Title	Core 3 Research Programme: Baseline investigation of subject-domain pedagogies in Singapore's primary and secondary classrooms (C3-PP) : Significant findings for PE (P5 and Sec3)
Author(s)	Onishi Pamela Grace Costes, Dennis Kwek and Alistair Peacock

Core 3 Research Programme: Baseline Investigation of Subject-Domain Pedagogies in Singapore's Primary and Secondary Classrooms (C3-PP)

Significant Findings for PE (P5 and Sec3)

ACKNOWLEDGEMENT

This study was funded by the Education Research Funding Programme (ERFP), National Institute of Education, Nanyang Technological University, Singapore. The project number is OER 10/17 KBK. The Core research project is headed by Dr. Dennis Kwek, Senior Lecturer (Senior Research Scientist) and Associate Dean, Strategic Management. This report was written by the Core 3 Programmatic Programme (C3-PP) Panel 2 team at the National Institute of Education. The C3-PP team consists of Dr. Onishi Pamela Grace Costes (Principal Investigator) and Mr. Alistair Peacock (Lead Research Assistant, PE). For more information on the project, please contact Dr. Pamela Costes Onishi at pamela.onishi@nie.edu.sg.

CONTENTS

BACKGROUND 3
PURPOSE 4
RESEARCH METHODS 5
RESULTS OF PE OBSERVATION DATA ANALYSIS 8
PHASAL CODES: DOMAIN-GENERAL 8
PHASAL CODES: DOMAIN SPECIFIC 13
LESSON CODES: OVERALL RESULTS 15
CORRELATIONS 17
KEY CONCERNS & RECOMMENDATIONS 19
REFERENCES 20
APPENDICES 21

BACKGROUND

In broad terms, the central objective of the National Institute of Education (NIE) Core Research Programme is to provide empirical answers to persistent questions about the instructional logic and intellectual quality of teaching and learning across Singapore classrooms. In Core 1 (2004-2007), lessons and surveys from English, Mathematics, Science, Social Studies and Mother Tongue classrooms at Primary 5 and Secondary 3 levels were collected. In Core 2 (2009-2014), three Panels were formed and organized along pedagogical beliefs and practices (Panel 2), classroom practices (Panel 3) and assessment practices (Panel 5) (Hogan, Towndrow, Kwek, & Chan, 2013). Both the Core 1 and 2 Research Programmes made important advancements in our understanding of a broad range of pedagogical practices through rigorous research designs and instrumentation. In addition, they had a significant impact on educational policy and research. The Core Research Programme continues to investigate what makes the Singapore education system successful, and what systemic pedagogical innovations are required to advance Singapore's education to the next level.

The Core 3 Research Programme (Core 3) has been reconceptualised to include a **Regular component**, one of the two categories of sub-studies aimed at improving the utility of findings that are aligned to MOE's knowledge needs and ensuring the timeliness of reporting of findings for MOE's monitoring purposes. The Regular component is complemented with an **Exploratory component** which comprise sub-studies to investigate learning outcomes which are difficult to measure, conduct innovative data collection methods and analytical approaches, develop evaluation studies investigating curriculum implementation and enactment, and develop curriculum and pedagogical innovations. In particular, this study includes a significant, highly refined regular component that examines classroom pedagogy and an exploratory component that develops indicators for new subject domains and further examines teacher pedagogical reasoning. This Core 3 programmatic study (henceforth, "C3-PP") follows a five-year subject domain sampling design that began in 2015. While the subjects that are the focus of this study (English Language, Mathematics, Additional Mathematics, History, Geography, Literature, Music, Visual Arts, Physical Education, Computer Applications, henceforth cumulatively termed "focus subjects") are wide ranging, they follow the Core 3 data collection schedule for the years 2017 and 2018. The sampling design and subjects have been agreed upon by the MOE and NIE.

PURPOSE

This study continues the broader Core Research Programme's objective of providing policy-makers, teacher educators and researchers with well-informed, timely and evidence-informed baseline descriptions on the state of pedagogical practice in Singapore schools. The following are the specific purposes of the C3-PP research:

1. This study seeks to deepen the engagement and collaboration with curriculum specialists to develop novel and validated indicators of learning and instruction in the focus subjects as well as understand teacher reasoning with regards to content pedagogy.
2. This study seeks to further develop and expand Core 2's theoretical and methodological groundwork by examining the nature of teaching and learning in the new focus subjects as taught in Singapore primary and secondary classrooms.
3. This study will also sharpen the focus on the nature of teacher pedagogical reasoning and teacher pedagogical repertoire in relation to the nature of Performative Pedagogy (PP) and Knowledge-Building Pedagogy (KBP) practices in the classroom, and seek to understand the practical and possibly strategic reasoning that makes teachers choose particular practices based on particular aims, contexts, content and learning outcomes.
4. This study continues to trial and develop a fast-cycle reporting format to generate useful and impactful findings to key stakeholders (MOE, NIE and schools) on a regular basis.
5. Importantly, this project will provide a baseline representative investigation on what goes on in primary and secondary focus subject classrooms, with the dataset usable for longitudinal cross-sectional analyses in the future.

RESEARCH METHODS

SAMPLE

The breakdown of the total number of units, lessons, and duration of lesson is indicated in Table 1. The total number of lessons is based on a realistic calculation of the number of weeks in the school year in 2018 (26 weeks) that can be used for data collection, the number of research assistants (full time) that will be involved, and budgetary constraints. Data collection took place during Terms 1 to 3 of the year, and data coding and analysis during the second half of the year. Additional data collection took place in Term 1 of 2019, and data coding and analysis were completed at the end of the year.

To achieve a representative sampling for Primary and Secondary schools, we looked at the distribution of school types for Primary and Secondary. Singapore schools are classified into government schools (about 60%), government-aided schools (about 30%), and autonomous or independent schools (about 10%). Therefore, we observed the focus subject classrooms in 10 government schools, 6 government-aided schools, and 4 autonomous or independent schools, at both Primary and Secondary levels. For each school, we asked for a representative teacher from the relevant Primary 5 and Secondary 3 levels. For Secondary 3, we observed Express classrooms as this constitutes the stream for the majority of the students in secondary schools. In total, we recorded 10 Primary and 12 Secondary units for PE.

