Learning in Physical Education

A1. What is learning in PE?

Knapp (1973) considers learning to be ‘permanent change in performance associated with experience.’ To help expand on this definition and provide some practical application of how learning takes place in PE, the following 3 stages should be considered; understanding phase, verbal motor phase and motor phase.

Phase 1 – Cognitive (understanding phase). This stage is inconsistent and performance is not guaranteed. Students rely on the teacher to inform them of what to do and the techniques associated with success. The main source of information for this stage comes from external feedback (from an outside source i.e. the teacher). This is because the student is not experienced enough to rely on their own references on how to improve performance. Experience is required for this to happen.

Phase 2 – Associative (verbal motor phase). At this stage performance is becoming more consistent. Simple tasks such as catching with dominant hand or kicking a ball with dominant foot look fluent (general spatial awareness). In this stage, a student’s sense of how the skill should feel, how and look is being developed. This will help to develop their ability to evaluate their own performance and try improvements.

Phase 3 – Autonomous (motor phase). In this final phase of learning, skills have become fluid and consistent. The motor programming involved in learning skill is now stored in the long term memory. This is the stage where a student can focus upon tactics and strategy. However, all skills need practice and a student should be encouraged to do this regularly. Although there are considered to be ways in which students learn, we must be aware that children will develop and master skills at their own level. It is also dependent on the child’s individual preference as to what system of learning they prefer. In this sense learning can take many forms. However, education is an ever-changing and developing environment and teachers of all levels should be aware of the various systems/strategies available to promote learning. Within this context VAK (visual, auditory and kinaesthetic) model developed by Fleming in 2001 is deemed to be more appropriate and reflects the learning needs and training a teacher receives more so than the traditional VAK (visual, auditory and kinesthetic) model developed by Fleming in 2001. There is little evidence that people learn better if this preferred modality is favoured in all situations. This may be because learning is context-dependent and therefore meaning and content is the most important influence over what is the most appropriate way to present information (Riener & Willingham, 2010).

A2. What is scaffolding?

The term ‘scaffolding’ comes from the works of Wood, Bruner and Ross (1976). The term ‘scaffolding’ was developed as a metaphor to describe the type of assistance offered by a teacher or peer to support learning. In the process of scaffolding, the teacher helps the student master a task or concept that the student is initially unable to grasp independently. The teacher offers assistance with only those skills that are beyond the student’s capability. Of great importance is allowing the student to complete as much of the task as possible, unsuassted. The teacher only attempts to help the student with tasks that are just beyond his current capability. Student errors are expected, but, with teacher feedback and prompting, the student is able to achieve the task or goal.

“Scaffolding is actually a bridge used to build upon what students already know to arrive at something they do not know. If scaffolding is properly administered, it will act as an enabler, not as a disabler” (Benson, 1997).

A3. How does scaffolding promote learning?

In keeping with Vygotsky’s theory of ‘scaffolding’, learning is promoted in a variety of ways. These include breaking the task down in to smaller pieces (technique of a skill), co-operative learning (peer support and teacher input), communication (dialogue between teacher and students, prompts, cue cards and modelling (demonstrations). These strategies develop teamwork, peer dialogue as well as a sense of achievement. It is important when trying to promote learning that teachers consider they are there to assist learning, this involves judging students current abilities and challenging students within their capabilities. Activities which are too far out of reach or too basic can lead to frustration and disengagement. Crucial to success is the teacher’s ability to ascertain what the student already knows so that it can be “hooked”, or connected to the new knowledge and make relevant to the learner’s previous experience, thus increasing the motivation to learn.
On first reflection, we can often observe children who flourish in the classroom but struggle in PE, or vice versa. Such observations can lead to the belief that children have different “styles” of learning that are fixed, such that a child who enjoys reading and writing may never be as comfortable learning in the physical domain. Each child is at a different stage of a learning journey that spans from the abstract and theoretical to the practical and physical reality. Learning in different domains is not incompatible, and in fact capacities in the physical domain can inform verbal and numerical reasoning, and vice versa.

The term ‘scaffolding’ comes from the works of Wood, Bruner and Ross (1976). ‘Scaffolding’ was developed as a metaphor to describe the type of assistance offered by a teacher to peer to support learning.

The zone of proximal development (ZPD) has been defined 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). As teachers, if we can offer learners different ways of engaging with a task, then we are catering for a wider range of learning opportunities and therefore facilitating learning.

Throughout the course of a lesson, a teacher may find they are using a variety of strategies to cater for different stage-of-learning – and therefore different approaches to engage with the aims, content and purpose of the lesson.

