Flow, leadership and serious games – a pedagogical perspective

Zoltan Buzady

Business School, Central European University, Budapest, Hungary

Abstract

Purpose – The purpose of this paper is to briefly outline the relevance of flow, a core concept of positive psychology increasingly applied in leadership development and in serious gaming. The author presents an innovative simulation game designed to teach and train how to manage and lead people based on the principles of "flow-based leadership."

Design/methodology/approach – This paper briefly describes the flow theory; it relates to leadership theory and why it is increasingly applied in the context of serious games. Then an extensive review and presentation of the features of an innovative serious gaming solution is presented to demonstrate that simulations are a fruitful area into which positive psychology and leadership science are being extended now.

Findings – Despite the growing market segment and various areas of training applications of serious games, very few games have been developed for leadership development. A detailed report presented the conceptual and practical aspects of such a new serious game.

Research limitations/implications – The author's contribution did not focus on testing a particular framework nor did it aim at exposing new numeric data findings. Instead, the author presented an in-depth case study as an inspiration for future, similar developments. Also, research questions for future analysis of data collected during the leadership development game were outlined.

Practical implications – Readers were informed about a new, innovative serious game application, which is successfully used for leadership development, and in particular to teach the practice of flow-based management concepts.

Social implications – Flow is a concept applied in many fields of life such as sports, music, arts, recreation and work-life. The positive benefits of happiness, creativity, outstanding performance and joy can lead to a fulfilling life which is a paramount value, across all cultures globally. This leadership development game can be applied in other countries and cultures. As a result, the quality of leadership across various cultures can be improved. Researchers are invited to join the outlined new research network and program.

Originality/value – Flow theory is probably the best known concept of positive psychology across related scientific domains such as management, arts, sports, education and spirituality. Professor Csikszentmihalyi – a global figure head – laid the scholarly foundations decades ago, but now the concept is constantly evolving and being adopted into new and changing environments. This necessitates a review – such as this contribution – where the theoretical elements also apply in the new areas of application.

Keywords Creativity, Learning and development, Leadership development, Positive psychology, Skills development, Happiness, Serious games, Leadership theory, Flow theory, Big data application, Leadership ethics, Management theory

Paper type Viewpoint

1. Overview

This special issue of the *World Journal of Science, Technology and Sustainable Development* focuses on new, computer-based and/or online learning tools with the aim to present current trends and innovations to professionals, consultants, instructors and academics. The author who contributed to this study is a researcher and professor of leadership, who has encountered a truly innovative leadership development simulation game – FLIGBY – the features of which will be presented here. Its relevance for management education is

grounded in its scholarly background: the theory of flow, a core concept in positive psychology. Its relevance for practitioners in management and training is rooted in the way this serious game helps players to transpose abstract, theoretical concepts into daily management practices.

2. Roots in positive psychology

One of the founding fathers of positive psychology, Mihaly Csikszentmihalyi (1991, 2003), focused his research on creativity and happiness. Positive psychology is a branch of the discipline that relies on scientific understanding and effective intervention to aid in the achievement of a good and socially productive life, rather than treating mental illnesses as outlined by Linley *et al.* (2012). Findings of positive psychology are of particular relevance for scholars in management theory and organizational sciences. The focal question is whether satisfied workers enjoy advantages over their less happy and satisfied peers, and whether they are likely to improve the performance of the organizations where they work. For an overview see the works of Luthans and Youssef (2012) and Salanova *et al.* (2006).

Research has shown that, regardless of context, culture, age, gender or education, when people feel a deep sense of enjoyment they describe the experience in very similar ways (Csikszentmihalyi, 1975). What they feel in such moments is rather consistent. This common experience of feeling a deep sense of enjoyment has been given the name flow, because respondents often made the analogy to be moving effortlessly in a current of energy where action and awareness follow each other spontaneously and freely as being "carried by a river or a stream". In short – the central concept of positive psychology – "Flow is a mental state in which a person performing an activity is fully immersed in a feeling of energized focus, full involvement and enjoyment" (Note: as the focus of this paper is to present an intellectually interesting combination of theories (flow and leadership) with modern simulation (gaming) technology for the purpose of leadership development, we will use the concepts of flow, happiness (job) satisfaction, engagement, enjoyment of work/life/gaming, somewhat loosely and interchangeably. For a more succinct discussion on flow, work engagement and work satisfaction, see De Fraga and Moneta, 2016).

