

INTEGRATION OF TECHNOLOGY AND AEROBICS: THE EFFECT OF INTERACTIVE VIDEO ON MOTIVATION AND EXERCISE CONSISTENCY

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Abstract. This study was motivated by the low consistency of student participation in aerobic exercise due to time constraints, limited access, and fluctuations in motivation. The use of interactive videos is seen as an innovative solution to enhance engagement in exercise in a flexible and structured manner. This study aims to analyse the effect of interactive videos on intrinsic motivation, extrinsic motivation, and exercise consistency. The method used was a quantitative approach with a quasi-experimental design involving 60 students divided into experimental and control groups. Data collection was conducted via questionnaires and observation, whilst data analysis utilised validity and reliability tests, t-tests, and linear regression. The results of the study showed that the experimental group had a higher average motivation score (3.735) compared to the control group (3.347), with a t - value of 3.996 and $p = 0.000$. Regarding the participation variable, the experimental group also scored higher (3.667) than the control group (3.298), with $t = 3.541$ and $p = 0.001$. Regression analysis showed that interactive videos had a significant effect on exercise consistency ($\beta = 0.497$; $p = 0.000$), contributing 49.6% ($R^2 = 0.496$). In conclusion, interactive videos are effective in increasing motivation and consistency in aerobic exercise and support the sustainability of students' physical activity.

Keywords: Interactive Video, Aerobics, Intrinsic Motivation, Extrinsic Motivation, Exercise Consistency

Abstrak. Penelitian ini dimotivasi oleh rendahnya konsistensi partisipasi mahasiswa dalam senam aerobik karena keterbatasan waktu, akses, dan fluktuasi motivasi. Penggunaan video interaktif dipandang sebagai solusi inovatif untuk meningkatkan keterlibatan dalam olahraga secara fleksibel dan terstruktur. Studi ini bertujuan untuk menganalisis pengaruh video interaktif terhadap motivasi intrinsik, motivasi ekstrinsik, dan konsistensi olahraga. Metode yang digunakan adalah pendekatan kuantitatif dengan desain eksperimen semu (*quasi-experimental*) dengan 60 mahasiswa yang dibagi ke dalam kelompok eksperimen dan kontrol. Teknik pengumpulan data dilakukan melalui angket dan observasi, sedangkan analisis data menggunakan uji validitas, reliabilitas, uji t, dan regresi linear. Hasil penelitian menunjukkan bahwa kelompok eksperimen memiliki rata-rata motivasi lebih tinggi (3,735) dibandingkan kelompok kontrol (3,347) dengan nilai $t = 3,996$ dan $p = 0,000$. Pada variabel partisipasi, kelompok eksperimen juga lebih tinggi (3,667) dibandingkan kelompok kontrol (3,298) dengan $t = 3,541$ dan $p = 0,001$. Analisis regresi menunjukkan bahwa video interaktif berpengaruh signifikan terhadap konsistensi latihan ($\beta = 0,497$; $p = 0,000$) dengan kontribusi sebesar 49,6% ($R^2 = 0,496$). Kesimpulannya, video interaktif efektif dalam meningkatkan motivasi dan konsistensi aerobik serta mendukung keberlanjutan aktivitas fisik mahasiswa.

Kata Kunci: Video Interaktif, Aerobik, Motivasi Intrinsik, Motivasi Ekstrinsik, Konsistensi Olahraga

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INTRODUCTION

The development of digital technology in the modern era has significantly influenced various aspects of life, including the sports and fitness sector. One emerging innovation in this field is the use of interactive video media, particularly in aerobics activities. Aerobics is widely practiced due to its accessibility and health benefits, including improved cardiovascular endurance and psychological well-being (Zhou et al., 2023; Mackenbrock et al., 2025; Arfanda et al., 2023). However, several studies indicate that participation in regular physical exercise among college students remains relatively low. Preliminary observations and previous findings show that many students tend to exercise inconsistently because of academic workload, lack of motivation, monotonous training methods, and limited time management (Trisnawati et al., 2024; Soni & Wijeratne, 2021). This condition demonstrates that maintaining long-term exercise behavior is still a major challenge despite increasing awareness of healthy lifestyles.

Motivation is considered one of the most important psychological factors influencing exercise participation and consistency. According to Self-Determination Theory proposed by Deci and Ryan, motivation is divided into intrinsic motivation, which originates from internal satisfaction and enjoyment, and extrinsic motivation, which is influenced by external rewards, social support, or environmental factors. Individuals with strong intrinsic motivation tend to demonstrate higher persistence and consistency in physical activity because they exercise based on personal interest and self-fulfillment rather than external pressure. Meanwhile, consistency in exercise refers to the ability to maintain regular participation in physical activity over time, which is closely related to habit formation, self-regulation, and behavioral commitment (Fernández-Espínola et al., 2020; Viveiros et al., 2025). Therefore, strengthening both motivational aspects is essential to sustain long-term engagement in aerobics activities.

