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# Playing Emotions: Designing an Educational Resource That Promotes Emotional Education Through Independent Video Games

Jorge Oceja
**University of Cantabria, Santander, Spain**
**Valencian International University, Spain**
jorge.oceja@unican.es

**Abstract:** This work covers the first stages of a process for designing and implementing an educational resource that aims to promote social and emotional competences in secondary students through independent video games. We start reviewing different educational uses of games based on the main learning theories. Then we highlight the strengths of independent games, focusing on the possibilities that they offer for promoting variables such as self-esteem, empathy, identification of emotions, responsible decision making, and creativity. After explaining the peculiarities of design-based research, we define the problem that guides this work (the lack of resources for teachers), we show the first version of our proposal based on a sociocultural theoretical framework, and we present strategies for gathering information from teachers to improve the quality of the educational resource. We conclude by showing some of the teachers' first reactions after a face-to-face workshop where we presented the resource and the ways that their vision would impact future versions.

**Keywords:** design-based research, emotional competence, emotional education, independent video games

## 1. Introduction

Almost since the origins of the game industry, we have seen attempts to explore the educational possibilities of videogames. Still, in more than 50 years of history, only recently we have seen the first reliable meta-analysis confirming the educational benefits of videogames.

One of the most important works is the meta-analysis of more than 55 studies carried by Sitzmann and Ely (2011). Their work showed that when using games for educational purposes, self-efficacy improved by 20%, procedural knowledge by 14% and declarative knowledge by 11%. Also, the retention rate increased by 9% and the ability to transfer learning to other contexts by 5%.

Nevertheless, as mentioned by Egenfeldt-Nielsen, Smith, and Tosca (2016), besides quantitative results, we might focus not only on learning outcomes, but also on the benefits that videogames may bring to several cognitive competences such spatial ability (Green & Bavelier, 2003) or problem solving (Ko, 2002). Moreover, one of the main conclusions is that the motivation towards learning content is clearly higher when educational experiences include games.

However, we cannot talk about educational efficacy as a whole unless we analyze variables such the specific educational use of games that we advocate for. A historical review shows that many times teachers have chosen to bring into the classroom games designed with an explicit instructional purpose (learning social sciences, practice mathematics, etc.), in which some authors have referred to as *edutainment* (Egenfeldt-Nielsen, 2006). In these superficial proposals many times learning and the game experience are not connected. Frequently they are based in behaviorist rewards where the game is a prize given when declarative knowledge is shown.

In a similar line, we have more complex educational games which some authors have referred to as *research-based educational videogames* (Egenfeldt-Nielsen et al., 2016). Their defendants believe that the analysis of the gamers' characteristics and the research involved in their design may lead to more efficient games. Besides some successes (i.e: *Global Conflicts: Palestine*), players perceive these games as far from those who normally play. Very often their educational intention contaminates the experience, especially when their technical quality is far from what they are used to in commercial releases.

If the production of educational games has been traditionally associated with behaviorism and cognitivism, from a constructivist perspective we find another scenario; this stances would advocate, primarily, for using commercial games that allow free interaction with the environment as it happens with some realistic *sandboxes,* open spaces such as *Second Life* or the surprising commercial success *Minecraft* (originally an independent game). This game, which is based entirely in the occupation of a world made of squares, gives users unlimited possibilities for creating and interacting with others. Besides its graphic simplicity, *Minecraft* has become a

commercial success and the trigger for teachers all over the world to create communities around its educational possibilities. The constructionist approach (a pedagogical application of the constructivist theories), would go one step further, proposing that learners themselves are the ones who should build and code their own games. Probably, the best example of this approach is the extensive use of the software *Scratch*, developed by the Massachusetts Institute of Technology (MIT), or even the use of commercial tools for game design such as *Unity,* where students have shown a fast learning curve.

Finally, we find the sociocultural approach, which advocates for using commercial games, looking at them as cultural products around which we can generate conversations that could lead to leaning. The most relevant work has been done by James Paul Gee (2014), who focus on the educational benefits that commercial off-the-self games (with no original educational purposes) may bring; he refers to games that belong to different genres which frequently constitute quality productions that learners perceive as familiar.

