

Course Pre requisites

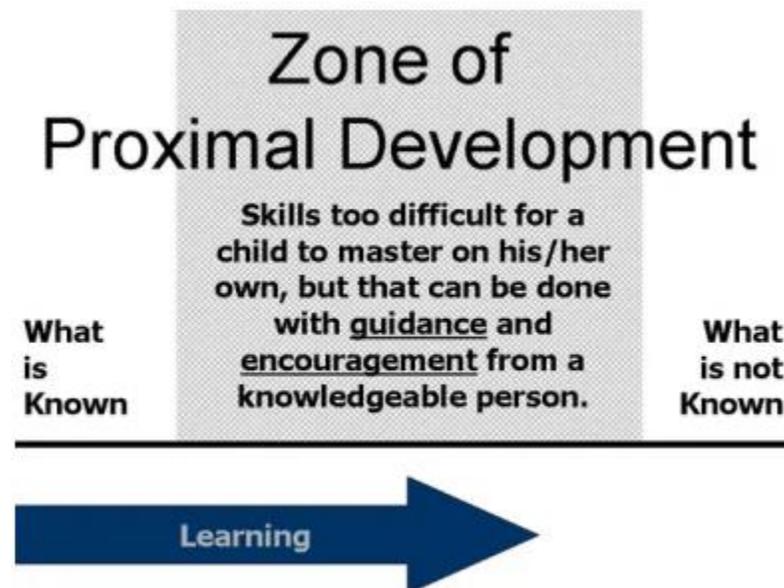
To ensure all coaches receive sufficient theoretical training prior to implementing knowledge in the course, it is a requirement for participants to undertake some pre-course reading and activities

Please read all the materials and complete the activities. You may choose to place it all in a folder to bring to the course with you.

Zone of Proximal Development and Scaffolding

By Saul McLeod (saul-mcleod.html), updated 2019
McLeod, S.A.(2019).What Is the Zone of Proximal Development? Retrieved from
<https://www.simplypsychology.org/Zone-of-ProximalDevelopment.html>

The zone of proximal development refers to the difference between what a learner can do without help and what he or she can achieve with guidance and encouragement from a skilled partner. Thus, the term “proximal” refers to those skills that the learner is “close” to mastering.



Vygotsky's Definition of ZPD

The concept, zone of proximal development was developed by Soviet psychologist and social constructivist Lev Vygotsky (vygotsky.html) (1896 – 1934).

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).

Vygotsky believed that when a student is in the zone of proximal development for a particular task, providing the appropriate assistance will give the student enough of a "boost" to achieve the task.



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To assist a person to move through the zone of proximal development, educators are encouraged to focus on three important components which aid the learning process:

- The presence of someone with knowledge and skills beyond that of the learner (a more knowledgeable other).
- Social interactions with a skillful tutor that allow the learner to observe and practice their skills.
- Scaffolding, or supportive activities provided by the educator, or more competent peer, to support the student as he or she is led through the ZPD.

More Knowledgeable Other

The more knowledgeable other (MKO) is somewhat self-explanatory; it refers to someone who has a better understanding or a higher ability level than the learner, with respect to a particular task, process, or concept.

Although the implication is that the MKO is a teacher or an older adult, this is not necessarily the case. Many times, a child's peers or an adult's children may be the individuals with more knowledge or experience.

Social Interaction

According to Vygotsky (1978), much important learning by the child occurs through social interaction with a skillful tutor. The tutor may model behaviors and/or provide verbal instructions for the child. Vygotsky refers to this as cooperative or collaborative dialogue.

The child seeks to understand the actions or instructions provided by the tutor (often the parent or teacher) then internalizes the information, using it to guide or regulate their own performance.

What is the Theory of Scaffolding?

The ZPD has become synonymous in the literature with the term scaffolding. However, it is important to note that Vygotsky never used this term in his writing, and it was introduced by Wood, Bruner and Ross (1976).

Scaffolding consists of the activities provided by the educator, or more competent peer, to support the student as he or she is led through the zone of proximal development.

Support is tapered off (i.e. withdrawn) as it becomes unnecessary, much as a scaffold is removed from a building during construction. The student will then be able to complete the task again on his own.

Wood et al. (1976, p. 90) define scaffolding as a process "that enables a child or novice to solve a task or achieve a goal that would be beyond his unassisted efforts."

As they note, scaffolds require the adult's "controlling those elements of the task that are initially beyond the learner's capability, thus permitting him to concentrate upon and complete only those elements that are within his range of competence" (p. 90).

It is important to note that the terms cooperative learning, scaffolding and guided learning all have the same meaning within the literature. The following study provides empirical support both the concept of scaffolding and the ZPD.



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Wood and Middleton (1975)

Procedure: 4-year-old children had to use a set of blocks and pegs to build a 3D model shown in a picture. Building the model was too difficult a task for a 4-year-old child to complete alone. Wood and Middleton (1975) observed how mothers interacted with their children to build the 3D model. The type of support included:

- General encouragement e.g., 'now you have a go.'
- Specific instructions e.g., 'get four big blocks.'
- Direct demonstration, e.g., showing the child how to place one block on another.