Primary	Units	Lessons (Duration)	Secondary	Units	Lessons (Duration)
Games and Sports	1	7 (30 mins)	Volleyball	3	16 (1 hour)
Tchoukball	2	10 (1 hour)	Netball	2	12 (1 hour)
Badminton	2	17 (1 hour)	Floorball	2	12 (1 hour)
Basketball	2	9 (1 hour)	Softball	2	14 (1 hour)
Floorball	1	7 (1 hour)	Basketball	1	8 (1 hour)
Softball	1	9 (30 mins)	Touch Rugby	2	14 (1 hour)
Captain's Ball	1	5 (1 hour)			
**Athletics*	*1*	*3 (1 hour)*			
Total	10	64	Total	12	74

Table 1: Sampling Frame

DATA COLLECTION

For lesson observations**,** teachers and researchers worked together to select an instructional unit of work for observation: "An instructional unit is a series of lessons and tasks through which students experience curriculum content relevant to a particular topic. In essence an instructional unit is a naturally occurring curriculum treatment in the classrooms when knowledge, rather than skill acquisition, is the primary goal" (Alton-Lee & Nuthall, 1992, p.32). Rather than discrete, random lessons for observation, the stipulation of a unit of work facilitates subsequent analyses that charts, models and examines the developmental ebb and flow of knowledge and skills over time.

All lessons were video- and audio-recorded using one to two high definition video cameras and up to two digital audio recorders. The cameras will be placed such that one captures the teacher throughout the lesson, and the second focuses on groups of students when group work occurs. The teacher wore a wireless microphone at all times. The setup therefore optimally captures as much of the whole class interactions and group work. Recordings are processed for subsequent coding by researchers using Singapore Coding Scheme 3 – Music, Visual Arts, PE, and Computer Applications (NT) (SCS3-MAPC). The lesson coding process is supervised by subject specialists in tandem with intensive training in the use of SCS3-MAPC. Interrater reliability issues were monitored through extensive, regular discussions of coded lessons as well as statistical checks. Video Coded data are entered into Microsoft Excel and compiled in SPSS for statistical analyses.

MEASURES

Coders coded each lesson in five-minute intervals ('phases'), as well as larger events such as inquiry activities or discussions/debates ('lessons'); this allows for a temporal examination of classroom practices from the start to the end of a lesson, and across the unit of work. We used a binary coding scheme for almost all the scales (most with multiple subscales and indicators) to record whether or not an instructional event happened during a phase. We also used a Likert scale codes for instances in which we particularly want to capture more detail about an instructional event. Please see Appendix 1 for a copy of the PE coding sheet.

ANALYSIS

Data analysis largely focuses on addressing the research question: "What are the relationships between pedagogical practices, the intellectual quality of knowledge work in the classroom, and teacher pedagogical reasoning in the focus subjects' classrooms?" For this report, we employed the following data analytical procedures (Table 2).

No	Data	Analysis	Addresses Aspect of Research Question
1	Coding Data	Descriptive Statistics: 1. Mean, SD 2. Correlations, Correspondences	1. Descriptions of individual indicators to ascertain pedagogical practices and intellectual quality of knowledge work. 2. To ascertain relationships between key pedagogical practices and intellectual quality of knowledge work.

Table 2: Data Analysis for Classroom Observations

8.

RESULTS OF PE OBSERVATION DATA

PHASAL CODES: DOMAIN-GENERAL

When presenting our data, these are the terms we use. Freq refers to the number of phases (5-minute intervals) where we execute our coding. ALO refers to At Least Once per Lesson where the code occurs. N refers to the total number of phases (5-minute intervals) across all the units, and L N refers to the total number of lessons across all the units (Table 3). For example, in Table 4 below, out of 557 P5 phases of 5-minute intervals, 424 phases were spent 'Listening to the teacher's exposition, whole class demonstration', which is 76.1% of the total phases. For ALO, this means that in 64/64 or 100% of the lessons across all units for P5, this variable occurred at least once during the lesson.

Table	P5 PE N = 557		P5 PE L N = 64		S3 PE N = 748		S3 PE L N = 74	
Domain General Variable Names	Freq	% of Freq	ALO	% of ALO	Freq	% of Freq	ALO	% of ALO

Table 3: Headings for Data Analysis

There is a lot of time spent on teacher's exposition for both Primary and Secondary levels (100%). Practice ranks quite high for both Primary and Secondary units, although Experimental/Exploratory[1] activities occur more frequently in Secondary units. Practice also occurs at a high rate for both Primary and Secondary levels (Table 4).

Table	P5 PE N = 557		P5 PE L N = 64		S3 PE N = 748		S3 PE L N = 74	
Domain General Variable Names	Freq	% of Freq	ALO	% of ALO	Freq	% of Freq	ALO	% of ALO
1. STUDENT LEARNING ACTIVITIES								
1.1 Listening to the teacher's exposition, whole class demonstration	424	76.1%	**64**	**100.0%**	593	79.3%	**74**	**100.0%**
1.10 Experimental/Exploratory activities	149	26.8%	37	57.8%	287	38.4%	60	81.1%
1.17 Practice	251	45.1%	**52**	**81.3%**	350	46.8%	**61**	**82.4%**
1.21 Individual work	75	13.5%	29	45.3%	114	15.2%	36	48.6%
1.22 Pair/Group work	356	63.9%	**60**	**93.7%**	537	71.8%	**74**	**100.0%**

Table 4: Data for Student Learning Activities

1. Experimental/Exploratory activities involves students who are engaged in **hands-on activities** that allow them to exercise a **degree of creativity on their own,** with **minimal rules, guidelines or parameters** within which they have to work on.

The nature of the teacher's exposition most of the time consists of closed questions for both Primary (89.1%) and Secondary (74.3%). Procedural Talk[2] is also the main epistemic focus of classroom talk for PE units for both Primary (98.4%) and Secondary (100%) (Table 5).

Table	P5 PE N = 557		P5 PE L N = 64		S3 PE N = 748		S3 PE L N = 74	
Domain General Variable Names	Freq	% of Freq	ALO	% of ALO	Freq	% of Freq	ALO	% of ALO
2. CLASSROOM TALK: QUESTION AND RESPONSE TYPE								
2.1.1 Teacher Closed Question (Whole Class)	170	30.5%	**57**	**89.1%**	117	15.6%	**55**	**74.3%**
2.1.2 Teacher Open Question (Whole Class)	38	6.8%	19	29.7%	12	1.6%	9	12.2%
6. CLASSROOM TALK: EPISTEMIC FOCUS								
6.2 Procedural Talk	506	90.8%	**63**	**98.4%**	686	91.7%	**74**	**100.0%**

Table 5: Data for Classroom Talk

As a result of heavy teacher instructions in the classes for both primary and secondary, we can say there is visible learning[3] in terms of how the teacher communicates the goals of the lessons, teacher summaries of content/key points and demonstrating exemplars or models of skills (Table 6).