The flow state can be achieved by a careful balance between two extremes: the state of anxiety, which is characteristic if the challenge at hand is far greater than a person's requisite skill level, and the state of boredom, which persists when a person's skills far exceed what is necessary. This balancing process happens sequentially: when a person needs to accomplish a new – more difficult than usual – task she/he begins to learn and gradually develop the necessary skills, thus moving away from a state of anxiety towards that of arousal and finally into flow.

Alternatively, people who feel bored tend to seek out new challenges, which test their skills, so they start to feel relaxed then in control and finally in flow.

Thus "being in the zone," as flow is often paraphrased, leads to people's greatest performances and personal bests.

3. Extending flow into leadership

Creativity, flow and happiness, core concepts of positive psychology, have particular relevance for organizations especially in forming business management practices. (Buzady and Marer, 2016)

Csikszentmihalyi conducted focused "conversations" with thousands of individuals, trying to understand the sources of individual creativity and happiness in one's life in general and at the workplace in particular. He found that people were happy when the activity they were engaged in was rewarding to them in and of itself, not just to make a living, or out of duty. Csikszentmihalyi's subjects often described the feelings they experienced when engaged in activities on which they were fully focused and enjoyed as

"things flowing effortlessly, like being carried away by a river." So he decided to call such states "flow" experiences.

Being in flow does not require engagement in a momentous task. One can experience flow repeatedly even while doing relatively simple things, if one does them extremely well.

Flow states can be described in terms of the following basic preconditions and characteristics:

(1) balance between challenges and skills;

(2) goals are clear;

(3) immediate and clear feedback (need not be positive but must be constructive);

(4) intense concentration;

(5) effortless action; loss of ego;

(6) sense of control;

(7) distortion of temporal experience (unaware of time, space, noise, hunger); and

(8) doing an activity because it "feels good" in and of itself, not in expectation of any external reward (Csikszentmihalyi, 2003, pp. 42-56).

Since most of us spend the largest portion of our waking hours at work (or at school), it is a common-sense observation that our jobs determine, to a large extent, what our lives are like. Just think of what happens when one comes home from school or work all stressed out as opposed to arriving home and telling a loved one, "today (or in a past week or month) I have really accomplished things and my achievements are appreciated (at school or at work)."

In response to these findings, Csikszentmihalyi (2003) wrote in his book *Good Business: Leadership, Flow, and the Making of Meaning* about what we as individuals, as members of teams, as managers, or as leaders of any group or organization – be it an educational institution, a business firm, a unit of government, or an NGO – can and should do to make the workplace attractive. The key statement that summarizes his flow concept's relevance for managers and leaders is: the best way to manage people is to create an environment where employees enjoy their work and grow in the process of doing it.

While the extent to which we enjoy our work and are contributing to the organization is partly a function of the attitude we bring to our tasks; managers and leaders can do a great deal to create a more rewarding work environment, thereby increasing the chances that the employees will be highly (or at least more) satisfied.

High satisfaction at work also brings substantial benefits to the organization because such a workplace:

• attracts the most able individuals and is likely to keep them longer;

• obtains spontaneous effort from most as they do their tasks;

• promotes individual and team productivity;

• leads to a more committed organizational citizenship behavior; and

• improves organizational performance, broadly defined (Ceja and José 2011).

The author also categorizes the positive consequences of work-related flow into "benefits for the individual employee(s)" and "benefits for the whole organization."

The first and perhaps relatively the easiest of tasks to create an environment where employees enjoy their work is to ease or remove the many obstacles that typically stand in the way of experiencing flow periodically, as well as engagement more continuously.

Concurrently, and after the obstacles have been removed as much as possible, the continuing focus of attention of managers and leaders should be to behave and act so as to help generate flow and to maintain a flow-friendly organizational atmosphere.

4. Combining flow and serious games

A detailed market study prepared by Learnovate Centre identified the state-of-the-art use of serious games for learning in the corporate sector. They report an uptake of such gamification, and list the following application areas of serious games: supporting marketing/sales function, supporting recruitment function (such as via Facebook games) and supporting training function in finance, corporate responsibility and sustainability, hospitality/etiquette, skills development (building IT networking structure) and the support of new hires. Leadership development applications are not mentioned in the comprehensive survey. Similarly, de Freitas and Routledge (2013) repeatedly write in their review of the current literature on how leadership models can be best designed, used and tested in available game environments that "despite the positive literature and study findings, there is still a dearth of evidence of leadership skills training in game environments and the accompanying research, so more research and implementation is required" (p. 956).