The results of the study showed that no single strategy was best for helping the child to progress. Mothers whose assistance was most effective were those who varied their strategy according to how the child was doing. When the child was doing well, they became less specific with their help. When the child started to struggle, they gave increasingly specific instructions until the child started to make progress again. The study illustrates scaffolding and Vygotsky's concept of the ZPD. Scaffolding (i.e., assistance) is most effective when the support is matched to the needs of the learner. This puts them in a position to achieve success in an activity that they would previously not have been able to do alone.

Wood et al. (1976) named certain processes that aid effective scaffolding:

- Gaining and maintaining the learner's interest in the task.
- Making the task simple.
- Emphasizing certain aspects that will help with the solution.
- Control the child's level of frustration.
- Demonstrate the task.

Scaffolding vs. Discovery Learning

Freund (1990) wanted to investigate if children learn more effectively via Piaget's concept of discovery learning or by guided learning via the ZPD.

She asked a group of children between the ages of three and five years to help a puppet to decide which furniture should be placed in the various rooms of a dolls house. First Freund assessed what each child already understood about the placement of furniture (as a baseline measure).

Next, each child worked on a similar task, either alone (re: discovery based learning) or with their mother (re: scaffolding / guided learning). To assess what each child had learned they were each given a more complex, furniture sorting task.

The results of the study showed that children assisted by their mother performed better at the furniture sorting than the children who worked independently.

Educational Applications

Vygotsky believes the role of education to provide children with experiences which are in their ZPD, thereby encouraging and advancing their individual learning. (Berk, & Winsler, (1995).

'From a Vygotskian perspective, the teacher's role is mediating the child's learning activity as they share knowledge through social interaction' (Dixon-Krauss, 1996, p. 18).

Lev Vygotsky (vygotsky.html) views interaction with peers as an effective way of developing skills and strategies. He suggests that teachers use cooperative learning exercises where less competent children develop with help from more skillful peers - within the zone of proximal development.



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Scaffolding is a key feature of effective teaching, where the adult continually adjusts the level of his or her help in response to the learner's level of performance. In the classroom, scaffolding can include modeling a skill, providing hints or cues, and adapting material or activity (Coppie & Bredekamp, 2009).

Consider these guidelines for scaffolding instruction (Silver, 2011).

- Assess the learner's current knowledge and experience for the academic content.
- Relate content to what students already understand or can do.
- Break a task into small, more manageable tasks with opportunities for intermittent feedback.
- Use verbal cues and prompts to assist students.

Scaffolding not only produces immediate results, but also instills the skills necessary for independent problem solving in the future.

A contemporary application of Vygotsky's theories is "reciprocal teaching," used to improve students' ability to learn from text. In this method, teacher and students collaborate in learning and practicing four key skills: summarizing, questioning, clarifying, and predicting. The teacher's role in the process is reduced over time.

Vygotsky's theories also feed into current interest in collaborative learning, suggesting that group members should have different levels of ability so more advanced peers can help less advanced members operate within their zone of proximal development.

Example of the Zone of Proximal Development

Maria just entered college this semester and decided to take an introductory tennis course. Her class spends each week learning and practicing a different shot. Weeks go by, and they learn how to properly serve and hit a backhand.

During the week of learning the forehand, the instructor notices that Maria is very frustrated because she keeps hitting her forehand shots either into the net or far past the baseline. He examines her preparation and swing. He notices that her stance is perfect, she prepares early, she turns her torso appropriately, and she hits the ball at precisely the right height.

However, he notices that she is still gripping her racquet the same way she hits her backhand, so he goes over to her and shows her how to reposition her hand to hit a proper forehand, stressing that she should keep her index finger parallel to the racquet. He models a good forehand for her, and then assists her in changing her grip. With a little practice, Maria's forehand turns into a formidable weapon for her!

In this case, Maria was in the zone of proximal development for successfully hitting a forehand shot. She was doing everything else correctly, but just needed a little coaching and scaffolding from a "More Knowledgeable Other (vygotsky.html#MKO)" to help her succeed in this task.

When that assistance was given, she became able to achieve her goal. Provided with appropriate support at the right moments, so too will students in classrooms be able to achieve tasks that would otherwise be too difficult for them.



Self-Determination Theory: LeBron James and his return to Cleveland

Written by Maximilian H Pollack, M.S

Surprising though it may have been, one of the most talented athletes in our world today, LeBron James, has chosen to leave the NBA's Miami Heat team to come home to the NBA's Cleveland Cavaliers team. For all athletes, being happy where you are and with what you are doing is a crucial aspect of peak performance. Playing the game you love leads to experiencing the most joy, self-fulfillment and true happiness.

Specific differences within an individual's intrinsic/extrinsic motivations could potentially ignite or dampen personal growth. This can result in a person achieving higher levels of self-motivation, energy, and integration in certain domains or situations than they would in others. In LeBron's case, leaving the Miami Heat to bring his talents to Cleveland, his personal development, performance, and overall well-being were all heavily considered. Similarly, every player makes crucial decisions at pivotal times during the span of a career but all of these decisions are made with specific, long range goals in mind. It all comes down to one's own self-determination.