Table	P5 PE N = 557		P5 PE L N = 64		S3 PE N = 748		S3 PE L N = 74	
Domain General Variable Names	Freq	% of Freq	ALO	% of ALO	Freq	% of Freq	ALO	% of ALO
3. VISIBLE LEARNING								
3.1 Teacher communicates learning goals and outcomes	87	15.6%	**49**	**76.6%**	136	18.2%	**68**	**91.9%**
3.6 Teacher summarises key points contributed by students during the lesson/activity	31	5.6%	25	39.1%	107	14.3%	**56**	**75.7%**
3.7 Teacher revisits/recapitulates and/or summarises lesson content	62	11.1%	**53**	**82.8%**	84	11.2%	**68**	**91.9%**
3.10 Exemplars of Performance (Successful/Unsuccessful/Incorrect)	166	29.8%	**58**	**90.6%**	188	25.1%	**56**	**75.7%**

Table 6: Data for Visible Learning

2. Procedural Talk is talk that focuses on how students complete a process or task specific to a discipline, subject or area of study.
3. Visible Learning involves making the process of teaching and learning as transparent (or "visible") to *both* teachers and students as possible.

Most of the feedback[4] occurs at the Task Level at both primary and secondary (Table 7).

Table	P5 PE N = 557		P5 PE L N = 64		S3 PE N = 748		S3 PE L N = 74	
Domain General Variable Names	Freq	% of Freq	ALO	% of ALO	Freq	% of Freq	ALO	% of ALO
4.1 FEEDBACK (WHOLE CLASS)								
4.1.2 Task level feedback	91	16.3%	43	67.2%	109	14.6%	**60**	**81.1%**
4.1.3 Task level feedback (Specific)	60	10.8%	40	62.5%	62	8.3%	41	55.4%
4.2 FEEDBACK (INDIVIDUAL/GROUP)								
4.2.2 Task level feedback	261	46.9%	**55**	**85.9%**	461	61.6%	**73**	**98.6%**
4.2.3 Task level feedback (Specific)	163	29.3%	**56**	**87.5%**	241	32.2%	**68**	**91.9%**

Table 7: Data for Feedback (Whole class & Individual/Group)

Procedural knowledge[5] was the type of knowledge honed in most of the lesson time for both Primary (98.4%) and Secondary (100%) (Table 8).

Table	P5 PE N = 557		P5 PE L N = 64		S3 PE N = 748		S3 PE L N = 74	
Domain General Variable Names	Freq	% of Freq	ALO	% of ALO	Freq	% of Freq	ALO	% of ALO
5. GENERIC FOCUS OF KNOWLEDGE WORK								
5.1 Factual Knowledge	49	8.8%	28	43.7%	35	4.7%	21	28.4%
5.2 Procedural Knowledge	528	94.8%	**63**	**98.4%**	726	97.1%	**74**	**100.0%**
5.3 Conceptual Knowledge	161	28.9%	49	76.6%	153	20.5%	49	66.2%

Table 8: Data for Knowledge Work

4. According to Hattie (2012), Feedback supplies information to *both teachers and students* involving critical task processing, task output, self-regulation and self-development. Teachers are aware of and aim to provide feedback relative to three levels: task, process, and self-regulation.
5. Procedural knowledge, is defined by us, as knowledge that focuses on *how* an epistemic agent undertakes and completes a task specific to a discipline, subject or area of study.

There is no significant Weaving[6] taking place in the lessons and any kind of critical thinking (epistemic pluralism and deliberation) (Table 9 & 10).

Table	P5 PE N = 557		P5 PE L N = 64		S3 PE N = 748		S3 PE L N = 74	
Domain General Variable Names	Freq	% of Freq	ALO	% of ALO	Freq	% of Freq	ALO	% of ALO
7. WEAVING								
7.1 Technical/Theoretical/Scientific - Commonsense/Practical/Everyday	39	7.0%	23	35.9%	24	3.2%	20	27.0%
7.2 Local/Individual - Global/Society	0	0.0%	0	0.0%	0	0.0%	0	0.0%
7.3 Literal/Concept - Metaphor/Analogy/Example	21	3.8%	11	17.2%	16	2.1%	6	8.1%
7.4 Concept - Macro/Contrasting Concept	10	1.8%	3	4.7%	0	0.0%	0	0.0%
7.5 Others	0	0.0%	0	0.0%	0	0.0%	0	0.0%
7.6 Disciplines: Making connections between disciplines	1	0.2%	1	1.6%	0	0.0%	0	0.0%
7.7 Contexts: Making connections between different contexts	15	2.7%	11	17.2%	3	0.4%	3	4.1%
7.8 Texts: Making connections between different texts or genres	0	0.0%	0	0.0%	0	0.0%	0	0.0%

Table 9: Data for Weaving

6. Weaving is the systematic connection making (by teachers and/or students) between different types of knowledge, different time spans, and different fields of knowledge (disciplinary, contextual, spatial), as they are systematically built up towards complex knowledge larger than its component forms.

Table	P5 PE N = 557		P5 PE L N = 64		S3 PE N = 748		S3 PE L N = 74	
Domain General Variable Names	Freq	% of Freq	ALO	% of ALO	Freq	% of Freq	ALO	% of ALO
8. EPISTEMIC PLURALISM AND DELIBERATION								
8.1 Knowledge as a Contestable Claim	0	0.0%	0	0.0%	0	0.0%	0	0.0%
8.1.1 Knowledge Claim Supported by Reasons	0	0.0%	0	0.0%	0	0.0%	0	0.0%
8.1.2 Knowledge critique	0	0.0%	0	0.0%	0	0.0%	0	0.0%
8.1.3 Comparing and Contrasting Information / Knowledge	0	0.0%	0	0.0%	0	0.0%	0	0.0%
8.2 Teacher	0	0.0%	0	0.0%	0	0.0%	0	0.0%
8.3 Teacher/Student	0	0.0%	0	0.0%	0	0.0%	0	0.0%
8.4 Student	0	0.0%	0	0.0%	0	0.0%	0	0.0%

Table 10: Data for Epistemic Pluralism and Deliberation

8.

PHASAL CODES: DOMAIN-SPECIFIC

High student engagement[7] occurs in 52.4% of Primary classes and in 61.4% of Secondary classes. For Primary, this happens at least once per lesson in 89.1% of the total lessons (N=64) while, for Secondary, it occurs in 95.9% of the total lessons (N=74) (Table 11).

Table	P5 PE N = 557		P5 PE L N = 64		S3 PE N = 748		S3 PE L N = 74	
Domain Specific Variable Names	Freq	% of Freq	ALO	% of ALO	Freq	% of Freq	ALO	% of ALO
9.1 STUDENT ENGAGEMENT (% of class)								
9.1.1 No Student Engagement (0%)	134	24.1%	49	76.6%	125	16.7%	59	79.7%
9.1.2 Low Student Engagement (<50%)	70	12.6%	23	35.9%	63	8.4%	23	31.1%
9.1.3 Medium Student Engagement (50% - 65%)	66	11.8%	23	35.9%	98	13.1%	28	37.8%
9.1.4 High Student Engagement (>65%)	**292**	**52.4%**	**57**	**89.1%**	**459**	**61.4%**	**71**	**95.9%**

Table 11: Data for Student Engagement

Activity setting for Primary is mostly Drills (81.3%) with nearly equal distribution for Secondary for Drills (82.4%) and Games (81.1%) (Table 12).

