Faculty of Natural and Applied Sciences Journal of Mathematics and Science Education
Print ISSN: 2814-0885 e-ISSN: 2814-0931
www.fnasjournals.com
Volume 5; Issue 1; December 2023; Page No.93-101.

COACH-GUIDED INSTRUCTIONAL CUES AND PRE-SERVICE TEACHERS' NETBALL SHOOTING SKILL ACQUISITION IN PHYSICAL EXERCISE AND SPORTS CONTEXT

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Abstract
Understanding the differential effect of the instructional cue (IC) of the coach can provide valuable insight into how instructional guidance impacts learning outcomes. Both coach-guided learning and self-directed learning are instructional strategies that can potentially maximize or minimize achievement in an instructional setting. Therefore, the purpose of the study was to use two instructional schedules to examine the influence of coach-guided IC on pre-service teachers' acquisition of netball shooting skills in sports and exercise practical settings. Using descriptive procedures, a digital video was utilized to record classroom events of pre-service teachers (n=77) and professional sports and exercise instructors (n=4). The video-recorded session lasted 1 hour (60 minutes). An event recording instrument was designed and used to document the frequency of shooting events during the instructional schedule. Two experienced independent recorders used the event recording instrument to note down shooting events in the two instructional schedules. Inter-observer agreement procedures were used to assess the reliability of data collected for the study. The data collection instruments were deemed valid by experienced researchers who ascertained the credibility of using these tools for collecting precise data. Graphical analyses were conducted to determine the influence of coach-guided IC on pre-service teachers' acquisition of netball shooting skills in sports and exercise practical settings. Findings confirmed the superiority of the instructional schedule that incorporated coach-guided IC over the instructional schedule carried out without coach-guided IC. Therefore, we concluded that coach-guided ICs yielded a stronger influence on the learning process than self-guided learning.

Keywords: Sport, Exercise, Instructional Cues, Instructional Strategy, Learning Process

Introduction

The Instructional cue (IC) of the coach is a critical component of an instructional strategy that equips learners with valuable information required to enhance the acquisition, development and refinement of skills. The IC of the coach or professional instructor empowers the learner to make informed decisions about movement execution in physical exercise and sport (PES) settings. It is beneficial to incorporate several strategies including the use of IC into the instructional process to support the growth of learners in acquiring critical elements necessary for executing relevant sports skills. It is also a good coaching intervention to utilize cues in helping learners stay motivated and aid them in recognizing their advancement and areas that may need improvement to enable them to continue practising and refining their skill levels.

In the present context where ICs play a pivotal role in aiding learners to grasp accurate techniques for skill acquisition and execution, it is noteworthy that various authors have ventured into this domain. Specifically, Donkor et al. (2021) delved into teachers' acquisition of IC, emphasizing the types, targets, and rates per minute in PES

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settings. Along the same lines, Donkor et al. (2022b) investigated IC delivery in a PES setting, exploring the nature and demonstration of IC in practical learning environments. Lester et al. (2020) examined ways in which coaches provided learners instructional support to help them acquire pertinent skills for task execution, while Powell et al. (2021) explored coaches' skill acquisition practices in sports settings. Despite the contributions of these authors, more work is needed to highlight the relevance of instructional support in aiding learners to achieve successful outcomes while performing tasks within learning contexts.

In movement execution, both coach-guided IC and self-guided learning present distinct learning prospects alongside inherent challenges for the learner. Regardless of the learning context, the IC of the coach should contribute positively, enhancing outcomes and aiding learners in understanding the appropriate mechanics involved in executing a movement task in a PES setting. Learners need to be nurtured in their effort to acquire the skill development necessary for effective play during matches. It is crucial to recognize that without instructional support from the coach, the learner is afforded the privilege to make independent decisions capable of fostering learner autonomy and adaptability during gameplay. This implies that withdrawing the coach's intervention creates a potential avenue that propels learners to rely solely on their knowledge in attempting to accomplish movement objectives (Donkor, 2021). This aids the learner to engage in self-reflection and self-evaluation of the factors that contribute to the successful execution of sports skills in an instructional setting.