Self Determination Theory (SDT)

SDT is an approach to human motivation and personality that highlights the importance of humans' evolved inner resources for personality development and behavioural self-regulation (Ryan, Kuhl, & Deci, 1997). Thus, its main focus is the investigation of people's inherent growth tendencies and innate psychological needs that are the basis for their self-motivation and personality integration, along with the conditions that bring about these positive processes (Ryan & Deci, 2000). The three such needs for Self Determination are competence, relatedness, and autonomy which all appear to be essential for facilitating optimal functioning. In meeting these needs as an athlete or performer of any type, a person's zone for optimal functioning can become clearly established and maintained.

The critical needs for Self Determination are defined below: Competence is defined as the individual's inherent desire to feel effective while interacting with the environment (Deci & Ryan, 2000; White, 1959; Broeck et al., 2010)

Relatedness is defined as individuals' inherent desire to feel a connection with others including being a member of a group, to give and receive love and care to and from others (Baumeister & Leary, 1995).

Autonomy represents the inherent desire to have a freedom of choice resulting in psychological freedom and the feeling of volition when carrying out an activity (deCharms, 1968; Deci & Ryan, 2000).

Motivation (Intrinsic/Extrinsic)

There are several questions that one must ask, "What is my driving force? What keeps me going? What am I after?" These questions will help one determine whether their motivation is of intrinsic interest or extrinsically focused. According to Csikszentmihalyi & Rathunde, 1993, intrinsic motivation is the natural inclination toward assimilation, mastery, spontaneous interest, and exploration that is so essential to cognitive and social development leading to a strong source of enjoyment and vitality throughout life. Based upon the individual's interpretation of the task (sport), their distinct type of motivation is discovered. To list a few, love for the sport, enjoyment in playing, invigoration of competition, and the feeling of family within the team are all strong forms of motivation.



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In LeBron James' recent essay citing his reasons to return to Cleveland to continue his NBA career he stated, "Before anyone ever cared where I would play basketball, I was a kid from Northeast Ohio. It's where I walked. It's where I ran. It's where I cried. It's where I bled. It holds a special place in my heart... My relationship with Northeast Ohio is bigger than basketball. I didn't realize that four years ago. I do now."

For LeBron, Cleveland was home. What better place to play the game you love than in a place you call home? Finding a place where one feels comfortable and truly enjoys playing, the intrinsic motivation becomes strengthened. Quite different, however, extrinsic motivation refers to the performance of an activity in order to attain some separable outcome (Ryan & Deci, 2000). Some forms of extrinsic motivation would include winning trophies, social support, external rewards, attention, or anything else that is not inherently satisfying from the activity itself. LeBron mentioned in his essay that he would like to bring a title to Cleveland similar to what he did in Miami. He wrote, "When I left Cleveland, I was on a mission. I was seeking championships, and we won two. But Miami already knew that feeling. Our city hasn't had that feeling in a long, long, long time. My goal is still to win as many titles as possible, no question. But what's most important for me is bringing one trophy back to Northeast Ohio". He has demonstrated a mix of both intrinsic and extrinsic motivation in his sought after endeavors. It is helpful to possess both types but too much extrinsic motivation can be detrimental. Intrinsic motivation will help to bring out the most in an individual because even when the extrinsic rewards (trophies, rewards, social support, money) aren't coming in, the athlete's passion and drive will continue to push him or her to train and improve.

Take Action

Having a better understanding of Self-Determination Theory and the differences between intrinsic and extrinsic motivation, coaches and players can begin to uncover self-determinations and motivations. I encourage all those who are reading this post to discover what your motivations really are and determine if you can establish a greater sense of intrinsic motivation rather than extrinsic. Find out if you love participating in sport for the fun and enjoyment or if it is primarily to win the trophy. Also, keep in mind that even if you are considered one of the most talented athletes in the world like LeBron James, your motivation and self-determination is of primary importance. After all, it is up to us to choose our own fates and achieve our individual happiness.

Extrinsic vs. Intrinsic Motivation: What's the Difference?

By Kendra Cherry



Why do we do the things we do? What is it that drives our behaviours? Psychologists have proposed some different ways of thinking about motivation, including one method that involves looking at whether motivation arises from outside (extrinsic) or inside (intrinsic) the individual.

While both types are important, researchers have found that intrinsic motivation and extrinsic motivation can have different effect on behaviours and how people pursue goals. In order to understand how these types of motivation influence human action, it is important to understand what each one is and how it works.

What Is Extrinsic Motivation?

Extrinsic motivation occurs when we are motivated to perform a behaviour or engage in an activity to earn a reward or avoid punishment. In this case, you engage in a behaviour not because you enjoy it or because you find it satisfying, but in order to get something in return or avoid something unpleasant.

What Is Intrinsic Motivation?

Intrinsic motivation involves engaging in a behaviour because it is personally rewarding; essentially, performing an activity for its own sake rather than the desire for some external reward. Essentially, the behaviour itself is its own reward.



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Extrinsic Motivation

Participating in a sport to win awards
Cleaning your room to avoid being reprimanded by your parents
Competing in a contest to win a scholarship
Studying because you want to get a good grade

Intrinsic Motivation

Participating in a sport because you find the activity enjoyable
Cleaning your room because you like tidying up
Solving a word puzzle because you find the challenge fun and exciting
Studying a subject you find fascinating

Extrinsic vs. Intrinsic Motivation: Which Is Best? The primary difference between the two types of motivation is that extrinsic motivation arises from outside of the individual while intrinsic motivation arises from within. Researchers have also found that the two types of motivation can differ in how effective they are at driving behaviour.

