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Effects of Self-Modelling Video Imagery Interventions on Futsal Players Performances

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ABSTRACTS

This study aim to investigate the effectiveness of self-modelling video imagery training (delivered using iPod Touch) on open skills among highly competitive futsal players throughout a competition season. Four male futsal players participated in a single-case ABAB study design for four months. Participants' performances of four skills (passing, receiving, dribbling, shooting), using hand notational video analysis were examined. Self-modelling video imagery training was customized to focus on the two weakest skills for each participant. The results using visual inspection and split middle technique analysis of individual graphs indicated improvement in performance of all targeted skills all participants during the intervention phases (B1, B2) compared to baseline phases (A1, A2). In conclusion, the self-modelling video imagery was found to beneficial, specifically improving performance of futsal skills in actual games in a season. The used of IPod as technology device to delivering self-modelling video imagery was found to be useful to enhance futsal players' performances.

Keywords: self-modelling, video imagery, futsal performance

INTRODUCTION

Imagery and self modelling video intervention are a couple of interventions found to be employed by athletes to enhance performance. In many condition self-modeling video and imagery have been used separately, however a few study have been conducted to combine both intervention to examine their effect on athletes' psychologically and physically (Khan, Abd Malek, Ishak & Mohamad. 2020). For example, a number of sport scientists, who have examined the use of modelling and self-modelling among younger people, have proposed these interventions as an effective method to increase the potential of spina bifida children in swimming (Dowrick & Dove, 1980: Steel et al, 2021) and school student skills performance in volleyball (Barzouka, Bergeles, & Hatziharistos, 2007). Imagery and modelling techniques have been showed in several studies to be used together, for example Ram, Riggs, Skaling, Landers and McCullagh, (2007) reported that lower level skill learners benefited more when they used the combination of imagery and modelling in the acquisition and retention of some motor skills tasks compared to participants using modelling or imagery only. Therefore, some sport psychologists have designed and implemented the combination of imagery and modelling techniques in sports to maximize individual motor skills performance and not specifically to examine the effectiveness of this combination method (Holmes &

Calmels, 2008). The combination of imagery and modelling training has also been shown to affect the sports skill learning and development process. According to some researchers, the use of video modelling within imagery programs has been used to provide participants with essential information to perform sport skills (Khan, Nor, Asmadi, Nur Haziyanti, & Ali, 2019). For example, in their study with skilled and novice soccer players, Blair, Hall, and Leyshon (1993), recommended that these interventions can facilitate the acquisition of complex soccer skills (dribbling, passing, and shooting). In a study of different combinations of imagery procedures, imagery interventions based on video modelling and combined imagery and modelling techniques have been shown to be a pragmatic method to enhance learning for various sports and learning circumstances (Khan, Morris & Marchant, 2015). Even though, self-modelling and imagery intervention were tested among various athletes and conditions an investigation on individual performance in a competitive season using technology device sometime not feasible to be conducted. Thus, for this reason this study was conducted to examine the effects of self-video modeling imagery to enhance futsal skill performance in four months competition seasons.

MATERIALS AND METHODS

Participants

Following approval from the Victoria University Human Research Ethics Committee (VUHREC) recruitment was conducted by inviting four male futsal players to participate in this study. They were aged between 21 and 31 years (M = 25.8, SD = 3.2). They were experienced players, who had more than 5 years (M = 5.8, SD = 1.1), played in 3 games (M = 2 hours) per week for 4 months (16 weeks) per season.

Study Design

A single-case ABAB study design was employed to examine the effects systematic self-modeling video imagery intervention on performance of competitive futsal players throughout a league season (Kazdin, 2011). The imagery training procedure in the present study was focusing on the use of the self-modelling thus, in this study design generated a sufficient time frame and opportunity to develop and revise the imagery audio instructions and the self-modelling video. The initial imagery intervention (B1) was introduced to the participants by editing video footage of their own performance from the A1 phase. Prior to the second intervention phase (B2), all participants' previous skills performances, feedback, and comments were collated and considered before a revised imagery intervention was implemented in B2. Imagery training content was developed in the second intervention phase by analysing and editing the video footage in the B1 and the A2 phases.

Measures

The video analysis method was the technique applied in this study to examine participants' performances in the futsal competition season. All participants were video recorded in every game (16 games). Based on the video footage from these games, hand notational video analysis was employed to evaluate participants' performance in each game (Khan, Karim & Sato, 2019). Two expert judges who were familiar with notational analysis techniques were employed to evaluate participants' futsal performances (Level A Asia Football Federation, AFC coaching accreditation).

