The tactical approach to teaching games from teaching, learning and mentoring perspectives

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The tactical approach to teaching games from teaching, learning and mentoring perspectives

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This study examined the teaching of games via a tactical approach (also known as teaching games for understanding) from the theoretical perspective of social constructivism. A pilot study (of student teachers (STs) and pupils) informed the ‘main’ study which included collecting data on 49 STs, 58 cooperating teachers (CTs) and 1177 pupils. ST data were collected through videotaping (lessons), interviews and questionnaires; CT data through interviews and questionnaires; and pupil data through questionnaires. Data analysis techniques included systematic coding of teaching behaviours through computer software, using constant comparison to code open-ended question responses, and computing frequencies of Likert-scale question responses. T-tests were used to compare pre- and post-CT workshop data. Findings suggest that STs’ teaching of the tactical approach was in line with a social constructivist perspective, in part because lessons were student-centred. Overall student activity was 53% of all lessons taught, and STs facilitated pupil learning through several question and answer scenarios. Pupils wrote that they enjoyed playing games in what amounted to ‘authentic’ settings. Their responses also suggest that learning took place through ‘legitimate peripheral participation in communities of practice’ and this facilitated pupil movement through the ‘zone of proximal development’. There were indications that pupil experiences were mediated by ST competence. CTs reported that an in-service workshop on the tactical approach and mentoring was beneficial and subsequent pairings with STs elicited positive feelings from both parties.

\textbf{Keywords:} Social constructivism; Physical education; Tactical games teaching

In response to a government policy shift aimed at producing critical and creative thinkers, Singapore introduced a tactical approach to the teaching of games within a major syllabus revision (1999). The implementation of this tactical approach within Singaporean schools, known as the Games Concept Approach (GCA), has been examined through the theoretical perspective of constructivism. Several authors, including Butler (1996, 2006), Dyson \textit{et al.} (2004) and Kirk and MacPhail (2002), have made connections between the tactical games teaching approach and constructivism.

The concept of educational constructivism (Matthews, 2000) may appear straightforward, but in reality is profoundly challenging. We accept that there are...
conflicting positions regarding constructivist teaching and learning and concur with Richardson (1997) in rejecting the idea that constructivist teaching is:

a monolithic, agreed-upon concept. The extent of the agreement among the various constructivist approaches is that constructivism is a learning or meaning-making theory. It suggests that individuals create their own new understandings, based upon the interaction of what they already know and believe, and the phenomenon or ideas with which they come into contact. (p. 3)

Our focus will be on ‘cognitive’ and ‘social’ aspects because these have been identified as the major constructivist approaches (Richardson, 1997). Claimants of the centrality of the individual in the learning process have alternatively referred to this type of constructivism as ‘cognitive’, ‘psychological’ or ‘personal’. Typically cognitive constructivists draw on the work of Jean Piaget for their theoretical grounding. In Piaget’s later years, his research and theoretical emphasis evolved from global learning stages to learning processes that enabled new constructions of knowledge (Fosnot, 1996). The emphasis in cognitive constructivism is on an individual’s learning, but according to Fosnot (1996), Piaget did not overlook the effect that social interaction had on learning.

That social context is important in the learning process is a widely held belief of the ‘socio-cultural’, ‘socio-historical’ or ‘social’ constructivists. The bulk of literature on social constructivism utilises the theoretical perspective of social and developmental psychologist, Lev Vygotsky (Phillips, 2000) who argued that scientific concepts were classroom-based, formalised and culturally bound. He determined that children made the leap from understanding spontaneously to understanding via scientific concepts through what he called the ‘zone of proximal development’. He defined this ‘Zone’ as ‘the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers’ (Vygotsky, 1978, p. 86). Within the Zone, practical activity is perceived as a system of social meanings and, as such, it has relevance in terms of knowledge construction that is supported within the social structures of team games, teacher networks, mentoring circles and formal pedagogical teams.

Vygotsky came to believe in the important role that dialogue plays between adult(s) and learner(s) and their peers as they question, converse, explain and negotiate meaning (Fosnot, 1996). Other psychologists extended this idea and proposed the concept of ‘scaffolding’ as a way to assist students in the Zone (Bruner, 1984). Teachers or adults initially frame a problem to be solved and facilitate learners’ engagement in its possible solutions by ‘controlling those elements of the task that are initially beyond (their) capability, thus permitting (them) to concentrate upon and complete only those elements that are within (their) range of competence’ (Wood et al., 1976, p. 9). The students become involved through the supportive structure put in place by the teacher and, when they ‘gradually gain control of the task, they take over more of the responsibility’ (Roehler & Cantlon, 1997, p. 9). The teacher then slowly pulls away the scaffolding to allow more independent
problem solving by the students. An example in games teaching would be where a teacher reduces play options by modifying game and setting conditions.

Barbara Rogoff, an often cited disciple of Vygotsky, also believed in the importance of language and communication in the learning process and used the phrase ‘guided participation’ to refer to the interaction between adults and children that ‘provides bridges between familiar skills or information and those needed to solve new problems’ (Rogoff, 1990, p. 66).