Besides the possibilities of this approach, Hanghøj and Brund (2010) have noticed that one of the main problems when bringing games into the classroom is the lack of teachers literacy on games. Thus, in this work we present a teacher's training project created through a design-based research methodology, that combines the sociocultural approach with some elements of the constructivist and constructionist perspectives that may be benefitial for developing creativity skills.

In the next lines of this section we explain why we have chosen a particular subgroup of games (independent games) and we review the social and emotional competences that we aim to target through our project.

## 1.1  Why independent games in this project?

Very often, mass media offer a biased view of video games. Frequently, the media highlight the games' violence and potential addictive behaviors, reducing video games to esports or to AAA commercial releases (*Call of Duty, FIFA*, etc.). What would happen if we approach other cultural products with the same lens? Today, no one questions the educational possibilities of cinema or literature. However, when we talk about cinema, we do not think about *Fast and Furious* and blockbuster products created exclusively with a commercial purpose in mind. Instead, we understand the complexity of the medium, and conscious of its creative value and its capacity to move people, we accept that many movies and books have great educational potential.

In the field of video games, these possibilities are represented by the independent scene. We are referring to projects developed by small teams (even by a single developer), with much space for autonomy and creative freedom. For many years, there was a debate questioning whether the term *independent* refers to the way these projects are financed or to the levels of creative freedom. In our opinion, the two go hand in hand. Although most of these games are off the main commercial channels, in the last few years, there have been surprising successes, such as *Minecraft*, developed by Markus Persson, *Braid* by North American designer Jonathan Blow, *Limbo* and *Inside* by the small Danish Studio Playdead, and the award-winning *Papers, please* by Lucas Pope. In our case, we are interested in *independence* as the attitude that leads these designers to create artistic products full of talent and creativity.

## 1.2  Promoting social and emotional competences through video games

The main goal of the educational resource that we present is to promote social and emotional competences through the use of video games. Some years ago, the Cantabrian Department of Education (Spain), in collaboration with the Botín Foundation, started the program *Responsible Education* (https://www.educacionresponsable.org), aiming to develop these competences by focusing on variables such as self-esteem, empathy, identification of emotions, responsible decision making, and creativity. To achieve this, several educational resources linked to different artistic disciplines were developed: *Literatura, Emociones y Creatividad* (literature), *Banco de Herramientas* (cinema and audiovisual production), *ReflejArte* (visual arts), and *El Coro de las Emociones* (music). Our goal is to go one step further and use the artistic and cultural dimension of independent games to develop these competences.

In particular, it is in the emotional domain where we are able to do more explicit work with self-esteem, empathy, and identification of emotions. One of the unique characteristics of games is the possibility they offer to empathize with others, allowing us to be the main characters of the play. Being this true also for books and movies, interactivity in games adds subtleties that are not reachable with other types of narratives. The capacity

of empathizing with others is what allows us to reflect and identify the emotions of our avatars and the ones we experiment in the act of play. In addition, video games expose us constantly to challenges (both complex and easy) which allow us to work with the students' perception of their skills and by extension, with their self-esteem and self-image. Another peculiarity of games is that they constantly propose that we make choices. Frequently, our avatars find themselves in situations where there is a need to choose between different options, which offers a great opportunity for dialogical work.

Regarding the social domain, research has shown that although excessive hours of autonomous play (especially with commercial and casual games made for fast consumption) may have a negative impact on players' sociability, video games can also help us connect with others online and offline, helping us to create meaningful relationships in which social skills may play an important role. Thus, this educational resource always recommends students play with others (other students, teachers, and family), to create situations that, based on cognitive negotiation, allow us to improve skills such as assertiveness and self-affirmation.

## 2. Methodology

In the last few years, we have seen consensus around the benefits of mixed-methods design in educational research, as combining quantitative and qualitative methodologies can help overcome the traditional limitations associated with the use of only one approach (Brewer & Hunter, 1989; Cohen, Manion, & Morrison, 2013; Morse, 2016). However, it is necessary to acknowledge the historical lack of applicability of some educational research, and on some occasions, the impossibility of generalizing results from a specific project to other contexts. This critiques have led some authors to talk about the "failure of educational research" (Miller, 1999, p. 17) or the "need [to] confront the sterility of past labors and take radical steps to conduct inquiry in more productive ways" (Reeves, 2000, p. 10). Thus, the last 20 years have seen the focus on approaches that, even based on mixed methods, highlighted the need to design and implement projects grounded on the problems detected by teachers and researchers (in addition to being informed by theoretical frameworks), testing and assessing results, adjusting these projects, and creating, at the same time, design principles that can be useful in the future. Researchers have used different terms to refer to these methodologies, such as *design research*, *development research,* or *developmental research,* or the more common *design-based research*. As mentioned by Christensen and West (2018), all these approaches propose research that in addition to focusing on designing projects, is situated and developed in particular contexts, iterative (as it constantly readjusts the project itself), collaborative, theory builder, and especially, practical and productive.

