

# BREAKING THE ICE, BUILDING THE CHALLENGE: INNOVATIVE ICEBREAKERS IN CHALLENGE-BASED LEARNING

Associate Professor Elena Paliță

„Constantin Brâncuși” University of Târgu Jiu

## Abstract

*Challenge-Based Learning (CBL) asks teams that are often newly formed to commit quickly to an authentic, open-ended problem, yet recent reviews of the CBL literature report no sustained discussion of how such teams should be prepared for that commitment before the challenge itself begins. This article addresses that gap by proposing a set of icebreaker designs built from two commercially available card decks — the storytelling game Dixit and personal values card decks derived from the Personal Values Card Sort — and by grounding each design in research on team learning in CBL and on the psychological conditions under which icebreakers help rather than hinder engagement. Dixit’s surreal, ambiguous illustrations are shown to support low-risk self-disclosure during a team’s earliest, most fragile stage, while structured values-sorting is shown to surface the individual motivations and working preferences that later determine how well a team coordinates and shares accountability. Three classroom-ready activities — Picture the Problem, Value Alignment Draft, and Ambiguous Ally — map these tools onto specific stages of the CBL process, from Big-Idea generation through team contracting to mid-challenge re-engagement, and the article closes with five design principles for adapting any commercial card game as a pedagogically purposeful, evidence-grounded icebreaker.*

**Keywords:** Challenge-Based Learning, icebreakers, Dixit, values cards, team formation, psychological safety, collaborative learning

## 1. Introduction

Challenge-Based Learning places a team of learners in front of an authentic, often ill-structured problem and asks them to move, together, from a broad theme toward a concrete, actionable response. The framework’s own description of the process emphasises collaborative identification of a “Big Idea,” the formulation of good questions, and sustained teamwork toward a solution that matters beyond the classroom (Challenge Institute, 2018). What that description does not specify is how a team that may have met only minutes earlier is supposed to arrive at the trust, shared vocabulary, and working agreements that this kind of sustained collaboration requires.

A 2025 systematic review of sixteen studies on CBL implementation in K-12 education, screened under PRISMA guidelines, found that engagement rose when learners were given autonomy alongside targeted support, and that collaborative learning was the single most common pedagogical component across the literature — present in fifteen of the sixteen studies reviewed. Yet the same review reports an explicit gap: none of the studies discussed introductory or warm-up activities preceding CBL implementation (Gandini & Morselli, 2025). Teams, in other words, are widely agreed to matter enormously to CBL outcomes, but how those teams are formed and prepared in the first minutes of a challenge has not been treated as a research question in its own right.

This article treats it as one. It draws on two card-based tools that already have independent pedagogical track records — the storytelling game Dixit, documented in language-teaching and even software-engineering classrooms, and the Personal Values Card Sort, a structured values-elicitation tool from motivational interviewing — and repurposes them as icebreakers designed specifically for the stages of a CBL process: forming a shared Big Idea, negotiating a working team contract, and re-engaging a team that has stalled mid-challenge. Section 2 reviews what CBL research says about team dynamics and what the broader icebreaker literature says about engagement and psychological safety. Section 3 introduces the two card tools and the design logic behind each. Section 4 presents three ready-to-use activities. Section 5 distils five general design principles for adapting other commercial card games in the same spirit, and Section 6 concludes.

## 2. Theoretical Framework

### *2.1 Challenge-Based Learning: teams, autonomy, and a missing first step*

CBL originated from Apple's Classrooms of Tomorrow—Today (ACOT2) initiative and has since been formalised by the Challenge Institute as both a philosophy of course design and a specific collaborative process: learners identify Big Ideas, ask good questions, identify and solve challenges, and in doing so gain subject knowledge and transferable life skills (Challenge Institute, 2018). Central to this process is a deliberate flattening of the usual teacher–student hierarchy and the provision of a safe space for creative risk-taking and productive failure — conditions that depend, in practice, on the quality of the team a learner has been placed in.