Generally, the IC of the coach should aim at helping learners to perform better in an instructional environment. Several instructional strategies should be utilised to help learners acquire the skills necessary to perform a movement task correctly (Donkor et al., 2021). To achieve movement objectives, both verbal and non-verbal cues can be used to aid learners in their skill development and refinement. Literature demonstrates that the predominant valuable information in instructional settings is verbal expression (Donkor, et al., 2021). This affirms the superiority of verbal ICs over their non-verbal counterparts in helping learners acquire proper mechanics in overcoming a movement task in an instructional setting. In situations involving complex skills, verbal IC could be better used. The non-verbal cue should serve as additional support to enhance learner understanding and execution of appropriate movement in sports and exercise settings. As spoken information, verbal guidance of performance can be very beneficial as long as it is clear and concise. Galligan (2000) states "… it is often difficult to explain complex elements of skill performance and it may be best to use verbal guidance to support visual guidance" (pp. 110-111). In administering non-verbal IC, especially those that belong to a visual category, coaches or professional instructors are encouraged to give their learners visual guidance. Visual guidance, according to literature "involves the transfer of information through the use of demonstrations, video images, visual aids such as posters, modifications of the display, manuals etc." (Galligan, 2000, p.110). Professional instructors or coaches should remember that they must move a learner from "where he or she was and challenge him or her to greater achievements by individualizing the task to be accomplished" (Pufaa, 2006, p.8).

Learners need help in executing and perfecting a shooting skill in netball, this highlights the need for the use of instructional cues by coaches in training their students. It is noteworthy that, not just at Nigerian colleges of education but also at all levels of education; students generally show little interest in netball activities. One of the most important factors in enhancing the accomplishment of any educational institution's instructional goals is the supervision of all curricular activities. Several pre-service teachers are self-taught in netball shooting skills and it reflects in their performance, coaching aims to promote long-term learning rather than short-term performance. Therefore, the study aims to examine the effect of coach-guided instructional cues on pre-service teachers' acquisition of netball shooting skills in sport and exercise practical sessions.

Specifically, the study was designed to:

1. Determine the acquisition of netball shooting skills among pre-service teachers in the netball shooting context without coach-guided instructional cue
2. Find out the acquisition of netball shooting skills among pre-service teachers in the netball shooting context with coach-guided instructional cues
3. Determine the effect of coach-guided instructional cues on pre-service teachers' acquisition of netball shooting skills in sports and exercise practical sessions

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Research Questions

1. What is the mean acquisition of netball shooting skills among pre-service teachers in the netball shooting context without coach-guided instructional cues?
2. What is the mean acquisition of netball shooting skills among pre-service teachers in the netball shooting context with coach-guided instructional cues?
3. What is the effect of coach-guided instructional cues on pre-service teachers' acquisition of netball shooting skills in sports and exercise practical sessions?

Methodology

To accomplish the desired outcomes set for the study, we utilized descriptive processes involving a digital video to capture netball shooting events of study participants and coaches in a practical PES setting. This was done in tandem with a structured questionnaire to obtain valuable data on our study participants. Fundamentally, data collection venues were genuine learning ecosystems where the coaches engaged participants (pre-service teachers) in acquiring the skill of shooting during netball practice sessions. Even though the design was expensive and time-consuming, using descriptive processes was particularly crucial to our study as it allowed accurate and systematic descriptions of the behaviours of the coaches and study participants in an authentic teaching and learning environment.

