Online ISSN: 3082-5121
Aloysian Interdisciplinary Journal of Social Sciences, Education, and Allied Fields
https://journals.aloysianpublications.com
Volume 1 Issue 5 (2025)

Development and Validation of Instructional Videos on Plyometric Exercises

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Publication Date: May 23, 2025 DOI: 10.5281/zenodo.15779963

Abstract

This study focused on developing and validating an instructional video on plyometric exercises aimed at improving volleyball players' performance at Fatima National High School, General Santos City. Plyometric training is known to enhance essential volleyball skills such as agility, speed, power, and vertical jump height, which are crucial for competitive success. Given the limited availability of culturally relevant and accessible training resources in regions like Mindanao, this research created a tailored video to support athletes and physical education teachers, especially in contexts lacking direct coaching supervision. The study employed a Research and Development (R&D) design to produce the video and gathered acceptability ratings from both teachers and students to assess its effectiveness.

The results showed that both teachers and students found the instructional video highly acceptable, with teachers rating it significantly higher, likely due to their deeper understanding of the pedagogical benefits. Students' more varied responses highlighted the importance of considering their practical experience and engagement when refining the material. This research underscores the value of instructional videos as affordable, accessible tools that can enhance athletic performance and physical education, particularly in underserved areas. The findings suggest that incorporating student feedback in future iterations will improve the video's usability and impact, ultimately supporting evidence-based training and injury prevention in volleyball.

Keywords: *Plyometric Exercise, Instructional video development, Physical education technology, Student and teacher acceptability, Injury prevention*

INTRODUCTION

Playing volleyball demands agility, power, speed, and explosive movements, which can be developed through specific exercises like plyometric training. Plyometric exercises have been shown to significantly improve key athletic abilities such as vertical jump height, leg strength, and acceleration, all of which enhance volleyball performance. Studies from various countries, including Indonesia, India, and the Philippines, support the effectiveness of plyometric training in improving volleyball skills and compensating for physical disadvantages like shorter stature. Additionally, instructional videos have proven to be effective tools for teaching physical exercises, offering accessible training without the need for direct supervision by coaches.

Online ISSN: 3082-5121
Aloysian Interdisciplinary Journal of Social Sciences, Education, and Allied Fields
https://journals.aloysianpublications.com
Volume 1 Issue 5 (2025)

In regions like Mindanao, where access to specialized sports facilities and trainers is limited, culturally relevant and context-specific instructional videos are essential to promote evidence-based training. Developing such videos tailored to local needs can help athletes and educators improve performance and reduce injury risk. At Fatima National High School, the lack of instructional videos on plyometric exercises motivated the creation of a validated video resource to support volleyball players and physical education teachers, especially in the absence of trainers. These videos provide an affordable, accessible alternative to traditional training methods, making plyometric exercises more widely available to schools and sports organizations with limited resources.

Objective of the Study

The primary objective of this study is to develop and validate an instructional video on plyometric exercises aimed at improving volleyball performance. Specifically, the study seeks to determine the level of validation of the developed video in terms of its content, instructional quality, and technical quality. Additionally, it aims to assess the level of acceptability of the instructional video among both teachers and students, evaluating their perceptions of the content, instructional quality, and technical quality. Finally, the study intends to examine whether there is a significant difference between the acceptability ratings provided by teachers and those given by students regarding the instructional video.

METHODS

This study employed a Research and Development (R&D) design to create and validate an instructional video on plyometric exercises for volleyball players. R&D in education involves identifying needs, developing products, and validating them through systematic procedures and field testing to ensure quality and effectiveness. The study analyzed data to develop the video and sought expert validation to assess content accuracy, instructional quality, and technical quality. Additionally, the acceptability of the video was evaluated by both teachers and students to determine its practical use and effectiveness in an educational setting.

The research was conducted at Fatima National High School in General Santos City, a hub for sports development in Mindanao, Philippines. The respondents included two groups: ten expert validators with backgrounds in sports science, physical education, and volleyball, who assessed the video's accuracy and quality; and 130 acceptability assessors, comprising 100 senior high school students and 30 experienced teachers, who evaluated the video's instructional and technical quality based on clarity, engagement, and curriculum alignment. This approach ensured that the video met both expert standards and the practical needs of its end-users.

