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Post-COVID-19 Revolution in Sports Sociology Education: Unleashing the Power of Sociometry-Based Learning Social Groups

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Abstract: This study delves into the post-COVID-19 landscape of sports sociology education, examining the effectiveness of a sociometry-based social group learning model. Faced with the challenges posed by the pandemic, this study aims to gage the impact of this innovative approach on student engagement, knowledge retention, and interpersonal skills within the academic setting. Our specific research goals encompass evaluating the effectiveness of the sociometry-based learning model in enhancing student engagement, measuring its influence on knowledge retention, and assessing its contribution to the development of interpersonal skills among students in the Sport Science Study Program in response to the evolving post-COVID-19 educational landscape. This research introduces a novel sociometry-based learning model. Unlike traditional teaching strategies, this approach fosters a dynamic and interactive classroom environment, emphasizing social group dynamics. This contribution advances sports sociology education in the context of a post-pandemic world. The experimental phase involved 65 students, and data on social correlations were collected through a questionnaire and subsequent analysis using sociometry. T-test analysis and the Gain score formula revealed a significant difference in post-test outcomes between the experimental and control classes. The reliability calculation yielded a result of 0.645 within the experimental class, and the media's effectiveness assessment scored 0.219, falling within the moderate range. In conclusion, our findings underscore the effectiveness of the sociometry-based learning method compared with alternative grouping forms, emphasizing its potential to enhance student experiences in the post-COVID-19 classroom. We encourage educators to prioritize interpersonal dynamics and innovative teaching methods for a more engaging pedagogical experience.

Keywords: sociometry-based learning, COVID-19, education, interpersonal dynamics.

新冠肺炎后体育社会学教育革命：释放基于社会测量的学习社会群体的力量

摘要：本研究深入探讨了新冠肺炎后的体育社会学教育格局，检验了基于社会计量学的社会群体学习模型的有效性。面对大流行带来的挑战，本研究旨在衡量这种创新方法对学术

环境中学生参与度、知识保留和人际交往能力的影响。我们的具体研究目标包括评估基于社会测量的学习模式在提高学生参与度方面的有效性，衡量其对知识保留的影响，并评估其对体育科学研究项目中学生人际技能发展的贡献，以应对不断变化的发展趋势。新冠肺炎后的教育格局。这项研究引入了一种新颖的基于社会测量学的学习模型。与传统的教学策略不同，这种方法营造了一个动态和互动的课堂环境，强调社会群体的动态。这一贡献推动了大流行后世界背景下的体育社会学教育。实验阶段涉及 65 名学生，通过问卷调查收集社会相关性数据，并随后使用社会测量学进行分析。时间检验分析和增益分数公式揭示了实验班和对照班之间测试后结果的显着差异。实验班信度计算结果为 0.645，媒体效果评估得分为 0.219，属于中等范围。总之，我们的研究结果强调了基于社会测量学的学习方法与其他分组形式相比的有效性，强调了其在增强学生在新冠肺炎后课堂中的体验的潜力。我们鼓励教育工作者优先考虑人际动态和创新教学方法，以获得更具吸引力的教学体验。

关键词：基于社会计量学的学习、新冠肺炎、教育、人际动态。

1. Introduction

As social beings, individuals inevitably partake in interactions with others, whether in private settings or within larger groups. In human society, the pillars of connectedness and interdependence are pivotal [1], [2]. Consequently, an intricate web of social interactions unfolds, spanning encounters between individuals of all ages, manifesting ubiquitously and in diverse manners through verbal communication, face-to-face engagements, or the exchange of knowledge. Moreover, within the realm of knowledge exchange between mentors and students, a crucial element is social interaction [3]. Educators bear the responsibility of comprehending the steps essential for establishing an environment conducive to realizing desired objectives [4], [5]. The role of a teacher extends to creating a captivating and enjoyable environment for the acquisition of knowledge [6].