Social constructivism and physical education

Since Rovegno and Kirk (1995) pointed out that physical educators have historically followed practices that share features of constructivism (such as Laban’s principles of movement education), there is developing literature that attempts to link constructivism with physical education. Kirk and Macdonald (1998) made a compelling case that ‘constructivist influences, sometimes associated with student-centred learning, have the potential to contribute to new theoretical perspectives on learning in the physical domain that can regenerate school physical education’ (p. 377). Their paper provides a concise summary of the limited research in the area of constructivism within physical education and discusses the influence that constructivism appears to have had on scholarly works of others in the field, such as Ennis (1992) and Rovegno (1993, 1995). They also introduce Lave and Wenger’s (1991, p. 380) theory of situated learning and ‘legitimate peripheral participation in communities of practice’ into physical education pedagogical discourse. These concepts were described as authentic participation within a group whereby members contribute shared practices within a given context. This significance of authentic participation has been extended by pedagogists who suggest that constructivist teaching can, and should, lead to students making connections between authentic learning in physical education and broader socio-cultural influences and contexts in the world beyond school (Fernandez-Balboa, 1997; Cothran & Ennis, 1999).

In the new millennium, several scholars (identified below) have continued to promote the potential of constructivism for teaching physical education. For example, Ennis (2000) suggests that students could be steered from their disinterest and/or disengagement in physical education classes if teachers embraced a ‘social constructivist perspective on curriculum development, such as (her designed model of) “Sport for Peace”’ (p. 119). Another researcher, Chen (2001), describes how an expert teacher utilises a constructivist approach to get students to use critical thinking skills while learning creative dance. Kirk and MacPhail (2002) revisit situated learning in physical education and make the case for its use as a theoretical perspective within the teaching of games. Others have explained how the constructivist teaching of two teachers led students to construct knowledge that made connections with their classmates and ultimately allowed them to link physical education content to ‘their lives, their communities, and the real world’ (Azzarito & Ennis, 2003, p. 179). Using constructivist theories, Rovegno (2003) provides a
detailed description of how teachers’ knowledge is constructed. Most recently, Dyson et al. (2004) discuss and compare how situated learning can be used as the theoretical basis for teaching using the tactical games approach, as well as the sport education and cooperative learning models of pedagogy.

Woven through the aforementioned arguments for social constructivism in physical education is the notion of a student-centred problem-solving approach. This pedagogy facilitates students’ construction of new understandings that draw on their previous knowledge and experience; learning goes beyond passively receiving the wisdom of their teachers.

Social constructivism in higher education

While much has been written in the recent past regarding constructivism and its application in primary and secondary education, far less has been discussed pertaining to the implications of constructivism for tertiary education (Richardson, 1997). As Smith (1991) has highlighted, ‘teaching through the (conceptual) Teaching Games for Understanding (TGfU) model takes considerable pedagogical skill and requires much practice’ (p. 186–187). It should go without saying that, if constructivism is being advocated for use in schools, then significant attention needs to be given to developing such pedagogy in teacher education programmes. Given that the advocacy and application of constructivist teaching is relatively new (particularly in physical education), it might not be easily or readily developed in school settings. Teacher socialisation research (Wright, 2001) has taught us that educating prospective teachers in new ways of thinking and knowing about teaching is not easy. Fosnot (1996) suggests that students in teacher education programmes nearly always enrol with traditional beliefs about teaching and learning and therefore need to experience learning from constructivist perspectives which will ‘challenge traditional beliefs through activity, reflection and discourse in both coursework and field work’ (p. 206). She argues that constructivist learning theories are not only relevant to children but also apply ‘on the adult level’ (p. 207). Of her teacher education programme she speaks about the importance of developing cooperating teachers (CTs) in the constructivist perspective and then placing her student teachers (STs) with them in an arrangement that is ‘cooperative’, rather than the traditional, ‘imitative’ model.

Given the corporeality of the field of physical education with its historical grounding in militaristic principles of physical training (Kirk, 1992), then a shift to a model of pedagogy that integrates the social, cognitive domains with the psychomotor may well be difficult. Indeed when Tjeerdsma (1998) used a constructivist perspective to examine the views of seven CTs within our field, she found that there was little change from pre- to post-practicum in their perceptions of the practicum or their beliefs about teaching physical education.

In our discussion of educating prospective teachers, we stress the importance of in-service education for practising teachers who would act as mentors to beginning
teachers learning to use constructivist pedagogy. ‘Just as young learners construct, so too, do teachers’ (Fosnot, 1996, p. 216). If teachers are to move from their traditional, transmission modes of teaching to more student-centred, constructivist approaches, then ‘conceptual change’ needs to take place. Many scholars, including Maria (2000) and Prawat (1992), suggest that while a social constructivist approach is effective in changing such mindsets, teachers will not succeed in pedagogical change unless they put ‘new’, constructivist advocations into practice. Prawat concludes in his article on teachers’ beliefs about teaching and learning:

In moving toward a constructivist approach to teaching, teachers will need to attend to their own conceptual change at least as much as they attend to this process in their students...If teachers are to rethink teaching and learning along the lines discussed in this article, they must have the opportunity to participate in a learning community with other teachers and educators similar to the one they are trying to provide for their students. (p. 389)

Chen (2002) compared three expert physical educators with three STs and found that all participants ‘demonstrated an adequate constructivist view of pedagogical content knowledge’ (p. 255). However, unlike the expert teachers, the STs did not exhibit constructivist instructional strategies sufficiently to probe their pupils’ deep learning through their responses.

**Purpose**

While there is a plethora of research pertaining to the tactical approach to teaching games, most of it examines students’ technical performance and cannot be confirmed as social constructivism. This study examined the tactical approach from the perspective of STs, pupils and CTs, through a social constructivist lens. A pilot study (McNeill et al., 2004) examining STs’ implementation of the GCA during their teaching practicum allowed us to test our research methods and set the stage for a broader investigation of the approach.

