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## Flow



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### Keywords

Flow · Optimal experience · Teams · Team flow · Creativity · Optimal collaboration · Challenge based learning

## Introduction

Imagine a group of 26 strangers who came together for a student competition centered around solving a sustainability issue. It is a long competition, which means that the team will need to divide tasks strategically, stay engaged, focus long enough to actually learn something, and create something meaningful that will help them when they graduate. That is a rather tall order, but the Solar Team Eindhoven (STE) of the Eindhoven University of Technology (Eindhoven University of Technology-TU/e) actually pulled it off in the World Solar Challenge in Australia and made a solar-powered car while they were at it. What does it take to empower a team to perform at

that high of a level with high engagement, good division of labor, and long term commitment? With so many business challenges and day-to-day tasks depending upon knowledge work and teamwork, the answer is priceless, and we propose that it is *flow*.

## Flow

The concept of flow (colloquially called “being in the zone”) was first published widely in 1975 by psychologist Mihaly Csikszentmihályi, who initially defined the construct as “a holistic sensation that people feel when they act in total involvement” (Csikszentmihályi 1975, p. 36). Over the intervening decades, he and his colleagues published many works about how flow experiences are considered by individuals to be some of the most enjoyable, rewarding, meaningful, and engaging they have experienced, and typifies flow as involving automatic and effortless action coupled with intense focus. The flow experience can therefore be viewed as an optimal experience of intense involvement, focus, and satisfaction in the present moment, and one that according to research (e.g., Csikszentmihályi 1997) is involved with higher levels of performance, as well.

## The Nine Elements of the Individual Flow Experience

Csikszentmihályi and colleagues (e.g., Csikszentmihályi 1997) conceptualized flow using nine elements that are all present when a person experiences flow (see below). Three of these nine elements tend to be solely emergent/experiential and are hard to create or promote intentionally and attempting to evoke them often backfires. The other six elements are more amenable to being generated by the individual either internally or by using aspects of the environment, which are often considered the prerequisites for individual flow (cf. Nakamura and Csikszentmihályi 2009; Van den Hout et al. 2018). The presence of these prerequisites increases the likelihood that flow occurs or augments the intensity of the flow experience. The distinction between elements of flow that are readily developed (a.k.a., prerequisites, antecedents, or preconditions) and elements that are purely emergent (a.k.a. experiential characteristics, facets, components, or indicators) is illustrated in Fig. 1.

