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Original Research

Systems based model: A Holistic Approach to Developmental Movement Education

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ABSTRACT

Considering the human body as a dynamic system, a given movement is the result of contributing subsystems (Thelen and Smith, 1994). In this view, gains in movement performance occur as subsystem performances become optimized. Movement instruction offered from a systems perspective is aimed optimizing learner's performance through evolving understanding and through application.

The Holistic Approach to Developmental Movement Education (HADME) is a systems-based instructional model that depicts the interactive process between learner and practitioner. This mind-body approach utilizes 11 steps to optimize movement performance: A) Current Understandings, B) Increased Insights of Evaluation, C) Truthful Reflection of Current State, D) Systematic Modification to Optimize Performance, E) Application of the Change Tool to Change Target Pattern, F) Fine-Tune Learner Perception Tool Application, G) Improved Understanding Through a Point of Control, H) Expanded Systemic Understanding of Learner's Knowledge/Movement, I) Isolation of Target Muscle for a Constant Steady Flowing Movement, J) Gained Conceptual Understanding of Movement and K) Increased Knowledge of Systemic Inputs.

The instructor adopting this viewpoint may experience continual insights on how to best optimize the performance for an increasing range of learners display unique systemic variations. Gaining insights on how to overcome movement limitations through optimizing subsystem performances, the learner taking part in a HADME may experience greater movement enjoyment and hopefully, a more active lifestyle.

1. Introduction

It is universally acknowledged that physical activity is an important ingredient of a “healthy lifestyle”. Health and fitness professionals thus, commonly promote physical activity and exercise in hopes that movers may enjoy an array of potential health benefits. With greater activity, a happier and healthier mover is thought to emerge, however, adoption of an active lifestyle eludes most adults (Caspersen et al., 2000; Knuth and Hallal, 2009). For such movers, reliance on poorly developed fundamental movement skills may limit the enjoyment or even result in discomfort when taking part in regular movement (Cleland et al., 2017; Lam, 2005).

Being able to better coordinate and control body movements appears to engender more personal satisfaction and greater health benefits from participating in a physical activity program (Haywood and Getchell, 2014; Magill and Anderson, 2014; Gallahue et al., 2012). Support for the notion that more physical activity occurs with more richly developed fundamental motor skills has been documented by Stodden, et al. (2009), who reported more physically fit young adult movers also tended to have highly developed motor skills.

Movement skills and fitness are reciprocally bound. Skill proficiency offers more movement opportunities and potentially increases motivation for movement. In turn, more movement may result in higher fitness levels such as improvements in strength, endurance, agility, and balance. Continued repetition of a movement repertoire can lead to greater skill development and provide opportunities for continued gains in fitness. Recognizing these interrelationships then reveals a critical need to equip individuals with more effective movement strategies. From this perspective, movement practitioners such as physical education teachers, therapists, coaches, and personal trainers might consider utilizing instructional approaches to prompt development of mature fundamental movement skills (Dodd, 2003).

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The focus of this paper therefore, is to present an effective approach of movement education to enhance enjoyment of being active and ultimately lead to an improvement in overall fitness.

2. Background

Bloom's Taxonomy (Bloom et al., 1956) holds that learning occurs in three domains: psychomotor, cognitive and affective. Based on this commonly accepted framework, instruction can be focused on enhancing performance within a specific domain. As *education* is largely concerned with advancing aspects of cognition, the majority of instructional approaches focus on this domain. Further, Bloom, et al. (1956) describes psychomotor performance as being separate and unique and suggests it is best improved through modifications of cognitive approaches.

2.1. Traditional approach to psychomotor instruction

Akin to the instructional design model (analysis, design, develop, implementation and evaluation) primarily used for cognitive gains (Dick et al., 2014), traditional psychomotor instruction is accomplished by first considering the abilities of the learner and then offering individual programming to meet performance goals. For instance, a movement professional in a typical fitness-therapy setting may initiate a movement regimen by first *assessing* an individual's performance through a battery of movement assessments. With fitness levels identified, successful programming would be *developed* to incrementally advance efforts toward reaching a specific performance goal. During program *implementation,* the practitioner assists the learner to perform and complete prescribed movement tasks. Upon completion, a post-program fitness *evaluation* is done to determine areas of program success and its potential limitations.

