Learning with Board Games

PLAY FOR PERFORMANCE®

Tools for Learning and Retention

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Executive Summary

Today's economy and the rapid pace of change is placing unprecedented challenges on businesses and educators – making it essential to recognize and select the best learning resources and use them efficiently. The Internet, and technology in general, are driving a shift in the approaches being used. More and more frequently technology is looked upon as a solution, rather than a useful vehicle to support learning and accompany other teaching methods and tools.

Most professional educators and business professionals are generally unaware of much of the known research about how we learn best and the importance of heads *and* hands-on learning. Myths about how we learn prevail. Failure to apply appropriate, interactive teaching methods often lead to learner apathy, discouragement, and wasted resources. Effective approaches should encourage, empower, and inspire when they are used to teach. This is true in all realms of education, especially with complex, technical topics.

Board games have been used in corporate settings for about a dozen years, but are not yet in broad use. In general, the true value and impact of board games designed for learning are unrecognized by most people. This paper presents some of the myths, specific solutions, and current research showing the power of certain types of board games to facilitate rapid learning and retention and the impact of "Play for Performance."

Background

Textbook publishers, organizations, and training functions today are all riding on the technology train. Vast amounts of information are available and each year online games and CD resources grow in number, improve in appearance, and become more interactive.

Initially "interactive learning" often meant little more than listening to an expert's presentation followed by questions and quizzes, with short discussion sessions or a case study added for "interactivity." Time constraints and the wish to present as much information as quickly as possible have led to today's PowerPoint presentation explosion. Unfortunately, PowerPoint presentations alone are unlikely to lead to learning retention, skill development, or behavior change,

As games online have improved, they have helped to raise awareness that simply presenting information is not enough to lead to lasting learning. However, even good online games don't reach those who are not Internet-savvy, nor do they appeal to all learner types.

Although in the corporate world board games have gained traction, sadly, in the world of education, most games today are created only for young children. In part, this is related to a pervasive lack of knowledge about how people learn – knowledge based on solid, reputable, decades-old research. The view that games of any kind are inappropriate for adults is held by many business executives who see their activities as serious and don't understand the power of play and entertainment in learning. In fact, combining "education" and "game" in the same phrase is often regarded as a deal killer. We need a better understanding of what drives successful learning.

Beliefs and Myths about Learning

Several of the prevalent myths about learning include:

- We learn by listening to experts
- Experience leads to learning
- Hands-on learning works best

We learn by listening to experts.
Research at Harvard, Kansas State, and elsewhere proves that individuals filter information, hear what they want to hear, and are generally unable to apply information after simply listening. To improve the impact, studies show that building in pauses and redundancy improved recall and comprehension as much as two letter grades.

Experience leads to learning.
How many pennies have you encountered in your lifetime? By the age of thirty, most Americans have had "experience" with about 20,000 pennies. Yet, few can draw both faces of a penny accurately. Experience alone is not enough. We need to provide meaning and relevance to the experience and to incorporate ways to provide reflection in order to translate that experience into knowledge or skills.

Paper money provides another good example. Adults and most children have considerable experience using money - to purchase goods they need (or want). Yet that experience in using money does not translate into understanding how to grow, protect, or use money wisely. Most of us would prefer our children not begin their financial education with a hands-on approach in learning to use credit cards or other plastic alternatives.

Hands-on learning works best.
In studies with Harvard and MIT graduates, all indicated they could use a bulb, wire, and battery to light the bulb. Yet none actually did. High school science students, after using a socket, battery, and wire to light a bulb, were then unable to take the battery and wire alone to light the bulb. Researchers concluded that none of these individuals had learned or understood the principles of electricity, in spite of hands-on practice.

Years ago I taught high school chemistry. I can still picture students' reactions to my announcement that all tests would be "open book". Their expressive faces of astonishment and glee conveyed their beliefs that I would be giving them the gift of an easy "A". It was only after the first exam, when half failed, that they caught on. Understanding, thinking, synthesizing, applying, and independent reasoning were going to be required. For some, it was a first. The activities I designed (that was a time when teachers had more flexibility and control) for both in and outside the classroom provided an experience base from which to problem solve and learn. Ultimately, most students did quite well.

The solution is that hands-on ***and*** heads-on learning works best. **Either alone is not sufficient. Properly designed board games are an effective way to provide this combination.** Let's look at how.

Learning via Board Games

Board games are an important tool to provide hands-on and heads-on skill and knowledge development for people of all ages on all subjects. Not only do well-designed games create an engaging atmosphere, they also provide a non-threatening, playful, yet competitive environment in which to focus on content and reinforce and apply learning. Mistakes are useful and point out what we need to learn. The board itself provides a visual metaphor to help connect information. Game elements, discussions, and problem solving with fellow team members about the content are vehicles for learning. Subtle redundancy to reinforce learning and insure retention should be incorporated into the game design. Good questions, problems to solve, and situations to consider allow players to think through and apply what they learn.