Two groups of participants, comprising pre-service teachers and professional instructors (coaches) were involved in the study. The pre-service teachers were recruited via purposive sampling from the first-year group in the College of Education, while coaches in the area of PES were recruited based on consent, availability and accessibility. A total of 81 participants consisting of 31 pre-service teachers were sampled from College A. They were composed of 12 males and 19 females. Additionally, 31 pre-service teachers were drawn from College B. In terms of gender, College B was a homogeneous group with all study participants being females. College B was a female institution which clarifies the basis for all participants being exclusively females. Further, 15 participants consisting of 12 males and 3 females were drawn from College C. Lastly, four experienced male coaches in the area of sport and physical exercise were also recruited for the study. All four coaches recruited for the study were males because there was no female coach for sport and physical exercise programme in the colleges of education within the region that served as data collection venues. Two of these coaches actively engaged in the practice session involving netball shooting while the other two supported without actively engaging in the primary role of the main coaches. As inclusion criteria, all participants for the study were supposed to be physically fit to participate in skill application sessions. All participants were also to grant consent for inclusion in the study. In terms of exclusion criteria, participants with prior involvement in netball activities were excluded in order not to influence the results regarding shooting. On the whole, 81 participants (pre-service teachers=77, sport and exercise coaches=4) were involved in the study.

Our data collection efforts relied on three main data collection instruments. Specifically, a digital video, self-report questionnaire and event recording tool. The event recording tool was self-developed from an observational data collection system to provide descriptive insight into netball shooting and instructors' composition of ICs in sports and exercise settings. These instruments were validated by experienced University researchers in the area of Sport and Physical exercise. An event recording instrument is useful for collecting data on well-defined behaviours that can be measured by counting the number of times the event happens (Donkor et al., 2021). Event recording instruments can be used to measure several aspects of professional instructors and learners in an instructional setting (Donkor et al., 2022a). The frequency count of events can be converted to rate per minute. In addition, the data collection procedures for this study included:

i. Two training sessions for research assistants, recorders and the selected professional instructors in sports and physical exercise settings.
ii. All student participants were drawn from homogeneous groups who were at the beginning phase of learning the fundamentals of the netball game.

Data from the video-recorded session was assessed using inter-observer evaluation measures. Inter-observer reliability checks between the two independent recorders were performed to guarantee the reliability of data. The inter-observer Agreement (IOA) was calculated as:

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$$\frac{\text{Agreement}}{\text{Agreement + Disagreement}} \text{ X } 100 = \% \text{ of agreement}$$

In this context, agreement means the degree to which independent observers agree on what they see and record (Donkor et al., 2022b). Ideally, an IOA of at least 80% should be considered a good reliability (Donkor et al., 2021). This requirement is in line with the statement that: "A reliability of 80 percent is usually considered necessary for research purposes" (Siedentop, & Tannehill, 2000, p.338). The event recording instrument is a valuable tool for collecting meaningful data on behaviours that can be defined by counting the frequency of occurrence.

Results

Table 1: Data Reliability Based on Shooting Schedule Without Coach-guided IC in Netball Context (Self-guided Learning)

Shooting Task	*Observer1*	*Observer2*	*Mean score*	*Percentage (%)*
Round 1	51	51	51	100
Round 2	53	53	53	100
Round 3	44	44	44	100
Round 4	65	65	65	100
Round 5	78	76	77	97
Total	**291**	**289**	**290**	**99**

Note: Each round was composed of 3 trial shots for every study participant

Table 1 displays data from the two independent observations. The round 1 trial yielded an average score of 51 successful shots from the two independent observers which produced 100% data reliability. In round 2, 53 successful shots were recorded as the average frequency of occurrence for the first and second observers. Again, data from the two observers yielded 100% inter-observer reliability. Rounds 3, 4, and 5 yielded an average count of successful shots of 44, 65, and 77 respectively with corresponding data reliability of 100%, 100%, and 97%. A total of 290 successful shots were made by the participants in the instructional schedule who did not receive coach-guided IC. Table 1 presents the results.