In achieving programming objectives, practitioners may draw from a variety of instructional approaches. To enhance learners' performance the movement practitioner may likely rely on cognitive approaches, such as prompting, corrective feedback, demonstration or direct instruction (Coker, 2017). For instance, direct instruction used to convey a particular task may likely begin with a procedural description. Then, as the learner completes repetitions, confirmation of correctness is provided. As the learner thoughtfully incorporates feedback during numerous repetitions, skillful performance results. For those lea**r**ners, unable to successfully perform the task, the practitioner may offer individualized and detailed instruction to assist them in overcoming movement limitations or proficiency barriers (Seefeldt, 1993). To successfully facilitate this process, practitioners use a variety of individualized instructional techniques to overcome existing *proficiency barriers* (Stodden et al., 2013). Such an approach would consist of corrective feedback aimed at improving problematic task segments and positive support for successful movements. Once correctly performed, the improved segment is integrated into the movement task. Movement programming using this approach advances the learner's performance from initial fitness assessment levels toward specific performance goals. In this way, fitness gains and skill mastery occur through *regular* rehearsal of a *properly* structured regime (Coker, 2017; Magill and Anderson, 2014; Schmidt and Lee, 2011).

An example of this traditional approach can be seen when, a movement practitioner might provide instruction on how to perform a push-up.

Step 1 (Starting Position): Start on hands and knees with hands directly under shoulders; fingers facing forward and knees are under the hips.

Step 2 Engaging abdominals extend legs to a plank position. Head is aligned with spine; feet are together and toes tucked under.

Step 3 (Downward Phase): Slowly bend the elbows, lowering body until chest or chin touch the mat. Keep the torso rigid and the head aligned with the spine; elbows should stay close to the sides of the body.

Step 4 (Upward Phase): Press upward through arms, straightening the elbows. Keep the torso rigid and head aligned with the spine. Imagine pushing the floor away (American Council on Exercise, 2017).

Incorporating these instructions while completing numerous repetitions, the learner, ideally, would overtime correctly learn how to complete a push-up as well as experiencing incremental gains in muscular strength. However, if aspects of the push-up are incorrectly performed, the practitioner may likely isolate the challenged segment and provide feedback on that specific aspect. Such input may include a recapitulation of the original instructions such as 'Remember to keep torso rigid' or 'Don't forget to keep elbows close to the body'. Learners unable to successfully complete a skillful push-up despite directed feedback will likely be given further instruction that focuses on practicing an isolated portion of the push-up such as 'hold the torso straight in a plank position' or 'with knees touching the ground, keep elbows toward body while lowering'. From this viewpoint, it would follow that the savvier instructor, is one who has a diverse "toolkit" and therefore able to connect different training approaches to meet the unique needs of the learner.

2.2. Alternative approach to psychomotor instruction

The progressive development of initial fundamental motor skills ideally results in the acquisition of mature fundamental skills. Ultimately skillful and enjoyable performance occurs as optimally developed fundamental motor skills are combined and used to complete sport skills and complex movements (Gallahue et al., 2012; Wall and Murray, 1994). For example, as running progresses from short rigid steps to a coordinated use of arms that extend the impact of a powerful stride, a more enjoyable running experience may follow.

Relying largely on a cognitive view, the traditional psychomotor instruction viewpoint asserts that learning occurs as the mover becomes more aware of the world and with practice is better able to self-correct to develop more optimal movements. However, for those learners experiencing ongoing discomfort, pain or dissatisfaction, an approach utilizing practice alone to sharpen ineffective skills may not provide a path for improved performance.

An alternative approach for movement instruction may be found when considering the learner's performance as a whole. A *dynamic systems perspective* holds that a complex system is comprised of numerous subsystems that self-organize into identifiable patterns. Considering the human body as complex system, a resulting pattern for a given movement task would be influenced by various factors such as body size, joint range of motion, and movement experience. In a continual process of solving movement problems to attain a set of physical goals, psychomotor instruction from a Dynamic Systems viewpoint would be aimed at improving subsystem efficiency to optimization the entire body system (Thelen and Smith, 1994).

In attempting to optimize performance of a complex system, it would seem that effective individual psychomotor instruction would promote the acquisition of a more efficient body sub-system regarding control and coordination. In fact, many contemporary movement researchers and scholars (Coker, 2017;

Csikszentmihalyi, 2009; Dodd, 2003; Gallahue et al., 2012; Cleland et al., 2017; Haywood and Getchell, 2014; Lam, 2005; Magill and Anderson, 2014; Mosston and Ashworth, 2002) have expressed the need for a shift in perspective by advocating that a more fruitful movement approach may be gained through events that promote greater understanding and knowledge of bodily movement.

