



# Flow Works: A Neurocognitive Workflow for Task Design towards Optimal Experience

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## Abstract

**Objective:** In neuroscience, despite high investments, paradigms designed to evoke cognition and other psychological processes remain scarcely founded in their theoretical characterization. This work aimed to achieve a deep understanding of Csikszentmihalyi's concept of flow, followed by its schematic representation in a neurocognitive workflow for task design: the Flow Works model.

**Methods:** Through a comprehensive review of Csikszentmihalyi's (1990) main book about flow, a schematic conceptual model was designed for the process of flow, based on neurocognitive understanding and other developmental models in psychology.

**Results:** From a neurocognitive framework, flow is presented by Csikszentmihalyi as a cyclic process depending on attention and executive functions, namely problem solving, response monitoring, and decision making. Our Flow Works model promotes meaning as the turning point that enhances origin-end linkage. It updates intention in a progressive manner, at the upper level, resulting in an increasingly engaged and enjoyable process.

**Discussion:** Our conceptual model of flow experience is a self-centered model in which challenges and results are described as perceived by individuals. It provided a cyclic frame work for both experimental and business task designs, expecting to add meaning itself through expanded equivalence between research (thinking), professional practice (acting), and life satisfaction (feeling).

**Conclusions:** Novel studies ought to formulate a more sophisticated design, integrating different features involved in flow, beyond the challenge-skill balance. This work is expected to expand its beneficial scope towards the integration of professional and personal realizations.

**Keywords:** Flow; Optimal Experience; Neurocognition; Task Design; Workflow

## Introduction

Pandemic times brought a permanent renovation to the way people all over the world molded their professional choices, prioritizing meaningful work commitments. That's what the recruitment and project management sectors are facing in

different specialization areas and continents [1,2].

A well-established research-based understanding regarding the acquisition of enjoyment and meaning in work (and other) tasks is the one proposed by Mihaly Csikszentmihalyi

[3], who presents the concept of flow, referring to optimal experiences.

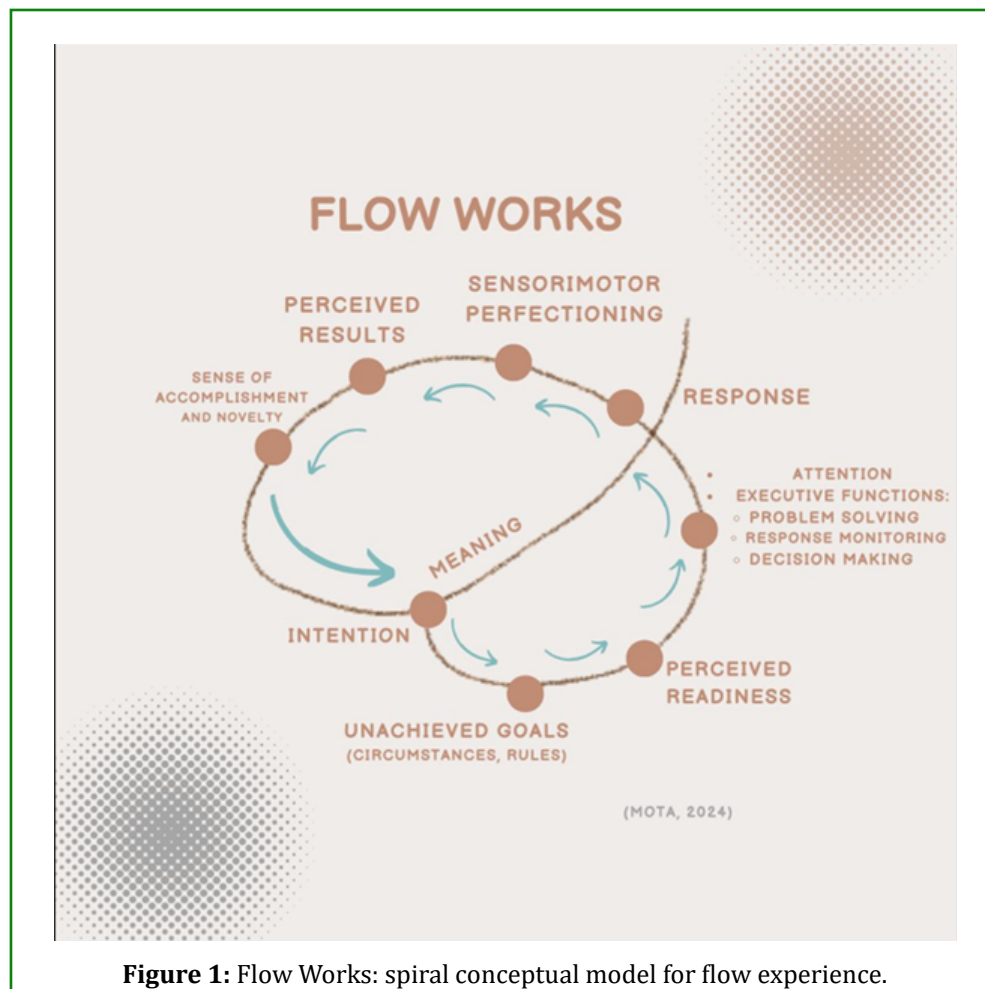
According to Csikszentmihalyi [3], the most enjoyable moments reported by people of different ages, countries, and interests are those in which one reaches satisfaction with their own performance in a relevant task, having mastered their skills. Thus, achieving skills under an achievable challenge has been considered a key core in flow states. Continuous engagement, reaching increasing precise results in such task brings a sense of unit (with the context), attributes meaning to the task, and enhances self-valuation, contributing to expanding the proportion of positive moments in someone's days or trajectory of life. This is how Csikszentmihalyi characterizes flow, also known as optimal experience.