Empirical work on how students actually learn within CBL bears this out. Helker, Bruns, Reymen, and Vermunt (2025) propose a framework in which student learning emerges from an interplay of individual learning conceptions and motivations with contextual factors at the course, institutional, and societal level — and they find that the social content of the immediate context, specifically how well a team collaborates, shows strong links to both learning patterns and learning outcomes. Their interview data also surface a genuine design tension: some instructors favour smaller teams because the gains in coordination and accountability outweigh the added workload, while others argue that what matters most is not team composition but whether each member understands their own strengths and weaknesses within the team. Both positions imply that coordination and accountability are negotiated, not automatic, and that a team benefits from surfacing them explicitly rather than discovering them by trial and error over the course of a multi-week challenge. Despite this, Gandini and Morselli's (2025) review found no CBL literature addressing how that negotiation might be supported at the very start of a challenge — the gap this article responds to.

### *2.2 Why icebreakers matter: engagement, safety, and the risk of getting it wrong*

Outside the CBL literature specifically, research on classroom icebreakers gives reason to take the opening minutes of a team's life seriously. A mixed-methods comparison of two senior-high sections over a full semester found a statistically significant increase in self-reported engagement and participation in the section using icebreakers, alongside qualitative reports of a stronger sense of community, an improved classroom atmosphere, and greater comfort participating in discussion (Sasan, Tugbong, & Alistre, 2023). A separate qualitative case study of Grade 11

students similarly found that icebreakers were credited with building psychological safety that let shy students participate more confidently, and with combating the fatigue that dampens engagement later in the day (Mepieza, 2024).

The same study, however, is explicit that the benefit is conditional: different icebreaker formats produced different levels of engagement, and a poorly designed or poorly matched activity was reported to discourage participation rather than promote it (Mepieza, 2024). This is the central design problem this article takes up. An icebreaker for a CBL team is not simply an entertaining warm-up; it needs to do real work — lowering the risk of early self-disclosure, surfacing the values and working styles that will shape the team's coordination, and doing so within a time-boxed, purposefully structured activity rather than an open-ended “tell us something about yourself.” The two card tools introduced next were chosen because each already has a documented mechanism for exactly this kind of structured, low-risk disclosure.

### **3. Two Card-Based Tools for Structured Disclosure**

#### ***3.1 Dixit: ambiguity as a design feature***

Dixit is a storytelling card game built around a deck of dreamlike, surreal illustrations with no fixed meaning. In each round, one player — the storyteller — selects a card from their hand and offers a word, phrase, or gesture as a clue; the other players each choose a card from their own hand that could plausibly match that clue; all chosen cards are shuffled together and revealed, and players then guess which card belonged to the storyteller. Crucially, the scoring rule rewards ambiguity rather than clarity: if every player or no player correctly identifies the storyteller's card, the storyteller scores nothing, so the game structurally discourages clues that are either too obvious or too obscure. This design detail matters pedagogically, because it means the game already trains the exact skill an icebreaker needs from a facilitator's prompt — an invitation specific enough to produce a real answer, but open enough that no answer can be judged wrong.

This quality has already been exploited outside its original game context. In language teaching, Astbury (2017) documents three classroom adaptations: using a chosen card as a stimulus for short narrative writing, particularly useful for students who otherwise struggle to generate ideas from a blank page; a “quick mingle” activity in which learners write and exchange conditional sentences inspired by a card; and curated thematic sets of cards used to practise specific language functions, such as giving advice. In a very different setting, Piccolo and Guerra (2016) restricted Dixit gameplay to software design-pattern vocabulary for nineteen graduate students, requiring players to justify each card choice by naming the pattern it evoked; the majority of participants reported both learning something new and preferring the game-based format to a conventional lesson. Across both contexts, the mechanism is the same: an ambiguous image gives a learner a metaphorical, low-stakes way to say something true about themselves or their thinking without the exposure of stating it directly — precisely the quality a CBL team needs in its first few minutes together.

#### ***3.2 Values cards: naming what matters before naming the challenge***

Where Dixit externalises disclosure through metaphor, a values-card deck externalises it through structured selection. The Personal Values Card Sort, developed by Miller, C'de Baca, Matthews,

and Wilbourne (2001) at the University of New Mexico for use in motivational interviewing, presents a large set of cards, each printed with a single value or personal quality, and asks the participant to sort them — first into broad piles such as “not important to me,” “important to me,” and “very important to me,” and then, through successive narrowing, down to a small handful the participant considers most central. Because the activity is done individually and privately before any sharing takes place, it separates the cognitively demanding work of identifying one's own values from the socially demanding work of stating them aloud, which lowers the stakes of the disclosure that follows.