Adopting a perspective that the body is a complex system, movement instruction can be expanded from traditional approaches of thoughtful practice to advancing human performance through enhancing systemic optimization. As such, movement education occurs as the learner is able to more effectively self-monitor movements as a greater understanding and knowledge of the body occurs. Applying theory to inform instructional practitioners how to better optimize movement performance is presented next.

3. Steps in the holistic approach to developmental movement education

Establishing a *holistic* viewpoint that assists the learner in understanding how their movement occurs as a *system;* a series of short qualitative studies was completed (Polsgrove, 2006). Analysis of this inquiry revealed distinct types of interactions occurring between practitioner and learner. The features of these interactions provided the basis for a *systems*-based model of movement education. The Holistic Approach to Developmental Movement Education (HADME) model is a framework to guide systemic movement skill performance through enhanced awareness and application.

The entire HADME model (Fig. 1) represents the instructional process taking place at 3 levels: 1) Overview, 2) Phases and 3) Steps in Holistic Instruction. The *Overview* level is a generalized view of the shared process between practitioner and learner. This interactive process is depicted as occurring through evaluation of the current system, programming and then identification of more optimal patterning. More specific details of movement education can be seen at the *Phases* level. Events (Scoping, Tooling, and Applying) at this level exemplify how systemic understandings results in more optimal movement performance (Polsgrove, 2012).

The *Steps of Holistic Instruction* represent the interactive process between learner and practitioner. The steps (A-K) at this level of systemic description, represent an increase in knowledge or a modification in movement performance. For the learner, there is greater awareness of the mind-body connection. For the practitioner, there is greater knowledge of how to create effective programming for a complex system.

With the goal of enhancing movement performance, the HADME model represents how learner and practitioner work together to optimize systemic organization. Considering holistic instruction from various *levels* provides the practitioner with ease of programming navigation as well as insights to interactive events. With an overarching description of the HADME previously expressed (Polsgrove, 2012), the following is a detailed description of the interactive steps between learner and practitioner. Note the terminology and order of *Steps of Holistic Instruction* (Fig. 1) is presented as a successful representation of how instruction may be offered from systems viewpoint to enhance movement performance. This description is not meant to be a rigid format and phrasing, rather this description is flexible; a readily adaptable approach that should be used to best meet developmentally appropriate needs of the learner.

3.1. Step A: current understandings

Focused on gaining insights about the learner, this initial Step of Holistic Instruction begins with an informal greeting and a recent movement history. This inquiry then extends to gaining greater insights into the most significant of these factors. From these findings, the practitioner determines the *scope* of programming. An example of this interaction could be when the practitioner asks