### The Prerequisites for Flow

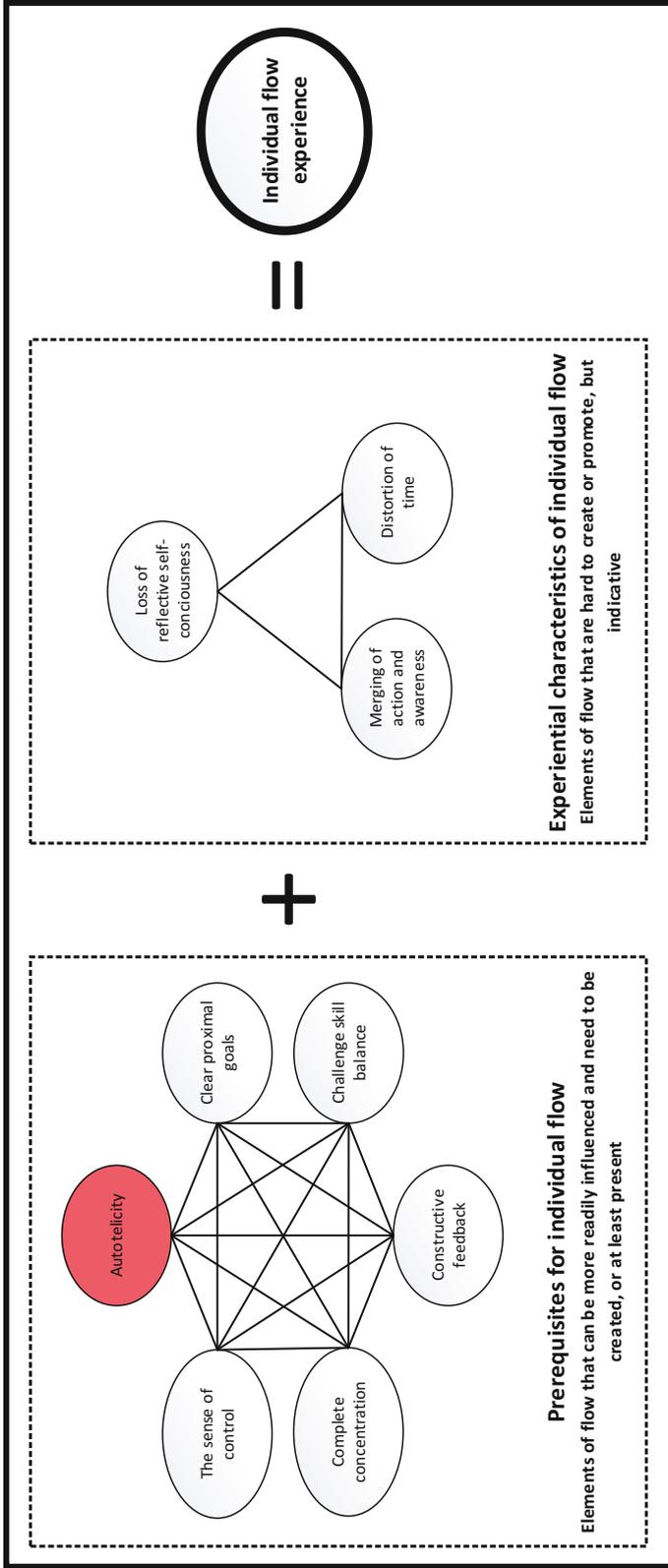
There are six elements of the flow experience that are readily modified by the individual to increase the chances of a flow experience occurring during the execution of a task (there is never a guarantee; cf. Csikszentmihályi 1997; Hektner et al. 2007). One of the main elements is *autotelicity*, which is about engaging in a given activity because it is intrinsically rewarding and worth doing for its own sake. This is one of the original core aspects of flow (Csikszentmihályi 1975) and demonstrates the value of being judicious in selecting activities that are appropriate to the situation and that are a fit with the individual's interests and current state (Csikszentmihályi 1997; Davis 2010; Van den Hout and Davis 2019). In addition to careful selection of activity, one can increase the probability of a flow experience by setting *clear, proximal goals* about which one can receive *clear, timely feedback*, both of which help the individual direct their efforts in *putting a high level of skill towards meeting a commensurately high challenge*

(Abuhamdeh and Csikszentmihályi 2009). This, too, represents a controllable element of the experience insofar as the individual can direct the level of effort they choose to put in, and can establish a challenging goal that is likewise motivating and can emphasize the intrinsically motivating aspects of the task (van den Hout and Davis 2019). This is not inconsistent with longstanding linear models of the flow experience (e.g., Fig. 2), but fits even better with more recent research indicating that flow is more of a continuum (Davis 2010) and a discontinuous, complex process (Ceja and Navarro 2009, 2011; Hektner et al. 2007; Hetland et al. 2018).

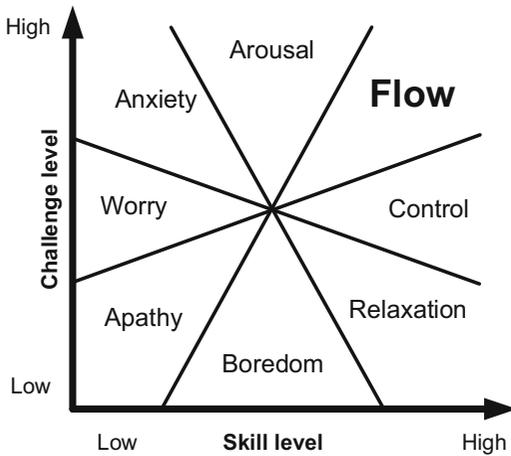
Still, Fig. 2 can be used as a clue for selecting a challenge and skill level based upon the desired experience and determining a growth trajectory for the individual so that they can stay in the sweet spot where flow is most likely. As noted above, the task experience can vary significantly, which means that one is likely to cycle erratically between relaxation, control, arousal, and flow, with a goal of staying within the flow continuum as much as possible.