Among the different models available, we choose Reeve's (2000), as it defines very clearly the steps to follow.
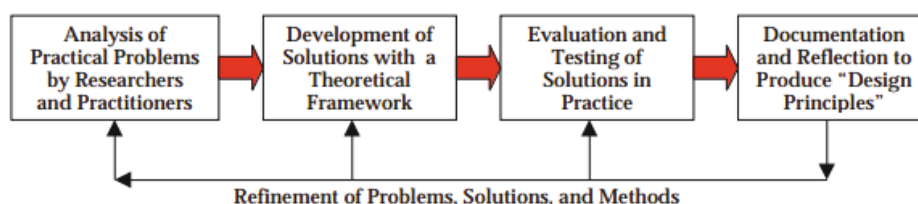


**Figure 1:** Phases of design-based research (Reeves, 2000)

Due to the nature of this methodology, the present work focuses on only the first three phases of Reeves' model: analysis of practical problems based on the contributions of teachers and researchers, development of the first educational proposal based on a theoretical framework, and evaluation strategies for gathering information after showing this proposal to a group of Cantabrian teachers in a face-to-face workshop.

Thus, in the Results section, three sections appear. In the first section (analysis and definition of the problem), we explain the contexts and organic processes that informed the project, and then we synthetize the problem that will guide the project. In the second section, we discuss the theoretical framework that sustains our solution, and we show the activities that we have designed. In the third section, we review the instrument built to gather the first impressions from teachers. Due to the methodological choices adopted, although in traditional approaches these elements appear in other sections (mainly in Methodology), in this case they represent the actual results of the research process.

## 3. Results

### 3.1 Analysis and definition of the problem

Below, we show the contexts and sources that helped us define the problem. As design-based research suggests, instead of gathering data in traditional ways, teachers' and researchers' experience has informed us about the problem through a dialogical process. The following elements have guided us:

- Practical knowledge of the educational system based on the researchers' experience as elementary and secondary teachers. Our years of experience at these stages allowed us to confirm students' growing interest in video games; a diverse interest that goes beyond fads and AAA games. Students understand the different genres and products, and show great knowledge of this medium. In turn, some teachers (often teaching Literature and/or Technology) show also interest in the games and transmedia narratives.

- Practicum supervision. Our work as supervisors of student teachers confirms year after year the situation exposed above. In addition, certified and practice teachers often highlight the distance between students' interests and the curricular content. In the coordination meetings, it is common to hear comments such as, "I find [it] logical that the students cannot see the link between the cultural products that we show them and the ones that they use."

- A dialogical process with the people in charge of the program *Responsible Education*. In mid-2018, we had a meeting with the program managers who shared with us that, after several years working on social and emotional competences and creativity through cinema, literature, and visual arts, teachers are showing signs of weariness, because they use the same educational resources year after year.

- The authors' personal interest in the educational possibilities of independent games based on knowledge of international experiences. Several academic residencies allowed us to make contact with the few international academics working through similar approaches, particularly the projects developed by Thorkild Hanghøj in Denmark with games such as Limbo (Hanghøj, 2017).

Based on these elements, the problem that guides this project is defined as follows: Secondary education teachers do not use video games (understood as cultural and artistic products) to generate dialogical experiences that promote social and emotional competences and creativity, because they do not have any educational resource available for doing so.

### 3.2 Development of solutions within a theoretical framework

To define the actual social and emotional competences to be targeted, the program *Responsible Education* looks at several theoretical contributions, such as the work on emotional intelligence by Salovey and Mayer (1990), Seligman's studies on strengths and positive psychology (2002), works on psychological well-being (Decy & Ryan, 2000), and research on resiliency (Rutter, 2000). Specifically, the educational resource that we are creating focuses on promoting empathy, identification of emotions, self-esteem, decision making, assertiveness, self-affirmation skills, and creativity.