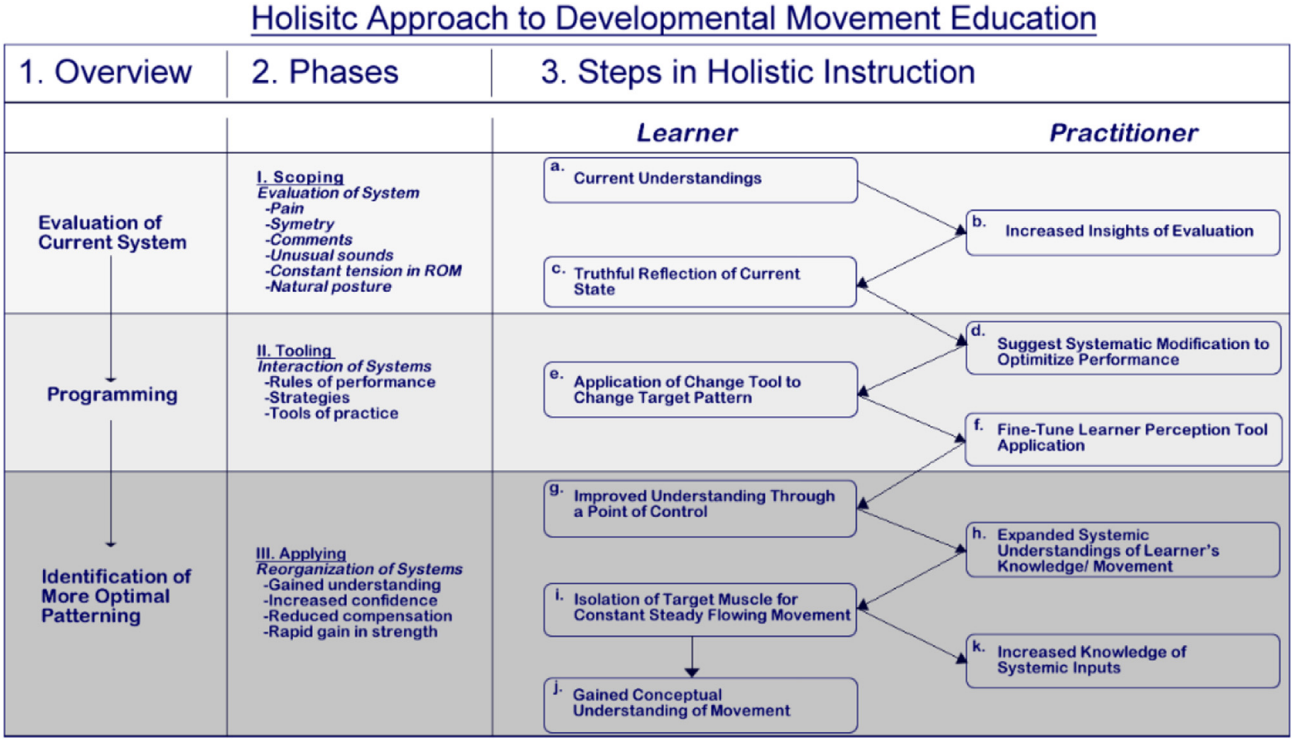

Fig. 1. The heuristic model of the holistic approach to developmental movement education.

questions such as: 'How are you feeling today?' or 'How does your back feel from your last session?' In this way, the learner establishes the habit of an interactive dialogue as communication between mind and body deepens.

Simultaneously, the practitioner is able to home in on salient features that may relate to the learner's current systemic organization. Processing these factors, a systemic representation of the learner's current range of performance begins to emerge for the practitioner.

A successful line of questioning guides the learner in revealing details about the specific areas of their body and how are functioning. The following are some key indicators that a learner may use to express their c*urrent understandings* of movement:

- Specific problems or expectations with regular exercise
- Identification of significant painful or tense areas
- Accurate description of the events of a recent exercise
- Description of a specific improvement of movement performance (e.g. easier to stand up from seated position)

3.2. Step B: increased insights into evaluation

By interpreting movement selections during warm-up exercises, in this second step, the practitioner moves toward a more concrete understanding of the learner's current body organization. To help confirm insights, the practitioner checks for understanding (Cleland et al., 2017), comparing the learner's initial oral description and their physical movement. To facilitate this process, the practitioner might even ask questions regarding a previously identified significant systemic feature, such as; 'last session you had mentioned there was pain in your knees. Are they hurting now?'

Striving to develop a clear representation, the practitioner checks consistency of these primary systemic attributes with the learner's perceptions. The following are example comments that may be offered by the practitioner to gain i*ncreased insights* during this step:

- 'Last week you mentioned that you felt great while you were running. Do you have that same feeling now? '
- 'How is your energy level considering the fact that you have worked more than usual at your job this week?'

3.3. Step C: truthful reflection of current state

With more complete systemic organization identified, the practitioner further tests the validity of this representation by offering a modest programming suggestion to optimize the learner's warm-up. Asking questions such as, 'When you lift your chest does it take tension out of your back?' or 'Do your hips feel more relaxed when you engage your abdominal muscles?' the learner is prompted to truthfully reflect on their current organization. In such instances, if the learner is able to reduce their pain as a result of the modification, then the systemic representation is confirmed. However, if there is an increase in pain then this outcome provides a gained insight that may then be used to identify a more accurate systemic representation of the learner.

In this way, through observation and suggestion, the practitioner is able to fine-tune their understanding of the learner's current systemic organization. For the learner, this reflective process begins to draw focus inward as a more precise ability to express their current body organization is gradually developed. The following are some key indicators used to express a more *truthful reflection* of learner's *current state* of movement:

- Accurate description of movement
- More specific questions about movement
- Offering input on how to modify the exercise routine
- Able to connect actions/movement segments to other events

3.4. Step D: systematic modification to optimize performance

After forming a meaningful representation of the learner's systemic organization, the practitioner is now able to offer more specific instructions on how to optimize movement performance. To accomplish this, the practitioner first considers ways in which the system could be more optimally organized. Through mental comparison, the practitioner selects the potential form that will lead to optimal organization. Mentally comparing the 2 states, the practitioner identifies a potential mechanism that could bring about a necessary systemic shift to the current organization, leading to a more optimal form. For instance, a learner standing with more weight on their right foot due to pain in the left low back might find a more optimal organization by standing with a more aligned posture by shifting hips to left.