Our main study revolved around the following research questions: (a) Teaching: To what extent were STs able to implement constructivism in their teaching? (b) Learning: What were the perceived benefits that pupils derived from their constructivist learning experiences? (c) Mentoring: What meanings did the CT participants garner from their participation in a constructivist in-service workshop?

**Method**

This study included multiple investigators, student and in-service teachers as well as pupils. The research ‘team’ consisted of six university faculty members, a project officer hired specifically to oversee the government-funded three-year study, and several research assistants. The project was generously funded by Singapore’s Ministry of Education (MoE) and took a total of five years to complete (from initial discussions to final data analyses). Access to local schools, ST and CT teaching sites
and to pupils in the STs’ lessons, was provided by the MoE. As a courtesy, each school principal was given the opportunity to decline participation, but none did. Approval came from the university’s ethical review board, and all participants provided informed consent. All were also advised that they could discontinue at any time without penalty.

No member of the research team had influence over where the STs were placed for their practicum experiences. All placements were determined by MoE personnel, a procedure consistent with policy for STs in all subject areas in Singapore. We asked that, once teachers were trained as CTs, MOE would place as many STs with them as possible; and in several situations this request was accommodated.

Participants

STs, their pupils and mentors reflected Singapore’s racial demographic (Chinese, 71%; Malay, 17%; Indian, 7%; and ‘Other’, 5%).

Teachers. A ‘pilot’ study involving 11 STs (seven women and four men) provided us with a clear understanding of the benefits and challenges faced implementing a constructivist approach. All STs completed their practicum teaching in government (public) primary schools and, for the purposes of the study, applied the GCA with a Grade 4 class or above.

The ‘main’ study commenced with an examination of a further 49 STs (22 women and 27 men) across three discrete pre-service programmes (two-year diploma, four-year degree and two-year post-graduate diploma). Of these 49 participants, 30 taught in a government primary school and 19 were placed in a public secondary school. A follow-up questionnaire was mailed to the participants after at least one year of teaching full-time and 41 teachers (26 primary and 15 secondary) responded.

Learners. The views of 1177 primary school children who were in STs’ GCA lessons were gained through questionnaire. These children were representative of two groups \((N_p = 297\) and \(N_m = 880\)) taught, respectively, by (a) STs in the pilot study or (b) STs who were awarded a ‘distinction’, ‘credit’ or ‘pass’ grade in the main study.

Mentors. Fifty-eight experienced Singaporean physical education teachers volunteered to take part in a mentor in-service workshop. Of these, 25 were women and 33 were men. They had an average of 10 years teaching experience and the majority (35) taught at the secondary level. Most of these participants (40) were classified as ‘experienced’ CTs, having worked with an average of three STs, while the rest were considered ‘inexperienced’. Subsequent to their mentor training, 10 CTs were assigned STs and volunteered to be part of a follow-up study. This cohort consisted of six women and four men.
Research team. The university faculty all had doctoral degrees related to physical education teacher education (PETE), but with varying foci. All had experience teaching in primary and/or secondary school physical education settings (from 4.5 to 18 years). We also ranged in tactical games teaching experience (from none at all to very extensive knowledge and practical implementation in school settings). In the writing of this paper which has involved synthesising understandings gleaned from researching across three interactive dimensions of learning, teaching and mentoring, we resonate with Vygotsky’s position (1986) that knowledge is dynamic. Over the course of six years since the pilot study was conceived, our PETE pedagogy has been shaped by ongoing interrogation of our beliefs and restructured understandings about the GCA and how to develop it as a constructivist pedagogy in the Singapore setting.

Method

In line with the notion of building a rich, collective understanding of the GCA implementation, multiple techniques were used to collect and analyse data.

Pilot study

Because they directly influenced the main study, the following aspects of the pilot study (McNeill et al., 2004) have been included.

Teaching. For the purpose of the pilot study the authors visited their respective STs up to seven times. Four of these visits were considered ‘official research’ and involved observing a GCA taught lesson and pre- and post-observation conferences with the ST. On these occasions the authors also took field notes as non-participant observers (Bogdan & Biklen, 2002). Other visits included informal observations and conversations with STs and CTs to gauge the influence of STs’ GCA teaching in the school environment and to glean insights to prior physical education in each site.

STs were interviewed (semi-structured protocol, each lasting approximately one hour) at the end of the practicum in order to elicit their assessment of learning to use the GCA and the practicum environment. They were asked to explain and expand on critical incidences that occurred during their practicum. Besides providing their perceptions and thoughts of teaching through the GCA, STs were encouraged to discuss issues that had emerged from a preliminary data analysis of the authors’ field notes taken as non-participant observers. These included challenges and/or hindrances to using the GCA; facilitators or support structures that were available (in particular, the CT); potential efficacy of their professional preparation; and anticipated in-service provisions to assist in overall GCA teaching in schools. In addition, a focus group interview took place with all the participants one week following the practicum. We anticipated that this forum would provide participants with deeper insights into their peers’ GCA use and would elicit another layer of
meaning to add richness to our own pedagogical practice. STs also kept a daily journal in which they reflected on their GCA teaching.

**Learning.** The pilot inventory was designed by the authors after a review of relevant literature. It was then vetted by a childhood literacy expert to determine its readability for fourth grade pupils whose first language might not be English. Its trial among 10 fourth graders (not part of the study) resulted in minor rewording to increase clarity. Beyond demographic information, 297 pupils who had had no previous exposure to the GCA were surveyed about their perceptions of the GCA and if the lessons varied from their usual lessons. If they responded, ‘Yes, the lessons were different’, they were probed to answer how they varied. However, because our site access was limited to the practicum period, we could not verify reports about ‘prior physical education’ (taught by the CT) through direct observation. Pupils were also asked about their perceptions of the purpose of the GCA lessons, and what parts of the lesson they liked most and least, and why. Finally, pupils were asked what they learned during the unit.