Intervention

The JVC Everio Camcorder digital video camera (model GZ-HD300) was used to record the imagery instructions and self-modelling videos. An individualized self-modelling video imagery intervention was prescribed to each participant, according to the results of preliminary performance analysis. At the beginning of the first intervention phase (B1), the video showed participants receiving the ball, passing the ball, dribbling the ball, and shooting on goal with the correct techniques and displaying 100% success. The video footage recorded during the B1 and A2 phases was used to develop advanced imagery training for the final intervention phase (B2). During the B2 intervention phase, the selections of self-modelling video were edited using participants' own video footage showing their advanced skills actions from previous games (i.e., A1, A2, B1). This second part of the imagery intervention program (B2 phase) was around 10 minutes duration. Participants were presented with a similar number of self-modelling video examples and imagery rehearsals as in the first phase of the intervention (total of 12 imagery rehearsals for each advanced skill).

Analyses

The futsal skill performance for each individual were calculated for each skill separately for each week throughout phases A1, B1, A2, and B2 and plotted on an individual graph using a Microsoft Excel 2010® program. Then, the individual graphs were examined for changes in level of performance, as well as direction and gradient of the slope, to identify consistent changes. The split middle technique (O.R. White, 1972, 1974) was also used as a statistical form of analysis to create a trend or celeration line. The level of the celeration line is calculated by determining the value of the dependent variable (successful percentage) where the celeration line passes through the end of one phase (last game in the A1 phase) with the beginning of the next phase (first game in the B1 phase). This calculation method is also known as an absolute level change. The multiplication sign (x) was used to signify an increment (shifted up) in the change in level and the division sign (÷) a decrement (shifted down).

RESULTS

Performance. Performance measured in terms of percentage successful passes, dribbling or shooting episodes, judged by expert coaches is presented in split middle analysis graphs. These figures show performance across the four phases in the study, including the mean for each phase, the level of the celeration line, and the slope of the celeration line into the next phase.

Colin

Participant profile. Colin was a 25-year old male competitive futsal player originally from Ireland, involved in three competitive tournaments.