Flow, despite being a spontaneous reaction, is mastered through a cyclic and self-regulated process: after a conflict between one's intention or goal and information that arises in consciousness (be it environmental or one's own thoughts or feelings), the person engages attention and problem-

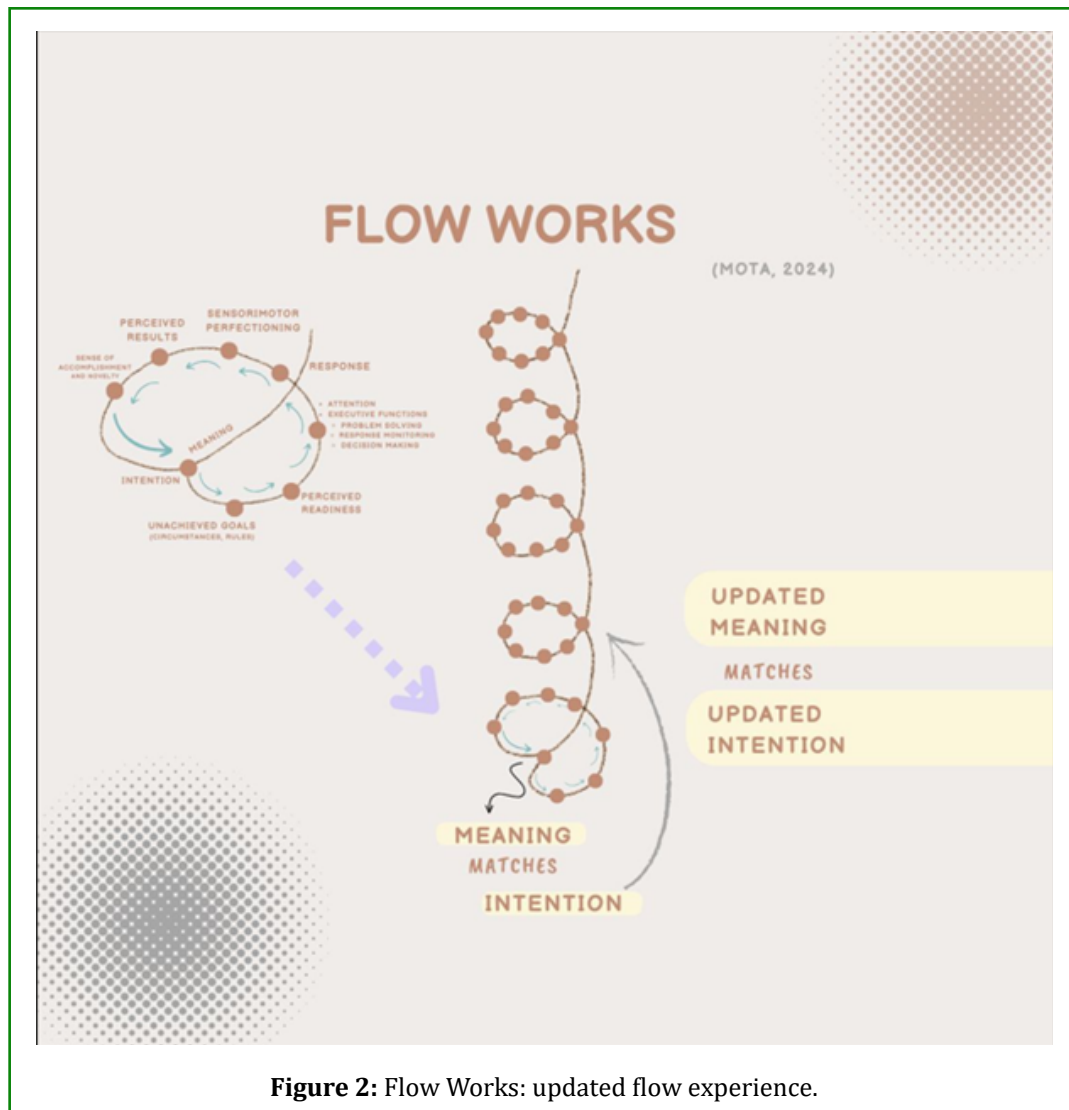
solving resources, updating their decision, in order to reach coherence between demand and response (skills), achieving a harmonious state.