The fifth element of flow is a form of *complete concentration* that excludes all distractions. The full measure of one's thoughts, efforts, and attention is applied only to the current activity. One can train in this aspect of flow through a number of different exercises (e.g., meditation, breathing, visualization) so that one can readily switch to deep task focus. One can also remove possible distractions in the environment (e.g., telephone) or internally (e.g., releasing work pressure, stress, uncertainty, fear of failure) that could act as disruptors. It is critical to note, however, that deep focus is only one characteristic of flow, and is in no way sufficient to do anything more than increase the likelihood of flow occurring if the context, goals, feedback, etc., are likewise at optimal levels during an *autotelic* activity (cf. Csikszentmihályi 1996).

The sixth element of flow is *a sense of control* over the task at hand, such that one *does not fear failure* (Jackson et al. 2008). It is not that failure is impossible in such a case, for the presence of a high level of challenge often implies the very real possibility of failure, but rather that one is focused on achieving the goal and confident that one has



**Flow, Fig. 1** A conceptual equation of the individual flow experience



**Flow, Fig. 2** Challenge skill balance required for flow (adapted from Massimini et al. 1987; Csíkszentmihályi 1997)

the wherewithal to succeed (Sawyer 2007). The opportunity to prepare (e.g., training, practice, analysis, positive self-talk) for the activity, and consequently reducing the fear of failure and increasing confidence, makes this element also a prerequisite of flow. This goes hand-in-glove not just with deep concentration and goals set, but also with autotelicity. When one is engaged in the action for the sake of the activity, one is less inclined to worry about failure precisely because the focus is on the activity.

### The Experiential Characteristics of Flow

As these six prerequisites increase the chance of experiencing flow, it behooves one seeking an optimal experience to aim for these conditions in advance. One must be mindful, however, of the role of context (Davis 2010) and that not every element can be controlled. Rather, one puts in the maximum effort to increase the likelihood of flow and then allows the activity to proceed and permit flow to emerge. One of the main emergent elements is the *merging of action and awareness*, in which one's actions feel spontaneous and automatic even as one actually has control over the activity (Quinn 2005). Consistent with this is the *loss of reflective self-consciousness*, in which one

loses sight of one's own role as an actor or agent in the situation, and likewise the *distorted sense of time* (either contracted or dilated), both of which tend to be byproducts of the deep absorption that occurs during flow (cf. Kihlstrom 2008; Tellegen and Atkinson 1974). Along with the seven prerequisites for flow, the emergence of these three experiential characteristics clearly signal that an individual flow experience has occurred.

### The Benefits of Flow Experiences

Flow experiences are considered profound and tend to improve the individual's overall satisfaction with life (Nakamura and Csíkszentmihályi 2009). Flow also promotes persistence in the activities in which it occurs (cf. Shernoff et al. 2014; Amabile and Kramer 2007, 2011), and likewise a higher degree of creativity and increased self-efficacy (the belief in one's own ability) and development (Csíkszentmihályi and LeFevre 1989; Csíkszentmihályi 1997; Ilies et al. 2016; Asakawa 2010). As such, flow can play an integral role in maximizing people's potential. But human beings are social creatures, and the demands of the business world today are so complex that no single individual can solve the extant challenges. Thus, it is important to look at flow at dyadic (e.g., Snow 2010) and team levels (van den Hout and Davis 2019).

### Team Flow

Before diving deeply into the complex workings of flow and interpersonal dynamics, it is important to provide a working definition of the terms "team" and "team dynamic." A *team* is "a small number of people with complementary skills who are committed to a common purpose, set of performance goals, and approach for which they hold themselves mutually accountable" (Katzenbach and Smith 1993, p. 112), and a *team dynamic* is the sum of all of the actions, processes, and

changes that happen within a team, either holistically or among its members (Forsyth 2009). This collection of forces affects the team's behavior and performance and is created by any number of factors. Extrapolating flow to the team level, *team flow* is the shared experience in which all team members are completely involved in a collaboration towards a gratifying and challenging common task. During this moment of optimal collaboration, they perceive adequate abilities to cope with the challenging situation and they have the feeling that their collaboration runs smoothly and effortlessly and consistently makes progress (van den Hout et al. 2011; Van den Hout and Davis 2019).

