

## Nonlinear Pedagogy and its Relevance for the New PE Curriculum

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### KEY IMPLICATIONS

- Nonlinear Pedagogy (NP) is effective in teaching invasion games with reference to enhancing performance outcomes and game play behaviours.
- NP encourages transfer of skills across games in the same game category (i.e., invasion game in this research context).
- NP is effective in teaching Fundamental Movement Skills in Primary School context.

### BACKGROUND

Increasingly, practitioners see the need to recognize the complex and dynamic interactions that occur between the individual, task and environmental constraints during learning. NP, underpinned by Ecological Dynamics, provides a suitable pedagogical approach to encourage exploratory learning that is learner-centred and exploratory in nature. Essentially, NP involves the manipulation of constraints which form boundaries for interacting components to self-organise, facilitating the emergence of goal-directed behaviours (Chow et al., 2016). Key pedagogical principles relating to representativeness, manipulation of constraints, awareness of focus of attention instructions, task simplification and the functional role of noise can encourage exploratory learning that helps develop 21st century competencies (Chow et al., 2016). This is in contrast to a Linear Pedagogy (LP) approach that is more teacher-centred and

focuses on repetition in practices to promote movement form consistency in enhancing the acquisition of movement skills.

### FOCUS OF STUDY

This study investigated the impact of NP on (i) the teaching of game skills using an invasion game in a school context (Secondary level) and (ii) the teaching of Fundamental Movement Skills (FMS) in a school context (Primary level).

### KEY FINDINGS

1. Significant improvements in performance outcome and game play in football was observed for the NP condition.
2. Evidence for transfer of learning for NP was not as strong as anticipated although there was still some potential for encouraging transfer of learning.
3. With regards to FMS competency (TGMD-2), both NP and LP were effective for most skills. Only the NP condition demonstrated significantly higher scores for overhand throw.
4. There was a greater transition in terms of percentage of students from Elementary Stage to Mature Stage for the skills of sliding and stationary NP condition.
5. NP can create an authentic learning environment that encourages innovation and creativity among students. A hybrid of NP and LP approaches could be further examined.

## SIGNIFICANCE OF FINDINGS

### Implications for Practice

Practitioners could incorporate key principles of NP in the delivery of content and teaching within PE settings to help develop greater creativity, teamwork and autonomy among students.

### Implications for Policy and Research

Key implications include how NP can be incorporated in Teacher Education programmes and Professional Development courses to encourage educators to incorporate NP in delivering the PE curriculum. Research on NP can also be conducted in the school setting to determine how to implement hybrid NP and LP teaching at different age groups, skill levels and for different activities.

### Learning Gains

NP can facilitate effective teaching and learning for football and FMS.

### Proposed follow-up activities

Future studies could focus on the translation of the current findings to more schools and other aspects of PE (e.g., Outdoor Education, Dance) in Singapore.

## PARTICIPANTS

This study involved two secondary schools and two primary schools, with eight teachers and 411 students.

## RESEARCH DESIGN

The study adopted a pre, post, retention, transfer test design, typical in skill acquisition studies. Performance outcome and positional data (using GPS system) for football were captured for all test sessions. FMS data was collected using TGMD-2, an obstacle course (Transfer Test) and Validated Developmental Sequences (Gallahue et al., 2012). Interview and focus group discussion were audio recorded, transcribed and collated into themes.

## REFERENCES

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