Highlighting how one masters these self-regulating cognitive skills while acquiring optimal brain functioning and feeling, this work expected to reach a refined update on flow's characterization as well as expand its beneficial scope towards an integration of professional and personal realization.

In neuroscience, despite high investments, paradigms designed to evoke cognition and other psychological processes remain scarcely founded in their theoretical characterization. Following, some flow features are briefly discussed, embasing the consecutive elaboration of Flow Works (Figures 1 and 2). It is a task design model for flow experiences, inspired by Bruner's [4] spiral model for educational development. The proposed model was intended to be used in neuroscientific experiments or business initiatives.



**Figure 1:** Flow Works: spiral conceptual model for flow experience.



**Figure 2:** Flow Works: updated flow experience.

Through a comprehensive review of Csikszentmihalyi's [3] main book about flow, a schematic conceptual model was designed for the process of flow, based on neurocognitive understanding and other developmental models in psychology. Then, a cyclic workflow was developed for task design: the Flow Works model.

### Immersion

Immersion, described by continuous feedback and other aspects, seems to provide a sense of integration with the goal, in such a way that it is not intimidating anymore. That might be one of the aspects that make learning idioms easier when living in a foreign country, as well as rock climbing, once the person is engaged in the task. This feature must be taken as an advantage when designing virtual reality learning tasks. Immersion comes up in a cyclic and increasing commitment to the goal.

### It's a Match

The achievement of the flow state requires intention matched to the unachieved goals (instructions and rules). Also, it comes up with certain enchantment with one's own results, joining the sense of novelty, accomplishment, and (once more) matching.

Moreover, flow brings to reality what has been intended. It is when one's idealization comes to reality, and what they are in behaviour matches what they are in intention. It is when intention is correctly manifested in observable reality.

### Getting Tuned

Self-efficacy is a concept well developed by Bandura [5]. It refers to one's estimation of their ability to achieve certain goals. Once in flow, someone increases their sense of self-efficacy under higher challenges or uncertain circumstances.

This continuous movement contributes to developing confidence, so the person can manage failure, frustration, or circumstantial changes, keeping and increasing their sense of readiness. With minimal confidence, one will engage cognitive resources in order to achieve their goals. This attitude inspires adjusted responses, bringing up sensorimotor perfecting. This adjustment process occurs through keeping the broad goal previously set (possibly changing subgoals) and reaching creative states that translate failure into success.

### **Making it Work**

Attention is our most important tool in the task of improving the quality of experience [3].