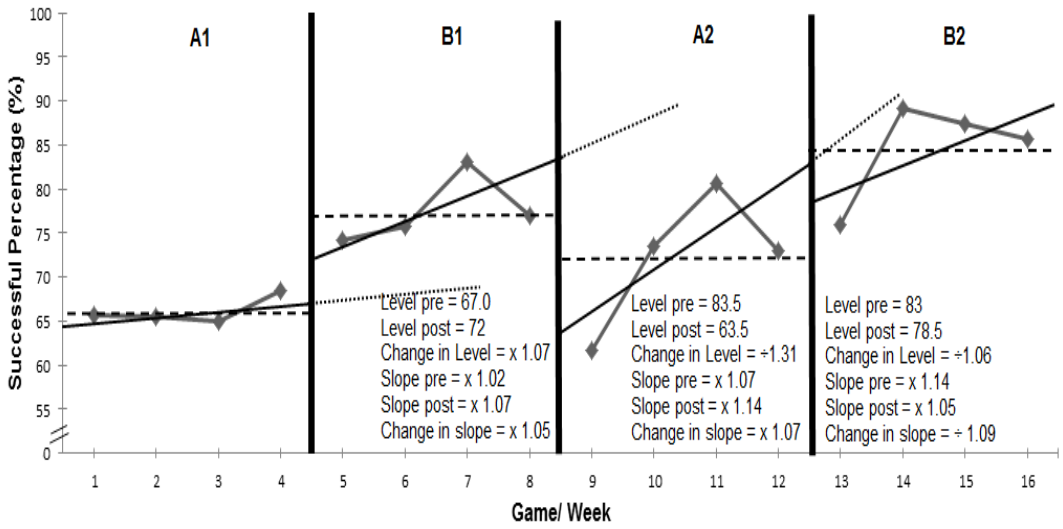

Figure 1. Split-middle analysis of Colin's passing skill performances

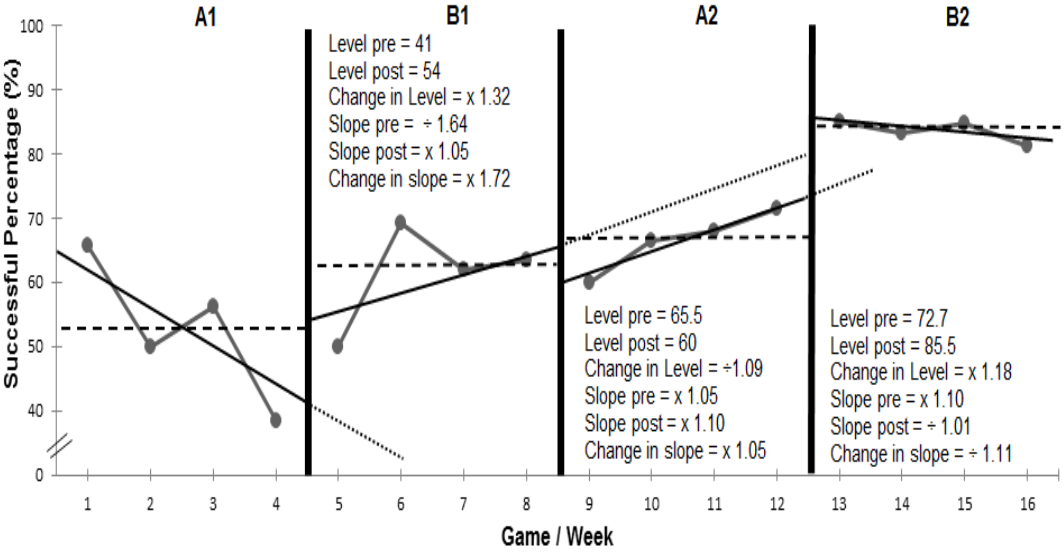

Figure 2. Split-middle analysis of Colin's dribbling skill performances

Colin's mean passing skill performance increased by 16.3%, the level shifted up 7.4%, and the trend line increased (x 1.05) during the initial intervention phase (B1) compared to the first baseline phase (A1). In comparison during the A2 phase (2nd baseline), Colin's mean passing skill performance decreased 6.78%, the level shifted down 23.9%, and the trend line increased (x 1.07). During the second intervention phase (B2), Colin's mean passing skill performance improved by 17.1%, the level shifted down marginally 5.4%, and the trend line decreased (÷ 1.09) compared to the second baseline phase (A2).

A similar condition was recorded for the visual inspection of Colin's dribbling skill. Mean dribbling skill performance increased by 16.4%, the level shifted up 31.7%, and the trend line increased (x 1.72) during the B1 phase compared to the A1 phase. Colin's mean dribbling skill performance increased 8.6%, the level shifted down 8.3%, and the trend line increased (x 1.05) during the second baseline phase (A2),

In the B2 phase, mean dribbling performance improved by 25.6%, the level shifted up 17.6%, and the trend line decreased (÷ 1.11) compared to the A2 phase.

Fred

Participant profile**.** Fred was a 27-year old male club level futsal player. He was born in Germany and represented a local soccer club from 6 years old until he was 15 years old.