In response to this problem, this study proposes interactive video as a technology-based intervention that can simultaneously support motivation and exercise consistency in aerobics, particularly among college students who are highly familiar with digital technology. Interactive video offers advantages beyond conventional instructional videos through features such as visual guidance, repeated demonstrations, flexible access, and more engaging learning experiences. These characteristics are expected to increase autonomy, enjoyment, and user engagement during exercise sessions, which are strongly associated with sustained physical activity participation (Lang et al., 2022; Sun et al., 2021).

Previous studies have explored the use of digital tools in physical activity, such as fitness applications and video-based learning, and generally reported positive effects on participation and skill improvement. However, most studies focus on general fitness applications and rarely

examine interactive video specifically in aerobics activities while simultaneously analyzing intrinsic motivation, extrinsic motivation, and exercise consistency outcomes. In addition, studies involving college students remain limited, even though this group is highly exposed to digital technology and vulnerable to inconsistent exercise behavior due to academic demands and lifestyle factors (Angosto et al., 2023; Liu et al., 2022).

Based on these gaps, this study aims to analyze the effect of interactive video on intrinsic motivation, extrinsic motivation, and aerobics consistency among college students. More specifically, the study focuses on examining how the use of interactive video influences students' enthusiasm, engagement, and persistence in participating in aerobics activities. The research also seeks to identify whether interactive video can encourage more sustainable exercise behavior through flexible access, attractive visual guidance, and interactive learning experiences that support independent practice. In addition, this study investigates the relationship between motivational factors and exercise consistency to understand how technology-based media can strengthen long-term participation in physical activity among college students. The findings are expected to provide empirical evidence and practical recommendations for developing technology-based exercise strategies that are more adaptive, engaging, and sustainable in supporting healthy lifestyles in the digital era.

METHOD

This study used a quantitative approach with a quasi-experimental design. The subjects were 60 female students from the Faculty of Sport and Health Sciences, Makassar State University, selected using purposive sampling techniques, then divided into two groups: 30 in the experimental group and 30 in the control group. The experimental group was given treatment in the form of aerobics using interactive videos for 6 weeks, while the control group used conventional methods with a live instructor.

Data collection techniques in this study were carried out through questionnaires and structured observation. The questionnaires measured intrinsic and extrinsic motivation using 9 items each on a 5-point Likert scale, while structured observation was used to assess exercise consistency based on attendance frequency and duration of exercise consisting of 12 indicators.

The instruments used in this study included a 9-item intrinsic motivation questionnaire and a 9-item extrinsic motivation questionnaire based on a 5-point Likert scale, as well as an observation sheet to measure exercise consistency, which included frequency of attendance and duration of exercise, totaling 12 items. Validity tests were conducted using Pearson Product Moment correlation, while reliability tests used Cronbach's Alpha with a limit of ≥ 0.70 . Data

analysis was carried out through descriptive statistical tests, normality tests, and independent sample t-tests to determine differences between the experimental and control groups. In addition, simple linear regression analysis was used to see the effect of interactive videos on exercise motivation and consistency. All tests were performed at a significance level of 0.05.

RESULTS

Table 1. Instrument validity test results

Variables	Number of Items	r count (Min–Max)	r table	Information
Intrinsic Motivation	9	0.505 – 0.718	0.246	Valid
Extrinsic Motivation	9	0.483 – 0.668	0.246	Valid
Participation	12	0.516 – 0.714	0.246	Valid

The validity test results show that all items in Table 1, the intrinsic motivation, extrinsic motivation, and participation variables, have a calculated r value greater than the table r of 0.246 at a significance level of 0.05. The calculated r value for the intrinsic motivation variable ranges from 0.505 to 0.718, extrinsic motivation between 0.483 to 0.668, and participation between 0.516 to 0.714. Thus, all items in the research instrument are declared valid and suitable for use in data collection. Once the research instrument is declared valid, the next step is to test its reliability to ensure the internal consistency of each item in measuring the construct under study. Reliability testing is conducted using the Cronbach's Alpha coefficient, where an instrument is considered reliable if its Cronbach's Alpha value is ≥ 0.70 .