Table	P5 PE N = 557		P5 PE L N = 64		S3 PE N = 748		S3 PE L N = 74	
Domain Specific Variable Names	Freq	% of Freq	ALO	% of ALO	Freq	% of Freq	ALO	% of ALO
10. ACTIVITY SETTING								
10.1 Warm Up	26	4.7%	15	23.4%	54	7.2%	32	43.2%
10.2 Drill Setting	247	44.3%	**52**	**81.3%**	346	46.3%	**61**	**82.4%**
10.3 Game Setting	150	26.9%	37	57.8%	288	38.5%	**60**	**81.1%**

Table 12: Data for Activity Setting

7. Student Engagement refers to the level of engagement or participation each PE class has with the activity assigned to the present session. It also tracks the period of time the students are actively engaged with the activity.

Primary spends 46.9% developing skills of shielding the ball from the defender (Table 13)[8].

Table	P5 PE N = 557		P5 PE L N = 64	
Domain Specific Variable Names	Freq	% of Freq	ALO	% of ALO
12. SKILLS (PRIMARY 5)				
12.3.1 Dribble towards the goal, keeping away from defender (On-the-ball attacker)	107	19.2%	23	35.9%
12.3.2 Throw/Kick/Push to a stationary or moving teammate and move to a new position (On-the-ball attacker)	129	23.2%	25	39.1%
12.3.3 Shield the ball from the defender (On-the-ball attacker)	157	28.2%	30	**46.9%**
12.3.4 Shoot on goal (On-the-ball attacker)	69	12.4%	13	20.3%

Table 13: Data for Skills (Primary)

There is a spread of skills present in secondary classes with teacher spending between 1.4% (defending the shot – hands over the ball) and 17.6% (shooting one-handed) depending on the activity (Table 14)[9].

Table	S3 PE N = 748		S3 PE L N = 74	
Domain Specific Variable Names	Freq	% of Freq	ALO	% of ALO
13. SKILLS (SECONDARY 3)				
13.3.1 Spiking/Tipping (Offence) - Volleyball	12	1.6%	2	2.7%
13.4.1 Pitching - Underhand toss (Offence) - Softball	73	9.8%	10	13.5%
13.6.8 Dribbling - Forehand - Open (Offence) - Floorball	51	6.8%	12	16.2%
13.8.13 Shooting - 1-Handed Shot (Offence) - Netball	59	7.9%	13	17.6%
13.8.16 Defending On-the-Ball Player - Hands Over the Ball (Defence) - Netball	2	0.3%	1	1.4%

Table 14: Data for Skills (Secondary)

8. Data information for each type of game is available showing the distribution of the different skills frequently used. This example was highlighted just to show the most frequently used among all skills. The relevance of the information depends on what is valuable to the game.

9. The above applies for the secondary skills.

LESSON CODES: OVERALL RESULTS

The Lesson codes results correspond to the Phasal results in terms of areas of quality. The domain-general codes are based on previous Core project codes that are STP-related. The domain-specific codes are additional STP codes that are included in the PELOT+ to identify lesson codes that were not covered by the domain-general code rubrics.

For Primary, we see that significant number of lessons have good quality (freq of 2 – good quality) in areas of positive culture (80%), visible teaching and learning (75%), setting expectations and routines (73%) and providing clear explanation (66%) (Table 15).

Table	P5 PE L N = 64		P5 PE L N = 64
Lesson Code Variable Names	% of Freq of 2	Lesson Code Variable Names	% of Freq of 2
14 Positive Classroom Culture	**80%**	22 Differentiated Instruction	**2%**
15 Visible Teaching and Learning	**75%**	23 LP5: Sequencing Learning	63%
16 Lesson Enactment: Questioning/Discussion	6%	24 LE8: Activating Prior Knowledge	28%
17 Lesson Enactment: Conceptual Development	19%	25 LE10: Encouraging Learner Engagement	59%
18 Metacognition	**0%**	26 LE12: Providing Clear Explanation	66%
19 Instructional Flexibility/Pedagogical Agility	6%	27 LE14: Facilitating Collaborative Learning	13%
20 Assessment & Feedback	8%	28 LE16: Concluding the Lesson	61%
21 Knowledge Building Pedagogy	**0%**	29 PCC22: Setting Expectations and Routines	**73%**

Table 15: Data for Lesson Codes (Primary)

For Secondary, we see significant number of lessons have good quality (freq of 2 – good quality) in areas of positive culture (92%), setting expectations and routines (93%), visible teaching and learning (88%), providing clear explanation (88%) and sequencing learning (70%) (Table 16).

Table 13	P5 PE L N = 64		P5 PE L N = 64
Lesson Code Variable Names	% of Freq of 2	Lesson Code Variable Names	% of Freq of 2
14 Positive Classroom Culture	**92%**	22 Differentiated Instruction	**0%**
15 Visible Teaching and Learning	**88%**	23 LP5: Sequencing Learning	70%
16 Lesson Enactment: Questioning/Discussion	5%	24 LE8: Activating Prior Knowledge	19%
17 Lesson Enactment: Conceptual Development	3%	25 LE10: Encouraging Learner Engagement	61%
18 Metacognition	**0%**	26 LE12: Providing Clear Explanation	**88%**
19 Instructional Flexibility/Pedagogical Agility	**0%**	27 LE14: Facilitating Collaborative Learning	7%
20 Assessment & Feedback	7%	28 LE16: Concluding the Lesson	45%
21 Knowledge Building Pedagogy	**0%**	29 PCC22: Setting Expectations and Routines	**93%**

Table 16: Data for Lesson Codes (Secondary)

CORRELATIONS

The positive classroom culture (positive interaction between teacher-student; based on general respectful behavior in class) significantly correlates when there is conceptual development during lesson enactment, which is largely teacher-centered. This means that when teacher is explaining concepts, the students are respectfully and attentively listening but not necessarily asking questions (Table 17).

Table		17 Lesson Enactment: Conceptual Development			17 Lesson Enactment: Conceptual Development
14 Positive Classroom Culture (P5)	Pearson Correlation	0.45	14 Positive Classroom Culture (S3)	Pearson Correlation	0.27
	Sig. (2-tailed)	**0.00**		Sig. (2-tailed)	**0.02**

Table 17: Correlation Data for Positive Classroom Culture and Conceptual Development

Visible learning is significantly correlated to activating prior student learning on the sport (Table 18).

Table		24 Activating Prior Knowledge			24 Activating Prior Knowledge
15 Visible Teaching and Learning (P5)	Pearson Correlation	0.36	15 Visible Teaching and Learning (S3)	Pearson Correlation	0.27
	Sig. (2-tailed)	**0.00**		Sig. (2-tailed)	**0.02**

Table 18: Correlation Data for Visible Teaching & Learning, and Activating Prior Knowledge

Setting expectations and routines is significantly correlated to conceptual development, assessment and feedback, and sequencing learning (Table 19).

