*\*,  $P < 0.001$ , \*\*\*\*

4.3.3. Brokering effects. Bootstrapping method was used for mediation effect test. Setting a random sampling sample size of 2000, confidence interval of 95%, Bias-Corrected estimation method, Amos

calculated to get the effect value, standard error and upper and lower confidence intervals, if the confidence intervals do not contain 0, indicating that the mediation effect is significant, and contains 0, indicating that the effect is not significant. The mediation effect test table of the model is calculated as shown in Table 7.

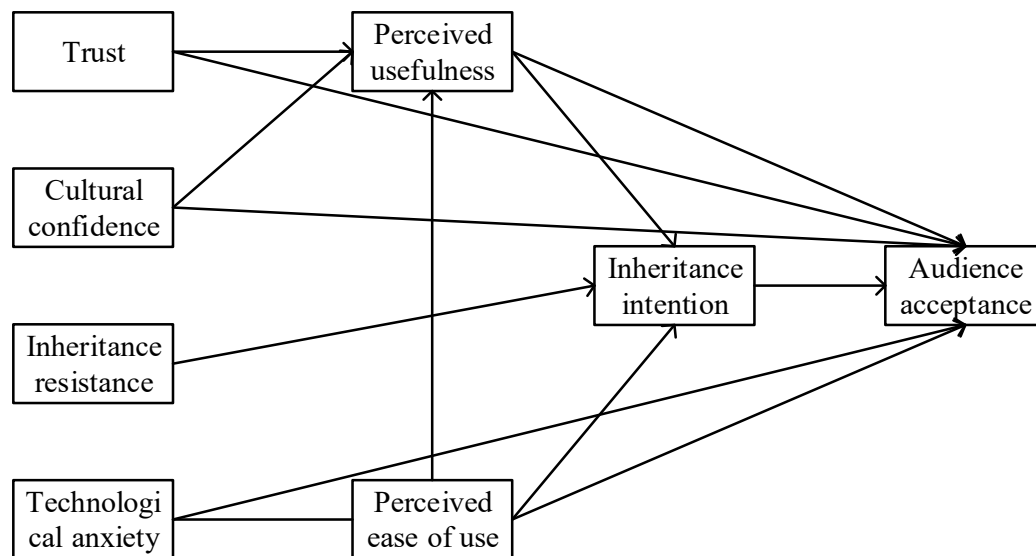
From the calculation results, we can get the following 9 tests of the mediation path:

- 1) Intermediary path 1: The 95% upper and lower intervals of the intermediary path “trust → perceived usefulness → audience acceptance” are [0.011, 0.175], which does not include 0, indicating that perceived usefulness plays a significant role in mediating between trust and audience acceptance, with an effect value of 0.083.
- 2) Intermediary path 2: The 95% upper and lower intervals of the intermediary path “trust → perceived usefulness → willingness to pass on → audience acceptance” are [0.012, 0.074], which do not contain 0, indicating that the chain intermediary effect of perceived usefulness and willingness to pass on is significant in the intermediary role of trust and audience acceptance, and the effect value is 0.032.
- 3) Intermediary path 3: The 95% upper and lower intervals of the intermediary path “cultural self-confidence → perceived usefulness → audience acceptance” are [0.014, 0.077], which do not include 0, indicating that perceived usefulness plays a significant role in the intermediary between cultural self-confidence and audience acceptance, and the effect value is 0.074.
- 4) Intermediary path 4: The 95% upper and lower intervals of the intermediary path “cultural self-confidence → perceived usefulness → inheritance willingness → audience acceptance” are [0.009, 0.072], which does not contain 0, indicating that the chain intermediary effect of perceived usefulness and inheritance willingness between cultural self-confidence and audience acceptance is significant, with an effect value of 0.029.
- 5) Intermediary path 5: The 95% upper and lower intervals of the intermediary path “inheritance resistance → perceived ease of use → perceived usefulness → audience acceptance” are [-0.084, -0.005], which does not contain 0, indicating that the chain intermediary effect of perceived ease of use and perceived usefulness between inheritance resistance and audience acceptance is significant, and the effect value is -0.031.
- 6) Mediation path 6: 95% of the upper and lower intervals of the mediation path of “inheritance resistance → perceived ease of use → perceived usefulness → inheritance intention → audience acceptance” were [-0.032, -0.002], excluding 0, indicating that perceived ease of use, perceived usefulness, and inheritance intention had a significant chain mediating effect between inheritance resistance and audience acceptance, with an effect size of -0.012.
- 7) Intermediary path 7: The 95% upper and lower intervals of the intermediary path “inheritance resistance → perceived ease of use → audience acceptance” are [-0.132, 0.012], including 0, which indicates that the intermediary role of perceived ease of use between inheritance resistance and audience acceptance is not significant.
- 8) Intermediary path 8: The 95% upper and lower intervals of the intermediary path “inheritance resistance → perceived ease of use → inheritance willingness → audience acceptance” are [-0.052, -0.002], which does not contain 0, indicating that the chain intermediary effect of perceived ease of use and inheritance willingness between inheritance resistance and audience acceptance is significant, and the effect value is -0.018.
- 8) Intermediary path 8: The 95% upper and lower intervals of the intermediary path “inheritance resistance → perceived ease of use → inheritance willingness → audience acceptance” are [-0.129, -0.011], which does not contain 0, indicating that the chain intermediary effect of perceived ease of use and inheritance willingness between inheritance resistance and audience acceptance is significant, with an effect value of -0.056.

