基於虛擬運動遊戲系統的介入對兒童基本運動技能之影響

The impact of on virtual sports game system-based intervention on children's fundamental motor skills

- 中英文摘要

在許多有關於運動探討的文獻中，大部分研究聚焦於使用健身運動遊戲系統來提升身體素質，使用虛擬實境系統的量化實證研究比較罕見。因此，本研究欲利用虛擬運動遊戲系統科技來進行體育教學課程，並將健身運動遊戲系統與虛擬運動遊戲系統進行比較。本研究的目的在探討使用虛擬運動遊戲系統對兒童的基本運動技能成效的影響，以及兒童對未來鍛鍊意圖的影響。將三個班級隨機分配組別為虛擬運動遊戲系統組、健身運動遊戲系統組及傳統體育教學組。每週有兩節的體育教學，一節教學四十分鐘，教學進行六週。實驗開始前，三組學生進行基本運動技能定點擊球測驗，做為前測，實驗結束後同樣的測驗再做一次，做為後測，還有進行未來鍛鍊意圖問卷測驗。

In many of the literature on motion research, most of the research focuses on the use of exergames to improve physical fitness, and quantitative empirical research using virtual reality systems is rare. Therefore, this study intends to use the virtual sports game system technology to conduct physical education courses, and compare the exergames with the virtual sports game system. The purpose of this study was to explore the impact of using virtual sports game systems on children's fundamental motor skills and the impact of children's future exercise intention. The three classes were randomly assigned to the virtual sports game system group, the exergames group, and the traditional physical education teaching group.There are two sessions of physical education every week, one forty minutes and one for six weeks. Before the start of the experiment, the three groups of students conducted a fundamental motor skills test as a pre-test. After the experiment, the same test was done again, as a post-test, and a future exercise intention questionnaire was conducted.

- 中英文關鍵字

虛擬運動遊戲系統、健身運動遊戲系統、基本運動技能、未來鍛鍊意圖

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- 第一章　緒論

Chen、Mason、Hammond-Bennett 與 Zalmout(2016)指出提高運動技能和增強健康相關的身體健康是學齡兒童的理想學習成果。實現運動技能能力是成為人的一生中身體活動的基礎。兒童的運動技能發展也是終身身體活動的決定因素(Bishopa & Pangelinan, 2018; Herrmann, Heim, & Seelig, 2017)。體育教師在幫助學生培養運動技能方面也發揮著重要的角色扮演，身體素養的人需要有運動技能才能享受終身的體育活動(Silverman & Mercier, 2015)。因此，有研究結果表示強烈建議在小學教育期間支持學生參與中度到劇烈強度的身體活動的機會，並指出在小學期間是基本運動技能模式的重要時期(Jaakkola et al., 2019)。基本運動技能的熟練程度被認為會影響兒童的身體活動，而那些基本運動技能越熟練的人則傾向於更多的身體活動量，並減少兒童在週末的久坐時間(Capio, Sit, Abernethy, & Masters,

2012; Capio, Sit, Eguia, Abernethy, & Masters, 2015)。因此，基本運動技能與身體活動之間有存在著正相關的關係(Capio, Sit, Eguia, Abernethy, & Masters, 2015)。總而言之，運動技能會影響身體的活動量，甚至影響著人們終身運動的可能性。

近年來，健身運動遊戲已成為全球流行的趨勢、越來越受歡迎(Huang, Wong, Lu, Huang, & Teng, 2017; Huang et al., 2018)。健身運動遊戲系統已被討論為鼓勵兒童參與身體活動的可能策略(Ho, Lwin, Sng, & Yee, 2017)。Sun(2013)學者的研究結果表示，健身運動遊戲是可以在體育活動中增強身體活動的可行方法。體育教育者在課程中可以加入健身運動遊戲系統的趨勢，作為將學生與身體活動聯繫起來的一種方法(Sheehan & Katz, 2013)。希望健身運動遊戲能夠吸引學生參加體育活動，並在中度和劇烈的強度水平上增強活動體驗(Anonymous, 2013)。

除了健身運動遊戲系統，虛擬實境系統也是近年來變得非常流行的科技(Huang, Rauch, & Liaw, 2010)。是一種越來越普遍的消費產品，可以用於各種的教學用途(Jang, Vitale, Jyung, & Black, 2017)以及可以促進知識共享、教育和樂趣等(Kim, Lee, & Kang, 2012)。Merchant、Goetz、Cifuentes、Keeney-Kennicutt 與 Davis(2014)的研究結果表示遊戲、模擬和虛擬世界可以有效地提高學習效果。因此，本研究將虛擬運動遊戲系統融入體育教學來探討。