For Csikszentmihalyi, flow state is when “attention can be freely invested to achieve a person’s goals, because there is no disorder to straighten out, no threat for the self to defend against” (Csikszentmihalyi, 1990, p. 40) [3]. Thus, for him, attention is a psychic energy that drives someone’s responses to established goals. It is seen as the first step towards refined behavior: through consecutive positive feedback and increasing satisfaction with oneself, reaching flow state. This concept is congruent with the neuropsychological definition of attention as a neurocognitive process characterized by allocating resources in order to direct one’s interaction with the environment, guided by an intention, instruction, or criteria [6,7].

### **Problem Solving: from Psychic Entropy Towards Flow**

According to Csikszentmihalyi [3], information that conflicts with an individual’s goals generates psychic entropy. In order to solve that problem, one engages attention and other problem solving resources, reaching, then, the state of organization in consciousness. When the information that comes into consciousness is congruent with one’s goals, attention flows effortlessly. This psychic organization, when mastered, conducts flow states.

Thus, the mentioned author considers that patterns of thought and feelings of disorganization drive people to implement problem solving strategies in order to overcome challenges. Constancy in this process leads to progressively refined, adjusted, and successful responses, achieving flow experience. Also, according to Kiili [8], for Csikszentmihalyi, solving puzzles is one of the oldest forms of enjoyable activities.

Problem solving is the ability to organize information by planning and implementing strategies in order to find an adequate response to a conflicting or challenging situation. Sternberg (1988) proposed six steps: identifying

the nature of the problem, determining problem solving steps, determining problem solving strategies, choosing appropriate information, allocating proper resources, and monitoring the problem solving process.

### **Response Monitoring: Goal-Directed and Bounded by Rules Activities are Predominant Flow State Elicitators and Evokers (Csikszentmihalyi)**

There is a clear emphasis on response monitoring or self-regulation processes in Csikszentmihalyi’s flow theory [3]. For him, one of the main aspects that promotes flow experiences is the constant response adjustment to well-defined rules. This psychological process is described in neuropsychology as response monitoring or supervision: the ability to keep checking if oneself is doing what they previously intended to do (goal directed or rule-circumscribed response) in a proper way [7].

### **Decision Making: Refined Choices as a Way to Optimize Interaction with the World (Reaching Specialization While Feeling Enjoyment)**

In neuropsychology, decision making is described as the ability to select an advantageous choice, among other options, under uncertain conditions [9]. Differently from risk-taking, decision making implies an implicit understanding regarding advantageous attributes, so successful people rapidly adjust their choices, preferring long-term but stable and cumulative gains compared to short-term, high, and instable gains.

