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IN SEARCH OF THE OPTIMAL LEARNING EXPERIENCE: FLOW THEORY AND ITS IMPLICATIONS FOR TALENT DEVELOPMENT

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Introduction to 'flow'

> *The act of writing justifies poetry. Climbing is the same: recognising that you are a flow. The purpose of the flow is to keep on flowing, not looking for a peak or utopia but staying in the flow. It is not a moving up but a continuous flowing; you move up only to keep the flow going. There is no possible reason for climbing except climbing itself; it is a self-communication* (cited in Csikszentmihalyi, 1975, pp.47–8).

The words of this young poet and rock climber first inspired Csikszentmihalyi's use of the word 'flow' to describe the autotelic experience. The concept of flow has attained such wide acceptance that it could be seen to have 'become a technical term in the field of intrinsic motivation' (Csikszentmihalyi, 1988, p.3). This article will trace the evolution of the theory of flow, comment on its research base, and discuss its implications for talent development.

Csikszentmihalyi was originally inspired to explore intrinsic motivation as a result of his PhD research on Fine Art students at the Chicago Art Institute (Csikszentmihalyi, 1988, p.3). He writes that 'one of the most intriguing enigmas about creative people is the origin of their motivation' (Getzels & Csikszentmihalyi, 1976, p.208). Subsequently he began a study 'to understand better what these intrinsic rewards are that people derive from a variety of different activities not rewarded extrinsically' (1975, p.13). In *Beyond Boredom and Anxiety* (1975), he details 'a new model of intrinsic rewards' derived from the self-reports of an eclectic group of participants. Hence it was in 1975 that Csikszentmihalyi coined the term 'flow' to describe the crucial moment of individual enjoyment of an activity (1975, p.36*)*.

Csikszentmihalyi (1975, pp.40–47) describes the following characteristics of the flow experience:

1. The 'clearest sign of flow' is the merging of action and awareness. In the flow state action follows action according to an internal logic that

seems to need no conscious intervention by the actor. There is a unified flowing from one moment to the next, in which there is little distinction between the self and the environment, between stimulus and response, or between past, present and future.

2. There is a centring of attention on a limited stimulus field.

3. Loss of the ego, loss of self-consciousness and even a transcendence of individuality occur.

4. The individual has no active awareness of control or worry about control.

5. The experience contains clear demands and clear feedback.

6. The experience is autotelic.

This idea of an optimal experience is not a new one and Csikszentmihalyi (1988, p.5) openly refers to the influence of the work of Maslow on peak experience, and the teachings of Zen and the Bhagavad-Gita. Researchers in creativity also mention experiences of this nature:

> If [the creator] can experience himself [sic] in this [creative] process, he loses himself. He transcends the boundaries of his own person, and at the very moment when he feels 'I am' he also feels 'I am you', I am one with the whole world (Fromm, cited in Briggs, 2000, p.80).

What is new here is the construction of a model that suggests that flow takes place when opportunities for action are in balance with the actor's skills. It is further suggested that if skills are high and challenge low, boredom results and, conversely, when skills are low and challenge is high, anxiety results (Csikszentmihalyi, 1975, p.11). The characteristics attributed to flow, and the delineation of the role of challenges and skills, change very little in Csikszentmihalyi's writing over the next twenty years or more (1990, p.49; 1996, p.110; Csikszentmihalyi, Rathunde & Whalen, 1997, pp.14–15). It would seem important therefore to survey the research methods used to come up with these clear-cut conclusions.

The original study

The first phase of the original study, published in Csikszentmihalyi (1975) *Beyond Boredom and Anxiety*, appears to be informal. Csikszentmihalyi and his colleagues contacted 'people in as many autotelic activities as possible' to ask them why they were doing what they were doing. The group included hockey and soccer players, explorers, mountain climbers, a champion swimmer and a handball player (1975, p.10). Perhaps choice was dictated by convenience. We are not told. It was from these informal interviews that the team developed 'questionnaires and a more structured interview form' (1975, p.60). There is no indication of how these initial interviews were conducted or how the data were developed into the questionnaires. Later publications refer to 'The Flow Questionnaire', which was apparently used in the next stage of this study and in subsequent research by Csikszentmihalyi and his colleagues (Han, 1988, p.141). It was presumably based on these initial interviews but again, we are not told.