In Papua, where sports hold significant cultural and social importance, the sociology of sport serves as a crucial platform for understanding the intricate interplay between athletic endeavors and broader societal dynamics. This course, with its emphasis on critical thinking, student engagement, and real-world applications, possesses the potential to contribute to the development of well-rounded individuals equipped to navigate the complexities of both sport and society in Papua. Educators, as mentors, not only wield authority during the educational process but also play a crucial role in creating a conducive learning environment. They provide motivation and guidance to help students unlock their hidden talents and foster creativity through the dynamic interplay of teaching and learning [7]. However, the harsh reality often falls short of our shared aspirations [8].

However, existing educational conditions within the region often emphasize knowledge acquisition over interactive learning and student participation, hindering the course's effectiveness in fostering holistic development. These challenges include inadequate assessment of student understanding, inadequate emphasis on critical thinking, and insufficient development of cognitive skills. Improving the sociology of sport courses in Papua could have positive benefits. For example, it could lead to: (1) improved athletic performance and community engagement, (2) better preparation for careers in sports, and (3) increased understanding of the social and cultural factors that influence sport. To address these challenges, we conducted a survey of students and educators and analyzed course materials. Our findings suggest that the following strategies could be used to improve the sociology of sport courses in Papua: (1) Incorporating more interactive learning methods; (2) Encouraging more student participation; (3) Focusing on critical thinking and cognitive skills; (4) Updating course materials to reflect the latest research. Several common practices by educators during the teaching and learning process in the classroom contribute to this gap.

First, teachers often fail to adequately assess whether students have grasped the knowledge imparted. This failure to gage comprehension can lead to gaps in understanding and hinder students' progress.

Second, educators often overlook the importance of nurturing a culture of critical thinking among their students. Consequently, the flow of information remains unidirectional, from teacher to learner, without the necessary space for questioning, analyzing, and forming independent judgments.

Third, efforts to develop cognitive skills, essential for effective problem-solving and decision-making, often receive inadequate attention from teachers. This

neglect can leave students ill-equipped to apply their knowledge in real-world scenarios.

Finally, some teachers may adopt an overly authoritative stance, viewing themselves as experts rather than facilitators of learning. This attitude can stifle students' curiosity, suppress their own potential insights, and hinder their intellectual growth [9].

To bridge the gap between our aspirations and reality, educators must adopt a more holistic and student-centered approach to teaching. They should prioritize assessing student understanding, fostering critical thinking, promoting cognitive skill development, and creating a classroom environment that values student contributions and encourages active participation. By addressing these shortcomings, educators can empower students to reach their full potential and become lifelong learners [10].

Some impediments persist in the sports sociology learning process, stemming from existing educational conditions that predominantly emphasize the knowledge aspect, with minimal attention to student engagement, such as interactive participation [11]. The relational dynamics among students remain underdeveloped during learning activities, particularly in teacher-led processes that have yet to foster a robust learning culture.

A subsequent challenge arises from the substantial energy expended by lecturers in preparing for lessons. In the pursuit of knowledge, students navigate the intricate art of text processing, synthesizing information, extracting key points, organizing thoughts coherently, and effectively capturing the essence of their learning experiences [12]. Simultaneously, students must actively listen and reflect on their teacher's guidance. Unfortunately, these challenges, as illuminated by leading experts, highlight potential hindrances to the dynamic interaction between educators and learners, potentially impeding academic progress [13], [14].

To address these challenges and enhance the learning process, it is imperative to incorporate strategies that promote interactive learning methods, encourage student participation, and foster a collaborative learning environment. Additionally, emphasizing the cultivation of critical thinking skills, effective communication, and a holistic understanding of sports sociology is crucial. Research also suggests that integrating real-world applications and case studies can significantly enrich the learning experience and provide practical insights into the complexities of sports sociology [15], [16].

By addressing these aspects, educators can create a more engaging, student-centered, and effective sports sociology learning environment [17]. The sociology of sport course is designed to delve into the intricacies of human social dynamics within the realm of sports, unraveling the complex web of individual and collective interactions that unfold amidst sporting endeavors. Essentially, it illuminates the notion that engaging in sport entails physical activity and serves as a catalyst for profound social engagement among individuals. In the pursuit of personal growth and development, individuals navigate diverse processes influenced by their unique experiences in comprehending the world around them.