The data gathering process involved several stages, starting with obtaining approval from relevant authorities and surveying volleyball players to identify training needs. The instructional video was then developed based on these insights and validated by experts using structured tools adapted from previous studies. Feedback from validators was used to revise the video to enhance its quality. Finally, the acceptability of the video was measured among teachers and students using quantitative methods, including mean scores and T-tests, to determine differences in perceptions and ensure the video's effectiveness as a training resource.

Online ISSN: 3082-5121
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https://journals.aloysianpublications.com
Volume 1 Issue 5 (2025)

RESULTS

Validation of the Developed Plyometric Exercises

Table 1. Level of Validation of the Developed Plyometric Exercises in terms of Content

Statements	Mean	SD	Description
1. The video covers essential plyometric exercises with clear explanations	4.70	0.68	Excellent
2. The information is accurate, well-defined, and easy to understand.	4.60	0.70	Excellent
3. The exercises are well-organized, progressing from basic to advanced.	4.60	0.70	Excellent
4. The content aligns with learning objectives, focusing on power, speed, and strength.	4.70	0.68	Excellent
5. The contents are free of bias and stereotypes.	4.70	0.48	Excellent
6. The difficulty level matches the intended audience's abilities.	4.60	0.52	Excellent
7. It emphasizes performance-based learning.	4.90	0.32	Excellent
Section Mean	**4.69**	**0.58**	**Excellent**

The developed plyometric exercise video received highly positive evaluations, earning an excellent overall rating (M=4.69, SD=0.58) and particularly high marks for emphasizing performance-based learning (M=4.90, SD=0.32). Evaluators agreed on the video's quality, noting its effective integration of visuals, narration, and text, clear learning objectives, and accessibility. Key features such as concise length, interactivity, and engaging presentation contributed to enhanced retention and learner engagement. The low variability in ratings further validated the video's clarity, structure, and audio-visual quality, suggesting it successfully minimizes cognitive overload and aligns with educators' preferences for practical, user-friendly content. Feedback highlighted the importance of explanatory visuals, interactivity, and real-world relevance, confirming that the video meets high standards for learner-centered instructional design.

Table 2. Level of Validation of the Developed Plyometric Exercises in terms of Instructional Qualities

Statements	Mean	SD	Description
1. It is a good supplement to the curriculum.	4.90	0.32	Excellent
2. It addresses the concerns of the students learning the plyometric exercises.	4.80	0.42	Excellent
3. The instructional material facilitates collaborative learning.	4.40	0.52	Excellent
4. It facilitates the achievement of instructional objectives.	4.89	0.33	Excellent
5. It integrates student's previous experiences in plyometric exercises.	4.80	0.42	Excellent
6. It reflects the current trend in P.E. instruction.	4.70	0.48	Excellent
7. It allows independent learning and creativity.	4.70	0.48	Excellent
8. It supports different modalities and intelligences.	4.70	0.48	Excellent
9. The instructions are clearly stated.	4.70	0.675	Excellent
10. It gives appropriate motivation.	4.50	0.53	Excellent
Section Mean	**4.71**	**0.47**	**Excellent**

The instructional quality of the developed plyometric exercise video received a very high validation score (M = 4.71, SD = 0.47), reflecting strong consensus among evaluators regarding its effectiveness. The

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https://journals.aloysianpublications.com
Volume 1 Issue 5 (2025)

video meets established standards for high-quality instructional materials through clear visuals, logical organization, motivational narration, and supportive features such as cues and labels. Its learner-centered design, accessibility, and alignment with learning objectives further enhance engagement and comprehension. Additionally, the use of animations and structured guides contributes to better understanding, improved student performance, and positive perceptions of the instructional video.