Generic “values cards” decks used in team-building and coaching contexts borrow this same sort-then-share logic, typically replacing the clinical vocabulary of the original tool with workplace- or team-relevant terms such as autonomy, recognition, fairness, or creativity. For a CBL team, this is a natural fit: before a group commits to how it will divide labour, handle disagreement, or share credit on an open-ended challenge, surfacing what each member actually prioritises in how they work together turns what would otherwise be an implicit, slowly discovered set of expectations into an explicit, shared reference point — addressing directly the coordination and accountability tension that Helker et al. (2025) identify as central to CBL team outcomes.

## **4. Three Icebreaker Designs for Challenge-Based Learning**

### ***4.1 Picture the Problem (Engage / Big Idea stage)***

At the very start of a challenge, before a team has a shared Big Idea, each member draws three Dixit cards face-down and chooses one that captures how they personally relate to the broad theme the challenge will address — sustainability, community health, digital wellbeing, or whatever the course has set. In under a minute, each member tells the story connecting the image to their own experience, concern, or curiosity about the theme, following the same low-stakes, metaphor-first logic Astbury (2017) documents for narrative writing. The facilitator then asks the team to listen across the stories for a shared thread — a concern, a tension, or a question that more than one image pointed toward — and to use that thread as the first working draft of the team's own Big Idea or essential question. Because every member has already spoken personally about the theme before the team drafts anything jointly, the resulting Big Idea starts from something closer to the team's actual, if not yet articulated, shared interest, rather than from whichever member happens to speak first or most confidently in an open discussion.

### ***4.2 Value Alignment Draft (team-contracting stage)***

Before the team divides tasks or sets a working rhythm, each member privately sorts a shared deck of value cards using the three-pile method drawn from the Personal Values Card Sort (Miller et al., 2001) — not essential to how I want to work on this challenge, important, and essential — and narrows their essential pile to their top three. The team then compares top values across members, looking specifically for overlaps, which become candidate ground rules the whole team can commit to, and for tensions, which become items to negotiate explicitly rather than discover through friction three weeks into the challenge. A member who selects autonomy alongside a teammate who selects consensus, for instance, has surfaced a real coordination question — how much independent work each prefers before checking in — while it is still

cheap to discuss. The session closes with a short, written team working agreement: how the team will communicate, how it will handle disagreement, and how it will share credit, each clause traceable to a specific value at least one member named. This directly operationalises Helker et al.'s (2025) finding that separating individual and team components of learning is a persistent challenge for CBL instructors, by giving teams a concrete artifact that makes each member's individual priorities visible within the team's shared plan.

#### ***4.3 Ambiguous Ally (mid-challenge check-in)***

CBL challenges typically span multiple weeks and pass through a period, usually during the Investigate or Act stages, when momentum stalls — exactly the kind of dip in energy and engagement that Mepieza (2024) associates with fatigue and that a well-timed activity can counteract. When a facilitator notices this stall, each team member draws one Dixit card representing where they feel the challenge currently stands and one value card representing what they feel the team needs more of right now, and shares both in a single sentence each: for example, an image suggesting the team is “circling without landing,” paired with the value focus. Because the format is identical for every member and takes only a few minutes, it functions simultaneously as a fast diagnostic for the facilitator, a low-stakes way for a frustrated member to name a problem without direct criticism of teammates, and a re-energiser in its own right, consistent with the mood and attention benefits documented in the icebreaker literature (Sasan et al., 2023; Mepieza, 2024). Unlike Picture the Problem and Value Alignment Draft, this activity is used repeatedly across the life of the challenge rather than once at its outset, and functions as the kind of lightweight, structured reflection point that Helker et al. (2025) argue CBL teams need for ongoing coordination.