Effective games serve to organize information in a conceptual framework and to make it concrete. They provide analogies and metaphors to link new information. When played in teams, members learn together; no one ever feels singled out for not knowing an answer. Questions help to verify understanding and to

signal where more learning is needed. For those who learn best from concrete specifics, games transform abstract concepts. Others, who need to begin with the big picture, are supported by the metaphor(s) of the game itself. Games are ideal to accommodate different learning styles.

In addition to requiring critical thinking, team-based board games help to build communication and relationship skills as players work face-to-face to answer questions or solve problems and see that together they often figure out something they thought they didn't know. The power of collaboration becomes apparent to all and, in organizational settings, can transform working relationships.

Research on Board Games

A growing body of research proves that properly designed team-based board games not only inspire learning, they encourage communication, collaboration and risk taking. They empower players by helping to build self-confidence. The different elements of game design support a wide range of player abilities, and learning translates to behavior changes.

An independent study by Vigil-Cruz and her colleagues, one a statistician, at a large northeastern university proved the impact of The PHARM Game®. This is a 3' x 4' board game designed by The Learning Key® as a learning tool for pharmaceutical employees and those who work with the pharmaceutical industry. Vigin-Cruz, et. al., tested learning effectiveness, retention, and student preferences over three semesters comparing the board game to other teaching methods.

Two outcome variables were used in the study. The first quantified each student's understanding and knowledge of information in the seven content areas addressed in the game. The second measure qualitatively assessed student perception of the impact of various laboratory-based exercises, and the game, on learning effectiveness and enjoyment.

The outcomes demonstrated that the post-test performance achieved after playing the game was significantly higher than the mean scores achieved after either the lecture or library assignment, while no significant difference in mean score was found between the two pre-tests. The game was regularly ranked first by the students as both the most effective and the most enjoyable way to learn. Performance on the knowledge tests and long-term retention was significantly enhanced by playing the game, more so than other teaching tools used.

Like children, adults enjoy learning when it is perceived as fun, making well-designed board games effective and valuable learning tools. Team-based board games that are designed on a specific topic to provide information, create an experience, entertain and engage, present challenges, and promote collaboration and discussion – in fact, do far more. This is likely because proper design incorporates all the elements found to promote effective learning.

Improving Learning

Lectures and Pauses

Ruhl, et. al., found that individuals exposed to lectures where the instructor paused for two minutes every 12-18 minutes did significantly better on a comprehensive test 12 days later and with free recall at the end of the lecture. In fact, improvement over the control group was two letter grades. In a board game, pauses are naturally built in when players discuss possible answers and again after answering. Ruhl and colleagues point out that short lectures are consistent with research indicating the ability to retain information drops significantly after 10-20 minutes.

Content and Information Density

Russell, et. al. showed that reducing new information in lectures to no more than 50% clearly improved retention both after the lectures and 15 days later. Using the balance of time with other activities to lower information density in a lecture reinforces the material.

Impact of Previewing

Other researchers (Chilcoat) found that previewing information to be learned significantly impacts learning. To provide a preview, they suggest using an overview to provide a conceptual framework for content and to familiarize learners with the topic. A game board provides such an overview. A second preview has two parts. It begins with an analogy to which new information is referred, so that learners can link new material to an already understood concept. *Like a board game, this approach encourages involvement and increased short- and long-term retention.*

1. Use a step-by-step (linear) approach. Begin with simple, concrete information.
   With a game, the board and cards provide this framework and structure.

2. Actively and frequently check for understanding.
   Games instantly show where understanding and knowledge exists or is missing.

3. Illustrate information with multiple examples.
   The redundancy built into effective learning games provides multiple examples.

4. Stress important points.
   The structure of the game both stresses and reinforces important points.

5. Review information frequently.
   The activities built into a game provide such a review. A well-designed game offers significant repeat play value. In fact, given the opportunity, students will continue to play and play until they are confident about answering the questions correctly. This has been demonstrated with both The Learning Key's board games and the CD version of one of these games.

Board Games from The Learning Key®: Outcomes

Examples from Industry

- Individuals without prior knowledge of the industry covered by a game learned and retained enough to successfully transition to a job in that industry, because they were "able to demonstrate a greater understanding of that business and its challenges compared to others who applied."

