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THE INFLUENCE OF RELATIVE ADVANTAGE ON CONSUMER ACCEPTANCE TOWARDS SYNTHETIC SHUTTLECOCK AMONG CASUAL BADMINTON PLAYERS IN MALAYSIA: A CONCEPTUAL PAPER

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Abstract:

The increasing prices of traditional waterfowl-feather shuttlecocks (WFS) have become a growing concern among badminton players worldwide, including in Malaysia. The rising cost has indirectly affected casual badminton players who participate in badminton activities regularly as part of their weekly recreational and social activities. The high consumption and low durability of WFS have increased the financial burden among players, leading to growing interest in alternative products such as synthetic-feather shuttlecocks (SFS). Furthermore, the involvement and endorsement of SFS by Badminton World Federation (BWF) have strengthened industry attention towards the future use of SFS in badminton activities and

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competitions. However, consumer acceptance towards this innovation remains uncertain among casual badminton players. Therefore, this conceptual paper aims to investigate the influence of relative advantage on consumer acceptance towards SFS among casual badminton players in Malaysia. This study adopts Diffusion of Innovations (DOI) theory developed by Everett Rogers to explain innovation acceptance behavior. The proposed framework suggests that relative advantage positively influences consumer acceptance towards SFS. This paper may contribute to sports innovation literature and provide practical insights for badminton manufacturers, sports retailers, and badminton governing bodies regarding consumer readiness towards synthetic shuttlecock adoption.

Keyword:

Badminton Industry, Casual Badminton Players, Consumer Acceptance, Diffusion of Innovations, Relative Advantage, Sports Innovation, Synthetic-Feather Shuttlecocks, Waterfowl-Feather Shuttlecocks



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Introduction

Badminton can be considered as one of the most frequently played sports in Malaysia and is widely played recreationally among various age groups. According to market research company Ipsos (2024), approximately two-thirds of Malaysians express interest in the game, which is significantly higher than the overall average across all surveyed countries (57%). Besides being a competitive sport, badminton has become a common weekly activity among casual players for health, leisure, and social interaction. Youth and Sports Minister Hannah Yeoh stated that 905 out of 2,402 event applications received nationwide were related to badminton, compared to 362 football events. The data indicates that badminton remains the most actively participated sport at the community level, reflecting the strong interest of Malaysians in the sport (Siti, 2025). However, the increasing global price of traditional badminton shuttlecocks has become a growing concern among badminton communities worldwide. Traditional shuttlecocks are known as waterfowl-feather shuttlecocks (WFS) because it was made from waterfowl feathers (Ozaki et al., 2025).

Problem Statement

The WFS price in Malaysia has shown a consistent upward trend from 2024 to 2025. This particularly affected recreational and community badminton players in Malaysia. The prices in

2024 increased significantly, caused by global shortages of duck and goose feathers. Additionally, rising production and logistics costs led to multiple price adjustments throughout the year (Mok & Seraj, 2024; Fong, 2024). The continuation of upward pressure can be seen in 2025, where shuttlecock prices stayed elevated, with some reports stating that the price increases were up to 40% compared to previous years, caused by sustained supply constraints and strong demand among both competitive and casual players (Global Growth Insights, 2025). WFS are commonly preferred because they have better flight consistency and overall playing experience. However, during gameplay, WFS are easily damaged and need to be replaced frequently, especially during extended badminton sessions (Vandekerkhove et al., 2021). The situation will indirectly increase weekly badminton expenses among players and affect financial pressure for regular recreational participation.

In order to respond to this issue, synthetic-feather shuttlecocks (SFS) were introduced as an alternative innovation within the badminton industry (Free Malaysia Today, 2026). SFS are regularly perceived as better in durability and cost-efficiency compared to WFS (Woo et al., 2024). Furthermore, the high involvement of the Badminton World Federation (BWF) in testing and endorsing SFS has given better public awareness about their potential future adoption in badminton competitions and recreational activities (Reuters, 2026). The BWF has authorized the implementation of synthetic shuttlecocks from YONEX and VICTOR for Junior International and BWF Grade 3 competitions. In order to assess the performance and quality of SFS in higher-level competitive situations, BWF is collaborating equally with VICTOR and YONEX. A special emphasis is being placed on making sure that flight and playing characteristics are in line with current competition standards (BWF News, 2026).