Table		29 Setting Expectations and Routines			29 Setting Expectations and Routines
17 Lesson Enactment: Conceptual Development (P5)	Pearson Correlation	0.31	17 Lesson Enactment: Conceptual Development (S3)	Pearson Correlation	0.28
	Sig. (2-tailed)	**0.01**		Sig. (2-tailed)	**0.02**
20 Assessment & Feedback (P5)	Pearson Correlation	0.11	20 Assessment & Feedback (S3)	Pearson Correlation	0.27
	Sig. (2-tailed)	0.39		Sig. (2-tailed)	**0.02**
23 Sequencing Learning (P5)	Pearson Correlation	0.58	23 Sequencing Learning (S3)	Pearson Correlation	0.28
	Sig. (2-tailed)	**0.00**		Sig. (2-tailed)	**0.02**

Table 19: Correlation Data for Setting Expectations & Routines, and Conceptual Development, Assessment & Feedback, and Sequencing Learning

Providing clear explanation is significantly correlated to assessment and feedback and facilitating collaborative learning for Secondary (Table 20).

Table		26 Providing Clear Explanation			26 Providing Clear Explanation
20 Assessment & Feedback (P5)	Pearson Correlation	0.04	20 Assessment & Feedback (S3)	Pearson Correlation	0.23
	Sig. (2-tailed)	0.78		Sig. (2-tailed)	**0.05**
27 Facilitating Collaborative Learning (P5)	Pearson Correlation	0.12	27 Facilitating Collaborative Learning (S3)	Pearson Correlation	0.23
	Sig. (2-tailed)	0.33		Sig. (2-tailed)	**0.05**

Table 20: Correlation Data for Providing Clear Explanation, and Assessment & Feedback, and Facilitating Collaborative Learning

Sequencing learning is significantly correlated to setting expectations and routines (Table 21).

Table		29 Setting Expectations and Routines			29 Setting Expectations and Routines
23 Sequencing Learning(P5)	Pearson Correlation	0.58	23 Sequencing Learning(S3)	Pearson Correlation	0.28
	Sig. (2-tailed)	**0.00**		Sig. (2-tailed)	**0.02**

Table 21: Correlation Data for Setting Expectations & Routines, and Sequencing Learning

KEY CONCERNS & RECOMMENDATIONS

The following recommendations are based on the overall findings from the phasal and lesson codes. These recommendations should be achievable for PE as they are aligned to what other performative subjects (Music and Visual Arts) in this project have already been emphasizing in their curriculum. We strongly urge the curriculum review committee to consider how these can be incorporated in PE classes.

- The lessons are largely teacher-centered although students are actively engaged in the activities. It is advisable to use less unidirectional teacher expositions and engage students through critical questioning and more teacher-student interaction.
- Activities are largely teacher-directed. It will be advisable to empower student learning through inquiry processes where students direct their own learning within the objectives.
- The teachers are flexible in reframing their instructions whenever the students appear not to understand. However, the lessons could use more room for student-directed learning and making real-world connections for a more meaningful learning. For example, the teacher does not provide the knowledge base for the skills being taught and practiced in the classes, thus the lack of weaving and any critical thinking in the lessons.
- There is mostly procedural and some conceptual knowledge developed in the classes. It would be good to consider developing other types of relevant knowledge (e.g., moral and civic knowledge, factual knowledge and metacognitive knowledge).

REFERENCES

Alton-Lee, A., & Nuthall, G. (1992). A generative methodology for classroom research. *Educational Philosophy and Theory*, *24*(2), 29-55.

Hogan, D., Towndrow, P., Kwek, D., & Chan, M. (2013). *Core 2 final report*. Singapore: National Institute of Education.

Ministry of Education (MOE) (2006). *Physical Education Syllabus (Primary, Secondary, Pre-University).*

Ministry of Education (MOE) (2018). *Physical Education Lesson Observation Tool plus (PELOT+).*

APPENDICES

Appendix 1

1	STUDENT LEARNING ACTIVITIES
1.1	Listening to the teacher's exposition, whole class demonstration; students take notes of what teacher says/writes on whiteboard/presents in PPT
1.2	Listening/asking/answering questions (content or curriculum related); IRE; S to S questions/answers (directed/redirected by T)
1.3	Listening /participating (commenting, asking questions) in whole class discussion and dialogue (including IDRE)
1.4	Using reference materials (e.g. textbooks, encyclopedia, teacher-prepared notes) to actively search for information
1.5	Reading written text, class notes/curriculum materials aloud/silently
1.6	Focused viewing of visual text based on teacher's instruction (e.g. political cartoon, portrait and etc.)
1.7	Reproducing text (verbal/written) or performance/action based on teacher's instructions
1.8	Watching video/listening to audio recording
1.9	Giving/listening to student presentations (guided/exploratory/prepared)
1.10	Experimental/Exploratory activities
1.11	Self-Assessment without Rubrics (inc exit passes, traffic light, 3-2-1, reflection journal etc)
1.12	Self-Assessment with Rubrics
1.13	Peer-Assessment without Rubrics
1.14	Peer-Assessment with Rubrics
1.15	Critiquing/Peer-editing
1.16	Working/talking with other student/s on an activity/walking around the classroom (explicit teacher instruction or student-initiated/Gallery walk/Four corners/Stay and stray)
1.17	Practice (includes working on workbook, notebook, worksheet or computer, physical practice or musical instrument)
1.18	Checking/Reviewing/Revising (exemplary/previously completed work) - includes proofreading (whole class)
1.19	Sharing reflection
1.20	Non-learning/non-curriculum oriented activities
1.21	Individual (seat)work
1.22	Pair/Group work

	CLASSROOM TALK: QUESTION AND RESPONSE TYPE
2.1	**Whole Class**
2.1.1	Teacher Closed Question
2.1.2	Teacher Open Question
2.1.3	Student Short Response to Teacher
2.1.4	Student Medium Response to Teacher
2.1.5	Student Extended Response to Teacher
2.1.6	Student Closed Question
2.1.7	Student Open Question
2.1.8	Teacher Short Response
2.1.9	Teacher Medium Response
2.1.10	Teacher Extended Response
2.2	**Individual/Group**
2.2.1	Teacher Closed Question
2.2.2	Teacher Open Question
2.2.3	Student Short Response to Teacher
2.2.4	Student Medium Response to Teacher
2.2.5	Student Extended Response to Teacher
2.2.6	Student Closed Question
2.2.7	Student Open Question
2.2.8	Teacher Short Response
2.2.9	Teacher Medium Response
2.2.10	Teacher Extended Response