- A facilities and engineering division of about 1700 employees played The PHARM Game® once a month to show its employees the challenges of their business. "The more you play, the more you learn about the process." (C. Dubin)

- A global Fortune 200 company replaced 80 hours of training with half that amount when they included a board game. The initial training had resulted in no measurable increase in ability to use a complex new process. However, after Information from the 80 hours was distilled into game content and the process itself illustrated on the game board, the training was successful. Elements of play reinforced how to use the process and key information was incorporated, leading to the ability to apply it on the job.

Example from Education
Cent$ability, a game on debt management and financial basics designed for a non-profit organization's community training, resulted in thank-you letters from at-risk teenage boys conveying the themes "I never knew learning could be fun." "I would have stayed in school if it had been like this; I learned so much." "I will start saving money." Important reasons for success with these individuals was their active involvement, the combination of engagement and learning, and the self-confidence they gained.

The game above also led to high school students with jobs opening individual retirement accounts with their graduation money, illustrating the impact of "playing" for performance.

Wi$eMoney®, a game to teach and supplement basic financial education in group and classroom settings, led to a substantial increase in student awareness and comprehension by pre and post self-evaluations. A family version, Destina...® Wi$eMoney®, The Town of Financial Literacy, is available through Destina, Inc. (www.destinagames.com), Both games cover the money management topics of budgeting, banking, investing, financing and credit, identity protection, and financial responsibility.

Research on Wi$eMoney® with students ages 12 to 24 and teachers from 23 states showed that even without additional lessons, pre- to post-game answers improved from 55 to 93 percent. The game is a useful formative assessment to show both students and teachers the areas needing reinforcement and additional learning. The discussions which happen playing Wi$eMoney® help students think through situations, take risks, and test ideas. Players learn not just from the game, but also from each other.

Relevance to Corporate America

Most executives would willingly buy games to teach the basics to their employees if they knew they would realize a significant return on their investment. According to two organizations, they could. MetLife (April 2010) claims that 75% of employees say financial advice and programs would improve productivity at work. The Personal Financial Education Foundation finds that 25-33% of employees cost their employers $2000 in lost productivity, absenteeism, and increased health problems.

Until recent years, most information available on the Internet was presented as computer-based reading materials or quizzes. Fortunately, technology improvements, negative reactions by participants, and a greater awareness of the value of fun in learning, has helped to improve the tools available.

How effective are these resources?
The key question is “Are these resources effective?” Does the format inspire, encourage, empower, and excite? Does it result in learning? What about retention? Do behaviors change? Overall, what is the impact and for how long?

Our interactive, technology-based world has lifted expectations well beyond the days of teacher-focused lecture-based “learning”. Even in standard classrooms, the days of expecting adults to sit and listen to long lectures, much less learn from that method, are gone. Our interactive, technology-based world has raised expectations well beyond the days of teacher-centric lecture-based “learning.” Well-designed classroom-based curricula which are exclusively paper-based (books, reading and writing activities, short problems to solve) can be excellent. They are not, however, the only solution -- or even the best solution for all learners. Incorporating highly interactive board and other games and learning tools opens the learning opportunity window for all. Whether as a stand-alone tool, or part of a planned curriculum, games provide instructors with entertaining and easy-to-collect formative assessment data for understanding students’ current knowledge and needs.

A major challenge in any education is to keep the learner’s attention, while communicating detailed information about the topic. There are many choices when it comes to resources: seminars, pamphlets, activity workbooks, videos and websites with on-line tools. Many of these do not meet the criteria of heads- and hands-on learning tools or promote engagement.

Board Games to the Rescue!

Properly designed board games in corporate classroom settings have proven their value with all age groups. Their flexibility to add or remove content, in the form of cards, make them a resource that can be used for years. It is now time to expand their use.

Conclusion

Decades of research on learning and teaching plus recent experience and testing of board games designed for learning provide confidence that such games are ideal to encourage, empower, and educate. Face-to-face games are a critical tool in our arsenal of educational products. Their use is growing in corporate America, but they should be incorporated more widely. The games described here are valuable supplements to other education tools. Technology is playing a growing and useful role in education -- but just as TV did not eliminate the radio, nor should technology-based learning tools be considered a replacement for those used in face-to-face settings.

We need to challenge the current bias in many educational settings against designing and using games. Games are useful, effective, and enjoyable for all ages. Board games provide many educational and teaching benefits and have proven their value when designed appropriately for learning.

Board games provide exceptional, cost-effective resources. They

- incorporate heads- and hands-on learning
- summarize and reinforce important information in an easy-to-grasp format
- reduce the time needed to learn, remember, and apply new information
- promote discussion, collaboration, and build communication

When it comes to board games designed for educating, Play for Performance® is not an empty slogan - it is a fact.

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