Despite the growing industry attention towards SFS, consumer acceptance of this innovation remains uncertain, particularly among casual badminton players in Malaysia. Most previous innovation studies focus on technology adoption rather than sports equipment innovation. Tan et al. (2025), for instance, used mechanical testing and 20 national-level players to compare synthetic and conventional shuttlecocks, concentrating on flight behavior, accuracy, and perceptions like control and time. Another study in 2025 conducted by Ozaki et. al, focused on physical characteristics, human testing, wind-tunnel testing and flight simulations. The question of whether perceived benefits result in market adoption among casual players is not directly tested in these studies. Therefore, this conceptual paper proposes a framework to investigate the influence of relative advantage on consumer acceptance of SFS among casual badminton players in Malaysia.

Research Objective

- **RO1:** To examine the influence of relative advantage on consumer acceptance towards synthetic-feather shuttlecock among casual players in Malaysia.
- **RO2:** To identify the level of perceived relative advantage of synthetic-feather shuttlecock among casual badminton players in Malaysia.
- **RO3:** To determine the level of consumer acceptance towards synthetic-feather shuttlecock among casual badminton players in Malaysia.

Research Question

- **RQ1:** Does relative advantage influence consumer acceptance towards synthetic shuttlecocks among casual badminton players in Malaysia?
- **RQ2:** What is the level of perceived relative advantage of synthetic shuttlecocks among casual badminton players in Malaysia?
- **RQ3:** What is the level of perceived relative advantage of synthetic shuttlecocks among casual badminton players in Malaysia?

Hypothesis

According to the principles of Diffusion of Innovations (DOI) theory, an innovation is adopted faster when consumers perceive it as offering superior economic value, performance, or functionality over existing practices. In this context, casual players are expected to choose the product if they believe it effectively contributes to minimizing long-term badminton expenses through better durability and reduced frequency of shuttlecock replacement without severely affecting gameplay quality.

To empirically test this relationship, the following null and alternative hypotheses are formulated:

- **H₀:** Relative advantage has no significant influence on consumer acceptance towards synthetic-feather shuttlecocks among casual badminton players in Malaysia.
- **H₁:** Relative advantage has a significant positive influence on consumer acceptance towards synthetic-feather shuttlecocks among casual badminton players in Malaysia.

Literature Review

Synthetic-feather shuttlecock (SFS) was introduced as an innovative alternative to traditional waterfowl-feather shuttlecock (WFS) within the badminton industry. SFS development was largely initiated due to concerns regarding shuttlecock durability, rising production costs, and long-term sustainability in badminton activities. The increasing price in the market for SFS has indirectly increased the financial burden among casual badminton players who regularly participate in weekly badminton sessions.

Previous studies have pointed out several physical and aerodynamic differences between SFS and WFS (Cooke, 2002). According to Ozaki et al. (2025), SFS was identified to be heavier and have a larger skirt diameter with a shorter length compared to WFS. The study further reported that the SFS initial velocity after impact was significantly lower compared to WFS, while SFS also experienced greater changes in attitude angle during gameplay.

Wind tunnel testing conducted in the same study demonstrated that SFS tends to have a greater aerodynamic drag at higher attitude angles, although lower drag was observed at smaller angles once the shuttlecock stabilized during flight. Flight simulations additionally showed that SFS travelled further than WFS during smash scenarios. These findings indicate that players may experience differences in shuttlecock speed, trajectory, and gameplay adaptation when using SFS compared to WFS.

Despite these differences, the study suggested that understanding the characteristics of SFS could help promote its usage in international competitions and support the transformation of badminton into a more sustainable sport. This reflects the growing importance of innovation adoption within the badminton industry.