Table 2. Reliability Test Results

Variables	Cronbach's Alpha	Standard	Information
Intrinsic Motivation	0.811	≥ 0.70	Reliable
Extrinsic Motivation	0.784	≥ 0.70	Reliable
Participation	0.801	≥ 0.70	Reliable

Based on the test results in Table 2, all variables in this study demonstrated a good level of reliability. The intrinsic motivation variable obtained a Cronbach's Alpha value of 0.811, the extrinsic motivation variable 0.784, and the participation variable 0.801. All of these values are above the established minimum standard and can therefore be categorized as reliable.

Descriptive statistics are used to provide an overview of the data characteristics of each research variable, including minimum, maximum, mean, median, mode, and standard deviation. This analysis aims to understand the distribution of data and respondents' tendencies in responding to the instruments used.

Table 3. Descriptive statistics

Variables	N	Min	Max	Mean	Median	Mode	SD
Intrinsic Motivation	60	2.9	4.5	3,735	3.72	3.7	0.427
Extrinsic Motivation	60	2.7	4.4	3,511	3.5	3.45	0.456
Participation	60	2.8	4.6	3,667	3.65	3.6	0.475

Based on the analysis results in Table 3, the intrinsic motivation variable has an average value of 3.735 with a minimum value of 2.9 and a maximum of 4.5. The median value is 3.72, the mode is 3.7, and the standard deviation is 0.427. These results indicate that most respondents demonstrate relatively high intrinsic motivation toward aerobics activities, suggesting that students tend to participate in exercise because of personal interest, enjoyment, and awareness of health benefits rather than external pressure. The relatively low standard deviation also shows that respondents' answers are fairly homogeneous, indicating similar perceptions regarding internal motivation in participating in aerobics activities.

In the extrinsic motivation variable, the mean value is 3.511 with a range of values between 2.7 and 4.4. The median value is 3.5, the mode is 3.45, and the standard deviation is 0.456. This finding suggests that external factors such as social support, environmental influence, and the attractiveness of interactive video also contribute to encouraging students' participation in aerobics, although the influence is slightly lower compared to intrinsic motivation. The variation in responses indicates that external encouragement differs among students depending on their social and learning environments.

Meanwhile, the participation variable shows an average value of 3.667 with a minimum value of 2.8 and a maximum of 4.6. The median value is 3.65, and the mode is 3.6 with a standard deviation of 0.475. Substantively, these results indicate that students generally demonstrate a relatively good level of consistency in participating in aerobics activities. The findings imply that the use of interactive video may support sustained exercise participation by creating a more flexible, engaging, and accessible learning environment for college students. Next, a normality test was performed to determine whether the data for each research variable was normally distributed, as a prerequisite for parametric statistical analysis. In this study, the normality test was conducted using the Kolmogorov-Smirnov method with a significance level of 0.05.

Table 4. Normality Test (Kolmogorov-Smirnov)

Variables	Sig.	Information
Intrinsic Motivation	0.19	Normal
Extrinsic Motivation	0.15	Normal
Participation	0.17	Normal

Based on the normality test results presented in Table 4, all research variables showed significance values above 0.05. The intrinsic motivation variable had a Sig. value of 0.19, the extrinsic motivation variable 0.15, and the participation variable 0.17. These results indicate that the data were normally distributed and met the assumptions required for further parametric analysis using the independent sample *t*-test. The study involved two groups, namely the experimental group and the control group, consisting of college students participating in aerobics activities. The experimental group received treatment in the form of aerobics learning using interactive video media, which provided visual movement demonstrations, step-by-step instructions, repeated playback features, and flexible access during practice sessions. Meanwhile, the control group participated in conventional aerobics learning using direct instructor explanation and demonstration without interactive video support. The treatment was conducted over several learning sessions to observe differences in students' motivation and exercise participation between the two groups.

An independent sample *t*-test was conducted to determine the mean differences between the experimental and control groups on intrinsic motivation, extrinsic motivation, and participation variables. This analysis aimed to identify whether the use of interactive video produced significant differences in students' motivation and aerobics consistency compared to conventional learning methods. The decision-making criteria were based on a significance value (Sig.) of 0.05, where a Sig. value below 0.05 indicates a statistically significant difference between the two groups.

Table 5. Independent Sample *t*-test

Variables	Group	Mean	t count	Sig.
Motivation	Experiment	3,735	3,996	0,000
	Control	3,347		
Participation	Experiment	3,667	3,541	0.001
	Control	3,298		

Based on the analysis results presented in Table 5, there was a significant difference between the experimental group and the control group in the motivation variable. The experimental group had an average score of 3.735, higher than the control group at 3.347, with a calculated *t*-value of 3.996 and a significance value of 0.000 ($p < 0.05$). In addition, a significant difference was also found in the participation variable between the two groups. The experimental group showed an average score of 3.667, while the control group was 3.298, with a calculated *t*-value of 3.541 and a significance value of 0.001 ($p < 0.05$). These results indicate

that the treatment given not only increased motivation but also had a positive impact on respondent participation.