Once a potential modifying adjustment has been identified, the practitioner then introduces an organizational modifying concept to the learner. Through a series of verbal, tactile and visual interactions between the learner and practitioner the adjustment gradually brings about the necessary systemic shift and is referred to here as a *tool*. In the case of shifting the hips, a practitioner may have to first lie the learner down and physically move the hips to facilitate the notion of more aligned posture.

The following are example comments that may be offered by the practitioner to gain a *systematic modification to optimize performance* during the *tooling* phase:

- 'Try repositioning your hips to reduce the tension in your knees.'
- 'Now raise your chest to better isolate the back muscles.'
- 'Rotate your body to the right to balance the lift on both sides.'

3.5. Step E: application of the change tool to change target pattern

Once a systemic-change tool has been suggested, the learner begins to include it in their movement patterning. The role of the practitioner in this *step* of holistic instruction is to help implement use of the *tool* in a manner that leads to a shift toward more optimal performance of the system.

Through integration of this *tool* into movement, the learner begins to convey greater implicit understanding of their body. This occurrence may be noted as the learner is able to more clearly describe the events of movement or ask a clarifying question about how to implement the tool. Most likely with the practitioner's aid, the learner should now be able to offer a richer and more aware description of their movement. It is this shared understanding of new movement options that will be used to guide programming. However, if a *tool* that elicits a more optimal performance is not identified, then the learner-practitioner interactive process goes back to Step B (*Increased Insights of Evaluation*) so that an effective change tool may be identified.

If the tool does work, the following are some key indicators used to express an *application of the change tool to change target pattern* of movement:

- Progression toward more advanced movements
- The ability to notice a difference in performance but not fully able to articulate the shift
- Asking for clarification of how to implement the tool

- Expressing a sense of getting the movement in new areas of his or her body, such as 'Wow, I am standing taller' or 'My left leg feels really straight'.

3.6. Step F: fine-tune learner perception tool application

The practitioner and the learner have created a shared understanding of how movement occurs. The practitioner now works to refine this shared insight into a pattern change tool.

From a *systems* point of view, the tool is used to more optimally organize movement related sub-systems thereby causing a shift towards optimal performance in the system as a whole. Through the rich interaction offered by thoughtful ways to improve movement performance, the *tool* is then further defined. In this dialogue, the practitioner asks questions that require more intuitive responses from the learner. From this exchange, the learner gains clearer insight into their movements and the practitioner is able to identify a clearer definition of the tool that can be used to more readily prompt optimal movements.

The following are examples of comments that may be offered by the practitioner to *fine-tune the learner's perception of the tool's application* during the *tooling* phase:

- 'Can you readily visualize how you would perform this movement?'
- 'What do you think would be a good movement task to do next?'
- 'Is there a part of the movement you don't understand?'
- 'Can you adjust your body to be more balanced?'

3.7. Step G: improved understanding through a point of control

Once a symbolic representation of tool has been created, the learner must next, understand how to successfully apply the tool to affect a shift in performance. The function of the practitioner in this step, therefore, is to assist the learner in creating a more robust understanding of how the tool can be used to optimize performance. This expansion occurs as learner makes a stronger connection with application of the tool results in enhanced movement.

As such, the role of the practitioner in this step is to prompt understanding of how application of tool can be used to how to optimize performance. Such a shift might occur as the learner becomes increasingly more stable while completing a series of chest presses; where with each repetition less and less postural variance results in more forceful contractions. With practice and time, the learner becomes more independent and better able to perform the movement with minimal practitioner input. This is indicated when instruction becomes more motivational and less procedural. The following are some key indicators used to express *improved understanding through a point of control* of movement:

- Rapid advancement in strength
- Stable symmetrical posture
- Increase in repetition speed
- Reduction or absence of pain

3.8. Step H: expanded systemic understanding of learner's knowledge/movement

Having established an understanding of how to optimize performance through the use of the change *tool*, the practitioner now aids the learner in applying that understanding in new ways. The goal in this step is to transfer this understanding to other movements and other parts of their body system so that the learner can develop a deeper ability and knowledge of controlling movement. To accomplish this, the practitioner expands upon these new understandings by having the learner apply the tool to a different movement situation. Due to the tenuous state of this more optimal but newly learned organization, attempting to apply the movement change tool to a very different movement is not recommended, as it may disrupt the new pattern development. To increase the likelihood that the individual will be able to successfully transfer a more optimal body organization, the tool should be applied to a movement similar to the activity for which it was developed. Performing a movement with only a slight variation allows for a similar context in which an understanding of how to apply the tool may be achieved. Successful transfer of the tool occurs when learner is able to optimize a varied movement task by applying the change tool.