**Main study**

Initial analysis of the pilot data generated understandings that led to the funded three-year project which is described at the process levels of teaching, learning and mentoring.

**Teaching.** Three separate techniques were used with the 49 STs in our ‘main’ study. Each participant was videotaped teaching a GCA lesson that ranged in length from 30 to 70 minutes. (Some schools had a double-period, block schedule.) STs were also interviewed towards the end of their practicum, using the same questions as in the pilot study. Additionally, a follow-up questionnaire/survey was sent to participants after they graduated and completed a year of teaching full-time in a public school. Questions determined whether participants were still using the GCA in their teaching, and if so what classifications of games had been covered. Additional questions pertained to successes and failures they experienced while using the GCA and whether GCA-related resources were available and used by the participants.

**Learning.** In the two years following the pilot study, primary school children in GCA lessons taught by subsequent cohorts of STs completed the questionnaire. However, it was then administered in two components: their perceptions of (a) their prior PE (in Weeks 1 or 2) and (b) their GCA lessons (in the last week of practicum). Given our concerns about STs’ having had difficulty eliciting ‘deep’ understanding of games-play among their pupils and, in order to reduce the ‘halo’ effect of the pilot study, we next examined the GCA experiences of primary school children on the basis of the practicum grade awarded to their ST (distinction, credit or pass, respectively: \(N_d = 305, N_c = 329, N_p = 246\)). The pupils of all ‘distinction’ and ‘pass’
STs were included and then matched by school type with a similar number of classes of ‘credit’ STs. Note that a ST’s grade was reflective of a range of competencies beyond those demonstrated in the GCA unit their pupils had experienced. Less than 2% of surveys were returned blank or incomplete. Our intention to elicit the views of secondary school pupils was thwarted by contingency school cancellations during Singapore’s incidence of the Severe, Acute Respiratory Syndrome (SARS).

**Mentoring.** These participants were in one of three in-service workshops that had 15 hours devoted to becoming an effective mentor. The general mentor topics included theory and practice of ‘active listening’, ‘problem solving’, ‘systematic observation’ (Randall, 1992) and collaborative conferencing during pre- and post-observation engagement (Glickman *et al.*, 2001). The other 15 hours were devoted to theoretical underpinnings and practical applications of the GCA.

Data from the 58 CTs were collected via three questionnaires, one of which was administered twice. First, a pre-training survey elicited information on demographics, prior experience in using the GCA and fulfilling the role of a cooperating teacher, as well as workshop goals. Second, the ‘Needs Assessment Questionnaire for Mentors’ (Gordon, 1991) was administered twice: pre-workshop (beginning of first day) and post-workshop (at the end of the 30-hour workshop). This questionnaire comprised 21 items regarding mentors’ perceived needs such as ‘interpersonal skills’, ‘collecting classroom observation data’ and ‘problem-solving strategies’.

The third CT survey, also administered at the end of the workshop, served as an overall evaluation. This instrument included nine open-ended questions pertaining to the participants’ feelings about the workshop, the extent to which it met their expectations, least and most helpful aspects, and what might be missing from the workshop.

Upon completion of the mentor training workshops, 10 of the 58 ‘trained’ CTs were paired with STs within the first year. These CTs volunteered to be interviewed after working with a ST for at least seven weeks. An average interview lasted 25 minutes and all interviews were audiotaped and transcribed verbatim. Questions were similar to those asked in the fourth survey but also included inquiries such as: ‘What frustrated or satisfied you as a CT this semester?’ ‘Have you learned anything from your ST this semester?’ and ‘Have you been using the GCA less, more, or about the same since the workshop you attended?’

**Data analysis**

Initial data was inductively analysed (Bogdan & Biklen, 2002) through the constant comparison method (Glaser & Strauss, 1967). The authors met to construct apparent themes based on field notes, and unanimous agreement of themes was achieved. Examples of hindrance themes from the pilot study were lack of facility space and impingements on lesson time (McNeill *et al.*, 2004).
All open-ended questionnaires and interview transcripts were likewise inductively analysed. Responses to each question were coded to the extent that ‘descriptors’ were identified. Similar descriptors were then ‘clumped’ together to help the authors determine categories (Strauss & Corbin, 1990). Once categories were determined, at least one other member of the research team examined the data and checked the categories. Discussion ensued until there was complete agreement on all categories. Key categories were then compared across subsets in the samples and frequency counts of like-descriptors led to calculated percentages.

Videotapes of the lessons taught by STs were analysed by two members of the research team. Concerns over STs’ use of time and their ability to stimulate pupils thinking via their use of the GCA arose during the ST pilot study and therefore became the focus of the lesson analyses. The lesson structure from each tape was broken down through duration recording into the amount of time the STs took to organise, explain, demonstrate, question and review, versus the time pupils were given to develop skills and participate in game activities. Pupil activity time was further categorised as practice (technical drills) or game activity, which was situational, modified or regular play (McNeill, Fry, Wright, Tan, & Rossi, 2008).

The STs’ question-and-answer sessions were also examined to determine question-timing, question-target (individual, small groups or whole class) and question-type (declarative, procedural, affective or tactical). A Noldus (2002) software program ( Observer 4.0) was used to analyse these data. Initially, double coding of the tapes helped to establish the categories related to STs’ use of time and questioning. Subsequently, independent coding generated an inter-observer reliability co-efficient greater than 90% (McNeill et al., 2008).