The concept of flow is highly applicable to various types of interactive learning, playing and gaming as well as serious gaming as recently described by Kaye (2016a, b). But the interest of Professor Mihaly Csikszentmihalyi within the context of new learning and gaming technologies shifted to the question of how best to transplant the theory of flow and the concepts of flow-based leadership into such a new serious gaming format. A detailed review on the topic of flow in education and in particular a discussion on defining the optimal learning environment that induces flow in the context of massive open online courses can be found in the work of Heutte *et al.* (2016).

We define simulation games (e.g. "car racing video games") as a hybrid of game and simulation elements. Training exercises (such as dynamic spreadsheets) combine simulations with learning contents. Edutainment applications (such as quizzes) combine learning content with game features. But serious games feature all three aspects: some theory (learning), use of technology (simulation) and fun element (games), representing a new and growing interdisciplinary industry segment.

Thus in 2010 Professor Csikszentmihalyi himself became gradually involved in creating FLIGBY, an interactive digital game, aimed at finding ways to best translate the concept of flow (learning) into a practical teaching tool (simulation) which also features motivating elements (game). Over the past six years he adopted various roles in the development process of this serious game: from being an initial conceptual adviser, then a co-developer of the draft simulation set-up and commentator on the key quality aspects, and now a promoter as well as contributor to the regular updates of the game.

The objective was and is to make a significant contribution in the growing importance of "serious games" around the globe in education and training. Thus, the aim of this game is to become a tool that makes the teaching and learning of flow-compatible leadership values and practices easy, funny and lastingly memorable.

The two basic groups targeted are: first, those still young who – owing to their personalities, ambitions, or university education – will most likely hold managerial/leadership positions during their careers; and, second, those with organizational experience already, ranging from small entrepreneurial ventures to large multinational firms.

The first group can be subdivided into two major subgroups: one is of those who are or will be teaching or taking university courses related to management and leadership. Such courses are taught not only at business schools, but also in schools of public administration (training civil servants), military (training officers) and healthcare and social work (where the principles of flow have widespread applicability at all levels in the hierarchy).

There is hardly a discipline or a field where effective management/leadership is not central. The other "still young" group includes the growing number of freelancers, advisors, consultants, subcontractors, etc., who would benefit greatly from a thorough yet easy-to-master set of principles and practices of good management. Such knowledge can be put to profitable use in any career situation in which such individuals will find themselves.

The second group, those affiliated with organizations, can again be divided into two subgroups. The members of one group are those with human resource management responsibilities, who would like to measure, with reasonable accuracy, the leadership competencies and potential of their key staff. The members of the other group are managers or leaders of units of any size, in any organization, whose productivity needs to be improved through everyone's more active engagement.

Whatever a person's interest is in FLIGBY, it should be helpful to highlight the design features of most serious games, which typically can induce flow state in the learner and game player:

(1) Online: it is a digital game, with a purposeful, goal-oriented, rule-based activity, which is played on the WWW and players perceive as trendy and up to date.

(2) Serious game: a serious game has the look, the feel and the excitement of an entertainment game, even though the primary purpose is education and training.

(3) Scenario-based game logic: also known as problem-based learning or whole-task learning, means that the player is put into the role of a problem solver, responding to realistic workplace scenarios. The lessons are built around a series of progressively more complex game situations. Scenario-based learning lets players learn through a trial-and-error process that is as effective as getting on-the-job training, without having to face possible real adverse consequences or bearing the burden of having made wrong decisions.

(4) Controlling outcomes of the game: the player develops a sense of control over the virtual characters. The greater the player's sense of control over the characters in the game, the more real and intense will be the player's sense of presence – the sense that he/she is a part of the virtual story world. Video makes it possible for the characters to display specific emotions in response to decisions made by each player – as the GM of Turul Winery – enhancing the realism of the game.

(5) The restart feature: it encourages players to experience two or all the possible endings in order to fully understand the game's overarching narrative and to travel on several branches of the story, and learn more thereby.

(6) Blended learning: is the integrated use of the internet with a rich variety of other approaches and technologies, such as formal and informal learning, face-to-face and online experiences, directed paths and reliance on self-direction, digital references and group discussions. These games are often self-paced, but can also be supported with readings and videos from the game's multimedia library.

5. Serious game features of FLIGY

FLIGBY has been designed by experts to be the globe's top leadership development game; it won the Gold Medal Prize of the International Serious Play Awards in Seattle in 2012. Since then it has been used by 10,000+ players in corporate trainings and university courses around the globe.

