

# Ambient Insight Targeted Research Report

## 2013-2018 North America Mobile Edugame Market

Consumers Continue to Fuel Demand for Engaging  
Edugames



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## Executive Overview

During the forecast period 2013-2018, the compound annual growth rate (CAGR) for Game-based Mobile Learning products in North America is 12.5%. Revenues will rise steadily from \$227.97 million in 2013 to \$410.27 million by 2018. In 2013, the US was the top buying country in the world for mobile edugames.

Consumers are by far the major buyer of mobile edugame digital content in North America and they will continue to dominate throughout the forecast period. The majority of consumer edugame purchases fall into the two ends of the age spectrum: math and language learning for young children and brain trainers and brain fitness apps for elders.

The academic market is growing, particularly K-12, as schools seek ways to increase student engagement. Non-profits and governments continue to fund tourism-related edugames for the same reason: engagement.

This Targeted Report includes revenue and growth forecasts for six types of mobile edugame products in the North America region.

- Knowledge-based
- Skill-based
- Brain Trainers and Brain Fitness
- Language Learning
- Location-based Learning
- Mobile Augmented Reality Edugames

We also highlight trends, buyer behaviors, and opportunities for Game-based Mobile Learning suppliers worldwide who are interested in the North America market.

Over 170 suppliers are cited in this report. This will help international as well as North American suppliers identify local partners, possible competitors, and potential merger and acquisition (M&A) targets.

The recent growth of Game-based Mobile Learning parallels the meteoric rise of casual mobile games on smartphones, tablets, and Facebook at the expense of PC and console games. Product substitution is taking place at a rapid rate in the game industry.

Nick Earl, senior vice president and general manager of Electronic Arts Inc.'s mobile and social studios, has said that he sees all game labels bringing their best titles to mobile devices. This shift bodes well for edugame suppliers as it reflects a cultural readiness to participate in gameplay on handheld devices. The edugame numbers bear this out.

Consumers are driving the edugame market in North America and the most popular products are those designed for young children. Now, more than

Familiar mobile phone and tablet features such as 3D, gesture control, and accelerometers found their footing in handheld gaming.

ever young children are interacting with learning technology and the Internet.

Suppliers need to stay up to date on changes in privacy protection laws and regulations, particularly those that apply to children under 13. For example, in July 1, 2013, The US Federal Trade Commission (FTC) issued new rules for the Children's Online Privacy Protection Act (COPPA), a law intended to protect children's privacy and safety online.

The new COPPA rules expand the definition of personal information to include persistent identifiers and geolocation information. Also, there are restrictions that require websites or online services to notify parents and obtain their consent before they can use, collect, or disclose a child's personal information. It is becoming more and more important to display a clear privacy policy.

In Canada the Personal Information Protection and Electronic Documents Act (PIPEDA) has been in force since 2004. It applies to personal information that is collected, used, and disclosed in the course of commerce. The law was intended to reinforce privacy protection mechanisms of the European Union's privacy directives. Privacy issues fall under the jurisdictions of some Canadian provinces (Alberta, British Columbia, Quebec, and Ontario).

This report will review the dynamics behind the following key and secondary findings.

### Key Findings

In North America, the growth rate for Mobile Game-based Learning (12.5%) is more than double than for all types of Mobile Learning combined (7.6%).

- Edugame revenues for content in North America will nearly double from 2013 to 2018
- Consumers are the top buyers of edugame packaged content in North America and around the world
- New content suppliers continue to flood the market, particularly for early childhood edugames
- Edugame investors were bullish in 2011, but held back in 2012 and the first half of 2013
- Telecoms, device makers, and NGOs provide Mobile Learning value added services (VAS) products in all regions of the world, except rarely in North America, so far.

### Secondary Findings

- Top "selling" (or downloaded) edugames are for young children; the number of edugames that offer parental involvement are on the increase