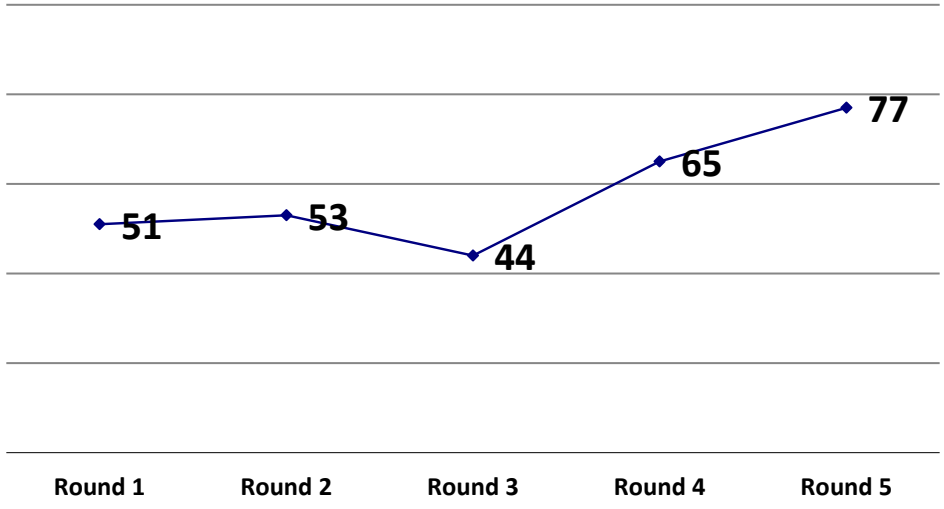

Figure 1: Outcome of Shooting Schedule Without Coach-guided IC

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Graph-based analysis in Figure 1 revealed that a total of 51 shots were successfully produced in the first round, increased to 53 shots in the second round, dropped to 44 shots in round 3, and consecutively increased to 65 and 77 in the fourth and fifth rounds.

Table 2: Data Reliability Based on Shooting Schedule with Coach-guided IC

Shooting Task	*Observer1*	*Observer2*	*Mean score*	*Percentage (%)*
Round 1	59	59	59	100
Round 2	54	54	54	100
Round 3	66	66	66	100
Round 4	74	74	74	100
Round 5	86	88	87	98
Total	**339**	**341**	**340**	**99**

Table 2 displays data from the two independent observations. The two observers for rounds 1, 2, 3, 4, and 5 trials yielded average scores of 59, 54, 66, 74, and 87 successful shots respectively. Inter-observer data reliability agreement was 100% throughout the rounds except round 5 which recorded 98%. A total of 339 counts of successful shots was recorded by Observer 1, while Observer 2 recorded a total count of 340 shots. We obtained 99% inter-observer data reliability for the entire observation. Table 2 presents the results.