This description shares aspects of Pels et al.'s (2018) definition of group flow, which they defined as:

[A] shared state of balance within a group as represented by (a) fluent, positive interactions within the group, (b) a high collective competence of the group, and (c) a collective state of mind of the group by means of positive relationships between group members, often resulting in optimal collective performance and creativity, and making group flow a positive collective experience. (p. 18)

The description of team flow above is also similar to Sawyer's (2007) definition of group flow, which is defined as "a peak experience, a group performing at its top level of ability" (p. 43), where he enumerated ten flow-enabling conditions.

Building upon Csíkszentmihályi's work on flow, the literature on team dynamics (e.g., Salas et al. 2008), and the pioneering work of several researchers on plural forms of flow (e.g., Snow 2010; Sawyer 2006), Van den Hout et al. (2019) defined team flow as a shared experience of flow during the execution of interdependent personal tasks in the interest of the team, originating from an optimized team dynamic. As shown in Fig. 3, this optimized team dynamic is defined by eleven elements that enable and indicate the experience of team flow, seven of which are mainly prerequisites (enablers) and four of which are primarily emergent/experiential characteristics (indicators).

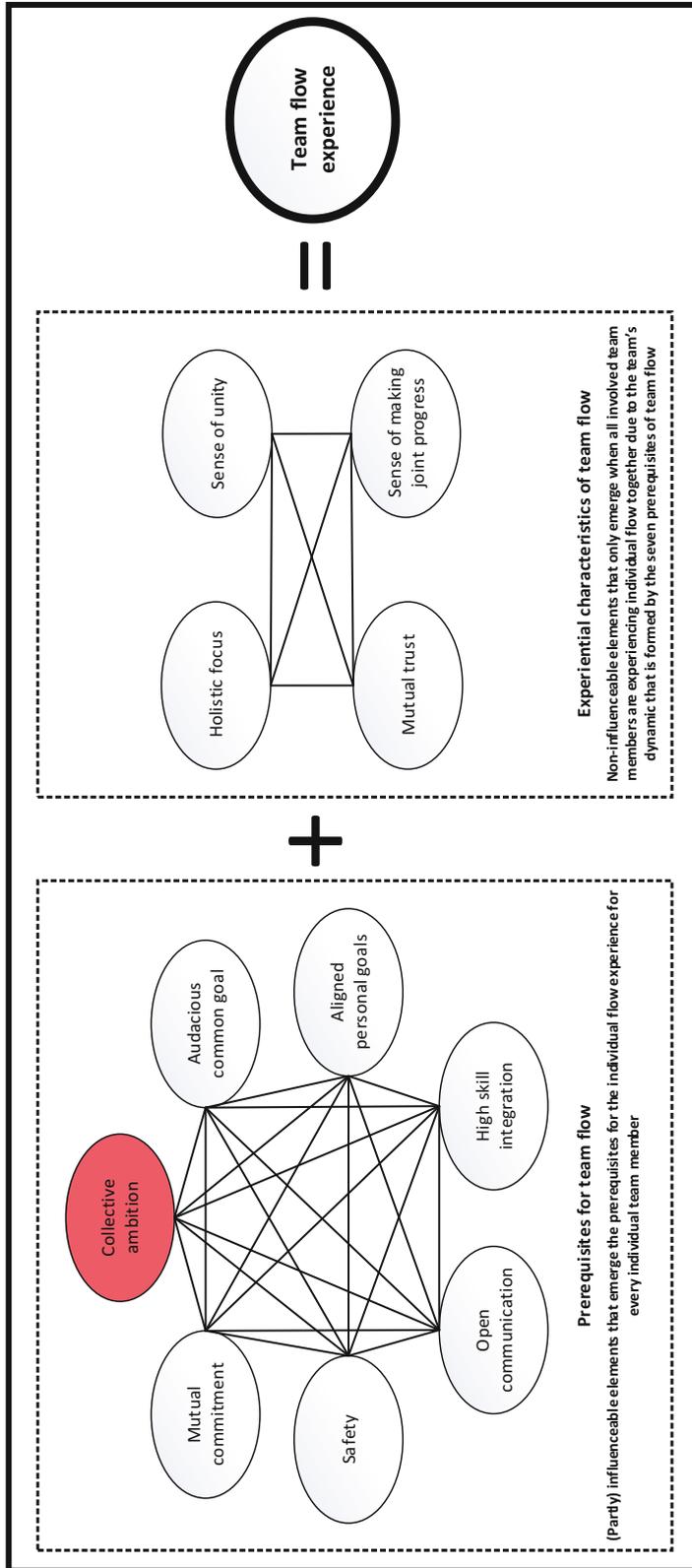
## The Eleven Elements of Team Flow

### The Prerequisites of Team Flow

Team flow experiences often initialize through a *collective ambition*, which reflects a shared intrinsic motivation (analogous to autotelicity in individual flow) to form a team and take on a common task that is meaningful and consistent with the values of the team members. This could be something enjoyable, like a game of soccer, or something important like providing good care to a patient. In all cases, the collective ambition also includes a recognition of the uniqueness of the each of the team's members and how that will contribute to fulfilling the goal, which is a crucial foundation for mutual trust and coordination of efforts.