A second sample is chosen for the next stage of this study. The selection is again interesting: rock climbers (experts and beginners), professional composers of modern music, modern dancers (professionals and beginners), basketball players, and chess players. The selection criterion appears to be that they are involved in 'autotelic' activities. Here we must assume that the 'professional' dancers and composers of music do not act from any extrinsic motivation. The reasons for choices are not made clear, and again, convenience may have been a factor.

It appears that the predominant methodologies for data collection were the interviews and the questionnaires. It is from the responses of this 'core group of 173 subjects' that the theory of flow was constructed (1975, p.11). Because the Flow Questionnaire was used, it is worth looking at its content. It seems that subjects respond to the following statements of flow experience (Han, 1988, p.114):

1. My mind isn't wandering. I am not thinking of something else. I am totally involved in what I am doing. My body feels good. I don't seem to hear anything. The world seems to be cut off from me. I am less aware of myself, and my problems.

2. My concentration is like breathing. I never think of it. I am really quite oblivious of my surroundings after I get going. I think that the phone could ring, and the doorbell could ring or the house burn down or something like that. When I start I really do shut out the whole world. Once I stop, I can let it back in again.

3. I am so involved in what I am doing. I don't

see myself separate from what I am doing.

It seems that before the first subject of the core group was interviewed, there was already a delineation of the 'flow' experience. Csikszentmihalyi admits 'the methodology of this report is not as neat and consistent as one would expect from an experimental study' (1975, p.12). He also states that the model is 'admittedly just another *as-if* construct that cannot do justice to the phenomenon studied … however as long as we remember that we are talking about a model and not the real thing not much harm will be done' (1975, p.12).

There are limitations to a study based solely on self-reports, and it is especially problematic that there is no indication of exactly how the data were analysed. There is no clear pathway of causality established between the challenge/skill ratio and the subjective experiences of flow.

Subsequent studies

Many subsequent studies by Csikszentmihalyi and his colleagues are written about in the 1988 publication, *Optimal experience: Psychological studies of flow in consciousness*. He claims that much of this research shows 'optimal experiences were described in the same way by men and women, young and old regardless of cultural differences' (Csikszentmihalyi, 1990, p.4). As in the first study, this research shows a lack of transparency regarding methodology. Data were again based on self-reports from an eclectic group. It is difficult to see how any of this research is not also vulnerable to report bias due to the unusual selection of samples. Some subjects were given the 'Flow Questionnaire' as in the initial study and then asked to state what activity precipitated and sustained the experiences and to describe the quality of the experiences in open-ended answers. There is sometimes description of data analysis methodology (Massimini, Csikszentmihalyi & Delle Fave, 1988, p.67; Han, 1988, pp.139–140), and sometimes not (Sato, 1988, p.95; Delle Fave & Massimini, 1988, p.194). Some studies appear also to have conducted interviews, but details are scant (Massimini et al., 1988, p.63; Sato, 1988, p.95).

Csikszentmihalyi and Csikszentmihalyi (1988, p.252) admit to the limitations of self-reports, which is strange when we consider the flow model is based on this research methodology. Experience Sampling Method (ESM) was developed to avoid the shortfalls of this earlier methodology (Csikszentmihalyi et al., 1997, p.50). Persons who participate in an ESM study wear an electronic pager and carry a booklet of self-report forms (Experience Sample Forms or ESFs) for a week. Each day at randomly chosen moments, signals activate the pagers and respondents fill out the forms, describing their behaviour and subjective state. It seems clear that the subjects will be filling out more forms more frequently, but how that removes vulnerability to errors including problems with memory, hasty completion, or exaggeration is not made clear. It also seems the content of the ESF is geared to get a response on assumptions made about the state of flow from the initial 1975 study. What is interesting is that during the early implementation of ESM, none of the theoretical predictions regarding the balance of skills and challenge was confirmed.