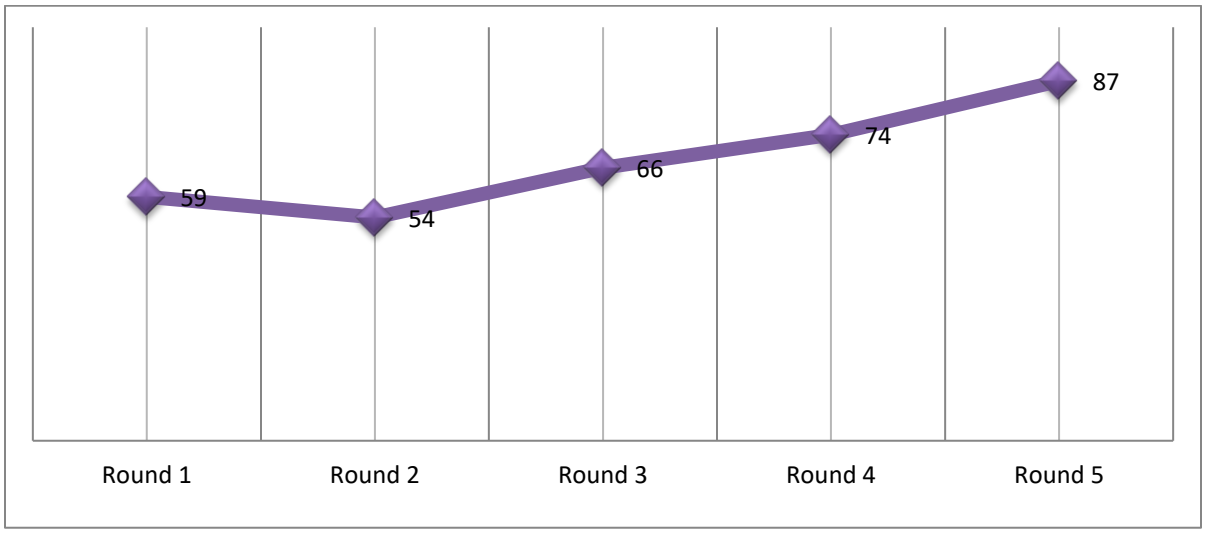

Figure 4: Outcome of Shooting Schedule with Coach-guided IC

From the graph-based analysis (Figure 2), it was revealed that a total of 59 shots were successfully delivered by the participants in the first round, dropped to 54 shots in the second round, increased to 66 shots in round 3, and repeatedly increased to 74 and 87 successful shots in the fourth and fifth rounds respectively.

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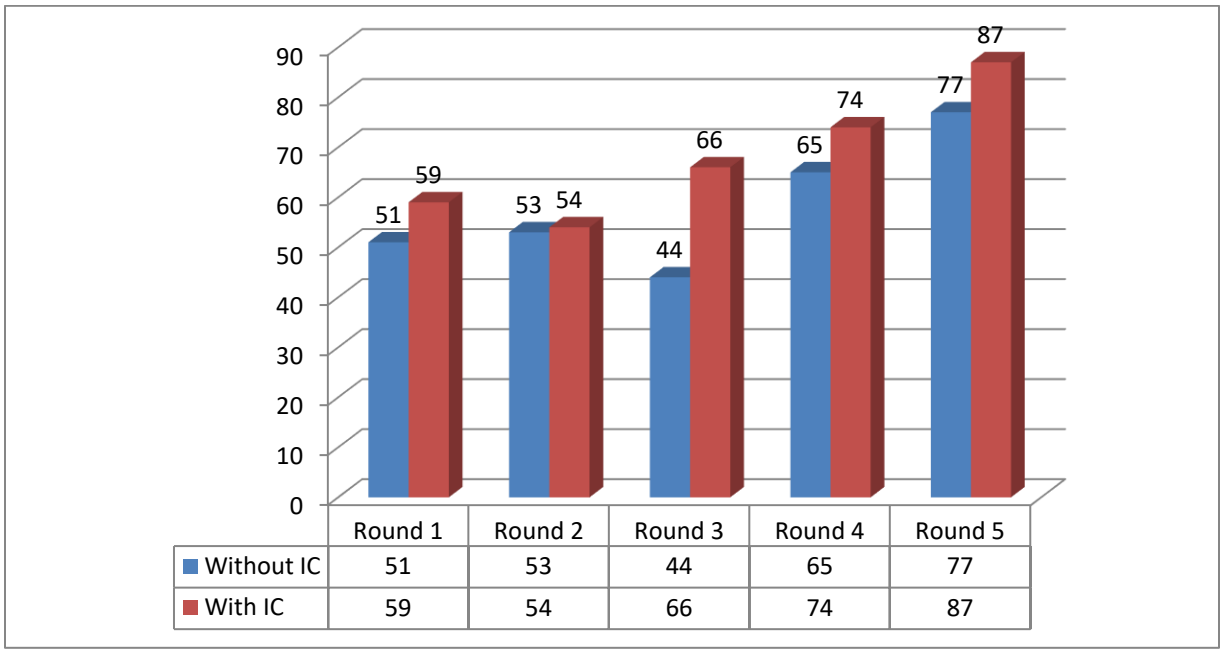

Figure 3: Comparison Between the two Instructional Schedules

From Figure 3, analysis of data suggested that coach-guided learning produced 51 successful shots while self-directed learning produced 59 (9 more successful shots) in the first round of 3 trials for each of the 45 participants. In the second round, shot execution without coach-guided IC resulted in 53 successful shots whilst coach-guided IC produced 54 successful shots, 1 more shot than the shooting task that was based on self-guided execution of shots in the same round. Round 3 yielded 44 successful shots in the schedule that involved self-guided execution of shots against 66 for the schedule that was planned around coach-guided IC. For rounds 4 and 5, schedules without coach-guided IC generated 65 and 77 successful shots as against 74 and 87 for coach-guided IC in the same rounds respectively.