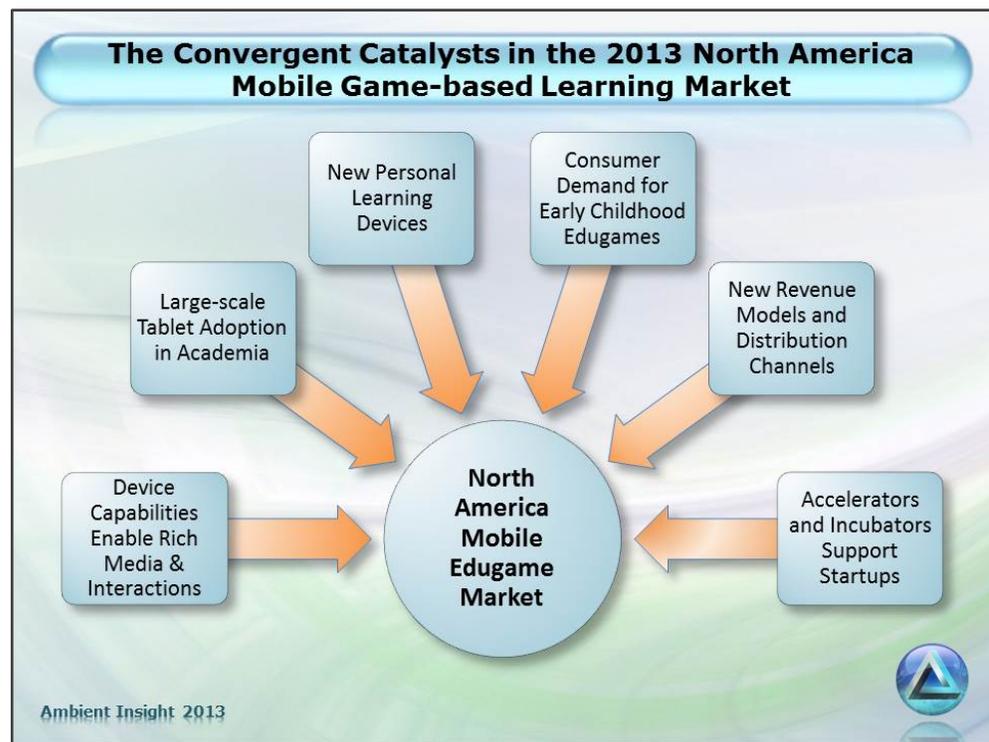
- Suppliers capitalize on consumers' interests: early childhood education, tourism, health, fitness and wellness, cognitive fitness, nature, and sustainability
- Consumer expectations for mobile-social (Mo-So) is now a given; mobile-local-social (Mo-Lo-So) continues to grow
  - Cultural institutions continue to invest heavily in edugames, with a mix of in-house and custom content development
  - Emergence of easy-to-use mobile game-building tools supports the cultural shift towards game-creation as an educational experience.

### Catalysts

A number of catalysts are converging that are energizing the market for edugames. They range from alignment of interests to hardware advances.

We are witnessing an explosion of interest by consumers in edugames. Business accelerators and incubators, sometimes encouraged by local government economic development initiatives, pave the way to success for startups. Brands seeking to increase interaction and affinity with their target demographic are willing to partner with content providers. Academic institutions push the creative boundaries and stimulate innovation. New revenue models, alternative funding, and new distribution channels add to the expansion of opportunities for suppliers.

**Figure 1 – Convergent Catalysts in the 2013 North America Game-based Mobile Learning Market**



On the hardware side, consumers have an abundance of personal learning devices (PLDs), mostly aimed at young children, and tablets from which to choose. Tablet use is also rising in academia. Smartphones have surpassed feature phones and the powerful features—accelerometers, 8 MP cameras, GPS, NFC, fast processors—make for good gaming experiences. The growth of game-suitable hardware fuels the need for content. Although augmented reality (AR) browsers are still not yet standard on new mobile devices, the growth rate for AR edugames is high.

### **Inhibitors**

Most of the inhibitors are not unique to edugames, but rather to Mobile Learning or to game development in general. Ironically, many inhibitors are the downside of an upside advantage.

Because the barriers to entry are so low, startups—often one or two person shops—continue to flood the market at a rapid pace.

Discoverability is increasingly a challenge for small suppliers. On July 24, 2013, the Google Play store boasted launching their one-millionth app. The number of app stores keeps growing, which on one hand offers additional distribution opportunities, but on the other having multiple outlets means to manage arrangements for those outlets.

In response to the persistent problem of visibility, in July 2013, Facebook unveiled a mobile discovery platform, the Facebook Mobile Games Publishing program, to help independent game developers gain visibility, for a percentage of sales. Facebook offers targeted advertisements to its up to 800 million users per month and analytics tools for the developers in return for a portion of participating games' revenues. Gameloft, 5th Planet, and OutPlay Entertainment were among the first ten developers in the program.

The benefits of the Facebook program for small suppliers are of course exposure to Facebook's 800 million monthly mobile app users and the 260 million people playing games on Facebook, plus not having to pay upfront costs for promotion. The risk is terrific sales and poor sales, both of which will transfer a share of game revenues to Facebook, in addition to the 30% to Apple or Google.

Another inhibitor in North America, which is also not unique to edugames, is selling formal education products in the highly fragmented academic purchasing environments in both Canada and the US.