Some studies have demonstrated that offering excessive external rewards for an already internally rewarding behaviour can lead to a reduction in intrinsic motivation, a phenomenon known as the overjustification effect.

In one study, for example, children who were rewarded for playing with a toy they had already expressed interest in playing with became less interested in the item after being externally rewarded. This is not to suggest that extrinsic motivation is a bad thing. Extrinsic motivation can be beneficial in some situations. It can be particularly helpful in situations where a person needs to complete a task that they find unpleasant.

However: External rewards can induce interest and participation in something in which the individual had no initial interest. External rewards can also be a source of feedback, allowing people to know when their performance has achieved a standard deserving of reinforcement.

Extrinsic motivators should be avoided in situations where: The individual already finds the activity intrinsically rewarding offering a reward might make a "play" activity seem more like "work"

When to Use Extrinsic Motivation

While most people would suggest that intrinsic motivation is best, it is not always possible in every situation. In some cases, people simply have no internal desire to engage in an activity. Excessive rewards may be problematic, but when used appropriately, extrinsic motivators can be a useful tool. For example, extrinsic motivation can be used to get people to complete a work task or school assignment in which they have no internal interest.

Researchers have arrived at three primary conclusions with regards to extrinsic rewards and their influence on intrinsic motivation:

1. Unexpected external rewards typically do not decrease intrinsic motivation. For example, if you get a good grade on a test because you enjoy learning about the subject and the teacher decides to reward you with a gift card to your favourite pizza place, your underlying motivation for learning about the subject will not be affected. However, this needs to be done with caution because people will sometimes come to expect such rewards.
2. Praise can help increase internal motivation. Researchers have found that offering positive praise and feedback when people do something better in comparison to others can improve intrinsic motivation.



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3. Intrinsic motivation will decrease, however, when external rewards are given for completing a particular task or only doing minimal work. For example, if parents heap lavish praise on their child every time he completes a simple task, he will become less intrinsically motivated to perform that task in the future.

How Do Intrinsic Motivation and Extrinsic Motivation Influence Learning?

Extrinsic and intrinsic motivation can also play a significant role in learning settings. Some experts argue that the traditional emphasis on external rewards such as grades, report cards, and gold stars undermines any existing intrinsic motivation that students might have. Others suggest that these extrinsic motivators help students feel more competent in the classroom, thus enhancing intrinsic motivation.

"A person's interest often survives when a reward is used neither to bribe nor to control but to signal a job well done, as in a "most improved player" award. If a reward boosts your feeling of competence after doing good work, your enjoyment of the task may increase. Rewards, rightly administered, can motivate high performance and creativity. And extrinsic rewards (such as scholarships, admissions, and jobs that often follow good grades) are here to stay," explains David G. Meyers in his text *Psychology: Eighth Edition in Modules*.

By John O'Sullivan / Wednesday, 12 February 2014 / Published in deliberate practice, problems in youth sports, specialisation.

The 10,000 Hour Myth – Changing the Game Project

A myth is a false belief or idea that is widely held. One such myth that has enveloped youth sports is the idea that to become an elite athlete all one needs 10,000 hours of sustained, deliberate training. This is a myth in every sense of the word.

I recently gave a talk at a national soccer coaches meeting. I asked the audience if they had heard of 10,000 hour rule. Everyone raised their hand. Then I asked if they had heard it was not exactly true and a misrepresentation of the study of performance. Only about 10% raised their hand. Myth confirmed.

Ten years ago, very few people outside of academia knew of Anders Ericsson or his study that found a correlation between thousands of hours of training and elite musical performance. That all changed in 2008 when Malcolm Gladwell popularized the 10,000 Hour Rule in his book *Outliers: The Story of Success*. The 10,000 hour rule has become the bedrock philosophy of many coaches and programs developing young athletes. They use the popularity of the rule to claim that kids need to train for 10,000 hours if they are going to become top players. They demand more commitment at younger ages. They demand specialization, which can be quite harmful to kids. They funnel every child into their "10,000 Hour System." They take kids who want to play other sports out of the developmental pipeline, demanding complete allegiance in pursuit of the holy grail of 10,000 hours. This is quite a shame, because the concept that 10,000 hours is needed to achieve elite performance status is not a rule. It's a myth.

The examples of athletes whom have performed on an Olympic or professional level with far fewer hours of deliberate training are abundant (see Donald Thomas the Bahamian long jumper). A study of professional hockey players found that on average they spent 10,000 hours in sport participation, but only 3000 of those hours were in hockey specific deliberate practice. The list of players that have competed at an elite level in multiple sports is vast and ever expanding, yet none of these athletes put 10,000 hours into two different sports.

Even the originator of 10,000 hours, Anders Ericsson, says that the use and misuse of his research has created a complete misunderstanding on the role of deliberate practice.



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That is not to say elite athletic performance does not require thousands of hours of dedicated, focused training and excessive commitment. IT DOES. As I have discussed at length in my book, the evidence shows that simply training deliberately for 10,000 hours does NOT make one an elite athlete, and there are many paths to mastery.