Thus, through this subtle shift in activity and maintaining the same level of optimal movement performance, a greater understanding and knowledge of the body is achieved. For example, if the learner has discovered how to improve performance on the leg press by engaging their low back muscles, then it is easier for her to transfer use of those same back muscles to the leg extension than it is for something more abstract such as the bicep curl.

As the learner adjusts the body to more optimally perform new tasks, movement skill is being learned. The practitioner gains valuable insights for future instruction by observing how the learner perceives and carries out new movements. For the learner, this generalizing process helps to reinforce learning by mapping patterning to other related events.

The following are example comments that may be offered by the practitioner to support an *expanded systemic understanding of learner's knowledge/movement insights* during the *application* phase:

- 'Remember how you held your shoulders from last week? Now combine that with how we are sitting today.'
- 'Now that we have established how to engage the abs, let's test it out on another leg lift.'
- 'Over the past few months we have developed the coordination for these lifts, now that you have it "locked-in". Let's put more weight on.'

3.9. Step I: isolation of target muscle for a constant steady flowing movement

At this point, the learner has progressed from general reflections of their body to a more complete understanding of how a change tool can optimize performance. With the practitioner's help, the learner is now ready to apply this insight to optimize novel movement tasks.

In the previous step (*Step H*) the practitioner assisted the learner in deepening their understanding of how application of a change tool can enhance the performance of a movement task. To accomplish this shift in performance the learner first initiates a set-up process to activate the change tool. An example of a set-up process could be the learner readying themselves by first taking a deep breath to lift the chest and then aligning the feet so they are even and then shifting the hips to the left so that body weight is distributed more evenly.

With a clear understating of how a change tool can impact performance, next the practitioner prompts the learner to notice how the body works as a system. Encouraging awareness to also include the flow and economy of the moving of their body the leaner may observe the integration of different subsystems having an impact on the whole. From this perspective, optimal movement

can be attained by utilizing a tool or by isolating target muscles both of with indicted more optimal positioning.

As the learner applies these insights to novel conditions ideally the learner begins to 'feel' the target muscles during the exercise. By actively taking part in this process of learning how to effectivity create more optimal patterning a sense of confidence and clarity is gained. Confirmation of a shift in perspective is seen as the learner is able to optimally adjust their body to target isolated muscles and not rely solely on utilizing a tool. For example, a learner noticing an imbalance in force produced by the quadriceps during while extending the legs during a press may shift their weight on the machine to create a more even and flowing motion.

Performing movement patterns with the specific intention of isolating a target muscle through more optimal systemic organization, the learner pointedly focuses on internal processes. Through repetition and continual internalization, the learner begins to make the shift to more automatic optimal movement. Through continued repetition, advanced performance is realized when movement shifts to a constant, continual and rhythmic movement. The system has been optimized. The learner has the means to continue to improve their movements.

The following are indicators that newly learned tools are being used to express *isolation of target muscle for a constant steady flowing movement*:

- Focused, uninterrupted lifting
- Asking for a greater level of resistance
- Displaying a lighter mood
- Adopting a new posture

3.10. Step J: gained conceptual understanding of movement

The learner now understands how to utilize the tool in novel contexts. At this point, although this understanding is of a kinesthetic nature, the practitioner works with the learner to cycle this sensation back to the conceptual understanding.

In this final step, the learner verbally expresses the optimizing strategy. To facilitate a deeper conceptual understanding, the practitioner scaffolds this description by filling in the gaps and encouraging more explicit responses. With a keen conceptual description, the learner is also able to describe how a new movement skill could be applied to enhance everyday events such as walking or getting up from a chair.

At the end of each session, the practitioner suggests a way that incorporates the newly gained awareness into the learner's regular exercise routine. It is now the responsibility of the learner to apply these new skills on their own until the next meeting. The following are newly learned indicators that can be used to express the *gained conceptual understanding of movement*:

- Being able to explain the movement in new ways
- Statement of being able to focus on a feeling versus a series of rules
- Wanting to take on new and different exercises

3.11. Step K: increased knowledge of systemic inputs

From this interactive process, practitioner and learner have both advanced their skill and understanding of movement. For the learner, the process has been one in which they have achieved a deeper understanding of how to use their body to perform more skillful, coordinated and thoughtful movements.