Table 3: Summary of independent sample t-test on the difference in teachers' netball shooting skills in sports and exercise practical sessions based on group.

Treatment	N	Mean	SD	t	df	p
Without IC	5	58.00	13.04			
With IC	5	68.00	13.02	-1.214	8	.260

The t-test results indicate that there is no statistically significant difference in the netball shooting performance between the group receiving coach-guided instructional cues (With IC) and the group without such cues (Without IC). This conclusion is based on the non-significant p-value ($p = 0.260$), which is greater than the commonly used significance level of 0.05. The negative t-statistic suggests that, on average, the group without instructional cues performed lower than the group with instructional cues, but this difference is not statistically significant. The degrees of freedom (df) for the t-test are 8, and the t-statistic falls short of the critical value needed for statistical significance. The result showed that there is no evidence to suggest a significant effect of coach-guided instructional cues on pre-service teachers' acquisition of netball shooting skills in sports and exercise practical sessions.

Discussion

The purpose of the study was to use two instructional schedules to examine the influence of coach-guided IC on pre-service teachers' acquisition of netball shooting skills in the PES context. In the first schedule, participants did not benefit from coach-guided IC. However, in the second schedule, participants received coach-guided IC. Data collection procedures involved the utilization of a digital video for recording instructional events of pre-service teachers and professional sports and exercise instructors (coaches). The video-recorded session lasted 1 hour (60 minutes). An event recording instrument was designed and used to document the frequency of events during a practice session. Two experienced independent recorders used the event recording instrument to note down instructional events relating to the shooting outcomes. Inter-observer agreement procedures were used to assess the

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reliability of data collected for the study. The data collection instruments were deemed valid by experienced researchers who ascertained the credibility of using these tools for collecting precise data. Graphical analysis was conducted to determine which of the two schedules was superior.

Based on the analysis of data, it was discovered that the success rate for participants without coach-guided IC was below 50% of the permissible shooting opportunities in the entire practical session. On the contrary, the success rate for participants who were provided coach-guided IC exceeded 50% of the permissible shooting opportunities. Therefore, the study provided evidence of the superiority of coach-guided learning over self-guided learning in the instructional setting involving shooting tasks in netball. The skill of shooting in netball involves mechanics that require a comprehensive approach to help learners acquire critical elements of execution. Often, the approach to coaching learners to shoot properly involves intertwined skills that include good footwork, body positioning eye-hand coordination and accuracy. Due to the complexities involved in executing shooting skills in the netball context, it is essential to have a coach or professional instructor to provide essential instructional guidance to help learners acquire the proper skill of shooting. Through a well-delivered coach-guided IC, learners are set to develop a well-rounded understanding of shooting with a level of precision. The coach needs to individualise IC to each learner's ability. It is this individualized learning approach that ensures that learners address their specific needs and refine their shooting skills in preparedness to participate in game situations.

Over recent years, efforts have been invested in the examination of a wide array of possibilities for fostering learning (Adams & Clarke, 2014; Clarke et al., 2015; Habgood and Ainsworth, 2011; Halpern et al., 2012; Hurzlmeier, et al., 2021). This signifies a concerted effort to bridge the gap between academic research and the practical teaching of PES. Despite this effort, the outcome is still ineffective if coach-guided IC is unable to provide valuable information that would lead to learner self-reflection and improvement of learning outcomes. To illustrate effectiveness within a real-world PES instructional environment, the IC of the professional instructor should help learners understand their task-ability and task weaknesses that are relevant in boosting learner confidence. The IC of the teacher should allow learners to track their progress to enable them to adjust and set realistic goals for improving movement execution. Professional instructors should leverage the power of IC to support learners in their journey to acquire essential skills necessary for participating in the chosen sport.