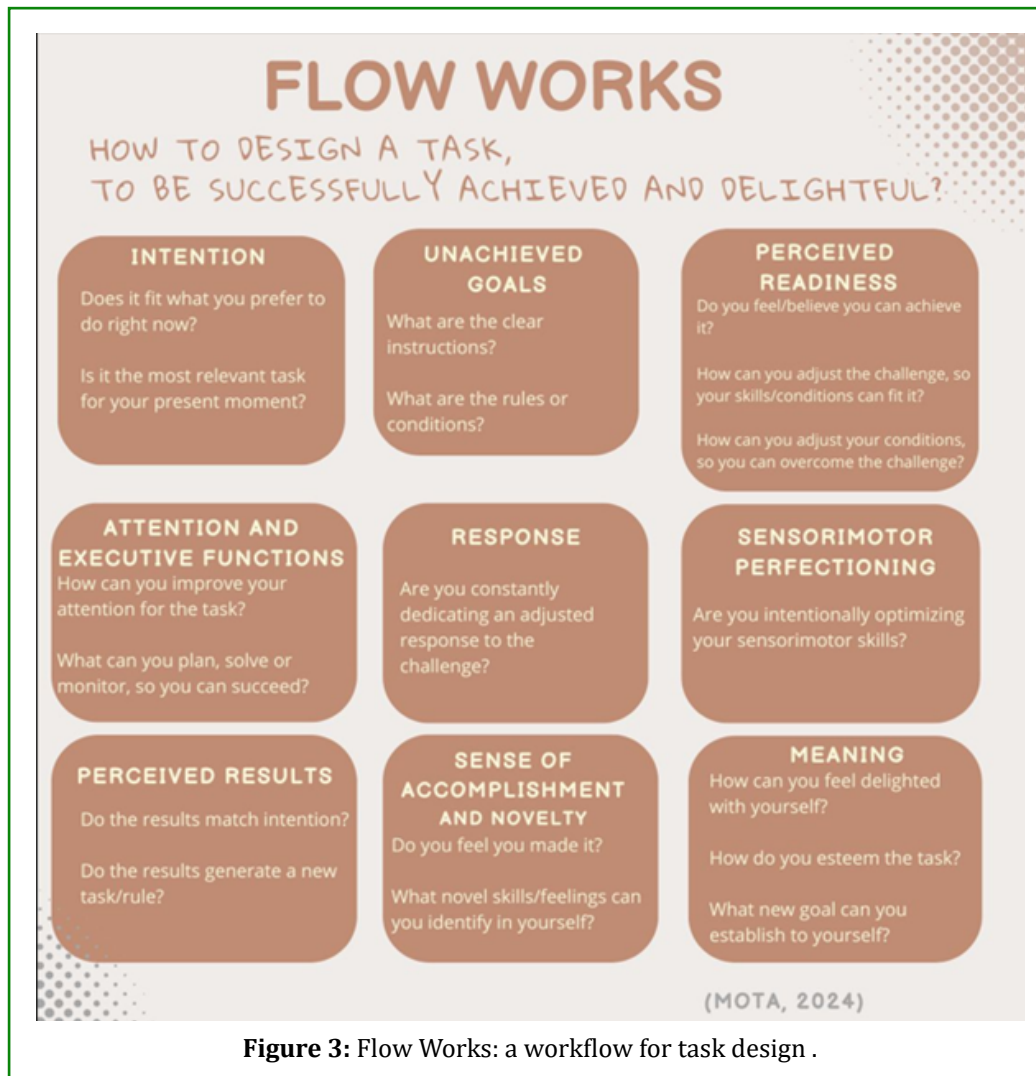
So, true engagement in flow indicates that one allows themselves to assume adjusted risks under uncertainty, demonstrating favorable decision making. As well, one absorbs (favorable or unfavorable) novelty as a first step for their new developmental achievement, keeping a constant ascending spiral.

### **Meaning**

Increasing satisfaction with one’s own results adds favorable meaning to the previous unachieved goal, which strengthens the intention to engage in the updated unachieved goal more and more in a cyclic approach.

Modeling flow experience, much attention has been given to its steps. This work, through an understanding of neurocognitive processes prior to steps or actions, has organized the flow process in a way that it can lead to creative results. Being a structured organization that facilitates creativity, the Flow Works model promotes meaning as the turning point that enhances origin-end linkage in a way that it updates intention in a progressive manner, at the upper level, resulting in an increasingly engaged and enjoyable process.

Stepping up, Figure 3 translates the conceptual model into a workflow for research or business task design.



**Figure 3:** Flow Works: a workflow for task design .

## Discussion

Therefore, our conceptual model of flow experience provided a framework for both experimental and business task designs, expecting to add meaning itself through expanded equivalence between research (thinking), professional practice (acting), and life satisfaction (feeling). It invites new studies to formulate a more sophisticated design, integrating different features involved in flow, beyond the challenge-skill balance.

It is important to note that not everyone is available to reach increasing joyful moments, neither in their lifetime nor at work. These optimal experiences demand differential motivation, increased sensorimotor activation, and cognitive effort through attention and executive functions. Sensitizing these people for flow process benefits through psychoeducation might be a priority in order to assure a fit

of their intention, since initial levels.

Flow experience has shown benefits to productivity and wellbeing [10-13] Divided between chore and work priorities, post-pandemic generation has decreased work commitment, prioritizing health-promoting activities [1]. Our Flow Works model promotes integration for these needs, facilitating their organization in the same frame by incorporating work tasks and achievements into personal goals. It allows for the creation of patterns of organization, which seem to organize consciousness itself.

Autonomy is highlighted by Csikszentmihalyi [3] as the most enjoyable way of living. Work Flows is a self-centered model in which challenges and results are described as perceived by individuals. It is also a matching product in a collective proportion, reflecting, by one side, different authors' commitment to translate experiences into concepts, and by

the other side, the business demand to make everyday life more emotionally comfortable while productive, bringing concepts to daily life.

Flow itself, as experienced while writing this study, seems to be a process of continuous matching towards stable harmony.

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