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1 Nanyang Walk Singapore 637616
NTU Reg No. 200604393R

**Physical Education and Sports Science**
Email: ssm@nie.edu.sg

# SPORT SCIENCE & MANAGEMENT
# SS2324 SKILL ACQUISITION: THEORY TO PRACTICE

| | | | |
|---|---|---|---|
| **Academic Year** | 2025-26 | **Semester** | 1 |
| **Course Coordinator** | | | |
| **Course Code** | SS2324 | | |
| **Course Title** | Skill Acquisition: Theory to Practice | | |
| **Pre-requisites** | SS1024 Foundations of Motor Behaviour and Learning | | |
| **No of AUs** | 3 | | |
| **Contact Hours** | 39 | | |

## Course Aims

This course aims to provide you with a sound understanding of motor skills development over time and knowledge to develop practical skills in designing practice sessions for physical education. The course will focus on the central questions of why, when, and how movements become coordinated over time by reflecting on current theories and research. In particular, this course will adopt the dynamical systems theory as the main paradigm to investigate coordination between limbs (intrapersonal) and between individuals (interpersonal). In addition, topics related to movement variability, sports expertise, visual perception, degrees of freedom, talent development, and specific practical strategies related to skill acquisition will be covered.

## Intended Learning Outcomes (ILO)

By the end of this course, you should be able to:

1. describe and critique the current debate on the theoretical paradigm used to study motor control and learning for physical education.
2. make educated deductions grounded in theoretical paradigms about the definition of motor expertise in various sports activities.
3. assess and evaluate motor coordination in both individual and collective sport activities.
4. identify key features of existing intervention design, analyse, and apply relevant modifications to enhance skill acquisition for physical education.

## Course Content

The following topics will be covered:

1. Functional Role of movement variability
2. Definition and assessment of Motor expertise
3. Motor Coordination from a Dynamical Systems perspective

4. Interpersonal Coordination and expertise in team games
5. Dynamics of motor learning and skill acquisition
6. Perception-action coupling: Ecological Dynamics perspective
7. Informational Constraints
8. Nonlinear Pedagogy
9. Sport Expertise: Visual Perception
10. Talent Development: Early diversification or Early specification

**NTU Competencies & Graduate Attributes**

| **NTU Competencies** | |
|---|---|
| Character | |
| Competence | √ |
| Cognitive agility | √ |

| **NTU Graduate Attributes** | |
|---|---|
| Graduate Attributes | Level (i.e., basic, intermediate, advanced) |
| 1. Collaboration | Advanced |
| 2. Communication | Intermediate |
| 3. Curiosity | Intermediate |
| 4. Problem Solving | Intermediate |

**Assessment (includes both continuous and summative assessment)**

| **Component** | **ILO Tested** | **Weighting** | **Team/ Individual** | **Assessment Rubrics** |
|---|---|---|---|---|
| 1. Individual Assignment | 1, 2, 3 | 20% | Individual | Appendix 1 |
| 2. Group Presentation | 3, 4 | 30% | Team | Appendix 2, 3 |
| 3. Final Examination | 1-4 | 50% | Individual | |
| Total | | 100% | | |

**Formative Feedback**

Feedback for learning will be verbally provided during each laboratory class session, where you can learn techniques and apply yourselves to problems related to movement evaluation in sport and designing the relevant intervention.

Feedback will be provided through recurrent personal self-assessment through different quizzes proposed during each lesson via a smartphone app (particularly Socrative).

During the completion of the Group Presentation, as a group, you will be provided with verbal feedback pertaining to your assessed performance. Generic verbal and written feedback will be provided to the class for the test and final examination.

Throughout the course, you will have the opportunity to use recording devices to help record your fellow classmates demonstrating anatomical and muscular movements for observation and analysis. During the learning process, you will receive verbal feedback on the

techniques and mistakes in observation and analysis. Suggestions for improvement will be provided.

**Learning and Teaching Approach**

| Approach | How does this approach support you in achieving the learning outcomes? |
|---|---|
| Lectures | Lectures will provide information on key learning concepts and theories and support understanding how they may be applied in the real world. |
| Online Learning | Time will be given for learning from online materials as a part of the flip teaching approach. These materials will support key concepts covered in lectures, tutorials, and practical sessions. |
| Laboratories | You will gain exposure to the motor behaviour laboratory and techniques used to measure motor skills and motor learning. Practical classes will also provide study opportunities to create their own practice of novel motor skills. The lecturer will provide feedback and information to facilitate your learning of a motor skill and discuss methods of quantifying motor learning. |

**Reading and References**

NIE Research and Publications


1. Chow, J. Y., Davids, K., Button, C., & Renshaw, I. (2016). Nonlinear Pedagogy in skill acquisition: An introduction. London: Routledge.