3	VISIBLE LEARNING
3.1	Teacher communicates learning goals and outcomes e.g. T states that the communication framework students will learn in the lesson will equip them with healthy social interaction skills
3.2	Teacher tells students what they have learnt previously e.g. T reminds students of the values learnt in the previous term
3.3	Teacher checks students' pre-requisite knowledge, concepts, skills and/or previous learning e.g. T invites students to share what they know about cyberbullying in a lesson on cyberwellness
3.4	Teacher relates concept/topic to everyday life e.g. T links classroom discussion to the roles students play in the wider community/society
3.5	Teacher connects the topic of discussion with the topic/theme/activity of the day's lesson e.g. T highlights that the issues they have discussed about fake news in the social media relate to the broader lesson focus on controlling freedom of speech
3.6	Teacher summarises key points contributed by students during the lesson/activity e.g. T concludes the lesson by meaningfully linking the various student responses she had listed on the whiteboard
3.7	Teacher revisits/recapitulates and/or summarises lesson content e.g. T consolidates student understanding by revisiting the symbols of culture they have learnt in the lesson

	Explicit ("Visible") Performance Standards
3.8	Technical
3.9	Explicit reference to quality
3.10	Exemplars of Performance (Successful/Unsuccessful/Incorrect)

4	FEEDBACK
4.1	**Teacher Feedback: Whole class** *(meant for all students)*
	Non-specific Feedback
4.1.1	Self level feedback
4.1.2	Task level feedback
	Specific Feedback (learning enhancing)
4.1.3	Task level feedback
4.1.4	Process level feedback
4.1.5	Self-regulation level feedback

4.2	**Teacher Feedback: Individual/Group** (*meant for individual students/ groups of students*)
	Non-specific Feedback
4.2.1	Self level feedback
4.2.2	Task level feedback
	Specific Feedback (learning enhancing)
4.2.3	Task level feedback
4.2.4	Process level feedback
4.2.5	Self-regulation level feedback
4.3	**Student Feedback (whole class/individual/group contexts)**
4.3.1	Student to Teacher feedback
4.3.2	Student to Students/s feedback
4.4	**Teacher-Student Interactive Feedback (whole class/individual/group contexts)**

5	**GENERIC FOCUS OF KNOWLEDGE WORK**
5.1	Factual Knowledge
5.2	Procedural Knowledge
5.3	Conceptual Knowledge
5.4	Epistemic Knowledge
5.5	Rhetorical Knowledge
5.6	Hermeneutical Knowledge (Not applicable in PE)
5.7	Metacognitive Knowledge
5.8	Moral and Civic Knowledge
5.9	Aesthetic Knowledge

6	CLASSROOM TALK: EPISTEMIC FOCUS (Whole Class, Individual and Group)
6.1	Factual Talk
6.2	Procedural Talk
6.3	Explanatory Talk
6.4	Temporal Connections
6.5	Conceptual Connections
6.6	Framing Talk
6.7	Reframing Talk
6.8	Justification Talk
6.9	Reflexive Talk
6.10	Performative Talk
6.11	Epistemic Virtues Talk
6.12	Values Talk

7	WEAVING (Talk-based)
	Conceptual Weaving
7.1	**Technical/Theoretical/Scientific - Commonsense/Practical/Everyday:** Making connections between commonsense or everyday knowledge, and technical or scientific knowledge, or between theoretical and practical applications or connecting concepts and procedures
7.2	**Local/Individual - Global/Society:** Making connections between local knowledge and global knowledge, or between individuals or selves and society or community issues or matters
7.3	**Literal/Concept - Metaphor/Analogy/Example:** Making connections between concepts and metaphorical or analogical examples
7.4	**Concept - Macro/Larger Concept/Contrasting Concept:** Making connections between a current concept with a contrasting one or with a larger concept
7.5	**Others**
	Field Weaving
7.6	**Disciplines**: Making connections between disciplines
7.7	**Contexts**: Making connections between different contexts (such as countries, situations)
7.8	**Texts:** Making connections between different texts or genres (intertextuality)

8	**EPISTEMIC PLURALISM AND DELIBERATION** **Epistemic Orientation (Whole class)**
8.1	Knowledge as a Contestable Claim
8.1.1	Knowledge Claim Supported by Reasons
8.1.2	Knowledge critique
8.1.3	Comparing and Contrasting Information / Knowledge
	Epistemic Agency (Time Based)
8.2	Teacher
8.3	Teacher/Student
8.4	Student

	Domain-specific Codes
9	**Student Engagement**
9.1	**% of class**
9.1.1	No Student Engagement (0%)
9.1.2	Low Student Engagement (<50%)
9.1.3	Medium Student Engagement (50% - 65%)
9.1.4	High Student Engagement (>65%)
9.2	**% of time**
9.2.1	Low Student Engagement (<50%) (<2min30s)
9.2.2	Medium Student Engagement (50% - 65%) (2min30s - 3min15s)
9.2.3	High Student Engagement (>65%) (>3min15s)

10	**Activity Setting**
10.1	Warm Up
10.2	Drill Setting
10.3	Game Setting

11	**KNOWLEDGE**
11.1	**Games from Net-Barrier Category (Badminton, Table Tennis, Volleyball) (1v1)**
11.1.1	Send the object into space that is located at either back **(close to boundary)** or front **(close to the net or service line)** away from the opponent to prevent the opponent from returning the object **(depth)**
11.1.2	Send the object into space that is located close to the side and away from the opponent to prevent the opponent from returning the object **(width)**
11.1.3	Find the central base position to maximise court coverage
11.1.4	Move from the central base position to return the shot
11.1.5	Recover to the central base position after returning the object to maximise court coverage
11.2	**Games from Net-Barrier Category (Badminton, Table Tennis, Volleyball) (2v2, 3v3)**
11.2.1	Send the object into space that is located close to the net, deep to the sides, or between the 2 opponents to prevent the opponent from returning the object **(On-the-ball attacker)**
11.2.2	Maintains central base position to maximise court coverage **(Off-the-ball attacker)**
11.2.3	Moves to position to either 'win the point' or carry on to 'set up the attack' **(Off-the-ball attacker)**
11.2.4	Moves from central base position to return the object **(On-the-ball receiver)**
11.2.5	Recovers to the original central base position after returning the object to maximise court coverage **(On-the-ball receiver)**
11.2.6	Covers by moving to a new central base position for the larger playing area **(Off-the-ball receiver)**
11.2.7	Recovers to the original central base position once the on-the-ball receiver has started to move back to his original central base position **(Off-the-ball receiver)**