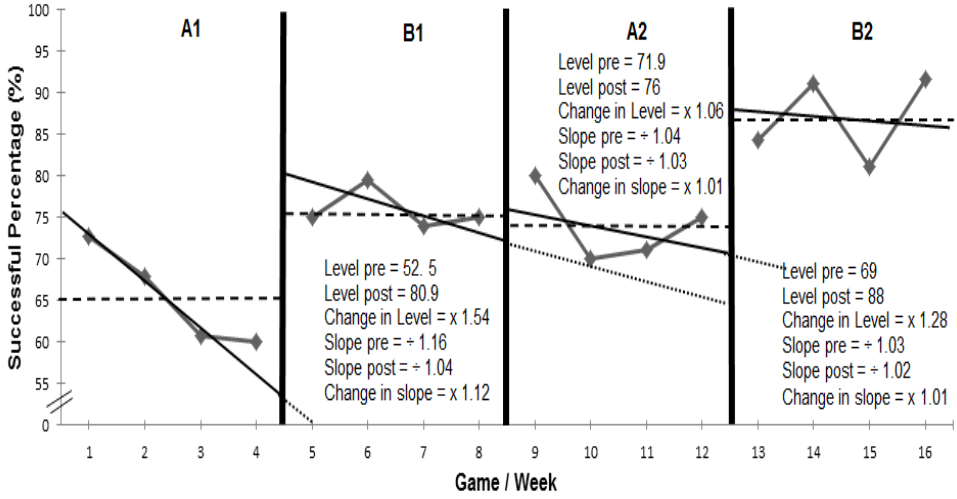

Figure 3. Split-middle analysis of Fred's passing skill performances

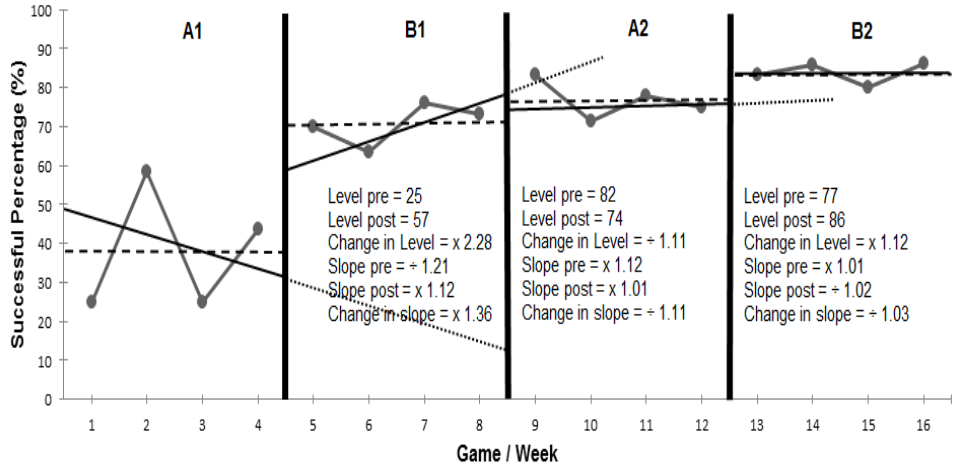

Figure 4. Split-middle analysis of Fred's dribbling skill performances

Fred's mean passing skill performance increased by 16.1%, the level shifted up 54%, and the trend line increased (x 1.12) during the B1 phase compared to the initial baseline phase (A1). Fred's mean passing skill performance deteriorated by 2.4%, the level shifted up marginally 5.7%, and the trend line increased (x 1.01) during the A2 phase compared to the initial intervention phase (B1). During the B2 phase,

performance improved by 17.5%, the level shifted up 27.5%, and the trend line increased (x 1.01) compared to the second baseline phase (A2).

In relation to Fred's dribbling skill performance, his mean performance recorded 86.1% improvement, the level shifted up 128%, and the trend line increased (x 1.36) during the B1 phase compared the A1 phase. During the second baseline phase (A2), Fred's dribbling skill marginally increased by 8.7%, the level shifted down 9.7%, and the trend line decreased (÷ 1.11) compared to the previous phase (B1). For the final intervention phase (B2), Fred's mean performance increased by 8.8%, the level shifted up11.6%, and the trend line decreased (÷ 1.03) compared to the A2 phase.

Martin

Participant profile. Martin was a 25-year old male futsal player, originally from Ireland, who started participating in competitive futsal games during the last few years while working in Melbourne. Figure 5 & 6 showed Split-middle analysis of Martin's passing & shooting skill performances