Unfortunately, the purveyors of the 10,000 Hour Rule have contributed to the “adultication” of youth sports, which has become far more about trying to develop tomorrow's elite superstar than creating an environment that is enjoyable, physically and mentally rewarding, and breeds adults whom are active for life. This has resulted in an environment that causes many children to quit sports. Combined with the rise in popularity of computers and video games, a decline in access to PE and other sports programs, and a rise in obesity, these factors have created a culture of inactivity in today's children. The scary statistic: today's 10 year olds are the first generation ever who will not outlive their parents!

It is high time to present the major issues with the 10,000 hour concept, and bring some sanity back to our youth sports programs. The 10,000 hour myth is a problem for three main reasons:

1. It puts all the eggs in one basket -10,000 hours of training, and ignores the role of genetics/talent in athletic performance: This point has been thoroughly researched in David Epstein's *The Sports Gene: Inside the Science of Extraordinary Athletic Performance* and should be required reading for any coach. Even Anders Ericsson agrees that the simple idea that 10,000 hours of training will make one elite is not a true statement. Aside from genetics, there are numerous other factors, including access to coaching, the psychological factors that affect performance, even luck, that all play a part. Some people are far more sensitive to training that improves speed, while others can gain in endurance faster than a test group. We are all not built the same, and training will not overcome genetic shortfalls. It also ignores the fact that without enjoyment and intrinsic motivation, players will not continue to train at the required level of focus and intensity to become elite. In a nutshell, hours of training is a part of elite performance, but not the holy grail.

2. It is misused by far too many ill-informed/misguided coaches to force children to specialize early in sports: This is my biggest issue with the 10,000 hours myth. On a weekly basis I get calls and email from parents asking whether they should commit their child to a single sport in elementary school because the coach told them “it is the only way to get your 10,000 hours in.” During the sampling phase of sports development (up to age 12), children can benefit not only physically, but psychologically and cognitively by experiencing a number of sports. This is how they develop autonomy and motivation. This is when they seek the sport that they enjoy the most. Yet many organizations try to force their “customers” to choose and commit to year round training and games far too young. The greatest benefactor of this is not the child; it is the organization's bottom line.

3. It ignores the significant role of deliberate play in athletic development: This is an area where ground breaking research continues to be done. The deliberate practice model sometimes discounts play, for it is an activity that focuses upon immediate gratification – enjoyment – and is not the delayed gratification that deliberate practice calls for. Research shows that play increases levels of autonomy, motivation and enjoyment, three critical factors in elite athletic development I have discussed previously. There is also evidence that children engaged in play spend more time on task (actually playing) than those in structured training environments, where they stand in line, wait for coaches to set up activities, etc. In an hour of pickup basketball, children will usually spend the vast majority of the time playing, developing motor skills through the game, while research on training environments demonstrates that athletes' time on task varies between 25% to 54% of total training time. The benefits of feedback from experienced coaches may be outweighed by the

30/07/2019 The 10,000 Hour Myth - Changing the Game Project <https://changingthegameproject.com/the->



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10000-hour-myth/ 3/7 amount of time not spent actually playing or practicing! This is why I advise coaches of our youngest athletes to “Just let them play!”

It is certainly clear that thousands of hours of deliberate practice are necessary for elite level performance, yet it is also clear that they are not sufficient. Factors such as motivation, genetics disposition and sensitivity to training, and access to the right coaching all factor in, and without them training alone does not predict elite level performance.

This is an important factor to consider as parents and coaches of young athletes. If you are involved with athletes age 14 and under, chances are that the vast majority of them will not become elite competitors, never mind professional athletes. Perhaps one athlete every few years will.

So why do we create programs that sacrifice the interest of the 99% for the slight chance that one kid will make it?

Why do we create excessive training environments for 9 year old soccer players and 10 year old baseball players based upon the myth that we need to get 10,000 hours of training in?

Why are we not creating environments that first ensure that our players fall in love with the game, and they show up and play because they want to, and not because they have to?

Why are youth sports organizations hoarding as many children as possible into year round programs at 8,9,10 years old, instead of doing right by the 99%?

And finally, can't a great coach create an environment that serves the 99%, and the potential elite player at the same time, at least prior to middle school?

If we work harder, and educate our coaches better, we can create youth sports environments that focus on developing better people and better players, and create the next generation of fans, coaches, adult league players, as well as the odd college or pro player. Great coaches do this, and still create a pathway to excellence for those with the talent, motivation, grit and love of the game to achieve greatness.

I believe we can do this through better coaching education and oversight.

I believe this requires a shift in philosophy toward the greater good, instead of the elite few.

I believe the best coaches are not afraid to let children experience multiple sports, and take time off for a family vacation or school event. Those who threaten that child's place on the team are not furthering their sport; they are cutting the legs out from under it.

I believe the youth sports organizations that see this first, and adapt to what serves all the children, instead of the infinitesimal percentage that have the tools to become a pro, will be the ones that thrive in the 21 Century.

I also believe that those of the Friday Night Tykes genre, the organizations across all sports that treat and attempt to train every single child like a future pro, who select them far too early and ignore the crucial importance of play and enjoyment, will eventually fade away. Or at least I hope they will.



The Great Practice Myth: Debunking the 10,000 Hour Rule • Six Seconds

“A provocative generalization,” is what Anders Ericsson calls the 10,000 hour rule. And it was Ericsson’s research on expert musicians that Gladwell cites as a basis for the rule. Ericsson says the rule is an oversimplification, and in many ways, an incorrect interpretation of his research. The 10,000 Hour Rule: Catchy and easy to remember, but on some pretty shaky scientific footing.