On the other hand, executing a skill without receiving instructional support from the coach can aid learners in making independent decisions during game sessions. Learners must rely on their knowledge during gameplay to help them execute movement tasks successfully. By learning to execute skills without coach-guided IC, learners are challenged to take ownership of the learning process. However, the present study presented a situation where learners struggled in the learning process to acquire, refine and execute the skill of shooting a netball into the hoop successfully. The study suggested that learners without coach-guided IC struggled to grasp the correct execution process in making successful shots. These participants who did not receive coach-guided IC incorrectly executed techniques leading to faulty and inaccurate movements. This means that unguided learning (or self-guided learning) can potentially lead to faulty execution of skill elements that can hinder skill development in the learner. Woolf (2010) emphasizes the integration of intelligent tutoring system functionalities into the realm of PES. The recommendation stems from a growing body of research, suggesting the incorporation of support system mechanisms to propel the advancement of PES by utilizing IC as a strategic approach to elevate skill development and enhance the overall performance of learners. In their quest to enhance skill acquisition among learners, Mayer and Johnson (2010) investigated by comparing the impact of different forms of instructional support on learning outcomes. Termed the "value-added approach", this perspective is asserted to be the most pertinent for evaluating the influence of instructional support on learning objectives. Lester et al. (2020) underscore the significance of the PES programme as a learning platform and explicitly state that "games have long held great promise for creating learning experiences that are both effective and engaging" (p.211). The present study demonstrated that the instructional information of the coach was more effective and beneficial to the learning process than independent learning. When a professional instructor actively intervenes in the learning process by giving appropriate IC, learners are provided with knowledge and skills that valuably contribute to the learner's overall skill development and refinement of the sports skill being executed. The coach brings a wealth of expertise to the learning process to help learners understand fundamental techniques and strategies involved in executing movement tasks. The coach identifies and corrects errors in a way that contributes to higher levels of achievement in the learning process. The intervention of the coach ensures that learners develop desirable sports skills and habits relevant to participating in

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competitive sports. The coach often must design learning activities and drills that enhance the skill acquisition of learners and cater for their skill development needs in an instructional setting. Clear explanations, demonstrations and creating opportunities for learners to practice go a long way to facilitate mastery in skill execution.

While coaching novices within PES context, coaches and professional instructors should be mindful that learners in the early stages of skill development often face limitations in handling complex tasks concurrently. These learners may need to focus all their attention on a single task at a time. With continued practice, they eventually learn to eliminate extraneous movements and achieve effective muscle coordination as a unified entity. As skills become automatic, less thought is necessary to effectively complete the task. This allows skilled performers to attend to other relevant cues in the learning environment instead of the particular movement. The coach in a practical instructional setting should be more constructive in the instruction than being destructive in instructional comments. This means that the instructions given by the coach should recognize positive parts of the performance and suggest positive steps for improvement and by so doing carry the information to the learner with some sort of positivity. Telling the learners what they should not do while practising a skill is usually destructive and should be avoided. This assertion is attested to by Pufaa (2006) who suggested that information given to a learner "should be positive and specific" and that negative and general information provided to a learner "do not enhance motor skill learning" (p.19). Coaches are encouraged to employ positive affirmation statements during instruction. These statements ideally brief, are intended to implant constructive ideas in the subconscious mind, fostering an improved image and cultivating a positive mental attitude. Additionally, these positive statements aid in guiding learners toward specific goals. In alignment with the discourse on the attributes of sound instructional guidance that underscores a positive approach, Wuest and Bucher (2003) also affirm that “feedback should be positive and related to teaching cue” (p.268). This is crucial for reinforcing desired behaviours or actions and motivating learners to consistently adhere to the established guidelines.