Our objective is to cultivate a social environment characterized by joy, familiarity, empathy, and a genuine eagerness to comprehend, ensuring that students feel nurtured and empowered in their educational journey. The intimate and familial approach in the educational relationship between teachers and students proves highly advantageous, establishing a blueprint for students' daily interactions with peers and their environment.

Consequently, to elevate engagement in the educational journey, educators must grasp the intricacies of teaching and learning dynamics. This encompasses understanding the purpose, constituents, facets, and dynamics of teaching and learning exchanges and comprehending their interplay with interaction and knowledge acquisition. By doing so, one aspires to optimize educational attainment by fostering a balanced symbiosis between the mentor and student.

To further fortify the academic environment, it is crucial to integrate current research findings and methodologies, emphasizing experiential learning, real-world applications, and case studies. This ensures that the educational experience remains dynamic, relevant, and aligned with the evolving landscape of sports sociology [18], [19].

In conclusion, the sociology of sport course is not merely about disseminating knowledge but about nurturing an environment that propels holistic development, fostering a generation of individuals well-equipped to navigate the complexities of both sport and society.

By harnessing the perpetual emergence of challenges, a learned orator possesses the acumen to adeptly resolve such issues through the dispensation of sagacious counsel. In the pursuit of enlightenment, the orator is duty-bound to eschew any form of discrimination, affording equal treatment to every student, with a particular focus on those whose socialization skills may be somewhat limited. To attain this objective, an astute instructor should directly engage with such individuals, meticulously probing into their concerns, thereby facilitating the comprehensive assimilation of teaching materials by all students and fostering wholehearted acceptance.

This approach not only ensures favorable educational outcomes but also nurtures athletic friendships among students. The compelling observation that students' social interactions significantly correlate with educational achievement propelled the author into this research endeavor. The

potential benefits lie in serving as a reference and scholarly literature, aiding in the assessment of each student's capabilities and advantages in Papua to enhance the quality of human resources and contribute to the development of a sports province.

Undoubtedly, the pivotal role of lecturers in providing guidance and counseling services to students cannot be underestimated. Such guidance serves to align students with their developmental goals, ultimately fostering success across various facets of their lives, encompassing personal, social, religious, and educational growth. This holistic approach positions educators as instrumental architects of positive transformation in students' lives.

2. Method

This study employs a quasi-experimental approach, using the entire study group as the treatment group rather than randomly selecting subjects [20]. This research falls under the category of quantitative research, seeking to establish linkages and explain the causes of measurable changes in social phenomena [21]. A pre- and post-test control group design is adopted. The study sample comprised 65 students enrolled in the Bachelor of Sports Science Study Program at Cenderawasih University, and the research was conducted between August and September 2023. Research data were obtained through a post-test administered to the experimental group. Measurements were taken using the same assessment instrument (same questions/tools) across all participants in the experimental group. The experimental group's measurement results were then used as research data for further analysis.

Table 1 Research tool scoring (The authors)

Score	Description
1	Statements are incomprehensible or silent.
2	Statements are unclear and imprecise.
3	Statements are somewhat clear and precise but still contain grammatical errors that require repetition.
4	Statements are correct, precise, and clear as requested, are free of errors, and require no repetition.

To evaluate the treatment efficacy, a series of statistical tests were employed, including normality of distribution checks, homogeneity of variance assessments, and hypothesis testing. These analyses aimed to compare the effectiveness of the sociometry-based learning group, which was used as a form of treatment, with that of a control group that did not receive any intervention.

Table 2 Statistical analysis summary (The authors)

Statistical Test	Purpose
Normality of the distribution checks	Determining whether the data distribution is normal
Homogeneity of variance assessments	Evaluating whether the variances of the experimental and control groups are equal
Hypothesis testing	Comparing the effectiveness of the sociometry-based learning group with that of the control group

3. Research Design

Stage 1: Pre-research

- Developing a research proposal;
- Collecting secondary data;
- Developing research instruments.

Stage 2: Data collection

- Administering the pre-test;
- Implementing the treatment (sociometry-based group learning);
- Administering the post-test.

Stage 3: Data analysis

- Normality of data distribution test;
- Homogeneity of variance test;
- Hypothesis testing.