Table 3. Level of Validation of the Developed Plyometric Exercises in terms of Technical Qualities

Statements	Mean	SD	Description
1. The instructional video is easy to navigate.	4.70	0.48	Excellent
2. The instructional video allows the learners to control the pace of learning.	4.70	0.48	Excellent
3. The graphics are excellent.	4.80	0.42	Excellent
4. The layout and design are appropriate.	4.80	0.42	Excellent
5. The manipulative controls are comprehensive and directive.	4.70	0.48	Excellent
6. The video dashes with minimum wait time.	4.70	0.48	Excellent
7. Intended users can easily and independently use the instructional video.	4.70	0.48	Excellent
8. The instructional video is aesthetically pleasing.	4.80	0.42	Excellent
9. The resolution of the video is clear.	4.80	0.42	Excellent
10. The sound/voice in the video is clear.	4.90	0.32	Excellent
Section Mean	**4.76**	**0.44**	**Excellent**

The developed plyometric exercises video received an excellent validation score for its technical qualities (M = 4.76, SD = 0.44), indicating strong agreement among evaluators on its high production standards. The video features high-definition resolution, clear audio, and smooth streaming, which are essential for enhancing student motivation and comprehension. Its logical content progression, clear transitions, and visual aids follow best instructional design practices that minimize cognitive overload and improve retention. Engaging multimedia elements, including dynamic visuals and interactive features, promote active learning and maintain viewer interest, while well-structured segments and optimal video length support sustained attention and deeper understanding.

Table 4. Summary Table of the Validation of the Developed Instructional Video in Plyometric Exercises

Statements	Mean	SD	Description
1. Content	4.69	0.58	Excellent
2. Instructional Qualities	4.71	0.47	Excellent
3. Technical Qualities	4.76	0.44	Excellent
Grand Mean	**4.72**	**0.50**	**Excellent**

The validation results for the developed instructional video on plyometric exercises assessed three main areas: content, instructional qualities, and technical qualities. The technical qualities received the highest rating, with a mean score of 4.76 (SD = 0.44), highlighting the video's excellence in visuals, audio clarity, and editing-key factors for maintaining learner engagement and comprehension. Content received the lowest score, with a mean of 4.69 (SD = 0.58), indicating some variability in evaluators' perceptions, possibly due to differing expectations regarding content depth or relevance. Despite this, the overall grand mean of 4.72

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Aloysian Interdisciplinary Journal of Social Sciences, Education, and Allied Fields
https://journals.aloysianpublications.com
Volume 1 Issue 5 (2025)

(SD = 0.50) falls within the "Excellent" range, demonstrating strong acceptability of the video as an effective instructional tool. These findings align with prior research emphasizing the need to balance technical quality and content accuracy to maximize the effectiveness of instructional videos.

The Level of Acceptability among Teachers of the Developed Instructional Video in Plyometric Exercises

Table 5. Level of Acceptability among Teachers of the Developed Plyometric Exercises in terms of Content

Statements	Mean	SD	Description
1. The video covers essential plyometric exercises with clear explanations	5.00	0.00	Excellent
2. The information is accurate, well-defined, and easy to understand.	5.00	0.00	Excellent
3. The exercises are well-organized, progressing from basic to advanced.	4.87	0.35	Excellent
4. The content aligns with learning objectives, focusing on power, speed, and strength.	5.00	0.00	Excellent
5. The contents are free of bias and stereotypes.	5.00	0.00	Excellent
6. The difficulty level matches the intended audience's abilities.	4.90	0.31	Excellent
7. It emphasizes performance-based learning.	5.00	0.00	Excellent
Section Mean	**4.97**	**0.09**	**Excellent**

The results show that several key aspects of the instructional video received perfect scores (mean = 5.00, SD = 0.00), including clarity of explanations, accuracy of information, alignment with learning objectives, absence of bias, and emphasis on performance-based learning. This unanimous agreement highlights the effectiveness of well-designed instructional materials in promoting active learning, supporting findings from multimedia instruction research. The lowest-rated item, concerning the organization of exercises from basic to advanced, still received a high mean score of 4.87 (SD = 0.35), reflecting minor differences in teacher opinions on content sequencing. Overall, the section's mean score of 4.97 (SD = 0.09) demonstrates a consistently high level of teacher acceptability, underscoring the importance of clear, structured, and engaging content in enhancing physical education quality.