In addition, the Badminton World Federation (BWF) has also initiated efforts to adopt SFS for long-term sustainability in badminton (BWF Corporate, 2020). The involvement of badminton governing bodies may strengthen public confidence and increase awareness regarding synthetic shuttlecock innovation among badminton communities.

Although synthetic-feather shuttlecock offers potential advantages such as durability and cost efficiency, players may still compare the innovation against traditional waterfowl-feather shuttlecock based on gameplay quality, flight consistency, and playing experience. Therefore, consumer acceptance towards synthetic-feather shuttlecock remains an important issue requiring further investigation, particularly among casual badminton players. (TNR, 12, single spacing, justify)

Theoretical Perspective

This study adopts Diffusion of Innovations developed by Everett Rogers as the underpinning theory. DOI theory refers to the degree to which innovations are implemented, communicated, and adopted in the social system over time (Rogers, 2003). According to DOI theory, consumers are more likely to accept an innovation if they perceive the innovation as offering greater benefits compared to existing products or practices. One of the most significant elements within DOI theory is relative advantage. Relative advantage can be explained on how the degree of an innovation is perceived as better than the existing product or practice. Relative advantage from DOI theory is relevant to SFS adoption because players may view SFS as more cost-effective and long-lasting than WFS because the SFS's innovation aims to lessen its heavy reliance on waterfowl feathers, which raises production costs and makes it less durable than SFS. Innovations with stronger perceived advantages are generally adopted more rapidly among consumers (Rogers, 2003).

In the context of this study, synthetic shuttlecock represents the innovation, while waterfowl-feather shuttlecock represents the traditional product currently used by badminton players. Casual badminton players may perceive synthetic shuttlecock as advantageous if the product offers better durability, cost savings, and value for money during weekly badminton activities. Previous studies comparing synthetic-feather shuttlecock (SFS) and waterfowl-feather shuttlecock (WFS) identified differences in durability, aerodynamic drag, shuttlecock trajectory, and player perception during gameplay, suggesting that synthetic shuttlecock may provide practical benefits for badminton participation. The DOI theory is suitable for this study because it specifically explains innovation adoption behavior and consumer acceptance towards newly introduced products.

Consumer Acceptance

Consumer acceptance can be defined as consumers' willingness to adopt, use, or purchase a product or innovation. In innovation studies, acceptance behavior is often influenced by consumers' perceptions regarding the advantages and benefits offered by the innovation

compared to existing products (Turner, 2007). Consumers are more likely to adopt an innovation when it is perceived as offering greater relative advantage over existing alternatives. Within the context of badminton equipment, consumer acceptance towards synthetic shuttlecock may depend on whether players perceive the product as capable of providing better economic value and practical benefits compared to waterfowl-feather shuttlecock. Casual badminton players may evaluate synthetic shuttlecock based on factors such as durability, cost-saving potential, flight performance, and overall playing experience before deciding whether to adopt the innovation. Previous studies comparing synthetic-feather shuttlecock (SFS) and waterfowl-feather shuttlecock. (TNR, 12, single spacing, justify)

Relative Advantage (IV) and Consumer Acceptance (DV)

Relative advantage is considered one of the most influential factors affecting innovation adoption within DOI theory. Consumers are generally more willing to adopt innovations that are perceived as superior, beneficial, and economically valuable compared to existing products (Toth-Peter et al., 2025).

According to Overbye-Thompson and Hamilton (2025), product innovations usually will bring noticeable improvements, particularly towards performance, durability, or functionality, making it easier for consumers to be aware of their advantages over existing products. The relative advantage of synthetic shuttlecocks may include lower long-term badminton expenses, longer product durability, reduced shuttlecock replacement frequency, and better economic value during gameplay sessions.

For casual badminton players who participate in weekly badminton activities, the cost of shuttlecock purchases may become a significant consideration. Therefore, players may develop positive acceptance towards synthetic shuttlecocks if they believe the product can reduce their overall badminton expenses while maintaining acceptable gameplay quality.