Figure 1 summarized the most important flow generating features of a serious game in which the player of FLIGBY is the recently appointed GM of the "Turul Winery" in California. The player faces the challenging task of having to achieve a state of harmony
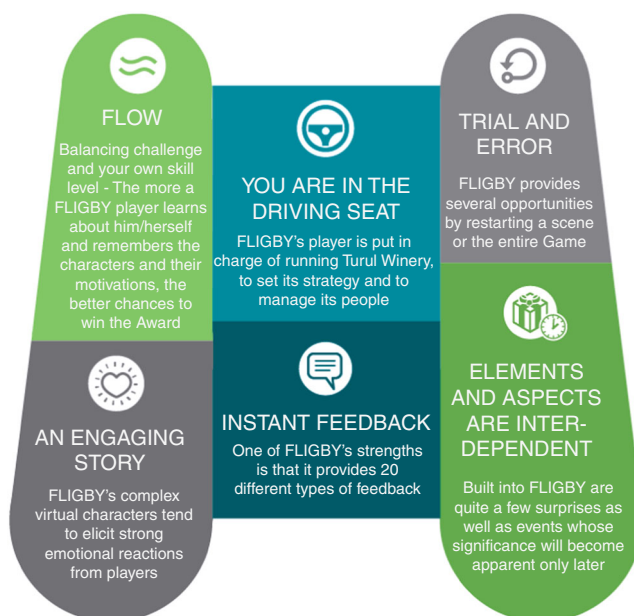
Source: The Author's own illustration

and cooperation in a team significantly weakened by internal conflicts due to the dysfunctional leadership style of the previous GM.
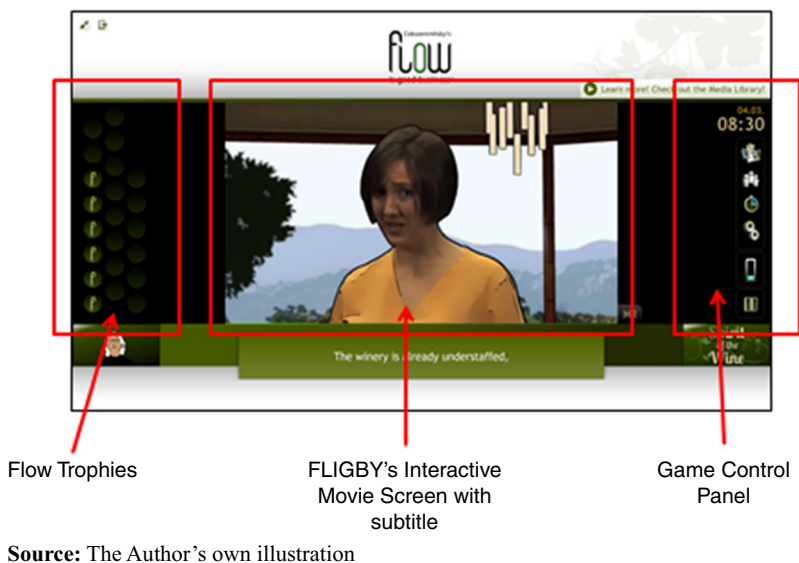
A key task is to create an environment that promotes teamwork and enhances flow. Thus, one of the key aims of the game is to bring as many colleagues as possible – even if just for a short time – into a flow state. The dilemma is when to be supportive of a colleague and when to protect the interest of the team, the Winery, its stakeholders, and prudent environmental management. At the same time, decisions concerning strategic questions of the future of the company have to be made in accordance with the expectations of the Winery's owner.

The game is a 23-scene adventure, each like a little story or a problem to solve within the overall plot. Each time the player earns a "Flow Trophy" or a "Sustainability Badge" (for making an environmentally friendly decision) a signal appears. In addition, the player can continuously monitor progress on various aspects of performance as General Manager. Figure 2 shows a snapshot of the main user interface.

From left to right in Figure 2 we can see: the number of flow trophies the player has earned up to this point in the game. At the center is FLIGBY's interactive movie screen, each with a subtitle; this shot showing Jan, the GM's assistant, complaining. On the right is the game control panel, where the player can set and modify various game functions.

During the game the player makes about 150 decisions. In case of most decisions – for example, on how to run a strategy meeting with a team – the player must choose one answer from two to five options presented. The answers selected will put each player on an own, individual story path. There are many possible paths that result in different outcomes at the end of the game.

The player will have to balance multiple objectives. Since FLIGBY's main purpose is to teach flow-promoting management/leadership skills, it should not come as a surprise that the most important objective is to promote flow at the Winery. This can be done in two

Flow Trophies   FLIGBY's Interactive   Game Control
Movie Screen with   Panel
subtitle

Source: The Author's own illustration

ways: by making managerial decisions that affect the colleagues so that they can get into a flow state or by calibrating one's decisions so as to promote an overall flow-friendly corporate atmosphere.