Questions from Gordon’s (1991) mentor needs assessment survey were answered on Likert-scales and therefore were analysed using SPSS (11.0). A student’s t-test compared pre- and post-workshop sums of means for possible workshop satisfaction. Then paired-sample t-tests were used for each question to determine if the workshop content had a significant effect on the specific perceived needs of the in-service participants.

Data trustworthiness

The initial ST pilot study procedures and early analyses were crucial to the ongoing implementation of this study and multiple data sources were used, including field notes on lesson observations and pre- and post-observation conferences, lesson plans, journal entries, semi-structured interviews and a focus interview. We were able to establish a link between what participants said and did. This link carried over to our examination of the 49 STs as we videotaped their lessons as well as collected survey and interview data. The data from 880 pupils in the main study allowed us to analyse a representative cross-section of Singapore’s student population. Finally, the data collected on 58 CTs included four surveys, with one instrument being used for a pre- and post-workshop analysis.
Triangulating data from multiple participants, collected in multiple ways and times, results in reliability (Cohen et al., 2000). In addition, multiple researchers within the team came to consensus over analyses of questionnaire and interview data. Transcription of interviews occurred within two weeks of each occurrence and member checks were employed (Lincoln & Guba, 1985) to ensure accuracy of transcription and depiction throughout this report.

Limitations

Considerable care and attention (McNeill et al., 2004) ensured that the STs’ participation in the study did not influence their student teaching grades; for example, analysis of videotapes did not occur until after student teaching grades were submitted. In addition, questionnaires for STs, pupils and CTs were un-identified and administered by research assistants. The strength of this study is in sample sizes for each of the sub-groups studied (STs, pupils and CTs), but the findings are contextually bound. One of the requirements of the study was to provide recommendations to the MOE, the research sponsor, regarding the implementation of the GCA in Singapore schools.

Results and discussion

This section is structured around understandings about GCA implementation derived from the three groups of participants. However, we stress that teaching, learning and mentoring are overlapping social fields, not three distinct levels of operation.

Teaching

Analysis of their lesson time allocation revealed that the STs were able to actualise the GGA lesson structure. (See McNeill et al., 2008, for a comprehensive analysis.) The total amount of student activity time (53%) for all the videotaped lessons was greater than combined teacher talk (explanations and demonstrations) and management time (47%). This result is atypical when compared with other research findings pertaining to the amount of student activity time in a given class (Siedentop & Tannehill, 2000, p. 27 <30%; Tinning et al., 2001, p. 295 ~25%): The STs were able to move ‘off-stage’ to a greater extent than that usually indicated in the literature. Thus, one component of constructivist teaching, student-centredness, appears to have been achieved in these GCA lessons. However, while the STs had attempted to initiate the inquiry dimension of GCA lessons, which promotes learners’ thought about situated play, these attempts were seemingly shallow. Of the 900 questions asked by 49 STs, the vast majority (93%) were categorised as lower-order questions (Metzler, 2000) as they were knowledge-based, technical or affective in nature and did not address tactical awareness or decision making. Only
7% were higher order questions that could elicit the desired outcome of critical thinking in pupils. Chen (2002) similarly found that STs in her study failed to probe appropriately during movement experiences that warranted exploratory or problem-solving types of questions. She suggested that teacher educators should consider having pre-service teachers study 'expert teachers' instructional strategies, such as how they ask open-ended questions’ (p. 269). Although questioning is a significant component in constructivist teaching, the intention for developing understanding, tactical awareness or games-sense (all considered to be synonyms) was not fully realised in our main study because declarative and procedural questions dominated the delivery. For conditional knowledge (Ennis, 1994) to evolve and game sense (den Duyn, 1997; Launder, 2001) or tactical awareness (Griffin et al., 1997) to be a significant learning outcome, more contextual game-related questions that probe options and decisions are vital during game-play.

The most prevalent hindrances to the STs’ teaching of the GCA were logistical, with 33% complaining of a lack of facility space and a further 22% bemoaning a lack of equipment. With most PE classes in Singapore having 40 or more pupils, and multiple classes scheduled simultaneously, these constraints are significant. Responses also pertained to pupils, with 29% of STs stating that pupil unfamiliarity with a tactical learning approach was a problem, or that pupils lacked the skills necessary to play a game (18%) or that they lacked conceptual knowledge (14%).

Responding to probes about what helped facilitate their teaching of the GCA, STs stated that university PETE coursework (49%) was most helpful, followed by CTs (16%). However, they also felt that more ‘activity’ (subject matter-based) modules within their PETE programme should be taught using the GCA. As their PETE instructors, we were reminded of Prawat’s (1992) warning that teachers need to make explicit their use of constructivist practices similar to the ones they are trying to develop in their students.

Just as we are arguing for both neophyte and experienced PE teacher-mentors, PETE practitioners themselves need to expand their professional practices and so become ‘multiliterate’ (The New London Group, 1999) pedagogues. For example, they need to be able to articulate procedural and conditional knowledge in both behaviouralist and constructivist forms of pedagogy and make the rationale for the use of these transparent in their own practice. This will enable them to locate themselves in current pedagogical discourse, make explicit their own beliefs and practices and structure their pedagogy in ways that help pre-teachers make conceptual connections in their programme of study.

The most prevalent ST response (33%) pertaining to MoE support of GCA teaching in Singapore schools was to provide more in-service support for experienced PE teachers who do not use the approach in their teaching. As mentioned earlier, teachers were expected to implement a concept approach (in Grade 4 and above) but in reality its use was not pervasive (Tan & Tan, 2001; Rossi et al., 2007).