In attempting to offer appropriate scaffolding for each learner, the teacher helps each student master a task or concept that the student is initially unable to grasp independently. The teacher offers assistance with only those skills that are beyond the student’s capability.

Of great importance is allowing the student to complete as much of the task as possible, unassisted. The teacher only attempts to help the student with tasks that are just beyond his current capability. Student errors are expected, but, with teacher feedback and prompting, the student is able to achieve the task or goal. When the student takes responsibility for or masters the task, the teacher begins the process of “finding”, or the gradual removal of the scaffolding, which allows the student to work independently. “Scaffolding is actually a bridge used to build upon what students already know to arrive at something they do not know. If scaffolding is properly administered, it will act as an enabler, not as a disabler” (Benson, 1997).

Central to the concept of ‘scaffolding’ is the concept of providing assistance with tasks students are unable to master for themselves. With this in mind, the way in which a teacher pitches their expectations of students is key. This is where prior knowledge of student abilities and differentiation methods come in to their own. A teacher should try to engage all students as fully as possible by pitching the expectations and skills at the appropriate level. This will in turn create a success rich environment where students want to achieve and learn. The environment a teacher creates will also encourage motivation from the teacher and peers. If we have a class which is motivated they are more likely to learn, persist with skills and try and help their peers. In conjunction with motivation, enthusiasm from the teacher also has a significant effect on students. If students get a sense that the teacher enjoys their job and has their best interest at heart, they are more likely to feel valued and want to succeed. Another aspect which affects learning is the type and frequency of feedback. Feedback is one mechanism a teacher uses to develop learning and reinforces expectations. Throughout the feedback process praise is also a useful tool to probe and maintain learning as well as reward individuals (Fishman & Tobey, 1978; Silfman, 1991). Finally Vygotsky mentions the term ‘relatedness’; students often seek the reasons why they are asked to complete certain skills/tasks. If a student understands the how these skills can ultimately improve their physical competence/success in physical education they are more willing to try. If they feel the task is completely unrelated to what they are interested in then they will become disengaged and not be motivated to learn.

References & Research


A7. What is the importance of repetition in learning?

Motor learning research has shown that repetition is integral to supporting motor learning, with some key considerations. So-called ‘blocked’ practice, where we repeat the exact same movement over and over, only teaches us how to do that movement in one particular context, with no challenge to vary and adapt it.

Hence, once the very core aspects of a movement are grasped, learners should be encouraged to repeat the movement in a variety of different contexts and situations. We can vary the distances, power, speed, time permitted, environmental conditions, equipment and more. This ‘contextual variability’ is integral to deep learning, and whilst progress may be slower, the results are more robust.

In order to achieve such prolonged engagement and repetition, it is vital to consider motivation and enjoyment.

A8. How well do teachers need to understand the term scaffolding?

Every teacher will have the capabilities to get the best from their students; this is inherent in the training a teacher receives throughout their PGCE or GTP course. However, this process is one which is continually development due to the variations of intakes, class and ages of students. Larkin (2002) suggests that teachers can follow a few effective techniques of scaffolding which would improve the implementation and understanding of this concept. These techniques include boosting confidence (acknowledging and praising good work), providing enough assistance (not jumping in too soon), avoiding boredom (pitching activity at the right level), and helping children ‘fit in’. Teachers will use these strategies in varying capacities day to day; these are the basic components of developing and maintaining the process of scaffolding.

References & Research


A9. How can scaffolding help a teacher evaluate their student learning and teaching?

The ‘scaffolding’ approach is centered on helping the child in tasks they cannot complete for themselves. In an educational setting this is one of the fundamental roles of a teacher. Teachers are trained and spend the majority if not all of their professional career trying to ensure they get the best out of their students.

One of the ways in which a teacher can develop their evaluation of a lesson is through reflection. This can be reflection on planning as well as teaching. The principles of scaffolding allow a teacher to implement feedback and advice based on their individual needs. Through planning and time with students a teacher will be able to apply the scaffolding principles more easily and confidently.

References & Research

http://jte.sagepub.com/content/53/1/33.full.pdf+html
A10. What role does scaffolding play in the overall learning in Physical Education?

It is important to be mindful that children learn in different ways, at different speeds and assign varying levels of important to tasks. These principles are at the very heart of scaffolding. During their career, teachers develop the skill of accurately judging the abilities of their students prior to setting the activities or during the activities. A crucial part of the scaffolding process is the ability to challenge students appropriately and provide stimulus which is relevant to them which serves as a ‘hook’, that is to use differentiation. If a task is too complex or too simple for a child, they will disengage and often become frustrated (Lipscomb et al, 2004). This not only affects the learning of the individual but can influence the whole class. Over time a teacher’s ability to implement the strategy of scaffolding will develop.