Table 6. Level of Acceptability among Teachers of the Developed Instructional Video in Plyometric Exercises in terms of Instructional Qualities

Statements	Mean	SD	Description
1. It is a good supplement to the curriculum.	4.97	0.18	Excellent
2. It addresses the concerns of the students learning the plyometric exercises.	5.00	0.00	Excellent
3. The instructional material facilitates collaborative learning.	4.97	0.18	Excellent
4. It facilitates the achievement of instructional objectives.	5.00	0.00	Excellent

Online ISSN: 3082-5121
Aloysian Interdisciplinary Journal of Social Sciences, Education, and Allied Fields
https://journals.aloysianpublications.com
Volume 1 Issue 5 (2025)

5. It integrates student's previous experiences in plyometric exercises.	4.87	0.35	Excellent
6. It reflects the current trend in P.E. instruction.	5.00	0.00	Excellent
7. It allows independent learning and creativity.	5.00	0.00	Excellent
8. It supports different modalities and intelligences.	4.97	0.18	Excellent
9. The instructions are clearly stated.	5.00	0.00	Excellent
10. It gives appropriate motivation.	4.97	0.18	Excellent
Section Mean	**4.98**	**0.11**	**Excellent**

The developed plyometric exercise video received a notably high level of acceptability from teachers, with an overall mean score of 4.98 (SD = 0.11), classified as "Excellent." This indicates that teachers view the instructional material as effective, relevant, and well-designed to support student learning. The findings align with previous research showing that instructional videos are well-received when they align with curriculum standards and incorporate sound instructional design. Moreover, teachers recognize that such videos can improve student performance, and positive educator perceptions are closely linked to greater adoption and integration of video-based learning tools in classrooms, reinforcing their instructional value.

Table 7. Level of Acceptability among Teachers in the Developed Instructional Video in Plyometric Exercise in terms of Technical Qualities

Statements	Mean	SD	Description
1. The instructional video is easy to navigate.	4.97	0.18	Excellent
2. The instructional video allows the learners to control the pace of learning.	4.97	0.18	Excellent
3. The graphics are excellent.	4.97	0.18	Excellent
4. The layout and design are appropriate.	4.90	0.31	Excellent
5. The manipulative controls are comprehensive and directive.	5.00	0.00	Excellent
6. The video dashes with minimum wait time.	5.00	0.00	Excellent
7. Intended users can easily and independently use the instructional video.	4.97	0.18	Excellent
8. The instructional video is aesthetically pleasing.	4.90	0.31	Excellent
9. The resolution of the video is clear.	5.00	0.00	Excellent
10. The sound/voice in the video is clear.	4.97	0.18	Excellent
Section Mean	**4.97**	**0.15**	**Excellent**

Table 7 shows that teachers highly accepted the technical qualities of the instructional video on plyometric exercises. Key features like manipulative controls, minimal wait time, and resolution received perfect scores (mean = 5.00, SD = 0.00), indicating unanimous approval. In contrast, layout, design, and aesthetic appeal scored slightly lower (mean = 4.90, SD = 0.31), suggesting minor variations in opinion. Overall, the section mean of 4.97 with a low standard deviation (SD = 0.15) reflects strong and consistent approval, highlighting the importance of technical quality in instructional videos.

Table 8. Summary Table of The Level of Acceptability Among Teachers of The Developed Instructional Video in Plyometric Exercises

Statements	Mean	SD	Description

Online ISSN: 3082-5121
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https://journals.aloysianpublications.com
Volume 1 Issue 5 (2025)

1. Content	4.97	0.09	Excellent
2. Instructional Qualities	4.97	0.15	Excellent
3. Technical Qualities	4.98	0.11	Excellent
Grand Mean	**4.97**	**0.12**	**Excellent**

Teachers rated the instructional video on plyometric exercises with an overall mean of 4.97 (SD = 0.12), indicating an "Excellent" level of acceptability. This reflects strong approval of the video's content, instructional, and technical qualities. The findings suggest that well-organized and high-quality instructional videos are effective teaching tools. Supporting studies highlight that perceived usefulness and ease of use are key factors in teachers' acceptance of educational technology, emphasizing the value of well-designed instructional materials.