Csikszentmihalyi and his colleagues tried different wording in the ESF to no avail until, in 1985, a 'conceptual breakthrough' occurred by Massimini and his team in Milan. They suggested that flow only happens when skills and challenges are above a certain level. It is not made clear anywhere how they came up with this idea, but the data analysis procedure was changed as a result. A person's individual mean for challenges/skills was created from answers on the ESF. The mean was used as an individual's base point, above which challenge or skill would be regarded as 'high' (Csikszentmihalyi & Csikszentmihalyi, 1988, p.261).

The study of talent development of teenagers published in *Talented Teenagers: The roots of success and failure* was an ESM study that measured flow as co-existent with high challenge and high skill (Csikszentmihalyi et al.,1997, p.233). The analysis of the data in this case not only standardises the score for each individual but also for the group as a whole. Thus if a student was paged four times and reported above average challenges and skills on two occasions, the flow percentage would be recorded as 50%. The second flow measure compared the individual to the group's weekly average, so that while in the first measure it is possible that everyone could have a flow experience, with the second measure someone could always be in flow or never be in flow (1997, p.233)! The book does not make it clear if measures of flow other than a comparative lack of high challenge and skill are considered in the data analysis.

This new high skill/high challenge model is proposed as just a model for the ESM data. Csikszentmihalyi states that the original model is not invalid because it shows how, in a single activity, flow proceeds through time. The idea is that no activity can sustain flow unless it becomes more complex over time, so that flow in this sense is seen as a 'dynamic force in evolution' (Csikszentmihalyi & Csikszentmihalyi, 1988, p.263). In some subsequent publications he refers to skills and challenges being in balance (Csikszentmihalyi, 1990, p.49; 1996, p.110). In another publication, however, he presents the new model as the flow model, stating 'people report the most positive experiences and the greatest intrinsic motivation when they are operating in a situation of high opportunities for action (challenges) and a high capacity to act (skills)' (Csikszentmihalyi & Wolfe, 2000, p.88).

It is interesting to note that a comprehensive search, using the University of New England Dixson Library search engines, was unable to locate any independent research on the existence of flow, or research confirming the flow model's parameters of challenge/skills. The closest find was one Australian study that correlated data from two previous studies on 'zone' experiences to eight qualities cited by Csikszentmihalyi in 1990. The study concluded 'the zone or flow state is a universal phenomenon across sports' (Young & Pain, 1999, p.21).

The most recent (non-independent) research on flow located was a study by the Csikszentmihalyi team, published in 2003, utilising data collected in the 1990s (Shernoff et al., 2003). Most research on flow seems to have been conducted from the 1970s through to the 1990s. Csikszentmihalyi's 1990 US best-seller *Flow: The psychology of optimal experience*, written for the popular market, had chapters on everything from flow and the family, flow and sex, to flow and culture. Flow seems to have taken on a life of its own, with or without new research. This is an interesting outcome considering the original caveat that the flow model is just another 'as if' construct.

Implications of flow for talent development

In Gagné's (2009, p.157) Differentiated Model of Giftedness and Talent (DMGT), motivation is a key intrapersonal catalyst, and Garrett (2005, p.40) comments, 'It is important to emphasize that not all gifted learners are highly motivated learners.' Even if students start by being highly motivated, it is easy to see how that can change with inappropriate experiences. One of the major conclusions of *A Nation Deceived* was that 'when bright students are presented with curriculum developed for age-peers, they can become bored and unhappy and get turned off from learning' (Colangelo, Assouline & Gross, 2004, p.2). Lens and Rand (2000, p.198) assert that 'motivation in general, and intrinsic motivation in particular, are important determinants of creativity, high achievement and development of high abilities'. Hoekman, McCormick and Barnett (2005, p.101) found that for gifted middle school students, 'adaptive self-system processes like optimism and intrinsic motivation may act as positive resources during experiences at school'.

Csikszentmihalyi's theory not only attempts to qualify the subjective experience of intrinsic motivation, but in the case of talented adolescents claims that 'when both personal skill level and challenge level are correspondingly high, adolescents experience a state of *flow* that allows for optimal learning' (Csikszentmihalyi et al., 1997, p.3).