### **5. Design Principles for Adapting Commercial Card Games as CBL Icebreakers**

Five principles generalise from the activities above to guide teachers who want to adapt other card games or decks in the same spirit. First, match the ambiguity of the material to the intimacy the moment requires: a highly ambiguous image such as a Dixit card suits an early, low-trust moment, while a more concrete prompt, such as a named value, suits a later moment where the team already has enough trust to negotiate specifics. Second, structure the sorting or selection step before any sharing happens, following the private-sort-then-share logic of the Personal Values Card Sort (Miller et al., 2001), so that no member is asked to generate a disclosure and voice it publicly in the same instant. Third, keep every activity time-boxed to a few minutes per member; the fatigue and mood benefits documented by Mepieza (2024) depend on the activity feeling like a brief reset rather than a competing demand on the team's limited time for the actual challenge. Fourth, always close the loop by explicitly connecting whatever artifact the activity produced — a card, a value, a sentence — back to the team's Big Idea or working agreement, so that the activity is documented and functional rather than free-floating fun, in keeping with CBL's own emphasis on reflection and documentation throughout the process (Challenge Institute, 2018). Fifth, and most important given Mepieza's (2024) finding that a poorly matched icebreaker can actively discourage participation, pilot any new activity with a small group before using it with a full class or cohort, and be ready to drop or adapt an activity that a particular team finds uncomfortable rather than treating the design as fixed.

## 6. Conclusion

A particularly significant benefit of integrating CBL into the educational process may be its potential to bring about a shift in the “educational coordinate” (Loga, 2022) by actively engaging students in classroom activities and, ultimately, contributing to the prevention of school dropout. Challenge-Based Learning depends, by its own design principles and by the empirical evidence on how students actually learn within it, on teams that can coordinate, negotiate, and take shared risks. A particularly significant benefit of integrating CBL into the educational process may be its potential to bring about a shift in the “educational coordinate” (Loga, 2022) by actively engaging students in classroom activities and, ultimately, contributing to the prevention of school dropout. Yet the systematic literature on CBL has, to date, said remarkably little about the minutes in which those teams are formed. This article has argued that two widely available card tools — Dixit, whose scoring mechanic structurally rewards productive ambiguity, and values-card decks descended from the Personal Values Card Sort, whose private-sort-then-share method lowers the risk of early self-disclosure — offer a concrete, evidence-grounded way to fill that gap. Picture the Problem gives a team a personally grounded starting point for its Big Idea; Value Alignment Draft turns implicit expectations about how the team will work into an explicit, negotiated agreement; and Ambiguous Ally gives a stalled team a fast, low-stakes way to name what has gone quiet. None of these activities is simply “fun” in the sense the icebreaker literature warns against when poorly designed; each is built to produce a specific artifact — a Big Idea, a working agreement, a diagnosis — that the challenge itself then uses. If Challenge-Based Learning is, as its own framework insists, as much about learning to work together as about solving the challenge at hand, then the first few minutes with a deck of cards on the table are not a detour from that work. They are where it begins.

## REFERENCES

- Astbury, M. (2017, August 24). *Three ways to use Dixit in the classroom*. Teaching Games EFL. <https://teachinggamesefl.com/2017/08/24/how-to-use-dixit-in-the-classroom/>
- Challenge Institute. (2018). *About Challenge Based Learning*. <https://www.challengebasedlearning.org/about/>
- Gandini, M. F., & Morselli, D. (2026). Challenge-based learning implementation in K-12 education: A systematic literature review. *Frontiers in Education*, 10, Article 1680347. <https://doi.org/10.3389/feduc.2025.1680347>
- Helker, K., Bruns, M., Reymen, I. M. M. J., & Vermunt, J. D. (2025). A framework for capturing student learning in challenge-based learning. *Active Learning in Higher Education*, 26(1), 213–229. <https://doi.org/10.1177/14697874241230459>
- Loga Raluca Gabriela, The coordinates of social environment – potential factors that generate school dropout, *Analele Universitatii „Constantin Brâncuși” din Târgu Jiu, Seria Științe ale Educației*, Editura Academica Brâncuși, No. 1/ 2022, ISSN-P: 1844-7031.
- Mepieza, R. (2024). The power of ice breaker activity: Examining the impact of icebreakers on student participation and engagement in the classroom. *European Journal of Learning on History and Social Sciences*, 1(1).
- Miller, W. R., C’de Baca, J., Matthews, D. B., & Wilbourne, P. L. (2001). *Personal Values Card Sort*. University of New Mexico, Center on Alcoholism, Substance Abuse, and Addictions.
- Piccolo, P., & Guerra, E. (2016). Using an abstract card game for teaching design patterns. In *Proceedings of the 11th Latin American Conference on Pattern Languages of Programs (SugarLoafPLoP’16)*.
- Sasan, J. M. V., Tugbong, G. M., & Alistre, K. L. C. (2023). An exploration of icebreakers and their impact on student engagement in the classroom. *International Journal of Social Service and Research*, 3(11).