The Road to Expertise

The road to expertise or expert performance is difficult to map definitively. Ericsson, Krampe and Tesch-Romer (1993) proposed that deliberate practice was key and that continued deliberate effort trumped experience. They defined deliberate practice to be those activities that promote and aid in the specific development of a skill (or skillset) required for performance in a domain, like a particular type of sports (Ericsson et al., 1993). Practice must be specific. Ericsson et al. (1993) described three phases in the timeline towards expert level: introduction (to the domain) where children or novice are introduced to the concept of practice and good practice-ethic; preparation (intermediate stage) building up to the last phase; and the last phase which is the individual's commitment or full-time involvement in the domain. Deliberate practice must also adapt to appropriately challenge the individual's skills in the domain. Ericsson et al. (1993) theorized that deliberate practice and continued effort are key to attaining expertise. However, they acknowledged that a few physical characteristics such as height determined by genetics as exceptions to their theory (Ericsson et al., 1993).

Baker and Horton (2004) described a more holistic view of primary and secondary factors that influence expertise. Primary factors included: genetics; training (with regards to motor skills) and deliberate practice; and psychological features such as stress management (with regards to performance and competition), motivation, confidence, and risk management (Baker & Horton, 2004). Secondary factors acknowledged the roles of culture and society in the individual's life, the individual's circles of influence (roles of different people in the person's life including family and friends), access to resources pertaining to the domain (e.g. sport), competition within the domain, and level of experience in the domain (Baker & Horton, 2004).

While the details need further study, it is generally recognized that both nature and nurture factor into expert level skills (Tucker & Collins, 2012). A common thread amongst the theories is the concept of focused, deliberate practice. However, the amount of deliberateness is unclear and new theories of contextual interference, feedback, and practice scheduling question whether the "deliberateness" as described by Ericsson et al. (1993) is necessary for skill acquisition and mastery.

Porter and Magill (2010) noted that the significance of skill acquisition theory is to help instructors and practitioners design effective learning environments and effective programs (practice sessions). Contextual interference and the contextual interference effect (Magill, 2011) challenge the unidimensional and linear quality of "deliberate practice". Contextual interference (CI) is "memory and performance disruption that results from performing multiple skills or variations of a skill within the context of practice" (Magill, 2011, p. 377). Studies have shown that past the beginning skills acquisition phase, contextual interference, even high levels of it, benefits skill development particularly in retention and transfer testing (Porter & Magill, 2010). Porter and Magill's (2010) research seemed to indicate that a practice program that progressively increased the amount of CI, challenged the performer to adapt and process information more efficiently leading to more robust skills development and performance.

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It should be noted that Zipp and Gentile (2010) found that contextual interference and the contextual interference effect presented differently amongst populations of children, adolescents, and adults. Contextual interference was contraindicated when working with 8-9 year olds (Zipp & Gentile, 2010). Older children (10-12 year olds) seemed to benefit from some lower levels of simplified CI in practice. This aberration from the contextual interference effect theory may be attributed to the ongoing stages of child development and lack of experience in children. The study by Zipp and Gentile (2010) also indicated that during the early acquisition phase of learning regardless of age, blocked practice where the practice "requires the same response on successive trials" (Wu et al., 2011, p. 1093) was more effective in skills development. Zipp and Gentile (2010) suggested that in the continuum, there is an early period where skills learning or movement tasks needed to stabilize before deriving benefits from adding variability or randomness, i.e. some level of contextual interference. The amount of "stabilization" time depended on the complexity of skill to be learned. This idea of progressing from simpler to more complex practice sessions is congruent to Gentile's taxonomy.

The study by Wu et al. (2011) introduced a new concept regarding the role of feedback (knowledge of results and knowledge of performance) coupled with contextual interference. Ericsson et al. (1993) described a feature of deliberate practice as repeatedly practicing the same movement set or skills required in a performance over and over again with immediate feedback and that deliberate practice does not always correlate with enjoyment (i.e. practice is not always enjoyable especially at the beginning, but perseverance is key). In contrast to Ericsson et al. (1993), Wu et al. (2011) found that along the continuum of practice and skills development, after the initial learning stabilized, a decrease in augmented feedback seemed to be more beneficial as it encouraged more internal problem-solving skills and situational decision making required by advanced levels of performance. Overall, for best retention and transfer testing, practice sessions with increasing contextual interference and decreasing augmented feedback seemed to be most beneficial by introducing the participants to the challenge of acquiring better problem-solving and decision making skills relevant to their performance goals (Wu et al., 2011).

While domain specific practice seems to aid in the improvement of skills and performance towards "expert levels", Ericsson's et al. (1993) "deliberate practice" may not be a key element in attaining expertise. Theories of contextual interference and the study by Wu et al. (2011) are significant in how practice sessions are best designed and scheduled, and impact how best to coach individuals based on where they are on the continuum of learning.

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