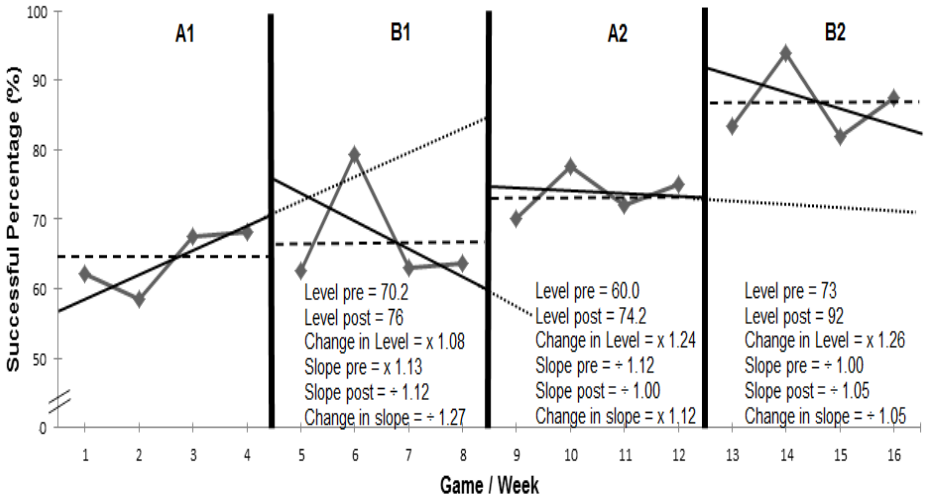

Figure 5. Split-middle analysis of Martin's passing skill performances

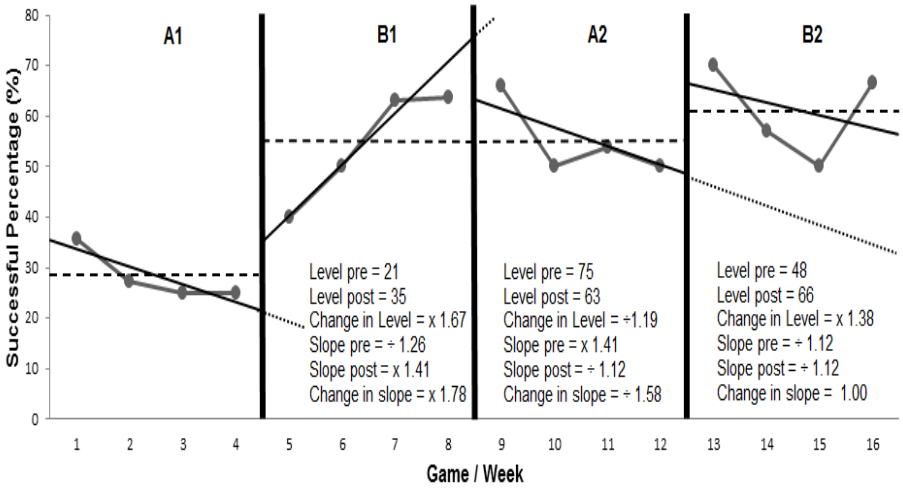

Figure 6. Split-middle analysis of Martin's shooting skill performances

Based on the split middle analysis, Martin's mean passing skill performance improved by 4.8%, the level shifted up 6.8%, and the trend line decreased (÷ 1.27) in the first intervention phase (B1) compared to first baseline phase (A1). Martin's mean passing performance in the second baseline phase (A2) increased around 9.7%, the level shifted up 23.6%, and the trend line increased (x 1.12) compared to the B1 phase. In the second intervention phase (B2) mean passing skill performance improved by 17.6% the level shifted up 26.0%, and the trend line decreased (÷ 1.05) compared to the second baseline phase (A2).

Martin's mean shooting performance increased by 91.9%, the level shifted up 66%, and the trend line increased (x 1.78) in the B1 phase compared to the A1 phase. Martin's mean shooting performance in the second baseline phase (A2) increased slightly by 1.4%, the level shifted down 16.0%, and the trend line decreased (÷ 1.58) compared to the B1 phase. During the B2 phase performance increased by 10.8%, the level shifted up 37.5%, and the trend line was stable (1.00) compared to the A2 phase.

Taku

Participant profile. Taku was a 21-year old male futsal player with four years of experience in the inter-club futsal competition in Japan.