Motivation and learning theory also suggest there is an optimal level of motivation that is influenced by the difficulty and novelty of the task at hand. For example:

- Atkins' research (cited in Lens & Rand, 2000, p.198) on work motivation cites the Yerkes Dodson Law, which explains that the optimal level of motivation is the level where the efficiency is 100%, a maximum use of ability. This optimal level of motivation is dependent on the difficulty of the task. The task cannot be too easy or too hard.
- One type of intrinsic motivation stems from the individual's need for competence and efficacy in solving challenging tasks. Locke and Latham's theory of motivation (cited in Lens & Rand, 2000, p.199) claims that people are more motivated to perform better at tasks that are difficult but attainable. Perceptions of high competence and efficacy require challenging tasks.
- Lens and Rand also propose that intellectual or epistemic curiosity is an intrinsic motivation for learning and that this curiosity is facilitated by complex and novel material, not familiar or simple material.
- Learning theory informs that an effective teaching model targets a zone in which problems slightly exceed the level already

> mastered. If work is too easy, boredom ensues; if it is too hard, the student does not understand. Thus the match of challenges and skills that are necessary conditions for Vygotsky's zone of proximal development (ZPD) and flow are very similar (Chaffey, 2004, p.23).

Curriculum developers have long sought a match between skills and challenges for the gifted (VanTassel-Baska, 1994, p.3). There actually appears to be little in the way of formal, controlled research available in the area of curriculum differentiation for the gifted; therefore, because the flow model is simple, and because it fits well with Vygotsky's ZPD and with motivation theory, it is not hard to understand why many writers in the field of talent development cite Csikszentmihalyi to reinforce their advocacy for curriculum differentiation (e.g. VanTassel-Baska, 1994, p.3; Tomlinson, 2008, p.169; Alexander & Schnick, 2008, p.345; Gross, 2004, p.20). Most writers indicate an acceptance of the validity that does border on the use of 'flow' as a technical term (Feldhusen, 1994, p.349; Gross, 2004, p.20; Renzulli & Reid, 2008, p.303; Chaffey, 2004, p.23).

In another example, Chaffey (2004, p.23) views flow as a way to understand the dynamics of cognitive growth. If working in a state of flow can be attained and maintained, the intrinsic rewards will maximise the chance of achieving mastery and optimise the conditions for the emergence of cognitive ability. In the case of gifted students who are underachieving, and in particular invisible underachievers, opportunities for flow at academic tasks, through differentiation according to ability and readiness levels, also provide a good way to enhance academic self-efficacy. Chaffey gives a clear application of flow theory when discussing the implementation of his Coolabah Dynamic Assessment method, which has been used to identify invisible gifted underachievers in Australian indigenous communities. The cognitive component of the intervention comprises the development of metacognitive skills and the enhancement of the emerging cognitive process:

> the idea is to help students achieve flow and be in Vygotsky's zone of proximal development. Numerous strategies provide meta-cognitive pathways and self-efficacy enhancement as well as cognitive engagement in the 'flow zone' (Chaffey 2004, p.13).

In an interview, Chaffey (pers. comm. 8 October 2009) stated that, as self-efficacy is a characteristic of flow, when 'we target self-efficacy, we target flow'. Strategies used to encourage self-efficacy appear to target social and emotional blocks to engagement as well as the meta-cognitive tools needed by students to achieve mastery. Attention is given to a comfortable and familiar environment, and students are placed in very small groups. The metacognitive intervention uses puzzles that depend neither on numeracy skills nor on literacy skills, and the session begins with 'an ice-breaker' to establish trust. Students are made to feel the intervention will be fun and that 'you'll get them all done'. CDA assessors also provide appropriate scaffolding and feedback, particularly at the outset when students sometimes appear anxious or disengaged. Chaffey comments that if assessors optimise the chance of success and continual consistent mastery, fear and resistance disappear and the 'characteristics of flow' start to emerge. These characteristics include the absence of anxiety and persistent, resilient engagement along with a sense of timelessness. The observation is that the child experiences flow as s/he moves from mastery to mastery and, even though the task becomes more difficult, the child experiences it as more effortless. Chaffey also made the clarification that individual cognitive mastery only occurs when the individual child is responsible for all the cognitive processing, and that this condition, in his view, is the heart of the flow experience for the child, at least in the cognitive domain.