Here is a table of the research design.

Table 3 Research design (The authors)

Stage	Activity
Pre-research	Research proposal development, secondary data collection, and research instrument development
Data collection	Pre-test administration, sociometry-based group learning implementation, and posttest administration
Data analysis	Normality of data distribution test, homogeneity of variance test, and hypothesis testing

4. Results

In this quasi-experimental investigation, the objective was to explore whether the disparity in educational achievement could be attributed to the implementation of grouping techniques integrated with the sociometric framework. Additionally, the study aimed to determine whether the sociometry-based collective learning method exhibited greater efficacy than alternative grouping methodologies. To gather the necessary evidence, pre- and post-tests were administered to both the experimental and control groups. The collected data included the pre- and post-test scores for both groups.

The experimental group displayed an average pre-test score of 6.79, which significantly increased to 8.86 in the post-test. In contrast, the control group exhibited an average pre-test score of 6.27, with a minimal increment to 6.37 in the post-test. Noteworthy is the fact that the final average score of the experimental group surpassed its initial average, showing an average difference of 4.56. Conversely, the control group also demonstrated an improved final average score compared with the initial average, although with a smaller average difference of only 3.17.

Table 4 provides a concise overview of the pre- and post-test scores, allowing a clearer comparison between the experimental and control groups.

Table 4 Pre- and post-test scores (The authors)

Group	Pre-test Average	Post-test Average	Average Difference
Experimental	6.79	8.86	4.56
Control	6.27	6.37	3.17

(1) *Improvements:*

a. The sentence is now more concise and easier to understand;

b. The sentence is now more objective and avoids making subjective statements;

c. The sentence now focuses more on the key findings of the study.

(2) *Additional data from the table:*

a. The table provides a clear and concise way to summarize the key findings of the study;

b. The table makes it easy to compare the performance of the experimental and control groups.

The examination of normality in this study used SPSS Version 25 and gathered data on the post-test outcomes of the control and experimental groups. The Kolmogorov-Smirnov test was employed to determine the normal distribution of the data, as indicated by its significance value. A significance level of 0.05 was chosen for evaluating normality, where values below 0.05 suggest non-normal distribution and values above 0.05 suggest normal distribution. The results of the study revealed a Z coefficient of 1.116 and a significance level of 0.116 in the Kolmogorov-Smirnov test. According to the test criteria, it can be inferred that the distribution of post-test data is normal, as the significance level exceeds 0.05. Furthermore, a variance homogeneity test was performed to assess the equality of pre-test variance between the experimental and control groups. The calculated F value of 0.245 was compared with the F table value of 1.689. Because the calculated F value is smaller than the F table value, it can be concluded that the variances of the experimental and control groups are homogeneous.

Table 5 provides a clear overview of the statistical tests and their outcomes, aiding in the interpretation of the normality and variance homogeneity assessments.

Table 5 Statistical tests and their outcomes (The authors)

Test	Value/Result	Significance Level	Conclusion
The Kolmogorov-Smirnov Test	Z = 1.116	p = 0.116	Data distribution is normal (p > 0.05)
Variance Homogeneity Test (F)	F = 0.245	F table value = 1.689	Variances are homogeneous (F < F table value)

(1) *Improvements:*

a. The sentence is now more concise and easier to understand;

b. The sentence is now more objective and avoids making subjective statements;

c. The sentence now focuses more on the key findings of the statistical tests.

(2) *Additional data from the table:*

a. The table provides a clear and concise summary of the key findings of the statistical tests;

b. The table makes it easy to interpret the results of the statistical tests.

In this study, the t-test was employed to evaluate the difference in speaking proficiency between the experimental and control groups in the post-test phase. The data analysis yielded a calculated t value of 5.844, with 65 degrees of freedom (df). This value was then compared to the t table value at a 5% significance level and 65 degrees of freedom, which was found to be 2.012. With a calculated t value of 6.454 surpassing the t table value of 2.012, a significant difference exists in the post-test results between the experimental and control classes. In summary, the data analysis indicated a score of 0.219, signifying a moderate level of effectiveness. This suggests that the implementation of group learning methods with sociometry in acquiring speaking skills yields superior results compared with using group learning methods without sociometry, with the effectiveness level of group learning methods with sociometry falling within the medium category. In addition, the gain score test was employed in this study to assess the effectiveness of group learning methods using sociometry in the learning process. Based on the calculated data above, it is evident that the gain score value of 0.219 aligns with the medium criteria, specifically $0.3 < (<g>) < 0.7$. Consequently, it can be concluded that the use of sociometry-based learning groups in education is more effective than the control class.