Linear regression analysis was conducted to test the extent of the influence of interactive video variables on the dependent variables in this study. This test aims to determine the direction, magnitude, and significance of the influence exerted by the independent variables. The decision-making criteria were based on the significance value (Sig.) with a margin of error of 0.05, where a Sig. value <0.05 indicates a significant influence.

Table 6. Linear Regression Analysis

Variables	B	Beta (β)	t	Sig.
(Constant)	1,174	—	2,377	0.017
Interactive Video	0.504	0.497	4,724	0,000

Based on the analysis results in Table 6, a constant value of 1.174 was obtained with a significance value of 0.017 ($p < 0.05$), indicating that when the interactive video variable is zero, the baseline value of the dependent variable is at that number. Meanwhile, the interactive video variable has a regression coefficient (B) value of 0.504 with a beta coefficient (β) value of 0.497, indicating a positive influence with moderate strength. The calculated t value of 4.724 with a significance value of 0.000 ($p < 0.05$) indicates that the interactive video variable has a significant effect on the dependent variable. This means that any increase in the use or quality of interactive video will be followed by an increase in the variables studied.

Analysis of Variance (ANOVA) in linear regression is used to test the model's goodness of fit and determine whether the independent variables simultaneously have a significant effect on the dependent variable. This test is based on the F value and significance (Sig.) with an error level of 0.05, where a Sig. value <0.05 indicates that the regression model used is feasible and significant.

Table 7. ANOVA

Variance	Sum of Squares	df	Mean Square	F	Sig.
Regression	10,517	1	10,517	27,791	0,000
Residual	21,306	55	0.367	—	—
Total	31,823	57	—	—	—

Based on the analysis results in Table 7, the calculated F value was 27.791 with a significance level of 0.000 ($p < 0.05$). These results indicate that the regression model used in this study is overall significant and appropriate to explain the relationship between the independent and dependent variables. In addition, the Sum of Squares value in the regression

of 10.517 indicates the magnitude of variation that can be explained by the model, while the Residual value of 21.306 indicates variation that cannot be explained by the model.

The coefficient of determination is used to measure the extent to which a regression model can explain variation in the dependent variable. This value is expressed through R Square (R^2), which represents the proportion of the independent variable's contribution to the change in the dependent variable. Additionally, Adjusted R Square is used to provide a more accurate estimate by considering the number of variables in the model.

Table 8. Coefficient of Determination

R	R Square	Adjusted R Square	Std. Error
0.694	0.496	0.487	0.289

Based on the analysis results in Table 8, the R value obtained is 0.694, indicating a strong relationship between the independent and dependent variables. The R-squared value of 0.496 indicates that 49.6% of the variation in the dependent variable can be explained by the interactive video variable in the regression model used. Meanwhile, the Adjusted R Square value of 0.487 indicates that after adjusting for the number of variables and sample size, the effective contribution of the model remains in the moderate to strong category. The Standard Error of the Estimate value of 0.289 indicates a relatively small level of model prediction error, so the model has a fairly good level of accuracy in predicting the dependent variable

DISCUSSION

Intrinsic Motivation

The results of the study showed that the use of interactive videos in aerobics had a positive and significant effect on increasing participants' intrinsic motivation. This finding indicates that individuals who participated in exercises with the help of interactive videos tended to experience stronger internal drives, such as enjoyment, personal satisfaction, and a desire to improve health. This is consistent with Self-Determination Theory (SDT), which explains that intrinsic motivation develops when individuals experience autonomy, competence, and relatedness in an activity (Soni & Wijeratne, 2022; Arfanda et al., 2025).

From the perspective of competence, interactive videos provide structured and step-by-step guidance that helps participants better understand and perform aerobic movements correctly. This aligns with Qiu et al. (2026), who emphasize that digital instructional media can strengthen learners' perceived competence through clear visualization and repetition of skills. At the same time, the flexibility of accessing videos anytime and anywhere enhances perceived

autonomy, allowing individuals to regulate their own training process, which is a core condition for sustaining intrinsic motivation.

In addition, previous studies have shown that video-based digital learning media in physical activity contribute to increased enjoyment and engagement in exercise routines (Garcia, 2024). Rather than functioning solely as instructional tools, interactive videos also shape emotional experiences during exercise by making activities more engaging and less monotonous. This supports findings by Mouatt et al. (2020), who note that enjoyable exercise experiences are strongly associated with sustained participation in physical activity.