Busting the Myth of the 10,000 Hour Rule

Let’s start with breaking down the myth of the 10,000 hour rule. Gladwell uses several examples in his book when introducing this rule: one is the research done by Ericsson that focused on violin students at a music academy in Berlin. The study found that the most accomplished of the students had put in 10,000 hours by the time they turned 20. Gladwell also estimates that the Beatles put in 10,000 hours of practice playing in Hamburg in the early 1960s, and that Bill Gates put in 10,000 hours of programming work before founding Microsoft. Hence the 10,000 hour rule was born: put in your 10,000 hours of practice, and become an expert in a given field. Pretty easy, right?

But upon closer examination, problems start to emerge.

First of all, Ericsson says, the number 10,000 is totally arbitrary. It’s catchy and easy to remember, but not really based on anything substantial. It’s the number of hours these promising violinists had put in by the time they were 20 years old. By the age of 18, they had put in an average of 7,400 hours, but the 7,400 Hour Rule doesn’t have quite the same ring, does it? And even at 20, they were very good at playing the violin, and probably headed to the top of their field, but they were not yet experts.

On top of that, Gladwell misunderstood that 10,000 hours was an average, and not all the best violinists had put in this number by age 20. In fact, half of the best hadn’t put in 10,000 hours.

Hmm. That’s definitely concerning, but are we sure that the 10,000 rule isn’t true? It sure seems like plenty of hours to master something. And if it isn’t true, what do we know about practice and how to master a craft?

Well a few things we know for sure are that not all practice is created equal – and not everyone starts from the same place.

10,000 Hours of What?

All Practice Isn’t Equal If you wanted to get better at shooting a bow and arrow, would it be the same thing to experiment on your own for 3 hours as it would be to practice with an expert for 3 hours, who is giving you tips on form and technique and getting better? The answer is self-evident, right? And this is one of the biggest flaws of the 10,000 Hour Rule: It focuses on the amount of time spent practicing, and not the quality of that practice – and not all practice is equally helpful.

Have you heard of the 10,000 hour rule? Me, too! But... it turns out it's not really true

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Gladwell doesn't differentiate between different types of practice, even though it's a really important distinction. The best way to get better at something is through something known as deliberate practice, which basically means practicing in order to get better: doing activities recommended by experts to develop specific abilities, identifying weaknesses and working to correct them, and intentionally pushing yourself out of your comfort zone. "This distinction between deliberate practice aimed at a particular goal and generic practice is crucial," Ericsson says, "because not every type of practice leads to improved ability. You don't get benefits from mechanical repetition, but by adjusting your execution over and over to get closer to your goal."

Deliberate practice is often guided by an expert, skilled coach, or mentor, "someone with an expert eye," according to bestselling author Daniel Goleman. These coaches and mentors are offering feedback on specific ways to improve, and "without such feedback, you don't get to the top ranks. The feedback matters and the concentration does, too – not just the hours."

So does the 10,000 rule hold up if it's 10,000 hours of deliberate practice with experts? No, it still doesn't. There are still a lot of other variables at play.

The Great Debate Continues: Nurture Has Its Limits

A recent meta-analysis by Case Western Reserve University psychologist Brooke Macnamara and her colleagues found that deliberate practice and skill are related – but far from perfectly related. Deliberate practice hours predicted 26% of the skill variation in games such as chess, 21% for music, and 18% for sports. This is the second biggest flaw of the 10,000 Rule: It leads to a misconception that anyone can become an expert in a given area by putting in the time. But clearly, since deliberate practice hours predicted only 20-25% of skill levels, there are other factors at play. Researchers have been able to pinpoint a few of them, including age and genetics.

The age at which someone gets involved in an activity seems to play a role. As with language learning, there may be a window during childhood when specific, complex skills are most easily acquired. Cognitive psychologists Fernand Gobet and Guillermo Campitelli found that chess players who started early reached higher skills levels as adults than those who started later, even after taking into account differences in deliberate practice hours.

Of course, genetics play a role as well. A lot of the best research on the role of genetics in acquiring certain abilities comes from studying – you guessed it – twins. Psychologist Robert Plomin led research at King's College London that found more than 15,000 twins in the United Kingdom and had them perform a series of tests and fill out questionnaires – and some of the findings are quite remarkable. Identical twins' drawing ability was much more highly correlated than fraternal twins' drawing ability. Since identical twins share 100% of their genes, whereas fraternal twins share only 50%, these findings indicate that differences between people in basic artistic ability is at least in part due to genetics. Using the same data set, over half the variation between skilled and less skilled readers was found to be due to genetics. Clearly, the number of hours two people will need to put in to master a skill will be different depending on their genetic disposition.