There are a set of inhibitors that are unique to edugames in academia, including:

- Logistics – Educators find it difficult to integrate games into the time structure of the school day (45-minute classes).
- Support for teachers – Most teachers have little experience in using games in the classroom and too few professional development

programs offer this type of support. Teachers lack the time and sometimes the incentive to do this on their own.

- Social and cultural structures – Some K-12 schools ban mobile phones and portable devices. In other cases, the schools/parents cannot provide enough devices for all students.
- Attitudes – Games aren't considered serious enough for education; on the other hand, teens may shy away from games they are told are "good for them" or even those that are labeled as "educational."

### ***What You Will Find in This Report***

There are four analysis sections in this report: trends, demand-side, supply-side, and investments patterns/business models.

- Ambient Insight identifies trends that shape the market.
- The demand-side analysis provides suppliers with insight into the buying behavior of buyer segments in the North America region.
- The supply-side analysis provides suppliers with the total addressable market (TAM) for six mobile edugame product types across the North America region.
- The "Follow the Money" section identifies investment patterns and business models.

All revenue forecasts in this report are in \$US dollars.

Targeting specific buyers with particular product types is key to generating revenues in North America. Ambient Insight provides a description of how we categorize product types in Ambient Insight's 2013 Learning Technology Research Taxonomy document, which is available on our website [www.ambientinsight.com](http://www.ambientinsight.com)

### ***Who Is the Buyer?***

Of the six buyer segments—consumer, nonprofit, government, academic, corporate, and healthcare—that purchase Mobile Game-based Learning products, throughout the forecast period consumers will provide the largest revenues across the board.

A significant challenge for edugame suppliers serving the consumer segment is determining the mobile platform they will target. Some segments, such as corporations and government agencies, are easier to target, since they often standardize on specific platforms. The consumer segment is more difficult since it uses all the mobile platforms including dedicated gaming devices, rarely in use in the other segments.

Typically, the buyer segments that contribute the most to revenues for edugame **packaged content** are consumers, PreK-12, and higher education. Revenues for **content services** are concentrated in the government, corporate, healthcare, and nonprofit segments. ***This report identifies trends that affect buying behaviors.***

## **Consumers**

Buying patterns vary depending on the sub-product type of edugame. Early childhood games generate the highest revenues by far in North America, as well as the rest of the world.

- In the US, 53% of all mobile edugame revenues in 2013 were generated from the sales of early childhood learning games.
- In Canada, except for one brain training game from Gameloft, all of the top fifty best-selling mobile edugames are for young children.

Consumers are the top buyers worldwide of Mobile Learning packaged content. Their demand for mobile-social (Mo-So) and mobile-local-social (Mo-Lo-So) content energizes the market for Game-based Mobile Learning content.

Consumer revenues are high for mobile brain trainers (for the older and younger populations) and language learning edugames for all ages. Consumers also buy mobile edugames that relate to their hobbies and general interests, such as birding and tourism.

Medical, nursing, and dental students are strong buyers of edugames that serve their needs for learning, skill development, and test prep. Healthcare professionals also purchase edugames to keep knowledge and skills refreshed, and to obtain continuing medical education (CME) or continuing education (CE) credits. Ambient Insight classifies these sales as consumer revenues as the products are purchased by individuals.

England's chief medical officer Sir Liam Donaldson originally coined the term the "expert patient" to identify a patient that strives to become informed about his or her medical condition and treatment regimes. The days of patronizing patients are long gone; medical professionals cannot ignore the technical knowledge that patients have literally at their fingertips. Health, wellness, and fitness edugames serve a growing demand.

## **Academic**

In the academic segment, Ambient Insight tracks buying patterns of both PreK-12 and Higher Education buyers. Neither Canada nor the US has a federally managed education system.

In Canada, education is overseen by federal, provincial, and local governments; and there are many variations between the provinces.

The Common Core State Standards is a US state-authored initiative designed to provide “a consistent, clear understanding of what (K-12) students are expected to learn, so teachers and parents know what they need to do to help them.”

Federal departments oversee some educational areas. For example, the Department of Indian and Northern Affairs Canada oversees the education of First Nations. Canada spends about 7% of its GDP on education.

The population of Canada is diverse: with more than 200 ethnic origins and 200 first languages, according to the 2006 census. In that census, over 57% of the population reported English and almost 22% reported French as their first language. Since passage of section 23 of the Canadian Constitution Act in 1982, education has been available in French and English, if the population of minority language-speaking children justifies it. Provincial governments regulate language programs at public institutions, but not necessarily at private institutions.