If there is a collective ambition in a team, the team members often jointly derive one or more challenging *common goals* to achieve concrete/recognizable results. From this, the team members are able to create *aligned personal goals* that they find personally meaningful (and often match self-designed developmental goals) and that draw upon their unique skills and values. In so doing, team members are able to *integrate high skills*. To be able to experience flow during the execution of tasks, it is important that people have a stimulating challenge that requires them to apply high levels of personal qualities, skills, or competencies. The high challenge needs to preclude a guarantee of success without inducing anxiety, which reflects a healthy tension that demands focus and energy.

For each team member involved, in order to achieve this optimal integration of team members' forces, it must also be clear at any given time who is engaged in which tasks and how those efforts relate both to the other team members' activities and to the team's overarching goal(s). This requires feedback on one's own task, the sub-team's task (as relevant), the group's [coordinated] efforts, and the collaboration process. In order for this feedback to meet the requirements of being clear, constructive, and timely, the team needs *open communication* and *safety*. Each team member must feel physically, psychologically, and socially safe to perform their individual tasks and to respond to what the others are doing.



**Flow, Fig. 3** A conceptual equation of the team flow experience

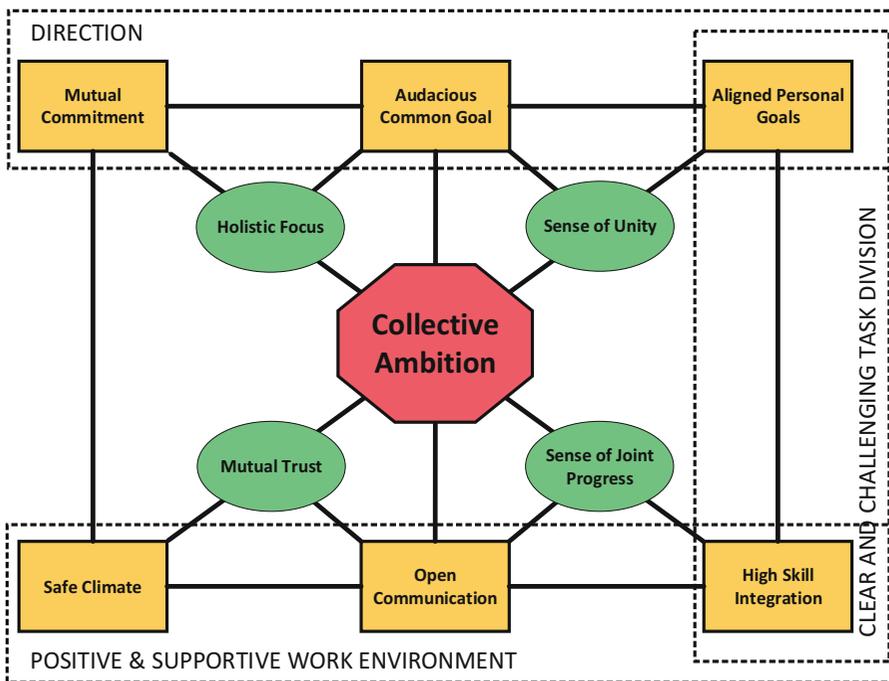
To achieve this, unnecessary and unacceptable risks need to be eliminated while giving team members the ability to take smart risks that are commensurate with their skills. If everyone’s abilities are respected and viewed as integral to the team’s success, cogent critiques that proceed on that basis will necessarily be positive and constructive even as they maintain the requisite level of candor to be clear and timely. This allows for clear lines of accountability and for task-oriented coaching, which in turn promotes a sense of both individual responsibility and of *mutual commitment*. The latter promotes compliance with agreed-upon rules of conduct, safety measures, and maintenance of personal and team integrity. These seven prerequisites allow each individual team member to experience flow while performing their personal task(s), which sets the stage for the team’s experiencing a group-level of flow.