11.3	**Games from Striking-Fielding Category (Softball)**
11.3.1	Sends the ball into open space, away from the bases that the runners are approaching **(Hitter)**
11.3.2	Maximise coverage of the space as a team **(before ball is sent)**
11.3.3	Fielder closest to the ball fields the ball and throws towards the base the runner is approaching **(after ball is sent)**
11.3.4	Fielder closest to base to be in position to be ready to receive a fielded ball **(after ball is sent)**
11.3.5	Remaining fielders to support the fielding by being available to: - relay the pass when the ball is too far out in the outfield - retrieve the ball in the event of a fielding error **(after ball is sent)**
11.3.6	Moves when the ball is away from the base that the runner is approaching **(Hitter, 1st base runner, 2nd base runner, 3rd base runner)**
11.3.7	Moves to 2nd/3rd base/home (forced run) and subsequent bases if ball is away from the base that the runner is approaching **(1st base runner/2nd base runner/3rd base runner)**
11.3.8	Fielder closest to the ball fields the ball and throws or brings the ball towards the nearest base **(after ball is sent)**
11.3.9	If any runner is advancing, fielder with the ball sends the ball to the base that the runner is approaching **(after ball is sent)**
11.3.10	Fielder with the ball checks that no runner is advancing and returns the ball to the catcher/pitcher **(after ball is sent)**

11.4	**Games from Territorial-Invasion Category (Basketball, Floorball, Football, Netball, Ultimate Frisbee)**
11.4.1	Moves towards the goal **(On-the-ball attacker)**
11.4.2	Sends the ball to off-the-ball attacker **(On-the-ball attacker)**
11.4.3	Supports on-the-ball attacker by moving nearer the goal and be ready to receive a pass **(Off-the-ball attacker)**
11.4.4	Protects the ball from on-the-ball defender by placing the body between the ball and the on-the-ball defender **(On-the-ball attacker)**
11.4.5	Moves beyond the personal space of the on-the-ball defender **(On-the-ball attacker)**
11.4.6	Supports on-the-ball attacker by moving beyond the personal space of the off-the-ball defender and into the line of pass and be ready to receive a pass **(Off-the-ball attacker)**
11.4.7	Moves into the personal space of the on-the-ball attacker (pressure) and into the line of passs to get the ball back, to prevent a pass or force an unsuccessful pass **(On-the-ball defender)**
11.4.8	Moves into the personal space of the off-the-ball attacker and into the line of pass to get the ball back or force an unsuccessful pass **(Off-the-ball defender)**
11.4.9	Moves and shoots when within range and ability and follow through for a possible rebound **(On-the-ball attacker)**
11.4.10	Moves beyond the personal space of the on-the-ball defender and shoot when within ability and range and follow through for a possible rebound **(On-the-ball attacker)**
11.4.11	Moves into position for a possible rebound **(Off-the-ball attacker)**
11.4.12	Pressures on-the-ball attacker to prevent him from having a clear line to shoot or force an unsuccessful shot **(On-the-ball defender)**
11.4.13	Moves into the personal space of the off-the-ball attacker to prevent him from receiving a pass or possible rebound **(Off-the-ball defender)**

12	SKILLS (Primary 5)
12.1	**Games from Net-Barrier Category (Badminton, Table Tennis, Volleyball)**
12.1.1	Strike/Serve/ Volley the object in the intended direction and move to the desired position **(On-the-ball attacker)**
12.1.2	Move to position to strike/volley the object in the intended direction and move back to desired position **(On-the-ball defender)**
12.1.3	Travelling **(Off-the-ball attacker and defender)**
12.2	**Games from Striking-Fielding Category (Softball)**
12.2.1	Strike/Kick/Throw a ball so that it travels in the intended direction and move to the desired position
12.2.2	Travelling
12.2.3	Receive and send a ball to a teammate
12.3	**Games from Territorial-Invasion Category (Basketball, Floorball, Football, Netball, Ultimate Frisbee)**
12.3.1	Dribble towards the goal, keeping away from defender **(On-the-ball attacker)**
12.3.2	Throw/Kick/Push to a stationary or moving teammate and move to a new position **(On-the-ball attacker)**
12.3.3	Shield the ball from the defender **(On-the-ball attacker)**
12.3.4	Shoot on goal **(On-the-ball attacker)**
12.3.5	Move into position to receive a throw/kick/push **(Off-the-ball attacker)**
12.3.6	Move into position for a rebound **(On- and off-the-ball attacker)**
12.3.7	Move into position to tackle **(On-the-ball defender)**
12.3.8	Move into position to block/intercept/prevent a throw/ kick/push **(On- and off-the-ball defender)**

13	SKILLS (Secondary 3)
13.1	**Games from Net-Barrier Category (Badminton)**
13.1.1	Smashing - Forehand **(Offence)**
13.1.2	Serving - Forehand (Low and High) **(Offence)**
13.1.3	Hitting - Overhead Drop Shot - Forehand **(Offence)**
13.1.4	Hitting - Net Lift - Forehand **(Defence)**
13.1.5	Hitting - Overhead Clear - Forehand **(Defence)**
13.1.6	Hitting - Net Shot - Forehand **(Offence & Defence)**
13.1.7	Footwork - Running Steps **(Offence & Defence)**
13.1.8	Footwork - Split Steps **(Offence & Defence)**
13.1.9	Footwork - Side Shuffle **(Offence & Defence)**
13.1.10	Footwork - Lunge **(Offence & Defence)**
13.2	**Games from Net-Barrier Category (Table Tennis)**
13.2.1	Driving/Smashing/Pushing - Forehand **(Offence)**
13.2.2	Driving/Smashing - Backhand **(Offence)**
13.2.3	Serving - Forehand **(Offence)**
13.2.4	Serving - Backhand **(Offence)**
13.2.5	Footwork - One Step **(Defence)**
13.2.6	Footwork - Side Step **(Defence)**
13.2.7	Footwork - Cross Step **(Defence)**
13.2.8	Blocking/Pushing - Forehand **(Defence)**
13.2.9	Blocking/Pushing - Backhand **(Defence)**
13.2.10	Return to the left of the centreline **(Defence)**
13.3	**Games from Net-Barrier Category (Volleyball)**
13.3.1	Spiking/Tipping (Offence)
13.3.2	Serving - Underhand (Offence)
13.3.3	Serving - Overhead (Offence)
13.3.4	Passing - Forearm (Offence)
13.3.5	Passing - Overhead (Offence)
13.3.6	Blocking (Defence)
13.3.7	Digging (Defence)
13.3.8	Footwork - Running Steps (Defence)
13.3.9	Footwork - Shuffle Steps (Defence)
13.3.10	Footwork - Side Steps (Defence)
13.3.11	Footwork - Lunge (Defence)