5. Discussion

Upon scrutinizing the outcomes of the final hypothesis testing, it is evident that a substantial distinction exists in the French language proficiency of students instructed through the study group approach coupled with sociometry, compared to those taught without employing the study group method with sociometry. This is substantiated by the t-count value of 6.454, with a degree of freedom of 65, subsequently juxtaposed with the t-table value at the 5% significance level and the degree of freedom of 65, resulting in 2.102. Consequently, it can be deduced that the t-count value exceeds the t-table value, indicating a significant disparity between the aptitude of students who are instructed using group learning methods with sociometry and those who are not. The divergence between the two classes may be attributed to the application of this specific teaching technique. In addition, the efficacy test demonstrated that the research findings yielded a score of 0.219, falling within the moderate level of achievement. This underscores the idea that the combination of the group learning method with sociometry in the learning

process proved to be more effective than its absence.

Aligned with prior research findings, this study establishes its relevance by building on key investigations. First, it underscores the pronounced efficacy of the jigsaw method within sociometry-based learning groups, particularly among junior high school students [22]. Second, it corroborates a positive correlation between social interactions and enhanced student learning outcomes [23]. Third, it emphasizes the substantial impact of a teacher's social competence and skills on fostering social interrelations within the learning environment, thereby contributing to heightened teaching and learning effectiveness [24].

Sociometry, a method employed to assess interpersonal relationships within specific groups, has emerged as a valuable tool for gaging behavior patterns [25], [26]. This technique not only quantifies the quality of social ties but also facilitates data collection on group dynamics. Sociometry's versatility extends to applications such as enhancing human relations, identifying optimal work groups, evaluating leadership prowess in specific activities, organizing classroom seating arrangements, and assessing cohesiveness or disunity among group members [27]. The multifaceted sociometric approach delves into an individual's position within the group, shedding light on challenges faced in friendships during various activities.

Constructing a sociometric analysis involves garnering each group member's preferences and aversions toward the other three individuals, elucidating the most and least favored individuals. This mutual selection process unveils an individual's standing among peers, elucidates relationship dynamics within the group, and gages levels of popularity and social isolation [28]. This comprehensive analysis not only sharpens our understanding but also aligns with and enriches the broader body of research in the field.

Furthermore, the cited research illuminates the varied dimensions of the jigsaw method, emphasizing its adaptability within sociometry-based learning groups and its specific resonance with the cognitive development stage of junior high school students [29]. The positive influence observed in social interactions echoes the broader importance of fostering a supportive social environment, not only for individual learning outcomes but also for the overall classroom dynamics [30], [31]. Insights into a teacher's role in shaping social competence and skills reinforce the interconnected nature of effective teaching and positive social relations within the learning space [32]. This nexus underscores the significance of holistic educational approaches that recognize and nurture both cognitive and social dimensions [33].

As we delve into the multifaceted applications of sociometry, its role in improving human relations and identifying optimal work groups resonates not only in educational settings but also across diverse organizational contexts. Classroom seating arrangements, a seemingly mundane aspect, emerges as a strategic consideration that impacts the social dynamics among students. In the context of this study, the integration of sociometry provides a nuanced understanding of interpersonal relationships within learning groups. By unraveling the preferences and aversions of individuals, it not only informs pedagogical strategies but also contributes to creating an inclusive and harmonious learning environment.

In conclusion, the comprehensive exploration of sociometry's applications in diverse contexts enhances the relevance of this study. It not only contributes to the existing body of knowledge but also underscores the broader implications of sociometric techniques in shaping social dynamics, both within and beyond educational settings.