The Level of Acceptability among Students in the Developed Instructional Video on Plyometric Exercises

Table 9. Level of Acceptability among Students in the Developed Plyometric Exercises in terms of Content

Statements	Mean	SD	Description
1. The video covers essential plyometric exercises with clear explanations	4.89	0.31	Excellent
2. The information is accurate, well-defined, and easy to understand.	4.79	0.54	Excellent
3. The exercises are well-organized, progressing from basic to advanced.	4.71	0.50	Excellent
4. The content aligns with learning objectives, focusing on power, speed, and strength.	4.71	0.62	Excellent
5. The contents are free of bias and stereotypes.	4.54	0.70	Excellent
6. The difficulty level matches the intended audience's abilities.	4.49	0.77	Excellent
7. It emphasizes performance-based learning.	4.78	0.44	Excellent
Section Mean	**4.70**	**0.56**	**Excellent**

Result in Table 9 shows that students prefer instructional videos with explanatory diagrams over purely aesthetic visuals (Dascălu et al., 2024). A survey by Khothori and Suzanne (2020) reported high content acceptability, with 66.67% of students having a strongly positive perception and 33.33% a positive one. Overall, students are more likely to accept videos that are clear, relevant, and engaging (Al-Maroof et al., 2022).

Table 10. Level of Acceptability among Students in the Developed Plyometric Exercises in terms of Instructional Qualities

Statements	Mean	SD	Description
1. The instructional video is easy to navigate.	4.82	0.44	Excellent
2. The instructional video allows the learners to control the pace of learning.	4.64	0.58	Excellent
3. The graphics are excellent.	4.73	0.51	Excellent
4. The layout and design are appropriate.	4.67	0.61	Excellent
5. The manipulative controls are comprehensive and directive.	4.63	0.70	Excellent

Online ISSN: 3082-5121
Aloysian Interdisciplinary Journal of Social Sciences, Education, and Allied Fields
https://journals.aloysianpublications.com
Volume 1 Issue 5 (2025)

6. The video dashes with minimum wait time.	4.53	0.72	Excellent
7. Intended users can easily and independently use the instructional video.	4.75	0.59	Excellent
8. The instructional video is aesthetically pleasing.	4.53	0.75	Excellent
9. The resolution of the video is clear.	4.77	0.58	Excellent
10. The sound/voice in the video is clear.	4.81	0.47	Excellent
Section Mean	4.66	0.59	Excellent

Students rated the instructional video on plyometric exercises highly across various usability and design aspects, with mean scores ranging from 4.53 to 4.82 and an overall mean of 4.66 (SD = 0.59), all interpreted as "Excellent." Top-rated features included ease of navigation (4.82) and sound clarity (4.81), highlighting the value of intuitive design and clear audio. Slightly lower scores for loading times and aesthetic appeal (both 4.53) suggest areas for minor improvement. These findings align with research emphasizing the importance of well-designed, high-quality multimedia in enhancing student engagement, comprehension, and motivation. Overall, students strongly accept the video's technical and instructional quality.

Table 11. Level of Acceptability among Students in the Developed Plyometric Exercises in terms of Technical Qualities

Statements	Mean	SD	Description
1. It is a good supplement to the curriculum.	4.74	0.56	Excellent
2. It addresses the concerns of the students learning the plyometric exercises.	4.78	0.60	Excellent
3. The instructional material facilitates collaborative learning.	4.73	0.51	Excellent
4. It facilitates the achievement of instructional objectives.	4.76	0.55	Excellent
5. It integrates student's previous experiences in plyometric exercises.	4.62	0.68	Excellent
6. It reflects the current trend in P.E. instruction.	4.84	0.42	Excellent
7. It allows independent learning and creativity.	4.81	0.51	Excellent
8. It supports different modalities and intelligences.	4.66	0.59	Excellent
9. The instructions are clearly stated.	4.89	0.35	Excellent
10. It gives appropriate motivation.	4.68	0.55	Excellent
Section Mean	**4.75**	**0.53**	**Excellent**