As explained, our approach is based on a sociocultural model that understands games as cultural and artistic products around which we can generate dialogical learning. Gee, the principal supporter of this approach, advocates for using off-the-shelf games without an educational purpose *per se*, instead of products with explicit educational content, as the first ones are often well produced, and students perceive them naturally (Gee, 2014). In this approach, the figure of the teacher is critical. Although teachers show a positive attitude toward incorporating games in the classroom, they often lack the necessary training. (Hanghøj & Brund, 2010) explained that when the right conditions are meet (the teacher can contextualize the game, create a ludic experience, and guide and assess the students), success is guaranteed.

Therefore, the activities that we propose, in addition to being useful for developing the targeted competences, should contribute to improving teachers' game literacy, so that they can share with their students a common vocabulary for games.

#### 3.2.1 ProjectsStructure

To develop this project, in 2018 we started to design a teacher's guide that included some accessible theoretical content and five activities to be done in the classroom. Our goal was that a small group of teachers in third and

fourth years of compulsory secondary education (mainly Language Arts and Literature teachers, but open to other subjects), got to know these activities thorough a five hours of face-to-face training, and test them in their classes later on. This training took place in the city of Santander in March 2018. In the next months, we will keep close contact with these teachers to analyze the strengths and weaknesses of the project, and to adjust it for a formal implementation in 2019/2020.
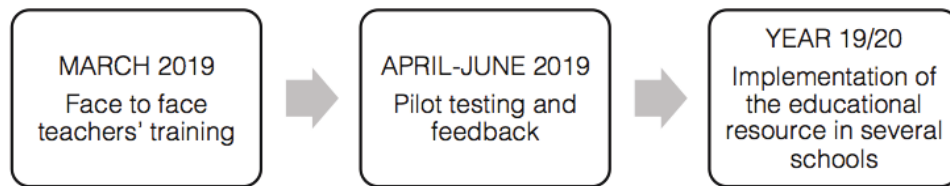


**Figure 2:** Project phases

*3.2.2 Activities*

Although the educational resource contains some theoretical content regarding game literacy (thinking on any potential teacher that could use it in the future), it consists mainly of a series of activities to be conducted in the classroom. These activities are structured around four moments: an introduction to the author and the game, activities before playing the game, activities during the game, and activities after the game. Figure 3 shows these activities, along with the competences targeted in each activity.
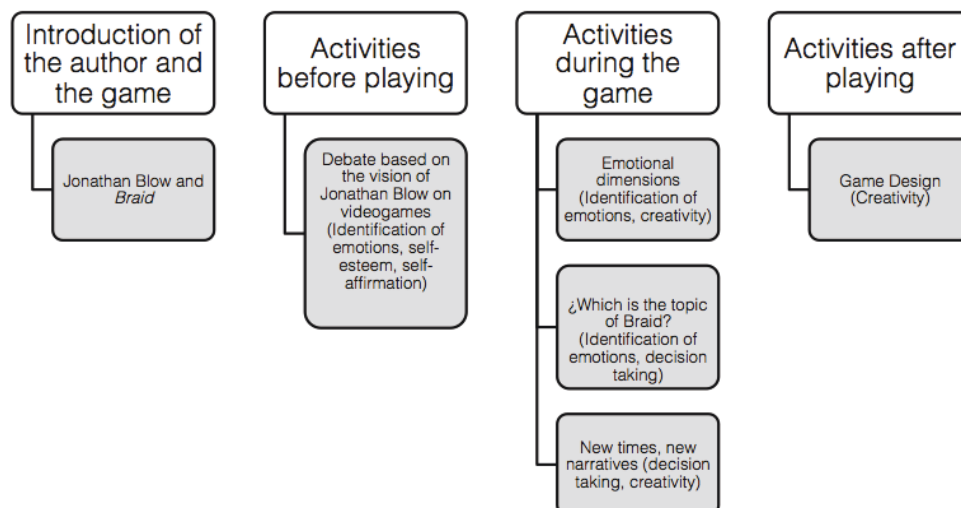


**Figure 3**: Structure of the activities

To start, the teachers will introduce to their students the author and the game that will be used in the following weeks. The teachers will mention that the game selected (*Braid)* was released by Jonathan Blow in 2008 after three years of independent work. He hired only a few individuals, such as David Hellman for the final art. After the launch, the game received great comments from players and critics who compared its mechanics and narrative with works such as *Invisible Cities* by Italo Calvino and the cinematography of David Lynch.