The one-year follow-up questionnaire revealed that the vast majority of participants (89%) were still engaging the GCA in their teaching (Wright et al., 2006a). A key concept in social constructivism is ‘scaffolding’, whereby teachers/teacher
educators are committed to ‘letting students do the thinking, or to collaborating as a partner in students’ thinking, and (then facilitate) a gradual removal of the support’ (Hogan & Pressley, 1997, p. 190). This is an example of how scaffolding worked with our former students to the extent that they continued to use the GCA without ongoing support from their former professors. We did not know if the experiences the participants had during their PETE would follow throughout the first year of their teaching to the extent that it did. More than half of the participants (55%) reported that they had resources available to them in their school to assist them in their continued use of the GCA. Those resources included books, collegial sharing and mentor advice. Clearly, the situated learning concept within the professional community of practice played a significant role for some of these teachers.

Learning

Multiple consistent reports from children in the pilot and subsequently in the main study indicated that from the learners’ perspective the GCA lessons had provided an interesting and enjoyable learning environment that distinguished those lessons from prior PE lessons. When this result is considered in relation to the findings of lesson time and questioning analyses presented earlier, we realised the potential the GCA has for adding value to physical education in the Singapore context (Fry & Tan, 2004).

In the main study, 80% of descriptors from 880 primary school pupils across all classes responded that their experiences in the GCA lessons were different from their previous PE, as they described, in terms of lesson content (53%, varied or not being fitness), learning climate (27%, motivating, challenging) and process (15%, being taught, learning, grouping). That more children taught by ‘pass’ STs than any other group reported ‘no difference’ between the GCA lessons and their prior PE suggests that those STs judged as least competent tended to have difficulty enacting lessons which manifested the distinguishing qualities of the GCA approach (games-play, small-group work and situated learning tasks). In contrast, children with the highest number of comments about the process components of the GCA making it different from prior physical education had been taught by ‘distinction’ STs, who it would seem were able to make a shift away from the concreteness of technical development.

The perceived focus of the GCA was game-related (45%, play, games-play, games concept), skill-related (36%, learning sports skills, practice tasks) or simply a specific sport (13%). Again, differences between the reported self-perceptions of three groups of students reinforced our supposition that teacher competence had an impact on their pupils’ perceived experiences of the GCA: Most game-play comments were made by pupils of the ‘distinction’ STs; most skill-specific comments were made by children from the ‘credit’ group; and most comments relating merely to the sport-specific context of the GCA lessons were made by the ‘pass’ group. This evidence pertaining to the ‘distinction’ STs supports Smith’s (1991) assertion that teaching for understanding is indeed a sophisticated pedagogy, requiring a degree of

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expertise. There is strong support from children to play the ‘real’ game, and this significant and explicit rationale must be discussed in order to deconstruct this misperception that modified games are not real and have no connection to the ‘bigger’ picture of codified games and sports.

Aspects of the GCA lessons that the children most-liked were ‘everything’ (3%), generally game-related (44%, playing, skill application, modified or authentic games, competition) and sport-specific aspects (34%, game/play, concepts, learning, teamwork). The most common reason cited was that these dimensions of the lessons were ‘fun’ (57%) and other explanations for the ‘most-liked’ lesson dimensions were learning, challenge, social environment and high activity. In their explanations, sport/game, playing the game and modified games often gave context to those areas of enjoyment. No appreciable patterns of difference in most-liked aspects emerged from the between-group comparisons.

Two-thirds of the children articulated in writing aspects of the GCA lessons that they liked least. These pertained to a particular modified game played (9%), a sport-specific skill (13%), a specific sport (14%), or various teacher behaviours (15%, such as talk, question and answer, assigned practice tasks). Reasons for their dislike of these areas were primarily attitudinal (75%, explained negative feelings towards a specific skill, specific sport, physical conditioning, rules, or practice tasks and generally ‘no fun’), related to task difficulty (12%, skill, or various dimensions of game/sport) or to the teacher-led question and answer (8%, ‘boring’, ‘waste of time’, ‘irritating’). Only a small percentage (4%) reported disliking everything in the GCA unit. Exploring the responses from the perspective of ST competency, we found the following trends. GCA lessons reported as having ‘nothing’ least-liked about them were taught by ‘distinction’ STs; those pupils also made the highest amount of comments that emphasised negative feelings towards a particular sport or specific sports skill. Pupils of ‘credit’ and ‘pass’ STs gave the most prevalent least-liked descriptors of teacher behaviours. The pupils of ‘pass’ STs also made the most comments that were merely the name of a sport without an explanation for those negative thoughts. Either the inability or reluctance of these pupils to elaborate on their feelings implies a limited experience within their GCA lessons that is likely associated with their STs’ weaker pedagogical skills.

The children’s perceived GCA lesson outcomes were games/skill-related (33%), concept-related (23%), social-process oriented (21%) and generally sport-related (6%). The comparison of pupils’ experiences on the basis of their ST’s teaching competence, reinforce Rink’s (2006) point that teacher ability does mediate the quality of physical education experiences through the process and product of their pupils’ learning. On the one hand, it seems as if our PETE pedagogy was having some success in stronger STs’ pedagogy because pupils of ‘distinction’ STs made the most comments pertaining to social-processes; and pupils of ‘credit’ STs made the most comments about games-concept outcomes. On the other hand, the most general sport-related outcomes were reported by those of ‘pass’ STs. These results suggest that more students of the most capable STs were deeply engaged in the cooperative small-group learning communities, characteristic of the GCA pedagogy.
that we were stressing, than were pupils of the least capable STs. However, they also imply that STs with weaker teaching competencies were seen by their pupils to be embedded in developing technical games-skills and whom we had seen struggling to shift their lessons away from the concreteness of technical development towards the cognitive and social objectives aspired to through the GCA lesson processes.