**Table 7.** Bootstrapping mediation effect test

| Variable            | Mediation path                                                                      | Effect value | Standard error | <i>Bias – Corrected</i><br>95%CI |        |
|---------------------|-------------------------------------------------------------------------------------|--------------|----------------|----------------------------------|--------|
|                     |                                                                                     |              |                |                                  |        |
| Trust               | Trust→Perceptual usefulness→Audience acceptance                                     | 0.083        | 0.012          | 0.011                            | 0.175  |
|                     | Trust→Perceptual usefulness→Inheritance will→Audience acceptance                    | 0.032        | 0.013          | 0.012                            | 0.071  |
| Cultural confidence | Cultural confidence→Perceptual usefulness→Audience acceptance                       | 0.074        | 0.039          | 0.014                            | 0.177  |
|                     | Cultural confidence→Perceptual usefulness→Inheritance will→Audience acceptance      | 0.029        | 0.012          | 0.009                            | 0.072  |
| Passing resistance  | Passing resistance→Perceptual ease of use→Perceptual usefulness→Audience acceptance | -0.031       | 0.016          | -0.084                           | -0.005 |
|                     | Passing resistance→Perceptual ease of use→Perceptual usefulness→Audience acceptance | -0.012       | 0.005          | -0.032                           | -0.002 |
|                     | Passing resistance→Perceptual ease of use→Audience acceptance                       | -0.043       | 0.035          | -0.132                           | 0.012  |
|                     | Passing resistance→Perceptual ease of use→Inheritance will→Audience acceptance      | -0.018       | 0.012          | -0.052                           | -0.002 |
|                     | Passing resistance→Inheritance will→Audience acceptance                             | -0.056       | 0.029          | -0.129                           | -0.011 |

4.3.4. Overall test results. Testing through the model and path, it can be found that the variables trust, cultural confidence, perceived usefulness, perceived ease of use and willingness to inherit are positive feedback relationships on audience acceptance; inheritance resistance is a negative feedback relationship on the willingness to inherit, and technological anxiety is a negative feedback relationship on audience acceptance. After testing hypothesis H9 does not hold, the rest of the 12 hypotheses hold. The effect of independent variable cultural self-confidence on audience acceptance is not significant, but the effect on audience acceptance through the mediating variable perceived usefulness is significant, indicating that most of the audience is rational, and will not accept because of cultural self-confidence, but will accept the content of the inherited traditional sports program after perceived usefulness. In addition, the modified model is taken as the final model of this study, as shown in Figure 3.



**Fig. 3.** The ultimate model of traditional sports digital inheritance

## 5. Conclusion

The study identifies the latent variables of the factors influencing the digital heritage of traditional sports and constructs a model. Assumptions are made about the role relationship between the latent variables. Questionnaire survey method is used to collect data for empirical research, test the hypotheses proposed in this paper, and amend and improve to get the final model of traditional sports digital inheritance influencing factors. The main findings of this paper include the following parts.

- 1) Using the Pearson correlation coefficient test, in which inheritance resistance and perceived ease of use, inheritance resistance and inheritance willingness and technology anxiety and audience acceptance are not significant outside, and there is a negative correlation.
- 2) Trust, perceived usefulness, perceived ease of use, inheritance willingness and technology anxiety all directly affect the effect of digital inheritance of traditional sports; inheritance resistance and cultural self-confidence need to rely on the intermediary variables of inheritance willingness and perceived usefulness in order to play a role in influencing the acceptance of the audience, which indirectly affects the effect of digital inheritance of traditional sports.
- 3) Perceived ease of use only plays a part of the intermediary role, in the “inheritance resistance → perceived ease of use → audience acceptance” path of the intermediary effect of the upper and lower intervals of [-0.132,0.012], including 0. The effect is not obvious. The influence of willingness to pass on and perceived usefulness on audience acceptance is significant.

## References

- [1] Gao, J. (2023). Construction of digital protection path for intangible cultural heritage of ethnic minority traditional sports: Take Tibetan traditional sports as an example. *Journal of Sociology and Ethnology*, 5(9), 27-32.
- [2] Qing, Z., Ming, H., & Zhichao, Y. (2023). Research on digital communication of Huxiang traditional sports culture. *Frontiers in Sport Research*, 5(10).
- [3] Li, Y., Yuan, T., & Chen, J. (2022, March). Inheritance and Development of National Traditional Sports Culture in the Context of Big Data--Take TikTok as an example. In *2022 7th International Conference on Financial Innovation and Economic Development (ICFIED 2022)* (pp. 3249-3252). Atlantis Press.
- [4] Qian, D. (2024). Case Study of Chinese Traditional Martial Arts Inheritance Based on Deep Learning.