**The 10,000 rule is an oversimplification.
Genetics, your age when you start, and how you
practice all determine when – or even if – you
become a master**

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And that wasn't the only finding indicating that we have a genetic predisposition to excel in some areas more than others. Psychologist Miriam Mosing of the Karolinska Institute in Sweden has led fascinating experiments with more than 10,000 twins that tests their basic music abilities, like whether two melodies carry the same rhythm, in relation to how much they have practiced music. What they found is that while genes influenced 38% of the musical abilities they measured, no evidence was found that the amount of practice influenced those abilities. That is to say, an identical twin who practiced music regularly was not any more likely to be good at these abilities than the identical twin who did not practice. This doesn't mean there's no point in practicing music. There are certainly music skills that you can improve with practice, like reading music and playing a keyboard. But it does indicate that there are limits to the power of practice. Not everyone could become an expert violinist even with 10,000 hours of practice – and I think I am one of those. There is some innate ability necessary to become a master in a field

Malcolm Gladwell got one thing right, without a doubt: it takes many years of concerted effort and practice to become a true expert in a field. But while the time spent practicing is important, it is far from the only factor. Your genetic makeup, when you start, and how you learn all combine to determine how many hours it would take you to master a specific craft.

Consider the research of master chess players by those cognitive psychologists, Fernand Gobet and Guillermo Campitelli. They found that there were actually huge differences in the number of hours of practice it took chess players to reach a specific skill level. The number of hours to reach “master” status ranged from 728 hours to 16,120 – meaning some players needed 22x more practice hours than others to reach the same skill level. Not so surprising now, huh? And even more reason to be skeptical of the 10,000 hour rule. Let's rename it the 728 to 16,120 Hour Rule. And when we get into skills that are less easily measurable than chess or sports, we may have to scrap the concept of practice hours altogether...

From 10,000 Hours to 10,000 Experiments

The meta-analysis discussed above, led by Brooke Macnamara, compared deliberate practice and acquired skills, and found that deliberate practice predicted 26% of performance in games such as chess, 21% for music, and 18% for sports. But what about fields that are less tangible? Learning how to play a guitar or how to shoot a soccer ball are tangible skills, with well-established “norms” for what mastery looks like, or sounds like. But what about practicing less tangible skills, like being a good boss or a good parent?

The study found that deliberate practice predicted even less of the performance in these areas, predicting only 4% of the variance in performance in education, and less than 1% for professions. Woah.

It's crazy, but it also makes sense. You could be a pretty terrible boss for 10,000 hours – putting in the hours but not mastering the craft by any means. And what's more is that there is not exactly a clear idea of what being a successful leader even looks like. The skills required for successful leadership are changing in today's rapidly changing world. In that context, what does it take to become a master or expert? It requires a new way



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of thinking about practice altogether. In these areas, we may want to replace the 10,000 hour rule with the 10,000 experiment rule.

The 10,000 experiment rule, first coined by Medium, requires taking the scientific method – develop a hypothesis, test it out, analyse the results, develop another hypothesis – and using it in everyday life. Deliberate experimentation has a lot in common with deliberate practice – the goal is to get better by developing crucial skills – but the means is different. It’s less rigid (“This is how you get better at this”) and more agile (“I wonder how this would work”).

If you want to master these less tangible skills, you need to develop what Stanford’s Carol Dweck calls a growth mindset, and infuse it into your deliberate experimentation. A growth mindset is the ability to learn from your mistakes and treat them as opportunities for growth. That way, every experiment you run is super valuable. Even if your hypothesis is incorrect, you will have learned something from it, and can use that to keep growing. That is the type of practice that will help you be successful in rapidly changing environments where success looks different today than it did in the past, or will in the future.

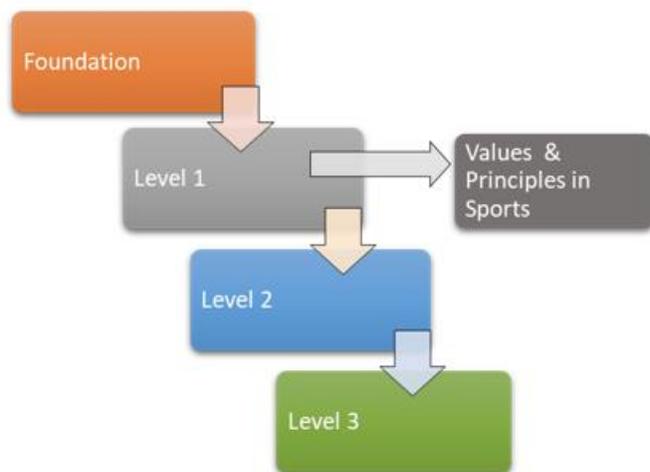
The 10,000 hour rule is a myth. If you want to master something tangible like chess or basketball, practice deliberately in the smartest way you can, and don’t worry about how long it takes – or assume that if you just put in the time, you will master it. And if you want to master a less tangible skill, go with deliberate experimentation, and infuse it with emotional intelligence.

In a rapidly changing world, success comes from deliberate experimentation and a healthy dose of emotional intelligence

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Netball Singapore Coaching Pathways

Netball Singapore’s Coaching Pathway





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What is NROC?

The National Registry of Coaches (NROC) was launched in 2003 to raise the standard and professionalism of sports coaching in Singapore. It aims to ensure that coaches meet baseline qualifications, that coaches continue to practise and improve, and that coaches provide a safe environment for their athletes. Today, there are over 4,700 coaches listed across 74 sports in the NROC and coaches can choose to publish their profile via an online public database called "[Find a Coach](#)".