It is also an objective for the Winery to follow business practices friendly to the wider social and ecological environment without eroding its profit potential.

The player's overall performance as the GM of Turul Winery will be indicated by winning or not the game's ultimate prize, the so-called Spirit-of-the-Wine-Award.
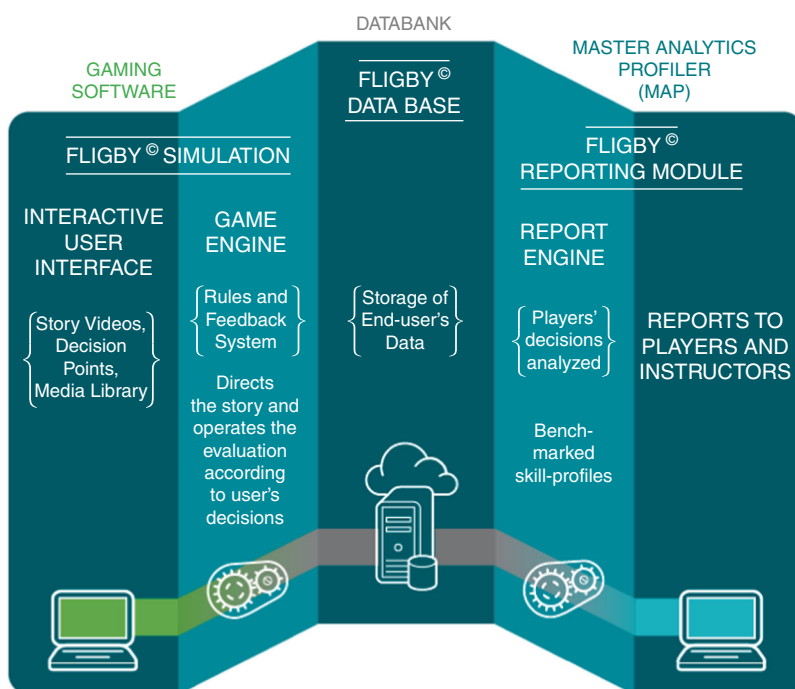
Players are motivated by periodically winning two other types of lesser awards: flow trophies (each time the players' decisions help put a colleague into flow) and sustainability-badges (each time an important decision is made that helps protect the environment).

The average game-time is nine to nine hours.

Being an online simulation game, FLIGBY is a software system, whose delivery method is "Software as a Service." It means access to the software and its functionalities is provided remotely, as a web-based service in the Cloud. The software structure is comprised of the following three major parts:

(1) The Gaming Software – this is the Game itself, presented in an interactive movie format, whose plot the player is driving forward by his/her decision choices. Mr Fligby, who comes on the screen at the end of each of the 23 scenes, provides instantaneous feedback to the player/learner.

(2) The Databank – stores all data (login, decisions, choices, actions) generated during the game play.

(3) The Master Analytics Profiler (MAP) – This system creates the final report for each individual player on his/her 29 management/leadership competencies measured during the game play.

Figure 3 shows that at the center we find the FLIGBY database; this powers two separate software applications. One is the game's driver (essentially the simulation), which brings up the sequences in each scene, and operates the user interface. The other application

DATABANK

GAMING
SOFTWARE

MASTER ANALYTICS
PROFILER
(MAP)

FLIGBY © DATA BASE

FLIGBY © SIMULATION

FLIGBY © REPORTING MODULE

INTERACTIVE USER INTERFACE

GAME ENGINE

REPORT ENGINE

Story Videos, Decision Points, Media Library

Rules and Feedback System

Storage of End-user's Data

Players' decisions analyzed

REPORTS TO PLAYERS AND INSTRUCTORS

Directs the story and operates the evaluation according to user's decisions

Bench-marked skill-profiles

Source: The Author's own illustration

Figure 3.
FLIGBY's software –
three basic
components

(the MAP) is for generating individual and group reports. It also assists instructors to monitor their players' progress, on individual as well as group levels.

Producing a serious but fun game for effective learning is an interdisciplinary effort which also necessitates pedagogical skills and understanding of concepts, which we describe in the following section.

Many different systems and approaches to measure management and leadership skills exist.

For example Zenger and Folkman (2014) present the 16 most important such management skills based on a data set in which 332,860 bosses, peers and subordinates were asked what skills have the greatest impact on a leader's success in the position the respondents currently hold.