While the practitioner's objective has been to expand the learner's knowledge of how the body functions as a system, such an interactive session has prompted a more robust systems view. Using the insights from a HADME session, the reflective practitioner (Schön 1983) continues to modify their hypotheses of movement. By being able to better explain movement from a *systems* perspective the practitioner is better able to predict the performance outcomes, explain movement behavior and create effective programs.

It is important to recognize the necessity of the dynamic and reciprocal interaction between the practitioner and the learner. Through this shared reciprocity and its concomitant exchange of information, an effective mutual understanding emerges and new insights achieved. From this perspective, the systems-minded practitioner is able to generalize understanding of holistic instruction and better able to adjust this perspective to meet the specific needs of the individual.

The following are some key indicators of an *increased knowledge of systemic inputs to current understandings* of movement by the practitioner:

- Able to speak clearly and concisely about systemic representations
- Able to express movement occurring as a system
- Increased skill in planning exercise sessions
- Quick performance gains

4. Application of HADME

Ideally, movement instruction should utilize approaches that best meet the needs of the learner. For individuals that are able to adequately perform a movement task, instruction from traditional approaches would likely suffice. However, for learners where practice and effort may not result in skillful movements, a *systems* view offers an enhanced approach to movement instruction.

Revisiting the push-up example, instruction offered from a traditional approach for improving performance can be thought of as practicing of series of sequential steps until mastery. Instruction that may be provided from a systems view, the HADME practitioner might first consider the current physicality features of the learner. Such features might include: current skill level, level of arousal, past movement experiences, physiological capacity, muscle strength, body size, and overall health. With an approximate organizational state of the body identified, a push-up variation that would best challenge the systemic organization of the learner would be presented. If the learner has moderate past exercise experience and does not exercise regularly, then a push-up with the following systemic objectives might be explained: 1) keep torso/body rigid with proper postural alignment, 2) with control lower body by bending elbows and shoulders proportionally and 3) push back up before a loss of control.

During performance, the HADME minded practitioner might assist the learner in overcoming non-optimizing features. For instance, manual assistance may be provided to facilitate a connection with the "target" posture by engaging the abdominal muscles. Or the holistic instructor might adjust the task difficulty by having the learner perform the push-up vertically with hands on a wall so the learner may better understand the arm motion of a push-up. With the constraining systemic features *optimized*, progression occurs with increased performance demands such as more repetitions or a wider hand placement.

Successful programming for a system, therefore, relies on assisting learner to advance performance by understanding how to best utilize relevant sub-systems. Programming from this approach

is a process of discovery on how to optimize sub-system functioning in such a manner that significant overall gains can be made. The successful movement practitioner, therefore, is one who is able to tailor instruction by offering movement tasks that best meet the learner's current skill level (systemic organization). Utilizing the HADME view, the critical programming events (analysis, design, develop, implementation and evaluation) are blended together through a seamless interaction with practitioner and leaner.

5. Summary

This paper was intended to delineate an approach to movement instruction that might offer a unique contribution to the psychomotor knowledge domain. Considering the body as a dynamic and complex system, movement education might be aimed at optimizing performance of the entire body system. Utilizing this holistic viewpoint allows for enhanced ways to consider and then provide movement instruction to a learner. For the instructor, it is hoped that this view may open dialogue about best practices of movement education as well as increasing the programming effectiveness of movement practitioners. Adopting the viewpoints expressed may also provide insights for questions including: What skills need to be developed to increase fitness? What are best ways to achieve skill proficiency? How can a learner be more engaged in a fitness program?

The learner taking part in physical activity with an instructional approach that is grounded in the psychomotor domain instead of the traditional cognitive realm may learn to optimize human performance through steps tailored to their unique system, resulting in less frustration and greater success throughout the process. The intended outcome of the Holistic Approach to Developmental Movement Education is for the learner to gain a clearer understanding and knowledge of how to better adjust the body to meet the requirements of the current task. Utilizing the HADME, a practitioner offers motor skill lessons with feedback to prompt a mind-body connection for the learner (Magill and Anderson, 2014; Malina et al., 2004). Instruction aimed at assisting learners to gain better awareness of their body through movement, may in turn provide an added confidence in the knowledge of how their body moves (Cleland et al., 2017; Graham et al., 2012; Darst and Pangrazi, 2015). Thus, by taking part in activities that promote a connection between thought and movement, a deeper sense of movement “understanding” enjoyment and pleasures may be gained (Dodd, 2003). Through greater awareness, appropriate strategies can be utilized that promote optimal individual performance. In this manner, the probability of adopting a more active way of life may be increased.