Before playing the game, teachers will use the debate to consolidate a common vocabulary about genres, playing down the value of blockbuster products (*FIFA, Fortnite,* etc.), and emphasizing the diversity of the game industry and the importance of the authors and their creativity. To start the debate, we recommend watching the first minutes of the documentary *Indie Game,* which contains some of Blow's statements (https://youtu.be/5A44GW0PtzY).

Then, for the next activities, teachers will launch the game using the projector and call on volunteers to complete, in cooperation with the rest of the class, the different levels. The first activity (*Emotional Dimensions*) will take place once they arrive at the character's house. Following the two-dimensional style used by Blow, students will replicate their house on white paper and will use *Post-its* to describe the feelings and emotions that they experience in each room. Then, once that they arrive at the clouds where the books are, the teachers will use cooperative groupings and the jigsaw method to find *Braid's* main topic. Each student will be in charge

of one of the books, and he or she will leave the group to join the other students responsible for the same book, before coming back to the original group and agreeing on the main topic of *Braid*. For the activity *New times, new narratives,* teachers will use an excerpt from a *Black Mirror* episode, "Bandersnatch," to illustrate that the alteration of traditional narratives is not exclusive to games (https://www.youtube.com/watch?v=2ab_cN_WyKg). This activity will be presented once students discover the main peculiarity of the game (the possibility of rewinding and fast forwarding time). Based on this game mechanic, and on what they have seen in "Bandersnatch," students will have to script a situation in which they get involved, where there are different choices, each with different consequences.

In the final activity, the groups will design a physical game based on what they consider to be *Braid's* main topic. Teachers will start explaining the different phases in game design (prototyping, testing, and production). Then, they will review the different types of physical games (board games, card games, etc.) and the concepts of mechanics, dynamics, and aesthetics, so that students can bring the desirable emotions to their game experience. Finally, they will provide the groups with basic materials (cardboard, Play-Doh, dice, dice cups, glue, ropes, etc.) so they can start working on their games.

### 3.2.3 Evaluation of the resource based on teachers' perceptions

To revise the resource, we conducted a two-day workshop with Cantabrian teachers on March 27 and 28, 2019, at Centro Botín (https://www.centrobotin.org/), with the goal of allowing them to perform a pilot application in the following months. To gather quantitative and qualitative information, a questionnaire was created, and sent online to the participants following the training. The questionnaire was structured around the two parts of the resource: the theoretical content and the activities. Teachers were asked to assess quantitively the theoretical framework as a whole, and then the appropriateness of each section: *What are video games?, History and actual situation of games, Genres and Independent games* and *educational uses of games.* The five activities were also assessed both as a whole and individually. In addition, the teachers were invited to share their qualitative views of these two elements (theoretical content and activities), as well as any other consideration that they might have.

## 4. Discussion and conclusions

The iterative process of this design-based research covered only the first three stages of a project that will continue for several years. After the analysis phase, the definition of the problem, the preparation of the first version of the resource, and the development of evaluation instruments, the educational resource was presented to a small group of teachers, who participated a five-hour face-to-face training workshop so they could be able to carry out a pilot application. Their contributions during the training were very interesting and will help improve the activities. First, they referred to potential difficulties when integrating the explicit work on social and emotional competences with the act of playing. While acknowledging the effort made in this direction, the teachers suggested to keep smoothing the transition between these two facets, to improve the material. This clarification is aligned with the vision of several authors, such as Padilla (2009), who stated that when the "educational facet is too explicit, students become less motivated towards the game" (p. 5).

Whereas the reaction to the final activity was very positive, some teachers suggested taking it a step further, and including the design of digital games, using software such as Scratch or Unity. As mentioned, this position would be supported by the constructionist approach, which focuses on the possibility of students creating their own games (Kafai & Resnick, 1996; Papert, 1993).