Reference & Research
B1. How can scaffolding be used in conjunction with learning outcomes within a lesson?

Scaffolding is a valuable tool both for planning lessons to achieve learning outcomes and for guiding observation and feedback in lessons. Zhao and Orey (1999) identify three general features of the scaffolding process as sharing a specific goal, whole task approach, and immediate availability of help. In addition, most tasks should also be monitored and assisted by an expert model. If we apply this to the context of a teacher's planning of a lesson, these features will be used to ensure that the outcomes within a lesson will form a crucial part of planning whether this is long or short term.

Step 1: sharing a specific goal — this can be the learning outcomes themselves, what is expected of students in the lesson.

Step 2: whole task approach — each feature of the lesson is related to the overall outcome; in effect the task is learnt as a whole instead of a set of individual skills.

Step 3: immediate availability of help — frequent success is important to the concept of scaffolding as it reduces frustration levels of the learner. Help given in timely and appropriate manner is key to increasing motivation and intrinsic self-efficacy and ensuring that the feedback received is not seen as negative.

Step 4: monitoring assistance — by ensuring the learner throughout the teacher can keep students focused on the task at hand. This step also ensures that productivity is maximised by focusing on an environment where success is achievable. Sometimes it is necessary to utilise students, this also can assist the monitoring assistance phase. Students may also need varying amounts of assistance throughout a lesson.

Step 5: optimal level of help — the delicate balance of how much help is required is something a teacher becomes accustomed to judge. For this step the level of help should be detected to students/child which will assist in motivating them. However, if the learner lacks the necessary skills, a demonstration may be appropriate.

Finally, step 6: conveying an expert model — this is the main strategy for providing an explicit example of the task. When demonstrating the expectations of the task, a clear focus of what is expected is crucial. This may come from the teacher or other pupils; a verbal demonstration can often ensure that expectations are clear.

Given considerations to these six steps should be part of a teacher’s planning as well as integrated in the lesson interaction between the teacher and the pupils.

References & Research


B2. What is the relationship between scaffolding and feedback?

Feedback refers to information provided by an agent such as a teacher or parent regarding performance or understanding (Thierry, 2008).

In a practical subject such as PE there are two types of feedback which are usually deployed; knowledge of results (KR) and knowledge of performance (KP).

Knowledge of results is feedback received about the final outcome of an activity or game, usually in the form of a score or in the case of times and abilities times and weights.

Knowledge of performance refers to information received associated with how well a skill is performed. This type of feedback can be internal or external. Internal knowledge of how well the skill is being performed comes from experience as well as practice. An example of this could be knowing if you throw a ball your throwing arm should be pointing as where you anticipate the ball to go. External feedback comes from an outside agent such as a coach/teacher. This could come in the form of ‘that was a good attempt, try bring your arms through faster.’

From an early age children do not have the capacity to understand or interpret internal feedback. It is up to the teacher to provide guidance on how to proceed so that they can start to accumulate experience. During their school career and sporting life pupils will have many opportunities to experience and engage in varying types of feedback. These experiences will develop learning and understanding about their own capabilities as well as ways to try and improve. In this sense feedback is crucial to the overall development of children physical competence.

References & Research


B3. What is the relationship between scaffolding and motivation?

When we consider a question like this we need to establish the two types of motivation. Intrinsic motivation is defined as the motivation (the drive to do something) from within. A person with intrinsic motivation will persist with a task even in the face of difficulty, will choose to challenge themselves, and will gain rewards simply from the task itself, not necessarily rewards, praise or winning. Extrinsic motivation on the other hand is motivation which is driven by external reward such as money, prizes, status, fear of punishment etc. Extrinsic motivation tends to predict less persistence, engagement and enjoyment, and therefore less secure learning. Often children will experience both types of motivation depending on the situation. In terms of learning, Deci & Ryan (2000) stated that intrinsic motivation results in high quality learning and creativity, thus making it a very important concept for teachers to understand. Bringing motivation and learning back to scaffolding, it is important to encourage pupils to engage in activities at their own level and in their own way. This gives the student a sense of personal meaning as well as encouraging persistence if the task is difficult. If this is fostered a student will be able to choose more challenging tasks which will develop progression and learning. In contrast if pupils feel as if there is only one way to complete a task/activity, in the case of ‘this way or nothing’ they may well experience less engagement, less personal meaning which can, ultimately, leads to a decrease/reduction in overall learning. The prescriptive nature of this approach reduces the autonomy the student feels and this affects motivation.

References & Research


Research

B4. What is the relationship between scaffolding and individualised learning?