Mentoring

Of the 49 STs that took part in this study, 10 were assigned to CTs who had completed one of our mentor training workshops. Eight of these STs stated that their CTs were important facilitators of their learning to teach with the GCA. Of the remaining 39 STs who were attached to untrained CTs, only two mentioned that their CT was helpful with regard to their teaching through the GCA (Wright et al., 2006a). These results indicate the importance of matching STs with suitable CTs who are experienced in constructivist pedagogy. As Lave and Wenger (1991) suggested, communities of practice are important milieux for teachers (CTs and STs) to exchange views and learn from each other. In the process, STs are supported in ‘establishing their own identity’ (p. 115) as full members of the teaching community. Fosnot (1996) has also highlighted the importance of CT training from the perspective of constructivism so that the CT–ST relationship is one of cooperation, rather than imitation.

A total of 58 CTs collectively joined a 30-hour workshop as a very motivated group who wanted to learn more about the GCA, as well as mentoring in general. All but two CTs reported entirely positive comments on their end-of-the-workshop evaluation surveys (Wright et al., 2006b). One criticism, which could also be interpreted as reinforcing the workshop process, was that the in-service should have been longer and another mentioned some confusion caused by different instructors using different jargon related to the GCA. Ten CTs were paired with our STs soon after their workshop participation, and they all agreed to be interviewed towards the end of the STs’ placements.

When asked about frustrations they may have encountered as a CT, the majority (59%) stated that they had none. Those that did feel some frustration spoke about a lack of time for proper post-lesson observation conferencing. We stressed the importance of these debriefing conferences during their ISE workshop and subsequently they reported frustrations about insufficient time to dialogue with their STs. When discussing what they enjoyed most about being a CT, 59% commented that they enjoyed sharing the experience and/or interacting with their ST, and a further 18% spoke of getting a fresh perspective from their ST.

These overall positive feelings expressed by the CTs align with Tjeerdsma’s (1998) findings on the PE CTs whom she studied from a social constructivist perspective. She summarised that a situational factor that seemed to affect positive CT perspectives is assistance provided by university faculty members. In this study, the CTs reported that the workshop was very helpful to them, particularly its
practical aspects (mentioned by 71%) such as practising using systematic observation instruments to assess STs’ lessons, and analysis of a case study that allowed for role-playing in a simulated post-lesson observation conference.

Conclusion

Findings from this comprehensive examination of a tactical approach to teaching games highlight some connections to social constructivism. Analyses of STs’ teaching revealed that pupils were engaged in activity or game time more than teacher talk time, which is consistent with a student-centred approach. Pupils reported enjoying the lessons and many implied that they learned about how to play games in ‘authentic’ settings through ‘legitimate peripheral participation in communities of practice’ (Lave & Wenger, 1991). Through the STs’ facilitation, the GCA also allowed pupils to navigate through the ‘zone of proximal development’ (Vygotsky, 1978). Our evidence suggests a strong link between the ST competence (as represented by their practicum grade) and the quality of perceived learning. However, as the STs’ questions were mostly categorised as lower order, our judgement is that this would not have sufficiently stimulated tactical awareness for games-understanding, especially if their pupils’ oral in-class responses were taken as evidence. This renders the GCA as potentially superficial and under-developed other than by a handful of ‘distinction’ novice teachers. We suggest that when STs, both in their schooling and their PETE programmes, are always asked for direct answers or asked ‘leading questions or shown how the problem will be solved’ (Vygotsky, 1978, p. 85) or solved for them, they will be less receptive to constructivist teaching.

STs valued university course work that helped prepare them to teach and indicated that they preferred to learn to teach using the GCA with students in ‘authentic’ school settings, rather than with their peers in the university setting. As alluded to earlier, we have undertaken both macro and micro changes to our PETE curriculum to improve the pre-service preparation for our STs, with regard to teaching games for tactical awareness. A cohesive picture needs to be presented across the physical activity curriculum, that aspect of PETE where STs build their content knowledge. This need intensifies when several faculty members are engaged in teaching those ‘content’ modules. With the likely diversification of pedagogical beliefs and practices that come with multiple faculty members (and their varied beliefs, skills and experiences), scaffolding between different aspects of the curriculum becomes an extremely complex and possibly inconsistent process of building STs’ pedagogical content knowledge, than it is when a pedagogy team is small.

CTs also saw value in the GCA mentor-training in-service workshop. They reported very positively about working with STs after their training and STs who had opportunity to work with ‘trained’ CTs also commented on how helpful they were. Clearly the concept of ‘communities of practice’ (Lave & Wenger, 1991) was at play in these collaborative relationships. Feiman and Beasley’s idea of mentoring as ‘assisted performance’ (1997) did not have many opportunities to come to fruition in
this socio-historical context where Singaporean physical education teachers have limited experience in constructivist pedagogy. In this particular aspect, the limitation was exacerbated by only a few STs’ being matched with a GCA-trained mentor. Without their CTs (the ‘more’ experienced teacher) having the content knowledge, pedagogical content knowledge and pedagogical experience in the GCA, then novice teachers become the GCA ‘experts’ at the school level. Here, where the more experienced are supposed to be the experts, this can be threatening and has the potential to result in unsatisfactory CT-ST working relationships.