Students rated the instructional video highly across ten instructional quality indicators, with mean scores ranging from 4.62 to 4.89 and an overall mean of 4.75 (SD = 0.53), all classified as "Excellent." The highest rating was for clarity of instructions (4.89), emphasizing the importance of clear guidance, while the lowest was for integrating prior experiences (4.62), suggesting a minor area for improvement. These results indicate the video effectively supports learning in plyometric exercises. Consistent with prior research, well-designed instructional materials, especially multimedia, enhance student engagement and learning outcomes. Continuous evaluation remains essential to maintain effectiveness and relevance.

Online ISSN: 3082-5121
Aloysian Interdisciplinary Journal of Social Sciences, Education, and Allied Fields
https://journals.aloysianpublications.com
Volume 1 Issue 5 (2025)

Table 12. Summary Table of the Level of Acceptability among Students in the Developed Instructional Video on Plyometric Exercises

Statements	Mean	SD	Description
1. Content	4.70	0.56	Excellent
2. Instructional Qualities	4.66	0.59	Excellent
3. Technical Qualities	4.75	0.53	Excellent
Grand Mean	**4.70**	**0.56**	**Excellent**

The instructional video on plyometric exercises received a high student acceptability rating, with a grand mean of 4.70 (SD = 0.56), indicating strong approval and consistent positive feedback. Students valued its clarity, structure, audiovisual quality, concise length, and engaging presentation, all of which supported knowledge retention and active learning. Features like explanatory visuals, real-world relevance, and high-definition audio-video quality enhanced comprehension and motivation. These findings affirm the video's effectiveness as a learner-centered and pedagogically sound tool that positively impacts student engagement and performance.

The Difference between the Mean Level of Acceptability among Teachers and Students in the Developed Instructional Video in Plyometric Exercises

Table 13. Welch Test Results Between Acceptability of Teachers and Students on Developed Instructional Video in Plyometric Exercises

Group	N	Mean	SD	t	p-value	Remarks	Decision
Teacher	30	4.97	0.05	6.98	0.00	Significant	Reject Ho
Student	100	4.71	0.36				

α=0.05 Level of Significance

Table 13 presents a Welch's t-test comparing acceptability ratings of the instructional video on plyometric exercises between teachers and students. Teachers (M = 4.97, SD = 0.05) rated the material significantly higher than students (M = 4.71, SD = 0.36), with the difference being statistically significant ($t \approx 6.98$, $p < .001$). Both groups viewed the material as highly acceptable, but teachers' higher ratings may stem from their deeper understanding of pedagogy, curriculum alignment, and instructional goals. In contrast, students focused more on practical experience, resulting in more varied evaluations. These findings suggest the need to balance technical and instructional quality with student-centered design. While teachers recognize the video's value for enhancing athletic performance and learning, future improvements should incorporate student feedback to boost engagement and usability. Supporting research confirms that both educators and students find video-based learning effective and enjoyable when well-designed and interactive.

CONCLUSION AND RECOMMENDATION

The study concludes that the developed instructional video on plyometric exercises is highly effective and well-received by both teachers and students across content, instructional, and technical dimensions. Technical aspects received the highest ratings, emphasizing the importance of clear visuals, quality audio, and smooth editing in enhancing learner engagement. While content ratings showed slight variability, they remained within the "Excellent" range, confirming the video's overall instructional value. Teachers rated the

video exceptionally high (mean = 4.97), appreciating its organized content and pedagogical quality, while students also expressed strong approval (mean = 4.70), particularly valuing its clear structure, engaging format, and user-friendly features that support active learning and motivation. The statistically significant difference in ratings between teachers and students is likely due to their differing perspectives—teachers focus more on educational outcomes and alignment with instructional goals, whereas students prioritize practical experience and usability.

Recommendations include integrating the video into physical education classes as a supplementary tool, allowing both teacher-guided and independent student use, and encouraging schools to consider student feedback for ongoing improvements. Further research is also suggested to evaluate the instructional video's long-term effectiveness in teaching plyometric exercises.

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