Considering students receive, interpret and process information in ways unique to themselves there is need to make every effort to use individualised learning. Although it would be virtually impossible to truly individualise learning for all students, teachers should employ differentiated approaches where feasible. Here teachers can modify the activity to make it more difficult or simpler, thus providing tasks that are appropriate to the individuals in their class.

There is some debate about how practical it is within a school setting to effect individualisation effective. However teachers should be aware of strategies which they have seen in practice and to which they have been introduced explore ways of individualising learning.

B5. What is the relationship between scaffolding and differentiation?

Differentiation is the practice of varying instruction in the learning environment to promote learning in as many students as possible (Tomlinson, 2000). Differentiation is an educational strategy in which students who possess different abilities, display different learning needs, and varying levels of academic achievement are grouped together or given individualized tasks. As a general instructional strategy, differentiation shares many similarities with scaffolding. Both refer to a variety of teaching approaches used to move each student progressively towards physical competence, understanding and ultimately greater independence in the learning process.

When a teacher scaffolds instructions, they typically break up the learning experience, concept/skill into discrete parts. From here teachers can give students the assistance they need to learn each part. For example a teacher may choose to move a group of students on to a more challenging skill such as outwitting an opponent while some other students continue to practice the basics of throwing and catching. This is differentiated learning within a practical subject such as P.E. Differentiation can be effected by task, outcome and by mode of engagement with the material. When a teacher employs differentiated approaches this can be seen as the creation of an environment for individualised learning and development.

B6. What is the relationship between scaffolding and mastery learning?

The relationship between scaffolding and mastery learning is key to the development of overall learning. Mastery learning is where the students are helped to master each learning unit before proceeding to a more advanced learning task” (Bloom 1968). In most cases a teacher would plan to break up a skill or concept in to small chunks to allow students to gain the necessary insight and practice to become content with the subject/activity. From here children would be assessed for their basic understanding and application of the skill and grouped according to their success. Teachers will increase the difficulty of the content allowing students to ‘master’ the topic. In essence placing one chunk of information/knowledge onto another to create a tower, increasing levels of mastery is achieved.

Scaffolding explicitly and deliberately applies these principles and reinforces that children learn in their own way, at their own speed and apply varying amounts of relevance to the tasks.
B7. What is the relationship scaffolding and deep learning/PE?

Scaffolding is a useful tool in developing deep learning within PE. But what is deep learning? Deep learning is said to occur when the learner uses higher order cognitive skills such as analysing, interpreting, synthesising or problem solving to construct long term understanding. Deep learning entails a sustained, substantial and positive application on the part of the learner. In a sense the learner makes the new knowledge/understanding/ability ‘their own’. The concept of scaffolding is applicable here because once someone has achieved sufficient depth in a particular domain, or domains, then the reflective skills and awareness they have developed can begin to facilitate and enhance learning in other domains. Deep learning is said to be beneficial in that it can facilitate transferable learning capacity.

Deep learners are able to reflect on the personal significance of what they are learning. Although they do learn autonomously, there is often an element of collaboration where they seek the teacher’s help to better understand certain areas. This process of asking for help, interpreting the help, applying the answer is also a component of deep learning. This process can be transferred across all curriculum subjects. Scaffolding and deep learning are highly complementary.

References & Research
http://www.simplypsychology.org/piaget.htm

B8. Why is it important to apply principles of scaffolding to pupil learning in physical education?

Schools form a controlled educational environment for most children from the age of two through to 18. Here children are exposed to their own means of physical activity during this period. It is important to challenge, motivate and encourage success from an early age in a subject like PE and this is why researchers such as Piaget (1932) and Vygotsky (1978) develop models such as scaffolding and Zone of Proximal development (ZPD).

The key principle behind scaffolding is delivering a skill in manageable chunks in order for the student to learn the skill. A practical subject such as PE lends itself very well suited to this approach. Without the teacher being able to ‘chunk’ the teaching points, provide context and an environment to practice and refine a skill, scaffolding or indeed learning would not take place. In addition to this PE is also an appropriate subject in which to ask questions and develop a child’s ability to recognise when and how to seek this help is a vital skill and one which scaffolding promotes though the small chunks of information imparted to the student at any one time. In this sense students experience the reward of learning, not only by being able to do a previous ‘impossible’ skill by knowing when to ask and to be able to solve the problem as a result of asking for help.

There are many benefits associated with scaffolding, these range from providing individualised instruction, engaging the learner, motivation, creating momentum (more time learning and discovering rather than searching for the answer), providing differentiated learning, all of which are key components of teaching PE.

References & Research


Research
http://www.piaget.htm