13.4	**Games from Striking-Fielding Category (Softball)**
13.4.1	Pitching - Underhand toss **(Offence)**
13.4.2	Batting - Ground ball **(Offence)**
13.4.3	Batting - Fly ball **(Offence)**
13.4.4	Catching - Ground ball (with 1 or 2 hands) **(Defence)**
13.4.5	Catching - Fly ball (with 1 or 2 hands) **(Defence)**
13.4.6	Throwing - Overhand **(Defence)**
13.4.7	Throwing - Underhand **(Defence)**
13.4.8	Running **(Offence & Defence)**
13.5	**Games from Territorial-Invasion Category (Basketball)**
13.5.1	Footwork - 1-Foot Landing **(Offence)**
13.5.2	Footwork - 2-Foot Landing **(Offence)**
13.5.3	Dodging - Body Feint **(Offence)**
13.5.4	Dodging - L-Cut **(Offence)**
13.5.5	Dodging - V-Cut **(Offence)**
13.5.6	Passing - Chest Pass **(Offence)**
13.5.7	Passing - Bounce Pass **(Offence)**
13.5.8	Passing - Overhead Pass **(Offence)**
13.5.9	Receiving **(Offence)**
13.5.10	Dribbling - Dominant Hand **(Offence)**
13.5.11	Dribbling - Non-Dominant Hand **(Offence)**
13.5.12	Crossover Dribble **(Offence)**
13.5.13	Shooting - 1-Handed Set Shot **(Offence)**
13.5.14	Shooting - 1-Handed Jump Shot from Under the Basket **(Offence)**
13.5.15	Intercepting **(Defence)**
13.5.16	Rebounding **(Defence)**
13.5.17	Guarding - Defensive Stance **(Defence)**
13.5.18	Guarding - Positioning **(Defence)**
13.5.19	Guarding - Slide Step **(Defence)**
13.5.20	Guarding - Drop Step **(Defence)**

13.6	Games from Territorial-Invasion Category (Floorball)
13.6.1	Shielding **(Offence)**
13.6.2	Dodging - Body Feint **(Offence)**
13.6.3	Dodging - Stick Feint **(Offence)**
13.6.4	Passing - Forehand - Wrist **(Offence)**
13.6.5	Passing - Forehand - Drag **(Offence)**
13.6.6	Receiving - On the Forehand Blade **(Offence)**
13.6.7	Receiving - On the Reverse Blade **(Offence)**
13.6.8	Dribbling - Forehand - Open **(Offence)**
13.6.9	Dribbling - Forehand - Closed **(Offence)**
13.6.10	Dribbling - Forehand - Cross Over **(Offence)**
13.6.11	Shooting - Forehand - Wrist **(Offence)**
13.6.12	Shooting - Forehand - Drag **(Offence)**
13.6.13	Intercepting - On the Forehand Blade **(Defence)**
13.6.14	Intercepting - On the Reverse Blade **(Defence)**
13.6.15	Intercepting - Defensive Stance **(Defence)**
13.6.16	Intercepting - Positioning **(Defence)**
13.6.17	Marking - Defensive Stance **(Defence)**
13.6.18	Marking - Positioning **(Defence)**
13.6.19	Tackling - Block **(Defence)**
13.6.20	Tackling - Poke **(Defence)**
13.6.21	Tackling - Positioning **(Defence)**

13.7	Games from Territorial-Invasion Category (Football)
13.7.1	Dodging - Body Feint **(Offence)**
13.7.2	Passing - Using Inside of the Foot **(Offence)**
13.7.3	Passing - Using Outside of the Foot **(Offence)**
13.7.4	Passing - Push Pass **(Offence)**
13.7.5	Passing - Wall Pass **(Offence)**
13.7.6	Receiving - Using Inside of the Foot **(Offence)**
13.7.7	Receiving - Trapping with Sole of Foot **(Offence)**
13.7.8	Shielding **(Offence)**
13.7.9	Dribbling - Forward **(Offence)**
13.7.10	Dribbling - Dragging the Ball Forward, Backward and Side-To-Side, and Turn 180 Degrees **(Offence)**
13.7.11	Turning - Inside **(Offence)**
13.7.12	Turning - Outside **(Offence)**
13.7.13	Shooting - In-step **(Offence)**
13.7.14	Intercepting **(Defence)**
13.7.15	Marking - Defensive Stance **(Defence)**
13.7.16	Marking - Positioning **(Defence)**
13.7.17	Tackling - Block Tackle **(Defence)**
13.7.18	Tackling - Poke Tackle **(Defence)**

13.8	**Games from Territorial-Invasion Category (Netball)**
13.8.1	Footwork - 1-Foot and 2-Feet Landing **(Offence)**
13.8.2	Footwork - Pivoting in All Directions **(Offence)**
13.8.3	Getting Free - Straight Lead **(Offence)**
13.8.4	Getting Free - Dodges (Single/Double) **(Offence)**
13.8.5	Getting Free - Change in Pace **(Offence)**
13.8.6	Getting Free - Change in Direction **(Offence)**
13.8.7	Passing - Chest Pass **(Offence)**
13.8.8	Passing - Bounce Pass **(Offence)**
13.8.9	Passing - Overhead Pass **(Offence)**
13.8.10	Passing - Shoulder Pass **(Offence)**
13.8.11	Passing - Lob Pass **(Offence)**
13.8.12	Receiving the Ball **(Offence)**
13.8.13	Shooting - 1-Handed Shot **(Offence)**
13.8.14	Intercepting **(Defence)**
13.8.15	Rebounding **(Defence)**
13.8.16	Defending On-the-Ball Player - Hands Over the Ball **(Defence)**
13.8.17	Defending On-the-Ball Player - Intercepting **(Defence)**
13.8.18	Defending On-the-Ball Player - Blocking **(Defence)**
13.8.19	Defending On-the-Ball Player - Defensive Stance (Open/Close) **(Defence)**
13.8.20	Defending On-the-Ball Player - Defensive Footwork (Shadow Defence) **(Defence)**
13.8.21	Defending On-the-Ball Player - Drop Back **(Defence)**
13.8.22	Defending the Shot - Hands Over the Ball **(Defence)**
13.8.23	Defending the Shot - Intercepting **(Defence)**
13.8.24	Defending the Shot - Block Out **(Defence)**

13.9	**Games from Territorial-Invasion Category (Ultimate Frisbee)**
13.9.1	Throwing - Forehand **(Offence)**
13.9.2	Throwing - Backhand **(Offence)**
13.9.3	Footwork - Pivoting **(Offence)**
13.9.4	Footwork - Stopping **(Offence)**
13.9.5	Footwork - Cutting **(Offence)**
13.9.6	Dodging - Body Feint **(Offence)**
13.9.7	Faking - Forehand Fake **(Offence)**
13.9.8	Faking - Backhand Fake **(Offence)**
13.9.9	Marking (When Marking the Cutter) - Positioning **(Defence)**
13.9.10	Marking (When Marking the Thrower) - Defensive Stance **(Defence)**
13.9.11	Catching - Pancake Catch **(Offence & Defence)**
13.9.12	Catching - 1-Handed Rim Catch **(Offence & Defence)**
13.9.13	Catching - 2-Handed Rim Catch **(Offence & Defence)**
	*Thrower refers to on-the-disc attacker *Cutter refers to off-the-disc attacker