International Journal of High Speed Electronics and Systems, 2540035.

- [5] Yaheng, Z., & Goh Weng Yewb Duan Yongbin, V. (2021). Research on the Inheritance of Traditional Ethnic Sports in Competitiveness. *Turkish Online Journal of Qualitative Inquiry*, 12(10).
- [6] Hsieh, Y. C., & Chen, T. H. (2019, May). Digital Archive Use in Physical Education and Sports Culture. In *Archiving Conference* (Vol. 16, pp. 120-124). Society for Imaging Science and Technology.
- [7] Zhang, J. (2017). Modernization process and traditional national sports inheritance research based on fuzzy clustering model. In *2016 National Convention on Sports Science of China* (p. 01015). EDP Sciences.
- [8] Zhou, R., & Wu, F. (2023). Inheritance and Innovation Development of Sports based on Deep Learning and Artificial Intelligence. *IEEE Access*.
- [9] Zhang, Y. (2023, September). Digital Experience Design of Traditional Martial Arts in Intangible Cultural Heritage. In *2023 4th International Conference on Artificial Intelligence and Education (ICAIE 2023)* (pp. 458-465). Atlantis Press.
- [10] Wang, X. (2023, June). Preservation and transmission of traditional chinese martial arts in the digital era. In *Of Papers Presented at 2023 4th Asia Sport Science Conference (ASSC)*.
- [11] Peng, Y. (2020). Reconstructing the way of sports communication in artificial intelligence's field of view. *International Journal of Education and Economics*, 3(3), 32-34.
- [12] Chen, X., Yang, T., & Li, Z. (2023). Research on the dissemination and evolution of the traditional ethnic sport culture. *Revista de Psicología del Deporte (Journal of Sport Psychology)*, 32(2), 1-9.
- [13] Wenming, Y. (2021, January). Communication of Emei Martial Art National Traditional Sports Culture Based on Computer Digital Platform. In *2021 IEEE International Conference on Power Electronics, Computer Applications (ICPECA)* (pp. 737-742). IEEE.
- [14] Zhen, Z. (2024). Establishment of an Open Information Platform for the National Sports Center in China. *Revista de Psicología del Deporte (Journal of Sport Psychology)*, 33(2), 99-107.
- [15] Cui, S. L., & Anurag, K. (2022). RETRACTED: An Improved Online Folk Sports Culture Exchange Model Based on Multimedia Data Analysis and Edge Computing. *Mobile Information Systems*, 2022(1), 1642988.
- [16] Huang, Q., & Wang, F. (2021, August). VR Technology on the Communication of Sports Culture in Chinese Universities. In *Retracted on September 15, 2021 The Sixth International Conference on Information Management and Technology* (pp. 1-5).
- [17] Li, Y., & Song, G. (2023). Research on Dissemination Strategy of martial Arts Intangible cultural Heritage in Anhui Area in New Media Era. *International Journal of Education and Humanities*, 9(1), 165-171.
- [18] He, N., Yan, S., Wang, J., Yu, Y., Qin, X., & Sun, J. (2021, January). Study on New Media Communication Strategy of Traditional Chinese Sports. In *2021 International Conference on Information Technology and Contemporary Sports (TCS)* (pp. 19-23). IEEE.
- [19] He, N., Wang, J., Yan, S., & Wang, W. (2021, January). The shortage and dilemma of international communication of traditional Chinese sports in the Omni-media era. In *2021 International conference on information technology and contemporary sports (TCS)* (pp. 363-369). IEEE.
- [20] Gong, X. (2021, June). Research on the Characteristics and Development Trend of Internet Sports News. In *2021 International Wireless Communications and Mobile Computing (IWCMC)* (pp. 1778-1782). IEEE.
- [21] Shi, M. (2015). A research on characteristics and development trend of sports communication in the era of big data. *The Open Cybernetics & Systemics Journal*, 9(1).
- [22] Pei, L. (2021, October). Opportunities and Challenges of Smart Sports Development in China under the Background of 5G. In *2021 International Conference on Health Big Data and Smart Sports (HBDSS)* (pp.

181-184). IEEE.

- [23] Rongbing Huang, Muhammad Farhan Hanif, Muhammad Kamran Siddiqui, Muhammad Faisal Hanif & Fikre Bogale Petros. (2024). Analyzing boron oxide networks through Shannon entropy and Pearson correlation coefficient. *Scientific Reports*(1),26552-26552.
- [24] Changelima Ismail Abdi & Elias Ruth. (2024). Mediating effect of purchasing efficiency on the relationship between purchasing analytical skills and restaurant performance: a PLS-SEM approach. *Journal of Money and Business*(2),138-149.
- [25] Entong Gao, Jialu Guo, Xipeng Pang, Danya Bo & Zhe Chen. (2024). Exploring pathways to comprehension performance in multilanguage smart voice systems: insights from Lasso regression, SEM, PLS-SEM, CNN, and BiLSTM. *Humanities and Social Sciences Communications*(1),1544-1544.