Furthermore, the improvement in intrinsic motivation can also be understood through the concept of exercise enjoyment, where positive emotional responses encourage voluntary and self-determined participation. The presence of varied movements, rhythmic music, and dynamic visual presentation in interactive videos helps reduce boredom, which is often a key barrier to consistent exercise. Swann et al. (2021) and Wen et al. (2025) similarly highlight that technology-based innovations play an important role in enhancing exercise enjoyment, which in turn strengthens intrinsic motivation and long-term engagement in physical activity.

Extrinsic Motivation

In addition to intrinsic motivation, the results of this study also showed a significant increase in extrinsic motivation among participants who used interactive videos. This increase is reflected in external factors such as easier access to exercise materials, perceived environmental support, and the availability of structured guidance during training. In line with this, Checa-Moreno et al. (2021) emphasize that usability and accessibility of digital exercise media are key determinants in strengthening users' engagement in physical activity. Interactive videos contribute to this condition by providing external stimuli such as a virtual instructor, engaging visual presentation, and a clear and systematic exercise flow, which collectively function as continuous external reinforcement for participant adherence. Similarly, Stockwell et al. (2021) highlight that digital platforms can reduce practical barriers such as time and place constraints, which are often major obstacles for consistent exercise participation among young adults.

However, extrinsic motivation derived from external support needs to be balanced with intrinsic motivation to ensure sustained engagement in physical activity. Deng et al. (2023) and Rodrigues & Teixeira (2023) argue that long-term behavioral consistency is more effectively achieved when external reinforcement is integrated with internal satisfaction and personal meaning in exercise. In the context of college students, this integration becomes particularly

important due to academic workload and stress, which often make external convenience a trigger for initial participation but insufficient for long-term consistency. Therefore, combining enjoyable exercise experiences with accessible digital support is essential to maintain both motivation and adherence over time.

Participation and Consistency of Exercise

The study results showed that the use of interactive videos had a positive impact on increasing participation and consistency in aerobics. Participants who used interactive videos tended to adhere to their exercise program more regularly than those who used conventional methods. This finding indicates that digital-based exercise media can effectively address the common problem of low sustainability in physical activity. In this context, Bentlage et al. (2020) highlight that digital fitness tools improve accessibility and reduce structural barriers to exercise, while Herbold & Thees (2020) emphasize that clear visual instruction enhances user engagement and supports continuous participation.

One of the main advantages of interactive video lies in its flexibility. Participants can adjust their workouts according to personal schedules, which minimizes barriers such as time constraints and limited access to facilities. In addition, the repetition feature allows users to review movements as needed, supporting gradual skill improvement and reinforcing learning through practice. This flexible and self-paced structure contributes to the development of consistent exercise behavior, particularly among individuals with dynamic daily routines. From a behavioral perspective, increased exercise consistency can be explained through habit formation theory, where repeated and structured activities gradually develop into automatic behavior patterns. Cossich et al. (2023) and Manskow et al. (2024) explain that consistent exposure to accessible and structured exercise environments strengthens behavioral repetition, which eventually reduces dependence on external motivation. In this way, interactive video functions not only as instructional media but also as a behavioral trigger that supports the formation of long-term exercise habits.

Furthermore, these findings have important implications for the development of technology-based fitness programs. The integration of interactive videos into aerobics can expand access to structured exercise experiences and support broader participation in physical activity. In the context of the digital era, this approach is relevant for promoting active lifestyles among populations with high engagement in digital devices. In addition, it opens opportunities for developing innovative fitness models that are more adaptive and scalable.

Moreover, the use of interactive video also has potential relevance for sports tourism development, particularly in creating digital-based experiential programs. Such media can be utilized to introduce culturally specific or regionally themed exercise activities, offering unique fitness experiences for users. This integration of sports, technology, and tourism provides added value not only for health promotion but also for creative economic development. The results of this study confirm that interactive video is an effective medium for improving motivation and exercise consistency in aerobics. These findings support previous research and contribute to the development of more adaptive, flexible, and sustainable technology-based exercise models in the context of modern physical activity behavior.

CONCLUSION

Based on the research results, it can be concluded that the use of interactive videos significantly increased intrinsic motivation, extrinsic motivation, and aerobics consistency in university students. Flexibility of access, ease of use, and movement repetition features were key factors supporting participant engagement in the exercise. Furthermore, interactive videos created a more engaging and structured exercise experience, thus helping to gradually form exercise habits. The integration of intrinsic and extrinsic motivation was also shown to be crucial for maintaining the sustainability of physical activity. Therefore, interactive videos can be used as an innovative strategy to increase participation and consistency in exercise sustainably

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