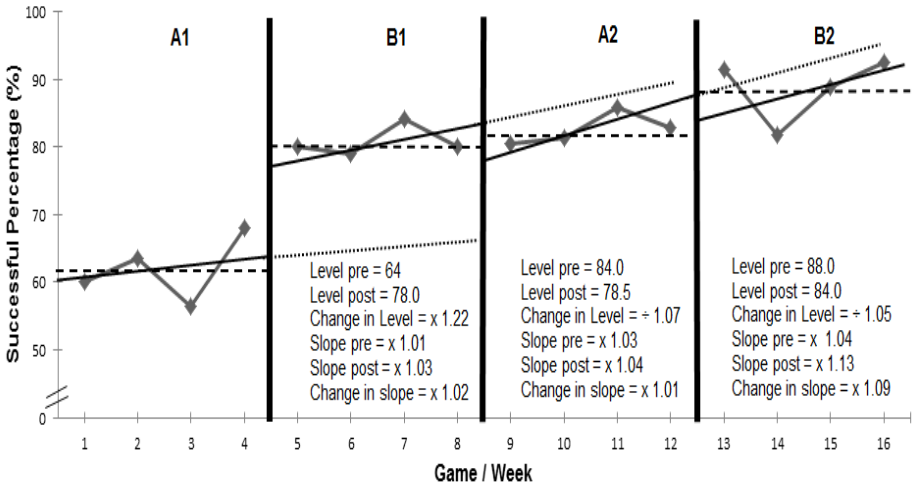

Figure 7. Split-middle analysis of Taku's passing skill performances

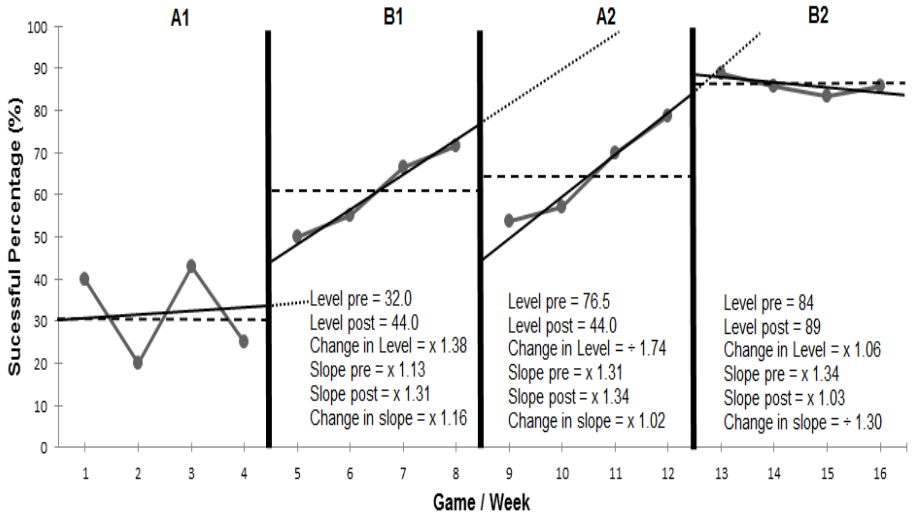

Figure 8. Split-middle analysis of Taku's dribbling skill performances

Visual inspection of Taku's passing skill performance indicated that his mean performance increased by 30.1%, the level shifted up 21.8%, and the celeration line increased (x 1.02) during the B1 compared to A1 phase. Performance increased marginally by 2.3%, the level shifted down 6.5%, and the celeration line increased (x 1.01) during the A2 phase compared to the B1 phase. Taku's performance improved by 7.1%, the level shifted down 4.5%, and the celeration line increased (x 1.09) in the B2 phase compared to the A2 phase.

Visual inspection of Taku's dribbling performance revealed that his mean performance improved during both intervention phases. During the B1 phase his mean performance increased by 90.1%, the level shifted up 37.5%, and the celeration line increased (x 1.16) compared to the previous phase (A1). Taku's dribbling skill performance showed a minor increment 6.7%, the level shifted down 42.4%, and the celeration line increased marginally (x 1.02) during the second baseline phase (A2) compared to the previous phase (B1). Finally, during the B2 phase his performance increased by 32.4%, the level shifted up 5.9%, and the celeration line decreased (÷ 1.30) compared to the A2 phase

DISCUSSION

The main objective of the current study was to examine the effect of employing portable devices (iPod Touch) to deliver self-modelling video imagery training on competitive futsal players' performance, Overall, participants' futsal skill performances increased during the intervention phases and remained steady in the baseline phases. For three participants (Colin, Fred, Martin), the results reflected that employing the iPod Touch (portable device) was an effective method for enhancing futsal skills performance during actual games. Improvements were found on both futsal skills for these three participants when they employed the iPod and steady performance levels were recorded when the device was withdrawn. This result supported the study by Khan Morris and Marchant. (2017) demonstrated that performance significantly increased when athletes employed self-modelling video imagery training compared to those who did not. The performance results for another participant (Taku) indicated that both his futsal skill performances increased at substantial rates during the intervention phases, but a slight increment was also recorded in the baseline phases. These large margins of futsal skills improvement during the intervention compared to the baseline phases illustrate that the iPod had an effect on Taku's futsal skills improvement. Taku's futsal skills performances calculated from the change in the celeration line slopes during intervention phases moved in a more positive direction compared to the baseline phases. This is in line with results reported by Khan, Morris and Marchant, (2015).

In conclusion, use of the iPod was a method to enhance the performance of competitive futsal players as all of their targeted futsal skills improved. This technology device as a medium application to deliver self-modelling video to improve performance was parallel to some researchers' suggestions (Lauer, Martin, & Zakrajsek, 2019). Moreover, self-modelling might be one of the key factors that could influence futsal players performance (Lao, Furlonger, Moore, & Busacca, 2016). A positive relationship between players self-modelling video imagery intervention and futsal performance was demonstrated, predominately as the self-modelling video provided specific skill that could be improved more clearly. All above situation indicates that self-modelling video imagery intervention will be beneficial to athletes and the use of technology device particularly MP4 player is useful to deliver psychology skill training.

Conflicts of interest
The authors declare that they have no competing interests.

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