2. Komar, J., Potdevin, F., Chollet, D., Seifert, L. (2019). Between exploitation and exploration of motor behaviors: Unpacking the constraints-led approach to foster non-linear learning in Physical Education. Physical Education and Sport Pedagogy, 24, 1-13.

3. Chow, J. Y., Komar, J., Seifert, L. (2021). The Role of Nonlinear Pedagogy in Supporting the Design of Modified Games in Junior Sports. Frontiers in Psychology, 12, 744814.


Other Readings and References


4. Davids, K., Button, C., & Bennett, S. (2008). Dynamics of skill acquisition: A constraints-led approach. Champaign, IL: Human Kinetics Renshaw, I.,

5. Davids, K., & Savelsbergh, G. J. P. (2010). Motor learning in practice: A constraints-led approach. London: Routledge.

6. Rose, D. J., & Christina, R. W. (2006). A multilevel approach to the study of motor control and learning. San Francisco: Pearson/Benjamin Cummings.


**Course Policies and Student Responsibilities**

(1) General

You are expected to complete all assigned pre-class readings and activities, attend all classes – lecture and laboratory - punctually, submit all scheduled assignments and take tests by due dates. You are not allowed to swap laboratory groups without express permission from the course coordinator. You are expected to take responsibility to follow up with course notes, assignments and course-related announcements for sessions they have missed. You are expected to participate in all discussions and class activities unless there is a valid medical reason not to do so.

(2) Absenteeism

Absence from class without a valid reason will affect your overall course grade. Valid reasons include falling sick, supported by a medical certificate and participation in NTU's approved activities supported by an excuse letter from the relevant bodies.

If you miss a lecture, you must inform the course instructor via email prior to the start of the class.

(3) Absence Due to Medical or Other Reasons

If you are sick and not able to complete a test or submit an assignment, you have to submit the original Medical Certificate (or another relevant document) to the Sport Science & Management (or Home School) administration to obtain official leave. Without this, the missed assessment component will not be counted towards the final grade. There are no make-ups allowed.

(4) Attire and safety

You are expected to participate in practical laboratory activities. Some of these activities involve exercise. You are expected to wear appropriate attire for participation, obey laboratory safety rules, and take appropriate care of and return all equipment after use.

**Academic Integrity**

Good academic work depends on honesty and ethical behaviour. The quality of your work as a student relies on adhering to the principles of academic integrity and to the NTU Honour Code, a set of values shared by the whole university community. Truth, Trust and Justice are at the core of NTU's shared values.

As a student, it is important that you recognise your responsibilities in understanding and applying the principles of academic integrity in all the work you do at NTU. Not knowing what is involved in maintaining academic integrity does not excuse academic dishonesty. You need to actively equip yourself with strategies to avoid all forms of academic dishonesty, including plagiarism, academic fraud, collusion, and cheating. If you are uncertain of the definitions of any of these terms, you should go to the NTU Student Academic Integrity Policy and Procedures link in the Student Portal for more information. Consult your instructor(s) if you need any clarification about the requirements of academic integrity in the course.

Special note: Generative AI tools will be allowed to the extent stipulated for each assignment in the assignment instructions, and any such use must be duly referenced or disclosed.

**Course Instructors**

| Instructor | Office Location | Phone | Email |
|---|---|---|---|
| TBA | | | |
| | | | |

**Planned Weekly Schedule**

| Week | Topic | ILO | Readings/ Activities |
|---|---|---|---|
| 1 | Functional Role of movement variability | 1 | Davids, Button & Bennett, 2008; Chapter 1 |
| 2 | Movement Variability in Postural Control | 1, 2 | Davids, Button & Bennett, 2008; Chapter 2 |
| 3 | Motor coordination from a dynamical systems perspective | 1, 3 | Davids, Button & Bennett, 2008; Chapter 2 |
| 4 | Motor expertise definition from a dynamical systems perspective | 3 | Davids, Button & Bennett, 2008; Chapter 2 |
| 5 | Interpersonal Coordination and expertise in team games | 3 | Davids & Savelsbergh, 2010; Chapters 10 & 11 |
| 6 | Dynamics of motor learning and skill acquisition | 1, 3 | Davids, Button & Bennett, 2008; Chapters 4 & 5 |
| 7 | The ecological dynamics perspective: perceptual-motor skill | 1 | Chow, Davids, Button & Renshaw, 2016; Chapter 3 |
| Recess Week | | | |
| 8 | Informational constraints | 1, 4 | Chow, Davids, Button & Renshaw, 2016; Chapters 7 & 8 |
| 9 | Nonlinear pedagogy | 4 | Chow, Davids, Button & Renshaw, 2016; Chapter 4 |
| 10 | Visual perception in sport expertise | 1, 2 | Davids & Savelsbergh, 2010; Chapter 4 |
| 11 | Work group | 2, 3, 4 | |
| 12 | Talent development: Early diversification versus Early specialisation | 1, 2 | Davids & Savelsbergh, 2010; Chapter 1 |
| 13 | Presentation of work group | 2, 3, 4 | |