Chaffey's perception of how the state of flow occurs during the implementation of his Coolabah Dynamic Assessment implies that even though the balance between challenge and skill level is addressed, there may be more involved in establishing the conditions for flow in the classroom, at least in the case of gifted students who are underachieving. The construction of learning environments and the implementation of pedagogical strategies must take into account the multi-dimensional nature of Chaffey's study, and the need for student ownership of each part of the cognitive processes involved in learning.

It would be interesting to see if engagement in the 'flow' state in the classroom is an important

factor in the development of creative talent. My experience suggests that such engagement might occur but that it involves more determining factors than a balance of skills and challenge.

In my own teaching practice, I am involved in the running of poetry workshops. Although it does appear that students are engaged, that they produce some very creative work, and that the experience is autotelic, I have no way of confirming whether or not 'flow' actually does occur in these sessions. One characteristic of the 'flow' experience reported in my classes is the merging of awareness and action. This may be because I use the technique of automatic free writing to strive for just that. We write for a certain amount of time with a prompt word or phrase and keep the pen moving no matter what happens. I think it is more likely that flow might occur because this technique is introduced within the context of a broad range of strategies I use to foster creativity. I emphasise a classroom that is a psychologically safe zone, and I use techniques to remove emotional and environmental blocks to creativity. The open-ended nature of the exercises and the choice allow for challenge to students at multiple skill levels. Students always have ownership of all aspects of their writing, and many consequently stay motivated to write in and out of class. It is my observation that persistent engagement and motivation have led many students to repeat the workshop up to three times and to show remarkable growth in their writing skills.

Discussion

It is seductive to think that optimal learning experiences can occur in the classroom, and that it might be possible to formulate strategies to encourage their occurrence through engagement in the 'flow' state. Despite its widespread acceptance, the model's research base is vulnerable to criticism. Finding ways to strengthen this research base may prove useful to the field of talent development.

First, the model needs independent, up-to-date research and, for talent development applications, research with children and adolescents in various school contexts.

Second, there are several ways in which studies on flow could be triangulated. Presumably the experience of flow like other human experiences has a measurable neuro-biological chemical profile. It is known that hormones and neurotransmitters influence brain activity and contribute to individual differences in cognitive functioning (Reuter, 2007, p.83). When the body is stressed it releases cortisol in the 'fight or flight' mode which has the effect of simultaneously shutting down higher functions of the brain in favour of increasing heart rate, blood pressure and alertness to deal with the perceived threat. High cortisol levels make learning impossible. In Sims' study (2009), for example, samples of student saliva were taken in a non-invasive process to determine high cortisol levels and hence assess student lack of receptivity to learning. It would seem reasonable to conduct an analogous study under the assumption that low cortisol levels would correlate with flow. Similarly, Flaherty (cited in Reuter, 2007, p.87) found that mesolimbic dopaminergic activity raises baseline arousal and triggers the focused aspect of creative arousal, in other words, the motivation to create. It would be possible to gauge the dopamine levels through urine samples. An increase in the 'pleasure seeking' dopamine might indicate flow. Or again, EEG imagery could be used to 'map' brain functioning during periods of apparent flow. Alpha wave patterns appear in the brain when a person is awake and relaxed, whereas Alpha is blocked and Beta waves become more evident when effort is engaged (Reuter, 2007, p.82). What would the Alpha/Beta pattern be in flow? Earlier EEG studies on creativity may be relevant, such as Martindale's work (cited in Reuter, 2007, p.84) on low cortical activity during primary processing, and studies by Jausovec and Jausovec (cited in Reuter, 2007, p.84) showing higher intra- and inter-hemispheric EEG coherence during the performance of so-called creative tasks. Along the way, such a study might shed some light on links between flow and the creative experience.

It would be pertinent to discover if other determinants are involved in the emergence of flow in the classroom. Working in a state of flow has intrinsic rewards, which theoretically, when it is attained and maintained by pitching each task at the correct skill/challenge level, optimise mastery and the emergence of cognitive ability. If supported by a strong research base, the flow model would contribute a valuable theoretical framework for understanding the nature of intrinsic motivation and its impact on the dynamics of cognitive growth. It has clear implications in the area of curriculum

differentiation for talent development. It may also have particular application to the development of creative talent.

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