**The Experiential Characteristics of Team Flow**  
 Team flow is when all team members experience flow during the execution of their interdependent

tasks, which gives the collaboration its own unique character. Just like flow, team flow is an optimal work experience, but it adds a social dimension. Collaboration is optimal when the following four characteristics are present: *a sense of unity* as if the team were one acting organism; *a sense of joint progress* as if building effortlessly upon each other, so that team members feel the synergy and are performing at a Gestalt level above the sum of their abilities; a sense of implicit *mutual trust* with the belief that the team’s task will be accomplished successfully; and a *holistic focus* on the shared task. All team members perform their personal tasks with deep concentration and in harmony with the (higher) goal of the team.

**The Team Flow Model**

An integrated model of team flow is contained in Fig. 4, in which the connections between the seven prerequisites and four experiential characteristics are highlighted. Collective ambition, the red octagon, is a starting point and anchor point.



**Flow, Fig. 4** The Team Flow Model (adapted from van den Hout et al. 2011; van den Hout 2016)

The other six prerequisites of team flow reflect the direction in which the team members want to move together, the attributes of a positive and supportive work environment, and a clear and challenging task division. These conditions, when activated by the collective ambition, interact with each other to activate the four experiential characteristics to promote the emergence of team flow.

### The Benefits of Team Flow Experiences

The description of the 11 elements of team flow already contains a number of possible benefits. Most people like it when there is a challenge, clarity, structure, things run smoothly, and they are deployed on tasks at which they are skilled and for which they are intrinsically motivated. Receiving feedback from team members may be difficult at times, but if this is done positively and constructively, it also offers growth opportunities. Seen in this way, there are already quite a few benefits to be gained from the team flow experience itself (cf. Csikszentmihályi and LeFevre 1989). In addition, studies have suggested that team flow leads to better team performance, more individual happiness, a more positive atmosphere (Van den Hout et al. 2019), and more creativity (Verhoeven 2018). Moreover, the shared experience of engaging in a meaningful and intrinsically motivating activity while serving a collective ambition strengthens the team experience and the affinity (in all forms) for the activity, which also increases the desire for the team to reconvene (Sawyer 2007; cf. Asakawa 2010; Csikszentmihályi 1990; van den Hout et al. 2017). It remains important to remember, however, that flow is not a lasting experience and comes and goes over the course of the team's endeavors. As such, a team should endeavor to promote flow, but not to obsessive levels, as these can lead to burnout, tunnel vision, and excessive risk (cf. Schüler 2012; van den Hout and Davis 2019).