**Appendix 1: Assessment Criteria for Individual Assignment (20% final grade)**

| | A+, A, A- | B+, B | B-, C+, C | D+, D | F |
|---|---|---|---|---|---|
| **Presentation and definition of the concepts (10%)** | Information provided clearly referenced definition. Examples are representative, clear, and coherent. | Information mostly presents the concept. Explanation is mostly clear, and the flow is generally coherent and logical. At least one example is well-defined. | There are weaknesses or absences in the definition provided, and the flow of the presentation is unclear at times. Examples are unclear or irrelevant. | Much of the information provided does not help to define the concept, and the flow is difficult to understand. | Little relevant information leading to unclear definitions and unclear flow. No or poor examples are provided. |
| **Application of theoretical knowledge to practical contexts (10%)** | Clear demonstration of how theory can be applied to practice | More than adequate evidence to show how theory can be applied to practice | Adequate evidence to show how theory can be applied to practice | Little evidence to show how theory can be applied to practice | No evidence to show how theory can be applied to practice |

Marks obtained will be converted to 20% of the total mark.

**Appendix 2: Assessment Criteria for Group Presentation (30% final grade marked out of 100, including 10 marks for peer evaluation in Appendix 3)**

| | A+, A, A- | B+, B | B-, C+, C | D+, D | F |
|---|---|---|---|---|---|
| **Quality of presentation (max 25)** | Information provided clearly answers the question set out. Presentation is clear, and the flow is coherent and logical. Pace is appropriate. | Information mostly answers the question set. Presentation is mostly clear, and the flow is generally coherent and logical. | There are weaknesses or absences in the information provided, and the flow of the presentation is unclear at times. | Much of the information provided does not answer the question, and the flow is difficult to understand. | Little relevant information and unclear flow. |
| **Understanding of material (max 30)** | Demonstrates a very good understanding of the material. Able to answer questions in a poised and articulate manner with a high level of confidence. | Demonstrates a good understanding of the material. Able to answer most of the questions clearly and with confidence. | Demonstrates a basic understanding of the material. Able to answer some of the questions clearly but lacks confidence at times. | Demonstrates a weak understanding of the material. Has difficulty answering questions and lacks confidence. | Does not demonstrate any understanding of the material. Unable to answer questions. |
| **Use of technology (max 10)** | Uses relevant technology very well to supplement and enhance the quality of presentation. | Good use of technology to improve the presentation. | Some use of technology to help improve the presentation. | Little use of relevant technology in the presentation. | No clear use of technology in the presentation. |
| **Communication and teamwork (max 25)** | Communication is very clear and easy to understand. All members of the team make active contributions. | Communication is clear and easy to understand most of the time. Most members of the team make good contributions. | Communication is unclear at times. Varied contributions of different team members. | Communication is unclear and there and difficult to understand. Most contributions are provided by a single team member. | Communication is unclear and not possible to understand. No team member makes an active contribution. |

Marks obtained will be converted to 30% of the total mark.

**Appendix 3: Peer Evaluation Component for Presentation**

For the peer evaluation component, group members within each group will be asked to rate each of their peers, and the score received for each group member will be the average of the scores from their peers' round to the nearest integer (e.g., student gets a score of 9, 8 and 8, respectively from the 3 other group members and will receive a score of 8 (average of 8.3).

| **Marks** | 10, 9 | 8, 7 | 6, 5 | 4, 3 | 2, 1, 0 |
|---|---|---|---|---|---|
| **Peer Evaluation**<br><br>**(10 max)** | Excellent work; was a crucial component of the group's success. | Very strong work; contributed significantly to the group. | Sufficient effort; contributed adequately to the group. | Insufficient effort; met minimal standards of the group. | Little or weak effort; was detrimental to the group. |

NB: Numeric scores for peer review do not necessarily align with the letter grade categories.