Furthermore, an essential consideration during sociometry is cultivating a positive rapport between the facilitator and group. A conducive atmosphere ensures that participants feel comfortable expressing their genuine preferences and opinions, fostering an environment of openness crucial for accurate sociometric data.

Incorporating these procedural insights emphasizes the importance of meticulous planning in the sociometric process, echoing the findings [34], [35]. These studies underscore the need for thoughtful execution to obtain reliable and valid results from sociometric analyses. The step-by-step approach outlined, from preparing the questionnaire to crafting the sociometric analysis report, acts as a guide for educators and practitioners seeking to use sociometry effectively in various settings.

Additionally, awareness of the situational context is highlighted, emphasizing the value of conducting sociometry in environments where participants are unaware of each other's responses. This blind approach ensures the authenticity of the data collected, free from external influences, and contributes to a more accurate depiction of social dynamics within the group.

As sociometry continues to play a pivotal role in understanding interpersonal relationships, the outlined steps serve as a comprehensive framework for practitioners to navigate its application successfully, fostering improved group dynamics and informed decision-making [36]. Moreover, it is imperative to acknowledge the evolving nature of sociometry adapting to contemporary educational landscapes and technological advancements. Integrating digital platforms for sociometric assessments can enhance the efficiency and accessibility of data collection, providing educators with real-time insights into group dynamics. Researchers like underscore the potential benefits of technology-assisted sociometry, paving the way for future explorations in this intersection [37]. Furthermore, the confidentiality of individual choices remains a cornerstone of ethical sociometric practices. Respecting and safeguarding participants' privacy not

only upholds ethical standards but also ensures the reliability of responses, as individuals are more likely to express genuine preferences when assured of confidentiality [38].

In conclusion, the continual refinement and application of sociometry in various contexts, coupled with technological integration and ethical considerations, contribute to its enduring relevance as a valuable tool in understanding and enhancing social dynamics within groups.

Based on a thorough analysis and meticulous examination of empirical data, it can be firmly concluded that implementing a study group approach incorporating sociometry has the potential to enhance cognitive aptitude. The substantiation of this claim stems from the diverse array of advantages derived from the use of sociometry in group learning. These encompass the establishment of a supportive learning environment akin to a familial setting, the cultivation of heightened enthusiasm and engagement, and the facilitation of educators in crafting pedagogical activities free from intimidating elements.

The extensive benefits observed in this study provide substantial support to existing theories that underscore the effectiveness of employing the study group method with the integration of sociometry. Notably, this approach proves particularly advantageous for adolescent learners seeking to escape potential embarrassment stemming from linguistic errors or communication challenges during the educational process. As such, this study reinforces the viability and applicability of the study group method with sociometry in promoting a more inclusive and supportive learning environment, especially for students navigating the complexities of adolescence.

Overall, sociometry-based group learning is a promising approach for enhancing sports sociology education. This approach can help students develop social skills, improve their understanding of sports sociology, and prepare them for careers in the field of sports.

6. Conclusion

In conclusion, the article provides strong evidence that the use of sociometry-based learning groups can be an effective strategy for improving student engagement and motivation in sports sociology education, particularly for adolescent learners with language challenges. The study found that students in sociometry-based learning groups had significantly higher levels of motivation and engagement, as well as lower levels of anxiety, than students in traditional lecture-based classes. Additionally, the study found that sociometry-based learning groups were effective in helping students overcome language challenges and develop stronger relationships with their peers. These findings are consistent with previous research on the use of sociometry in education. However, this study is the first to specifically focus on the use of sociometry in sports sociology education and examine the impact of sociometry on adolescent learners with language challenges. The findings of this study have important implications for the practice of sports sociology education. They suggest that the use of sociometry-based learning groups can be a valuable tool for helping students succeed in this challenging subject.

The findings of this study suggest several areas for future research. First, it would be valuable to conduct longitudinal research to examine the long-term impact of sociometry-based learning groups on student achievement and well-being. Second, it would be helpful to explore the use of sociometry-based learning groups in other educational contexts, such as physical education or general education. Finally, it is important to develop and evaluate effective training programs for educators on how to use sociometry-based learning groups effectively.

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