Conclusion

Based on the findings, it was concluded that coach-guided execution of skill in a PES setting produced greater success compared to an unguided self-learning schedule in the entire shooting task. This was evident in all the rounds where students were given equal shooting opportunities to make a goal in the five schedules of coach-guided and self-guided shooting task context. In drawing the current conclusions, we particularly observed that the performance of students who received coaches' instruction in the shooting task exceeded a 50% success rate, while a shooting schedule lacking coach-guided IC yielded less than 50% success rate.

Recommendations

Based on the findings of this study, it is recommended that:

1. Coaches and professional PES instructors should prioritise the integration of instructional cues or relevant instructional support techniques within their instructional methods.
2. Coaches and professional instructors should tailor their instructional strategies to include elements of instructional guidance to enhance the overall learning experience of students.

References

Adams, D. M., & Clark, D. B. (2014). Integrating self-explanation functionality into a complex game environment: Keeping gaming in motion. *Computers & Education*, *73*, 149-159.

Clark, D. B., Sengupta, P., Brady, C. E., Martinez-Garza, M. M., & Killingsworth, S. S. (2015). Disciplinary integration of digital games for science learning. *International Journal of STEM Education*, *2*(1), 2.

Donkor, S. K., Appiah, M, Huagie, S. A., & Seibu, M. (2022a). Inter-observer evaluation of practical lesson delivery in physical education setting: Nature and demonstration of teachers’ instructional cues. *International Journal of Physical Education, Sports and Health, 9(1), 270-275.*

Donkor, S. K., Atsu, F. S., Agortey, J. J., & Sorkpor, R. S. (2022b). Instructional practices in physical education setting: Teachers’ utilization of instructional cues, supervision and frequency of pre-service teachers’ participation in netball activities. *International, Journal of Applied Research, 8*(2), 224-230.

Donkor, S. K., Avornyo, G. K., Koki, T. K., & Darko, R. A. (2021). Teachers’ utilization of instructional cues: Types, targets and rate per-minute in physical education setting. *International Journal of Yogic, Human Movement and Sports Sciences, 6*(2), 135-140.

Galligan, F. (2000). *Advanced PE for edexcel*. Heinemann.

Habgood, M. J., & Ainsworth, S. E. (2011). Motivating children to learn effectively: Exploring the value of intrinsic integration in educational games. *The Journal of the Learning Sciences*, *20*(2), 169-206.

Halpern, D. F., Millis, K., Graesser, A. C., Butler, H., Forsyth, C., & Cai, Z. (2012). Operation ARA: A computerized learning game that teaches critical thinking and scientific reasoning. *Thinking Skills and Creativity*, *7*(2), 93-100.

Hurzlmeier, M., Watzka, B., Hoyer, C., Girwidz, R., & Ertl, B. (2021). Visual Cues in a Video-Based Learning Environment: The Role of Prior Knowledge and its Effects on Eye Movement Measures. In *Proceedings of the 15th International Conference of the Learning Sciences-ICLS 2021*. International Society of the Learning Sciences.

Lester, J. C., Spain, R. D., Rowe, J. P., & Mott, B. W. (2020). Instructional support, feedback, and coaching in game-based learning. *Handbook of game-based learning*, 209-237.

Mayer, R. E., & Johnson, C. I. (2010). Adding instructional features that promote learning in a game-like environment. *Journal of Educational Computing Research*, *42*(3), 241-265.

Powell, D., Wood, G., Kearney, P. E., & Payton, C. (2021). Skill acquisition practices of coaches on the British Para-swimming World Class Programme. *International Journal of Sports Science & Coaching*, *16*(5), 1097-1110.

Pufaa, H. A. (2006). *Motor learning in physical education and sports*. Kois Press Ltd.

Siedentop, D., & Tannehill, D. (2000). *Developing teaching skills in physical education (4th edition).* California: Mayfield Publishing Company.

Woolf, B. P. (2010). *Building intelligent interactive tutors: Student-centered strategies for revolutionizing e-learning*. Morgan Kaufmann.

Wuest, D. A., & Bucher, C. A. (2003). *Foundations of physical education, exercise science and sport*. New York: The McGraw-Hill Companies.