### The Continuum from Individual Flow to Team Flow

While team flow arises from individual flow experiences, and the chance is greater if the prerequisites for individual task flow are created via the team flow prerequisites, there are many in-between levels of flow that occur during team activities that warrant analysis (van den Hout and Davis 2019):

- *Individual task flow*: Flow experienced during the execution of personal tasks for the team's purpose varying from microflow to deep flow (cf. Davis 2010).
- *Interactive flow*: Flow experienced during interactions with other team members while completing a task together. These interactions emerge from the team dynamic, and during these interactions team members get "in sync" with each other. This is sometimes referred to as interactional synchrony or flow synchronization (cf. Snow 2010; Keith et al. 2014; Magyaródi and Oláh 2015; Walker 2010). For interactive flow to take place, each person involved in the interaction should experience individual task flow and the interaction should not directly involve all team members simultaneously.
- *Contagious flow*: Experiencing flow through contagion by other team members' individual task flow experiences while completing a task together. This means team members are affected by the flow experiences of their fellows, increasing the intensity of their own flow experiences as they perform their individual tasks. Contagion is the reason team flow often starts with one team member's individual flow experience igniting a fellow teammate's, who in turn ignites another and so on until a tipping point is reached where the remaining team members "sync up" or "plug in" to the flowing team dynamic (cf. Bakker 2005; Walker 2010).
- *Unit flow*: The experience of flow at the unit level (one hierarchical layer higher than the individual level). This means that the unit's performance as an entity is functioning "in flow," as when the collective awareness of all

members in that performing unit are smoothly merging with their joint actions. At this moment, the unit is functioning at the peak of its abilities (cf. Sawyer's group flow definition, 2003; Salanova et al.'s collective flow definition, 2014; Zumeta et al. 2016).

Notably, all of the experiences above occur during team flow and highlight how individuals can feel that they are given the space to perform their tasks autonomously while still maintaining a sense of connection with the team.

Sometimes the performance of a personal task readily rises to the collective level because of the tight link required between individuals' tasks. Consider, for example, a rowing team or a healthcare team that performs a surgical operation. Though individuals are performing separate tasks, the effect of every person's task has a clear and direct impact upon every other person's task and upon the collective performance. In other teams, the mutual link is less strong, such as in a home care team where the nurse goes out alone and the interaction with teammates is often not direct (and can even be turn-based) when providing care. Despite the cumulative nature of each person's work, the lack of real-time integration of the effects makes team flow more elusive.

### **Disruptors that Block Team Flow Experiences**

In addition to looking at the factors that promote team flow, it is worthwhile also to review team flow inhibitors, such as negativity, politics, ambiguity, fear of failure, and insecurity (van den Hout et al. 2017). Corollary to the items above, there are four main categories of obstacles. Motivation is a major underpinning of flow, but is readily killed by laxity and bureaucracy, both which inhibit accountability, trust, and the freedom to take the requisite smart risks. As open communication and trust are essential to team flow, miscommunication, destructive criticism, personal conflict, and gratuitous negativity are inimical to the flow experience. Just as clear goals and timely feedback

promote flow, a lack of clarity, external pressures, limited challenge, and limited feedback inhibit team flow. And, notably, anything that causes distraction is going to remove any possibility of flow emerging. The good news about these pitfalls, however, is that they are relatively easy to avoid and remedy with proper precautions, planning, and coaching.

### **Team Flow Catalyzes Unprecedented Possibilities in Challenge-Based Learning Environments**

In today's practice, be it in schools, business, or daily life, intricate challenges are increasingly appearing. To answer the call of these complexities, the education system (writ large, and including adult and professional education) has started developing *challenge-based learning environments* (CBLEs), which are crucibles for developing the intellectual and social skills to go after the toughest problems as a team (Nichols et al. 2016).

Needless to say, CBLE's would benefit significantly from ensuring that participants learn how to foster team flow. To achieve this, it is first of all important that all participants feel connected to each other and willing to commit to a collective ambition. This serves as the proverbial "stake in the ground" amidst the chaos and complexity and anchors the team to a point on the horizon.

From there, it is helpful to turn first to the experience of individual flow, looking at how each member of the collaboration can maintain their professional autonomy (freedom to act based on expertise) in a way that visibly and uniquely contributes to the team. Participants need to know how things are going and how they can contribute individually to take the next step together.