It is perhaps not surprising from the pupils’ perspectives that the strongest constructivist experiences came from ‘distinction’ STs who were able to generate a more authentic and supportive learning environment. This finding sits favourably with Smith’s (1991) assumption that teaching for understanding requires complex pedagogical skills and highlights a possibly unrealistic expectation of neophyte teachers to use the GCA while struggling to manage a class of 40 pupils with limited space and resources. However, as only a handful of STs fall into the ‘distinction’ category, the challenge for our university pedagogy is to scaffold the understanding of constructivism across more of the pre-service modules and increase the intensity of exposure. This might avert potential confusion for STs and CTs about tensions between traditional behaviouralist orientations (favouring techniques and drills) and contemporary constructivism (emphasising tactical awareness through game-play).

The limited amount of PETE pedagogical preparation in teaching for understanding that we are able to provide appears to be insufficient to shift mainstream values and practice to tactical from technical, where STs’ experiences and values are embedded. Without an influence from active professional constructivist practice in the field, the GCA implementation process could falter, save for the efforts of a persistent few.

Nevertheless, research in the area of social constructivism in physical education and PETE is an emerging and very promising field. To date much of the research on the implementation of constructivist approaches in schools has focussed on development of introductory level pedagogy. Investigation of ‘expert’ GCA practice developed by experienced teachers and associated perspectives of their students is warranted, if we are to understand how GCA processes are effective at a more advanced level of practice. Rovegno (1998, 2003) suggests that physical education teachers can ‘reconstruct’ their prior knowledge. However, this is typically not without encountering confusion and conflicting ideas with only partial understanding before the reconstructed knowledge becomes accepted and deeply understood.

As a result of our initial pilot study and main study findings, we changed a number of aspects of the PETE curriculum. The second of two pedagogy modules has become specifically focussed on developing GCA-specific pedagogical content knowledge through learning to use this approach in ‘authentic’ local school contexts. In attempting to move the STs beyond conceiving of the GCA as merely a lesson structure (McNeill et al., 2004), we have begun to emphasise pedagogical processes to a greater extent than we did when this project started; for example, we stress using
the opening situational game to stage the lesson’s tactical focus. Within the GCA lesson framework we encourage extended contextualised practice time at the expense of closure time. Game-play is rich in situations with potential for developing games-understanding. We have been emphasising both the ‘instant replay’ and ‘TV analyst’ techniques (Metzler, 2000) as means for intervening and probing students’ thought related to decision-making and problem-solving situations they encounter during game activity.

We also further stress the importance of Metzler’s questioning stems for inquiry teaching by reinforcing the nature of higher order questions and the contexts in which they are needed. Particularly, we encourage STs to question within small-group activity as opposed to its being staged in a whole-class setting. In this way, not only would students be given a less threatening opportunity to suggest/trial the range of possible options within the small learning communities of their ‘practice’ teams, but also in the smaller setting the beginning teacher might also have a more immediate opportunity to see the success or otherwise of their own framing of the question(s) and this relevance and immediacy of feedback can be lost in an ‘orchestrated’ whole-class Q&A session. PETE students are also given more opportunities to practise sequencing and developing probing questions (through role-playing) to use when pupils are not forthcoming with answers to initial questions. These, as well as peer support in school-based microteaching, are all examples of scaffolding STs’ learning in the zone of proximal development where their learning about and through teaching with the GCA is supported until their pedagogical development catches up. All of these instructional strategies are premised on the assumption that STs already have sufficient content knowledge to make meaningful interpretations of their pedagogical content knowledge (Shulman, 1987).

As Rovegno (1998, 2003) has stated, PE teachers can often struggle with reconstructing knowledge. To change the way teachers teach they also need ‘assisted performance’ (Feiman-Nemser & Beasley, 1997, p. 108) from a more knowledgeable peer or mentor. When a change is mandated, it makes sense that in-service support be available over extended time for teachers to acquire knowledge, skills and dispositions needed to implement the innovation. To accommodate this need, we offer a range of short-term in-service courses focussing on the tactical approach and have created a module at the Master’s degree level, targeted specifically at teachers, developing the role of critical thinking and problem solving in physical education. In this module, teachers, as action researchers, are required to create and implement a constructivist project and evaluate its process and outcomes. From our findings, we infer that mentoring enhances the likelihood that beginning teachers will implement the GCA beyond the institutional demands of their teacher education programme, thus giving more pupils opportunities to develop games-sense through what they see as a more exciting and value-adding experience than that offered in their usual physical education lessons. Wright et al. (2004) summarised socialisation outcomes that can support this approach to teaching through in-service workshops, finding at least one supportive physical education colleague, collecting information regarding the tactical approach (such as textbooks and conferences) and joining an electronic
listserve to share teaching experiences with others who use the tactical approach in their teaching.

These teachers, both novice (STs) and experienced (mentors), in effect become agents of curriculum change, but it is critical that they receive support to go along with their ‘new’ knowledge and experiences in using the tactical approach in their games teaching. The idea of learners who approximate the desired practices of a teacher or a mentor, through the guidance of another teacher or mentor, as the more skilled peer, is an extremely powerful teaching-learning model. Learning to play games under the guidance of a teacher, the more skilled games player, parallels the notion of supported learning within the zone of proximal development (Vygotsky, 1978). In other words, in the Singaporean context where ‘real’ experts in tactical games teaching are scarce, the notion of scaffolding learning within the ‘Zone’ is significant.

References