The results of the questionnaire and the answers to the open questions showed a great appreciation for the content and the activities. However, regarding the content, the teachers expressed that the sections *What are video games?* and *History and actual situation of games* might be too theoretical. They also suggested extending the guidelines for how to work the variables of *Responsible Education* into the games, in addition to the given activities. The five activities were considered highly appropriate, and some teachers even proposed creating guides for the three alternative endings of the game. In the open questions, teachers mentioned that although it would be nice to include future activities for families (as proposed by the authors), it would be difficult to communicate to them the value of games and the possibilities that they offer.

We realize that only a few works have tried to use independent games from a sociocultural perspective to develop educational competences, with the work of Hanghøj (2017) being one of these exceptions.

We are also aware of the resistance that the formal educational system frequently presents when implementing projects linked to arts and new narratives. However, we think it would be a mistake to turn our backs on the possibilities that independent games offer by undervaluing their educational possibilities.

Games tell stories with the same transcendence as books or cinema. They convey emotion with beautiful soundtracks, and they add to all this possibilities that no other media offer: the choice of making decisions, acting in autonomous ways, adopting multiple identities, and the possibility of empathizing with all of them. Opposing the simple and violent image of games shown by mass media through blockbuster games, the independent scene offers products full of talent, creativity, and beauty that, as any art form, can be a source of emotion and learning. All teachers participating in this project expressed that *Braid* is particularly representative of these products, and that the activities that we have designed are a great starting point for building a resource from which all the educational community could benefit.

## References

Christensen, K., & West, R. E. (2017). The Development of Design-Based Research. En *Foundations of Learning and Instructional Design Technology*. Recuperado de https://lidtfoundations.pressbooks.com/chapter/design-based-research/

Cohen, L., Manion, L., & Morrison, K. (2013). *Research methods in education*. Oxon, UK: Routledge.

Deci, E. L., & Ryan, R. M. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry*, *11*(4), 227–268.

Egenfeldt-Nielsen, S. (2006). Overview of research on the educational use of video games. *Nordic Journal of Digital Literacy*, *1*(03), 184-214.

Egenfeldt-Nielsen, S., Smith, J., & Tosca, S. (2008). *Understanding video games: The essential introduction.* Abingdon, UK: Routledge.

Gee, J. P. (2014). *What Video Games Have to Teach Us About Learning and Literacy. Second Edition*. Hampshire, UK: Macmillan.

Green, C. S., & Bavelier, D. (2003). Action video game modifies visual selective attention. *Nature*, *423*(6939), 534.

Hanghøj, T. (2017). Computerspil–som multimodal tekst og som handlingsrum. *Viden Om Literacy*, (21).

Hanghøj, T., & Brund, C. E. (2010). Teacher roles and positionings in relation to educational games. En B. Meyer (Ed.), *Proceedings of the 4th European Conference on Games Based Learning* (pp. 116–122). Copenhaguen, Dinamarca: ACI.

Kafai, Y. B., & Resnick, M. (1996). *Constructionism in Practice: Designing, Thinking, and Learning in a Digital World*. New York, NY: Routledge.

Ko, S. (2002). An empirical analysis of children's thinking and learning in a computer game context. *Educational psychology*, *22*(2), 219-233.

Miller, D. W. (1999). The black hole of education research. *Chronicle of Higher Education*, *45*(48), 17-18.

Papert, S. A. (1993). *Mindstorms: Children, Computers, And Powerful Ideas*. New York, NY: Basic Books.

Reeves, T. C. (2000). Enhancing the worth of instructional technology research through "design experiments" and other development research strategies. *International Perspectives on Instructional Technology Research for the 21st Century*, *27*, 1-15.

Rutter, M. (1992). Psychosocial resilience and protective mechanisms. En J. Rolf, A.S. Masten, D. Cicchetti, K.H. Nuechterlein, y S. Weintraub (Eds), *Risk and protective factors in the development of psychopathology* (pp. 181-214). New York, NY: Cambridge University Press.

Salovey, P., & Mayer, J. D. (1990). Emotional intelligence. *Imagination, cognition and personality*, *9*(3), 185-211.

Seligman, M. (2002). *La auténtica felicidad*. Barcelona, España: Ediciones B.

Sitzmann, T., & Ely, K. (2011). A meta-analysis of self-regulated learning in work-related training and educational attainment: What we know and where we need to go. *Psychological bulletin*, *137*(3), 421.