In contrast to this the developers of FLIGBY used a different approach: Csikszentmihalyi's (2003) global best seller book *Good Business: Leadership, Flow, and the Making of Meaning* describes several biographic interviews with successful leaders who created a flow-inducing work environment at their organizations. The author and a team of management scholars then analyzed the management and leadership skills, characteristics of those case study personalities and drew up a list of 29 key skills. Then the team analyzed the 150 game decisions with two objectives: is either of the managerial decision alternatives clearly preferable to the other options? If so, then which of the 29 skills can be traced in the preferred alternative? The resulting individual skills profiles of several hundred players were then validated by involving experienced coaches and management trainers. After the first 2,000 players had completed the game, the initial coding of the skills was independently verified by a second expert team. Furthermore, we can report that the subjective feedback from the users themselves has been strongly supportive of the reliability of the measured skills.

Based on the theory of flow and the observations described by Csikszentmihalyi (2004) there are four skills which are particularly important because they might create a work environment favorable to flow experience. Marer *et al.* (2015) describe how the 29 skills measured by FLIGBY can be combined with other systematizations of management skills such as the "Executive-Core-Qualifications-system," the standard for measuring high-level applicants in the US federal administration, or with "Gallup's-Strengthsfinder," a globally used such set.

6. Serious gaming technology enables blended learning pedagogy

Our aim in this contribution is also to tell the reader our experiences about using this particular serious game as a blended learning tool for effective training and development of flow-based leadership and management skill (Marer *et al.*, 2015). Our observations were gained during numerous corporate trainings and university courses with 10,000+ participants in various locations.

The topics covered by FLIGBY's plot and the decision dilemmas during the game make it an appropriate teaching tool in a variety of courses, such as: leadership – managing people (human resources), leadership development – self-management, business strategy and business development, marketing in the context of general, organizational behavior and managing change, managing agricultural enterprises, especially wineries, leading teams, entrepreneurship, cross-cultural management, management, sustainability in business, business ethics, applied psychology.

For an effective, meaningful and yet entertaining leadership development process we recommend to follow four plus one optional phases or stages when using FLIGBY as a training tool.

### 6.1 The briefing session – what to tell players before the game
This section contains information for instructors and trainers who plan to adopt FLIGBY in a course or a training program. The preparation and implementation requirements fall into two major categories, which should be made available to the players before they start the game:

(1) Personal preparation by the instructor: the instructor herself or himself should be playing FLIGBY first, completing the game. It is essential that a teacher play FLIGBY so as to experience the game's potential, to be prepared to understand students' comments later, to be able to answer their questions and to be ready to conduct stimulating debriefing session(s) during the third phase.

(2) Introducing FLIGBY to the participants: we suggest that during the introductory session the instructor summarize the key features of the game and indicate where and how FLIGBY fits into the course material.

6.2 Intermediate sessions and continuous feedback
Intermediate session between the briefing and debriefing session of FLIGBY are valuable opportunities to enhance the learning and personal development process. A blended-learning approach already takes place when serious games are designed for educational purposes because the development of a game itself typically involves cooperation between scholars and other professionals on the one hand and experts in game design and programming on the other. Scholars bring theoretical knowledge; and they – and other experts, too – contribute applied knowledge on the topic. The creation of FLIGBY is a good example.

Figure 4 shows how teaching with the Game is most effective via a blended learning approach. The drawing depicts a so-called flipped-classroom, a pedagogical model where the typical "lecture," followed by "homework," is reversed. Video lectures are viewed or
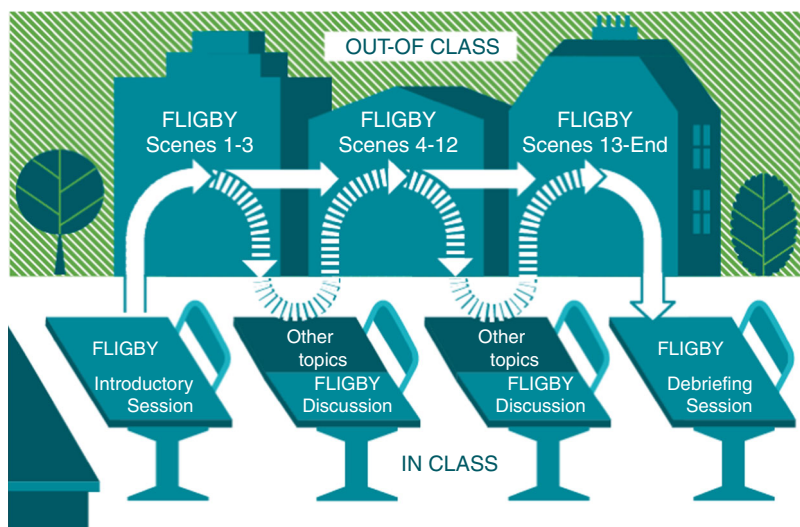
Source: The Author's own illustration

serious video games are played by students at home (out of class), while class time is devoted to discussion, exercises and projects.