健身運動遊戲可以促進遊戲過程中的體育鍛煉(Castañer, Camerino, Landry, & Pares, 2016; Lwin & Malik, 2012)。健身運動遊戲可以讓體力消耗或運動來改善身體健康，進一步而增強了健康的益處(Nguyen et al., 2106)。健身運動遊戲系統在體育教學上提供一開始有趣的環境，可以用於激勵新手參與體育教學或身體活動的一種方法(Ennis, 2013; Gao, Zhang, & Stodden, 2013; Vernadakis, Papastergiou, Zetou, & Antoniou, 2015)。因此，學校應考慮將健身運動遊戲系統納入學校們的體育課程裡(Lwin & Malik, 2012; Staiano, Beyl, Hsia, Katzmarzyk, & Newton, 2017)。

除了健身運動遊戲系統之外，D. Lee、B. I. Lee、Park 與 Kim(2018)指出需要新的運動技術，例如：基於虛擬實境的運動系統。可以使用虛擬實境的技術來促進我們的身體活動(Murray, Neumann, Moffitt, & Thomas, 2016)。虛擬實境的遊戲還可以為兒童提供愉快的體育鍛煉，以及改善身體的健康(Smits-Engelsman, Jelsma, & Ferguson, 2017)。在許多有關於運動探討的文獻中，大部分研究聚焦於使用健身運動遊戲系統來提升身體素質，使用虛擬實境系統的量化實證研究比較罕見。因此，本研究欲利用虛擬運動遊戲系統來進行體育教學課程，並將健身運動遊戲系統與虛擬運動遊戲系統進行比較。

➢ 第二章 文獻探討

許多文獻研究如何提升基本運動技能，最基本的方式是使用基本運動技能的傳統培訓方法。Capio、Sit、Eguia、Abernethy 與 Masters(2015) 研究結果證明，基本運動技能培訓組的研究對象的基本運動技能的熟練程度有所提高。

使用健身遊戲的介入來看是否有提升基本運動技能。研究結果證明，實驗組的研究對象確實提高了他們對感知技能能力的看法，並可以提高他們參與體育活動的動力(Edwards, Jeffrey, May, Rinehart, & Barnett, 2017)。

探討基本運動技能與身體活動的相關性。研究結果物體控制熟練的孩子有可能成為更有活躍的青少年(Barnett, Beurden, Morgan, Brooks, & Beard, 2009)。研究結果表明學齡前兒童的運動技能與參加劇烈的身體活動呈現正相關(Webster, Martin, & Staiano, 2018)。發展移位和物體控制技能的能力可能是平日和周末促進幼兒積極生活方式的重要因素(Foweather et al., 2015)。

虛擬實境不僅是一個沉浸式的使用者界面，而且還有助於呈現和解決工程、醫學和教育等領域的實際問題(Huang, Rauch, & Liaw, 2010)。虛擬實境科技的研究有應用於逃生疏散知

識的傳遞訓練和行為上的評估(Feng, González, Amor, Lovreglio, & Cabrera-Guerrero, 2018)及應用虛擬培訓的環境來培訓警務人員進行複雜的合作任務(Bertram, Moskaliuk, & Cress, 2015)。在學科學習上應用於化學課程及英語課程，研究結果兩者的學業成績都有顯著提升(Merchant et al., 2012; Yang, Chen, & Jeng, 2010)。

許多的研究都集中在健身運動遊戲是否會促進足夠的身體活動以及運動的強度(Castañer, Camerino, Landry, & Pares, 2016)。從幼稚園階段到大學階段都有學者研究健身運動遊戲系統是否可以改善身體活動強度的水平(Staiano et al., 2017; Pasco, Roure, Kermarrec, Pope, & Gao, 2017; Gao et al., 2017; Gao, Zhang, & Stodden, 2013)。研究是否可以改善研究對象的姿勢穩定性(Sheehan & Katz, 2013; Vernadakis, Derri, Tsitskari, & Antoniou, 2014)、是否可以提升研究對象的運動技能（即協調和敏捷性）(Hsiao & Chen, 2016)及是否可以提升研究對象的身體素質(Huang, Wong, Lu, Huang, & Teng, 2017; Smits-Engelsman, Jelsma, &, Ferguson, 2017)，研究結果都有提升。