References

American Council on Exercise, 2017. Exercise library: push-up. Retrieved July 6, 2017, from. https://www.acefitness.org/exercise-library-details/0/41/.

Bloom, B.S., Engelhart, M.D., Furst, E.J., Hill, W.H., Krathwohl, D.R., 1956. Taxonomy of Educational Objectives: the Classification of Educational Goals. Handbook I: Cognitive Domain. David McKay Company. Inc., New York.

Caspersen, C.J., Pereira, M.A., Curran, K.M., 2000. Changes in physical activity patterns in the United States, by sex and cross-sectional age. Med. Sci. Sports Exerc. 32 (9), 1601–1609.

Cleland, D.F., Muellller, S.S., Gallahue, D.L., 2017. Developmental Physical Education for All Children, fifth ed. Human Kinetics, Champaign.

Coker, C.A., 2017. Motor Learning and Control for Practitioners. Taylor and Francis, Milton.

Csikszentmihalyi, M., 2009. Flow: the Psychology of Optimal Experience. Harper Row, New York.

Darst, P.W., Pangrazi, R.P., 2015. Dynamic Physical Education: for Secondary School Students, eighth ed. Pearson Education, San Francisco, CA.

Dick, W., Carey, J.O., Carey, L., 2014. The Systematic Design of Instruction. Merrill Pearson, Upper Saddle River, NJ.

Dodd, G.D., 2003. Toward a Broader Appreciation of Human Motion in Education. Deakin University, Melbourne.

Gallahue, D.L., Ozmun, J.C., Goodway, J.D., 2012. Understanding Motor Development: Infant, Childern, Adolescent, Adults, seventh ed. McGraw Hill, Boston.

Graham, G.M., Holt-Hale, S., Parker, M., 2012. Children Moving: a Reflective Approach to Teaching Physical Education, ninth ed. McGraw-Hill, Boston.

Haywood, K.M., Getchell, N., 2014. Life Span Motor Development, sixth ed. Human Kinetics, Champaign.

Knuth, A.G., Hallal, P.C., 2009. Temporal trends in physical activity: a systematic review. J. Phys. Activ. Health 6 (5), 548–559.

Lam, H.M., 2005. Effects of Instructional Methods on Gross Motor Proficiency of hong kong Preschoolers. Unpublished Dissertation. University of South Australia, Sydney.

Magill, R.A., Anderson, D.I., 2014. Motor Learning and Control: Concepts and Applications, tenth ed. McGraw Hill, Boston.

Malina, R.M., Bouchard, C., Bar-Or, O., 2004. Growth, Maturation, and Physical Activity, second ed. Human Kinetics, Champaign.

Mosston, M., Ashworth, S., 2002. Teaching Physical Education, fifth ed. Macmillan College Publishing Company, New York, NY.

Polsgrove, M.J., 2006. Increasing personal understandings of movement for improved performance: an application of dynamic systems theory. Revista da Educacao Pisica. J. Phys. Educ. 17 (2), 219–225.

Polsgrove, M.J., 2012. A holistic approach to movement education in sport and fitness: a systems based model. J. Bodyw. Mov. Ther. 16 (1), 36–41.

Schön, D.A., 1983. The Reflective Practitioner: How Professionals Think in Action. Basic Books, New York.

Stodden, D., Langendorfer, S., Roberton, M.A., 2009. The association between motor skill competence and physical fitness in young adults. Res. Q. Exerc. Sport 80 (2), 223–229.

Stodden, D.F., True, L.K., Langendorfer, S.J., Gao, Z., 2013. Associations among selected motor skills and health-related fitness: indirect evidence for Seefeldts proficiency barrier in young adults? Res. Q. Exerc. Sport 84 (3), 397–403. https://doi.org/10.1080/02701367.2013.814910.

Schmidt, R.A., Lee, T.D., 2011. Motor Control and Learning: a Behavioral Emphasis, fifth ed. Human kinetics, Champaign, IL.

Seefeldt, V., 1993. Developmental Motor Patterns. Psychology of Motor Behaviour in Sport. Human Kinetics, Champaign, Ill.

Thelen, E., Smith, L., 1994. A Dynamic Systems Approach to the Development of Cogntition and Action. The MIT Press, Cambridge.

Wall, J., Murray, N., 1994. Children and Movement Physical Education in the Elementary School. Wm. C. Brown, Dubuque.