FLIGBY has been designed to give each player a continuous stream of valuable, multidimensional feedback. De Freitas and Routledge (2013) write "[…] the aspect of feedback in games lends well to monitoring performance and building up the acquisition of soft skills […] but game-based feedback is formative and continuous […] and has positive benefits for learning" (p. 955).

Providing frequent, specific and actionable feedback is one of the most important features of flow-promoting leadership practices – as it is a crucial element also for successful learning and enjoyable gaming.

The two dozen different kinds of feedback given to FLIGBY players are of three types, if we use as the basis of classification the time when the feedback is given.

Multiple feedback while playing the game. The player can periodically or continually check the game's dashboard for instruments that show how the GM's decisions impact the flow state of each member of the management team, the "corporate atmosphere," and the Winery's profit potential. Each time the player manages to get someone into a flow state, FLIGBY signals that the player has collected a flow trophy, and each time the player's decisions promote/enhance the environmental sustainability of the Winery's operations, FLIGBY signals that a sustainability badge has been earned.

However, each player receives much more than quantifiable feedback: he or she will also obtain, continually and visually, emotional-reaction-based feedback from the members of the team as they respond with voice tone and body language to the GM's communications with them and to the GM's decisions affecting them. One characteristic of a flow-friendly manager is that he or she pays attention to such type of feedback, as opposed to just continuing on his or her merry way, as many "bosses" do in real life.

At the end of each scene, Mr Fligby, the player's personal game and leadership mentor and coach, is ready to offer personal feedback. At several junctures in the game, the player will get a signal that FLIGBY'S Multimedia Library has a brief classic reading or video to guide the GM on the decisions he or she is about to make. Those resources provide

intellectual-academic learning and reinforce the overall purpose of the course or the training program where FLIGBY is used. The player has the choice of making use of those aids or skipping them and possibly revisiting them later.

And there is, of course, the grand prize: the Spirit of the Wine Award. The player will learn only at the end of the game whether he or she has succeeded in earning that award, a measure of the player's success in skillfully balancing difficult tradeoffs, such as generating individual flow, enhancing the quality of corporate atmosphere, earning satisfactory profit and adequately protecting the environment.

How deeply a player wants to engage in playing FLIGBY is up to him or her, guided of course by the instructor or trainer (e.g. by making certain readings mandatory). At the other end of the options, a player may play FLIGBY straight through, enjoying its decision challenges, and seeing where "gut" decisions are leading. Alternatively, the player can make use of some or all of FLIGBY'S "bells and whistles" by checking, or asking for and responding to, the multiple feedback available throughout the game.

Feedback when finishing the game. A comprehensive, automatically-generated report on the strengths and weaknesses of each player's leadership profile, is sent individually to each player (as well as to his or her instructor/trainer) right after the game. This feature will be discussed in the section on skills evaluation.

Multiple feedback during debriefing the game. Discussion with the player's peers – during the debriefing sessions arranged by the instructor/trainer – on the reasons why some players have made different choices on key decisions from other players or the Game's designers did (see next section).

6.3 The debriefing session: review the game, proceed to implementation
Debriefing sessions are a vital part of the overall learning and training process: participants explain their thinking and reasoning on decision dilemmas, and debate with each other. This additional learning is especially useful because everyone will hear that there are numerous plausible and defensible ways to think about a problem or to react to a situation (in the case study, the simulation game, etc.). Some differences will reflect varied cultural backgrounds (the instructor may emphasize); others can be traced to distinct personalities, shaped by inherited genes and individual experiences. Such discussions are bound to open minds, strengthen tolerance toward other views, and teach the importance of empathy with others (especially subordinates). Tolerance toward different views and empathy with others are essential skills in a flow-based management framework.

6.4 Follow-up options: skills evaluation and sustainable development
One of the first steps in the development of FLIGBY was identifying the skills helpful for generating flow, along with other typical management/leadership skills. Upon finishing the game, each player receives a detailed, benchmarked report on his or her 29 managerial/leadership skills, as well as areas suggested for further development. The report shows relative strengths and weaknesses within each individual's own skills profile. At the same time, each skill and group of skills is automatically benchmarked against the average of the player's cohort (e.g. employees of an organization who played the game at the same time, or that of a class whose instructor assigned FLIGBY). In addition, instructors and trainers may request other, tailor-made comparisons with specified benchmark groups (e.g. by industry, age, leadership level), which FLIGBY's service providers will assemble from the detailed (but anonymous) scores of the thousands who had played FLIGBY up to that point.