使用虛擬實境訓練運動技能，結果表明，在虛擬環境培訓期間，大多數績效變量往往更接近專家的表現(Covaci, Olivier, & Multon, 2015)。虛擬實境是可以減少運動的疼痛感與運動相關的努力感知的有效方法。研究結果證實，無論個人身體意識的水平如何，運動期間的虛擬實境都可以減少與運動相關的負面感覺(Matsangidou et al., 2018)。健身運動遊戲系統可以增加我們目前在體育教學中的身體活動，透過有趣的身體活動選項來促進身體活動的參與(Gao, Zhang, & Stodden, 2013)。

- 第三章　研究方法

採用虛擬運動遊戲系統應用於國小體育教學，採準實驗研究法之「不等的前測–後測設計」進行研究。本研究的研究對象，以臺北市某國小為取樣目標，採取立意抽樣的方式選取一年級三個班級進行實驗研究。三個班級隨機分配組別為虛擬運動遊戲系統組（VIVE 虛擬實境系統）、健身運動遊戲系統組（Nintendo Switch 健身運動系統）、傳統體育教學組。三組教材分別為第一人稱網球-實境網球仿真器運動遊戲軟體（VIVE 虛擬實境系統）、Mario Tennis Ace 運動遊戲軟體（Nintendo Switch 健身運動系統）及傳統體育網球教學，三組教學內容皆為網球課程。每週有兩節的體育教學，一節教學四十分鐘，教學進行六週。實驗開始前，三組學生進行以 Ulrich(2000)粗動作發展測驗-第二版的物體控制定點擊球測驗，做為前測，實驗結束後同樣的測驗再做一次，做為後測。實驗結束後，還有針對虛擬運動遊戲系統組、健身運動遊戲系統組及傳統體育教學組進行翻譯於 Li 與 Lwin(2016) 的鍛鍊意圖問卷進行網球未來鍛鍊意圖問卷測驗。

本研究旨在探討使用虛擬運動遊戲系統對兒童的基本運動技能成效的影響，以及對未來鍛鍊意圖的影響。

- 研究結果

預測實驗結果虛擬運動遊戲系統組及健身運動遊戲系統組的基本運動技能成效高於傳統體育教學組。此外，預測虛擬運動遊戲系統組對於網球未來鍛鍊意圖得分略高於健身運動遊戲系統組。最後，預測使用虛擬運動遊戲系統組及健身運動遊戲系統組融入國小體育課程是可以提高學生的基本運動技能。

➢ 圖表

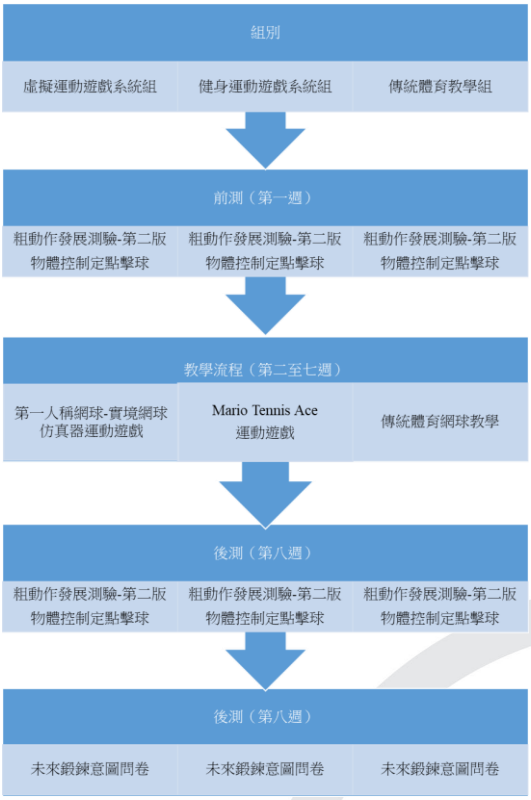

圖　整體研究設計表

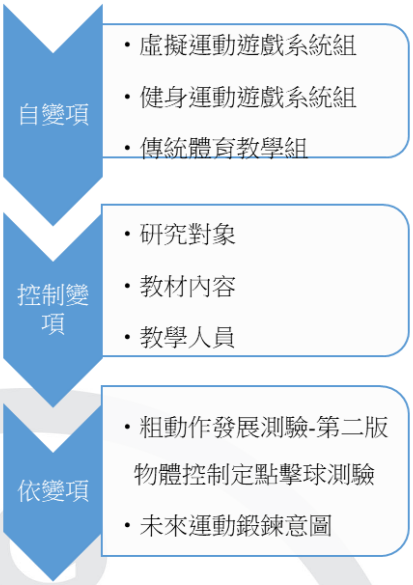

圖　研究架構圖

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