Coaches in the NROC are duly certified under the [Singapore Coach Excellence \(SG-Coach\) Programme](#) (formerly known as the National Coaching Accreditation Programme or NCAP) in their respective sports and must hold Standard First Aid certification (including CPR&AED). They are committed to abide by the [Coach's Code of Ethics](#) and meet the requirements for the [Continuing Coach Education](#) Programme. This is part of the quality assurance to users of the coaching services that the coaches registered under NROC are up-to-date in their coaching knowledge and skills.

Through NROC, Sport Singapore aims to give recognition to coaches who have been certified and deemed competent by a national body. Doing so also allows the public to have easy access to [qualified coaches](#).

Sports Development Continuum

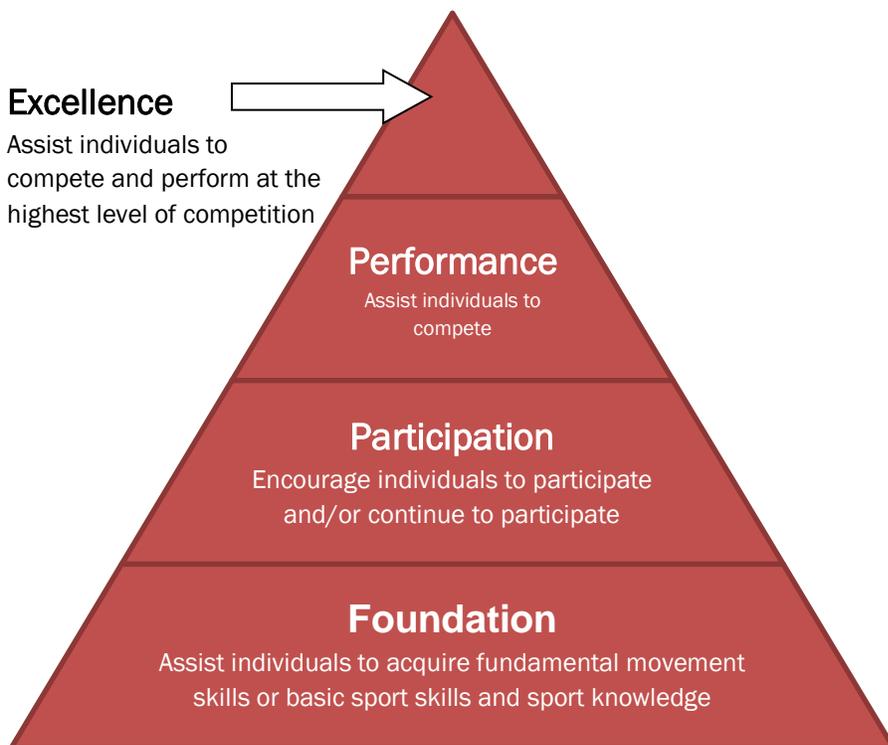


Figure 1: The traditional sports development continuum (Bramham, P., Hylton, K., Jackson, D. & Nesti M., 2001)



Key Organisations & Their programmes (In Netball Singapore Context)

International Olympic Committee (IOC)

National Olympic Committee (NOC)

- Singapore National Olympic Council (SNOC)

International Sports Federations (IFs)

- International Netball Federation (INF)
- INF splits the globe into 5 main regions. Namely, Netball Africa, Netball Americas, Netball Asia, Netball Europe and Netball Oceania. Singapore is part of Netball Asia.

Singapore Sports Organisations

Ministry of Community, Culture & Youth (MCCY)

- Entrusted with the development of Singapore's sporting culture and sport excellence

Singapore National Olympic Council (SNOC)

- SNOC is IOC's representative in Singapore. It is the authority that oversees Singapore's representation and selection of athletes for major games – Olympics, Asian Games, Commonwealth Games and SEA Games

Sport Singapore

- A statutory board under MCCY, its role is to plan and promote sports activities and PE in Singapore through collaboration with the MOE, SNOC, Singapore Sports School and National Sports Associations (NSA). It is the main driver for sports infrastructure and events, and provides funding and support to NSAs.

Organisations under Sport Singapore:

1. Singapore Sports Institute

- High performance planning
- Sports Excellence Scholarship (spexScholarship)
- High Performance carding
- Athlete Life Management Programme
- Sports Science Centre
- Sports Medicine Centre

2. ActiveSG

- National movement that offers individuals, families and communities opportunities to experience and enjoy living better through sport

3. Sports Education Programme (SEP)

- SEP is a collaborative partnership between Sport SG and MOE. Schools are provided with matching grants to take up sports programmes from an endorsed list.

4. Singapore National Games (SNG)

- A multi-sport competition organised by Sport Sg

5. Sport Cares

- Sports programmes for under-privileged beneficiaries



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Other Organisations/Affiliations

- Singapore Sports School (SSP)
 - A specialised independent school under the purview of MCCY.
 - SSP provides an integrated academic and sports programme in a world class environment
- National Sports Associations (NSA)
 - NSAs are registered charities whose mission is to promote specific sports.
 - Each NSA acts as the sanctioning representative of their respective sport
- Sports Coaches Association
- National Youth Sports Institute (NYSI)
- MOE and IHL
 - Under the MOE are the Singapore Schools Sports Council and the Singapore Primary Schools Sports Council. These are further divided into 4 zones – N,S, E and W.
- People's Association (PA) Community Sports Clubs
- Others like private clubs