In addition to employing FLIGBY for its intended purpose, namely, to help individual managers/leaders and organizations to create a flow-friendly workplace, further value of a game like FLGIBY is its ability to measure, without bias, the leadership skill set of

prospective (to be hired) managers or that of its current management group. An organization may rely on FLIGBY's skill set (which overlaps a great deal with other, frequently used, leadership skill set classifications) if it does not have its own so-called "competency system." FLIGBY's skill set can be readily translated into any organization's own leadership competency system. Either way, the skill feedback a company obtains at the conclusion of the game about its own personnel can be benchmarked, in various ways, within and outside the organization. The results can serve as the basis for a company to establish personal development plans for each participant.

6.5 New vistas for corporate and academic research
Knowledge of the skill levels of employees obtained during a serious game can be especially useful for predictive HR analysis. This new, analytical approach is employed when an organization faces (or might soon be facing) a new challenge, which requires certain managerial/leadership/strategic skills. One of the most useful applications of predictive analysis is, in case of planned mergers and acquisitions, where the incompatibility of organizational cultures can be – and often is – a fundamental cause of failure. In sum, game-based learning, used appropriately, can help corporations build strategic skills in a timely, cost-effective and focused manner – a critical capability in today's dynamic business environments.

Furthermore, serious games can create an experiential, interactive and tailored common understanding of key management/leadership/ strategy concepts at a low cost and in an easily scalable manner across the entire organization. Games can be rolled out easily to all relevant managers and key staff members. Whereas conferences, seminars and coaching practically limit the number of participants.

In addition to FLIGBY's credentials as a game-based leadership teaching and training tool, the game also offers a unique databank, generated by thousands of player decisions linked to skill measures, ready to be exploited for academic research purposes.

In the above sentence, the adjective "unique" – so often used to fluff and hype ordinary things – is an appropriate descriptor for the large number of data observations that players of FLIGBY contribute to the data bank during their game play.

In order to document the unique properties of the FLIGBY data set and its particular suitability for research, we need to explain briefly the distinctive, systematic biases that are unfailingly present in the other methods of establishing (rating) leadership competencies. The game creates an environment that offers a new type of platform for observing management behavior. The player gets totally absorbed into the story and game plot. The player unwittingly reveals his or her real self. This approach to testing skills is non-intrusive. It is not influenced by the Idiosyncratic Rater Effect. It is not distorted by the player feeling observed and thinking that he/she must respond as expected. And the player is not worried about the embarrassment of having to respond in front of peers, who will judge him/her. In playing FLIGBY, each player can and will behave like he/she would in similar situations in real life; being true to himself/herself.

About 10,000 people have played FLIGBY to date, generating more than three million data points, a number that is expected to increase 10- to 100-fold in the coming years. The accumulated Big Data available for research purposes are anonymous in that the identity of the players is protected in a foolproof way. At the same time, the replies can be sorted by age bracket, experience level, gender, nationality, work culture, economic sector the player works in at the time of playing the game. Given the large size and the uniquely unbiased properties of the FLIGBY databank, it obviously represents a great empirical resource for leadership research.

Possible future research question are the following:

RQ1. Are measured management skills and in particular the four flow-leadership skills consistent across national cultures or can significant differences be traced?

RQ2. What is the relationship between the 29 leadership skills measured during the game and the other independent variables of the players, such as their organizational hierarchical position, their professional identity, their age, the number of years and industry of their work experience?

RQ3. How can the many behavioral data gained during game play be best used for supporting HR and strategic planning of organizations?

RQ4. Can managers trained with this serious game become better in leading with flow and thus creating more effective and more successful organizations in the long run.

7. Summary
In this contribution we have presented what constitutes the mental state of flow, a core concept of positive psychology. We have argued that the extensions of flow are not limited to the field of arts, sport, music, etc. but it is highly relevant to the modern practice of management and the contemporary theory of leadership.

Flow has often been described in the context of modern serious games, but this paper also focused on a case in point simulation game: FLIGBY, which actually has been designed in cooperation with Mihaly Csikszentmihalyi, with the purposes of educating about flow and training in the field of managing people.

Finally, we have given detailed pedagogical insights and practical suggestions to other teachers, educators and corporate trainers who potentially wish to adopt this particular serious game. The main findings of our contribution can be extended and generalized to almost all serious games and scholars are now invited to join our new research network on the wider applications in the field of flow, leadership and serious games.

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Corresponding author
Zoltan Buzady can be contacted at: zoltan@buzady.hu