Additionally, the growing involvement of the Badminton World Federation (BWF) in synthetic shuttlecock testing and endorsement may strengthen players' confidence regarding the credibility and future potential of the product.

Previous innovation adoption studies have shown that innovations perceived as offering stronger relative advantages will affect higher consumer acceptance (Liu et al., 2025). Therefore, relative advantage is expected to positively influence consumer acceptance towards synthetic shuttlecock among casual badminton players in Malaysia. (TNR, 12, single spacing, justify)

Conceptual Framework

This conceptual paper proposes that relative advantage influences consumer acceptance towards synthetic-feather shuttlecock among casual badminton players in Malaysia.

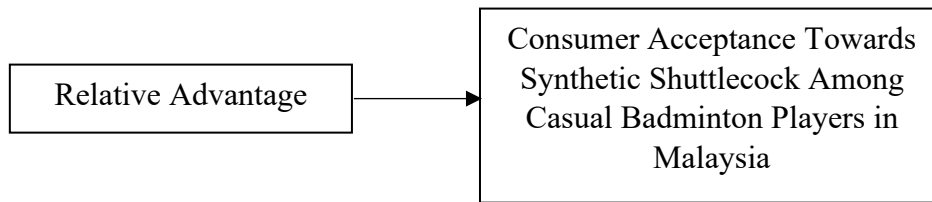


Figure 1: Conceptual Framework

Research Methodology

Research Design

This study adopts a conceptual research design to develop a framework explaining the influence of relative advantage on consumer acceptance of synthetic-feather shuttlecocks among casual badminton players in Malaysia. Rather than collecting and analysing primary empirical data, this conceptual paper develops the proposed framework based on a review of relevant literature and the application of Diffusion of Innovations (DOI) theory developed by Everett Rogers.

The literature review focuses on previous studies related to innovation adoption, relative advantage, consumer acceptance, synthetic-feather shuttlecocks, and badminton participation. The findings from the reviewed literature are synthesised to identify relevant relationships between relative advantage and consumer acceptance. DOI theory is then used as the theoretical foundation for explaining why perceived relative advantage may influence consumers' willingness to accept and adopt an innovation. Based on this theoretical and literature-based synthesis, a conceptual framework is proposed for future empirical investigation among casual badminton players in Malaysia.

Population Sampling

As this study is conceptual in nature, no primary data are collected, and no respondents are recruited. Therefore, population sampling and sample size calculations do not apply to the present study.

However, the conceptual framework proposed came with the intention to be studied in future empirical research involving casual badminton players in Malaysia. The target population proposed would involve some individuals who participate in badminton recreationally at least once per week and have experience using waterfowl-feather shuttlecocks. Future studies may consider purposive sampling to ensure that respondents meet these criteria.

Conclusion

In conclusion, the proposed conceptual paper framework needs to be investigated to examine how relative advantage influences consumer acceptance of synthetic-feather shuttlecocks among casual badminton players in Malaysia. The adoption of the DOI theory is used to investigate the degree of innovation adoption behavior and consumer acceptance of SFS. This framework will assist manufacturers and retailers in understanding how casual badminton

players' perceptions of the relative advantages of synthetic-feather shuttlecocks, which include improved durability, cost efficiency, and suitability for recreational play. This may influence their acceptance and willingness to adopt the product. The identified insights may help manufacturers and retailers to identify the product benefits that should be highlighted in marketing communication, product development, and promotional strategies to the targeted consumers. The paper discussed that relative advantage may highly influence players' willingness to accept and adopt synthetic-feather shuttlecocks during recreational badminton activities. Future studies are recommended to empirically test the proposed framework using quantitative research approaches involving casual badminton players in Malaysia.

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Declaration on the Use of Artificial Intelligence (AI) The author(s) declare that generative AI or AI-assisted technologies were used during the preparation of this manuscript. The following tool(s) were used: [ChatGPT and Quillbot AI]. The tools were used for language editing and grammar improvement. All AI-assisted content was reviewed and verified by the author(s), who take full responsibility for the accuracy, originality, integrity, and final content of the manuscript.

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