It is therefore important that everyone has the freedom to be themselves, act upon their personal values and views, and from there contribute to the cooperative effort. In this way, team flow can develop without the potential negative aspects that can arise in the emergence of a collective mind. Consider, for example, irrational decision-making by *groupthink* (Janis 1971) or

exaggerating sentiments, showing impulsive behavior, or failing to reason, as described by Le Bon (1896) in *Psychologie des Foules*. Rather, professional autonomy must be balanced with alignment (see Fig. 5), in which the team uses the collective ambition as a foundation for establishing individuals' and units' challenging subgoals/milestones (Van den Hout 2016). What remains is to find a safe, efficient, and inspiring way of tuning into and receiving feedback on one another's work, and the literature on team workflows is rife with information about this (e.g., Hackman and Wageman 2005).

Once the group is aligned, it becomes necessary to create systems of accountability and methodologies for constructive feedback. This can be done, for example, on the basis of the following questions:

- Is there clarity about the expected team result?
- Is it possible for individual team members to join forces to form a dynamic/flexible performance unit?
- Is it possible for individual team members to experience individual flow during the performance of their personal task for the team?

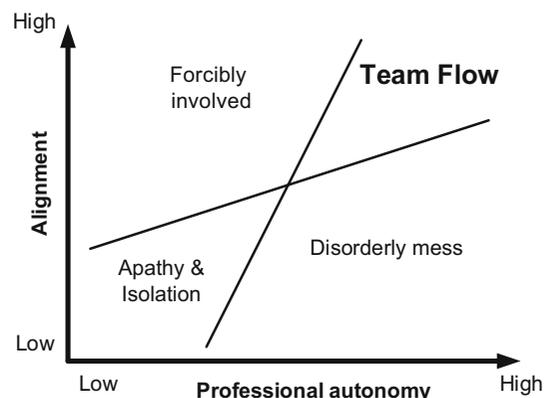
If working groups are formed in the CBLE, not only must a joint assignment based on the collective ambition be formulated, but, as above, the instructor should work with the team to guide them towards developing the additional conditions that significantly increase the chance of team flow emerging and likewise keep disruptors

out. As these conditions develop, the coach can focus on smoothing interactions and highlighting bottlenecks and disruptors as they emerge. A skilled facilitator can have the team working to counter these inhibitors, which can in turn strengthen the relationships among the team members.

By focusing on team flow, the team takes steps forward more quickly and participation in the CBLE is likely to be experienced as useful, enjoyable, educational, and effective. If the desired solutions have not yet been achieved, the seed may have been planted to continue this in the future within future work environments or during subsequent participation in other CBLEs.

The success of the team flow model and ideas around it lies in its simplicity, its focus on the core ambitions, and its roots in positivity. The model has now been proven effective within healthcare organizations, IT companies, research and development institutions, construction companies, and educational institutions (van den Hout 2016; van den Hout and Davis 2019). In order for teams to experience team flow, it is the responsibility of organization leaders to ensure that the elements from the team flow model can be present for each team. They should therefore not bother the teams too much with unnecessary procedures, meetings, and policies, but rather provide the resources and freedom for them to be self-determining. Likewise, an important role for leaders is supporting teams' collective ambitions and challenging team goals (results) that fit the overarching values of the organization, particularly with the provision of

**Flow, Fig. 5** The balance between alignment and professional autonomy (van den Hout and Davis 2019)



personnel and resources. Hard as it may seem to some, it is actually incumbent upon leaders to provide these resources and then step back and leave the teams to their flow and the excellence it promotes.

The Eindhoven Solar Team has already become the world champion four times, and members of the original team are now bringing the first solar car, called the Lightyear One, to the market. They serve as a prime example for how a challenging collective ambition can be turned into a reality through team flow, and thence to solving problems of global proportions.

## Cross-References

- ▶ Collaborative Creativity
- ▶ Complexity
- ▶ Creative Learning
- ▶ Creative Mindsets
- ▶ Creativity
- ▶ Development
- ▶ Mindfulness
- ▶ Positive Psychology
- ▶ Purpose
- ▶ Self-actualization
- ▶ Talent Development
- ▶ Uncertainty
- ▶ Zone of Proximal Development

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