Canadian students who are temporarily out of the country or foreign students who wish to obtain a Canadian provincial high school diploma, to continue their studies in a Canadian higher education institution may seek schools using a provincial curriculum. In 2013, seven out-of-province accredited international schools used the Alberta curriculum (including Hong Kong, China; Macao, China; Abu Dhabi, UAE; Qatar; Guadalajara, Mexico; and Muscat, Oman).

Education in the US is primarily a state and local responsibility; locally elected school boards have jurisdiction over school districts, which vary greatly in size. Libraries often buy language learning products.

In the US, approximately 88% of children attend public schools, 9% attend private schools, and 3% are homeschooled. The National Home Education Research Institute reported the homeschool population has been steadily growing in the US, and is often overlooked by suppliers of educational content.

### ***PreK-12***

Tablet usage in Canadian schools is relatively new, and more prevalent so far in private schools. Tablet use is expanding in US schools; new personal learning devices (PLDs) designed for school use continue to come on the market. LeapFrog is the dominant PLD supplier to the PreK-3 market in the US.

The US Department of Defense Education Activity, the District of Columbia, and 45 of the 50 states have adopted the K-12 Common Core State Standards for language arts and math. Although the standards are not federally mandated, federal funding is conditional on adoption. Ambient Insight advises suppliers of K-12 classroom content to the US market to keep up to date as it evolves.

### ***Higher Education***

In both Canada and the US, higher education includes formal instruction in academic, vocational, technical, and continuing professional education.

Although higher education institutions in Canada and the US foster development of the edugame market and experiment with creating edugames, they do not rank highly as buyers of edugames. However, academic accelerators and incubators support innovation that helps drive the market for Mobile Learning products.

The University of New Mexico developed a mobile game called Mentira to teach an introductory Spanish language course. Students interact with members of a Spanish-speaking neighborhood, Los Griegos in Albuquerque's North Valley, to solve a mystery and use language in an authentic context. The university reports that the game shifts student priorities from grades to learning.

Universities around the world have been contributing research and tools development, and spinning off startups in mobile edugames and Location-based Learning. According to the National Business Incubators Association, as of July 2012, at least 36 universities in the US have business incubators that promote development of mobile apps.

The MIT Teacher Education Program in collaboration with MIT's Education Arcade developed augmented reality simulation edugames. The first was Environmental Detectives, which challenges students to uncover the source of a toxic spill. The game was run in three locations: at MIT, at a nearby nature center, and at a local high school. Research indicated the mode of learning was successful and provided an authentic mode of scientific investigation.

## **Governments**

Federal government sectors in Canada and the US include military and civilian agencies. Federal, state, provincial, and local government buyers primarily purchase custom content services and packaged content, and less frequently develop apps in-house.

The US Army has a long and strong history of involvement in game development. The US Army funded America's Army (also known as America's Army Game Project) as a series of video games and other media on July 4, 2002 to encourage recruitment. In February 2007, Gameloft and the US Army released an edugame version that offered players to serve as an infantryman, man an armored vehicle, or pilot a combat helicopter. The edugame serves as a recruitment tool.

The Citizenship and Immigration Canada agency has released several online games related to citizenship, immigration, and multiculturalism, and one to play on Facebook or on iPhone, Android, and BlackBerry devices. The mobile edugame created by developer Jennifer Savage called How Canadian Are You, Eh? is the official quiz game to test players knowledge of citizenship and immigration. Parks Canada has also created edugames.

The Canadian federal government oversees the operation of national museums. The Museums Act in 1990 created four Crown Corporations to operate those museums: The National Gallery of Canada Corporation, the

Although the annual "Museums and Mobile Survey" is not specific to edugames, it has relevance to mobile Game-based Learning suppliers as the findings provide insight into current educational strategies of cultural institutions. Of the 551 survey respondents in 2013, 75% came from the US and 11% from Canada.

Canadian Museum of Civilization Corporation, the Canadian Museum of Nature Corporation, and the Canada Science and Technology Museum Corporation.

Tristan is an Ottawa-based developer of mobile apps for museums, art galleries, parks, and cities. Their handheld visitor guides to the Art Gallery of Ontario and the Memphis Brooks Museum of Art in Tennessee include puzzle games that educate visitors to the institutions and their collections.

State, provincial, and local governments tend to hire custom content service suppliers to develop Location-based Learning tourism and cultural heritage edugames to engage visitors in their area. An exception to this is Pass the Past, an edugame launched by the State of Virginia in 2010 and designed to help Virginia students prepare for the Standards of Learning standardized tests.

### **Nonprofits: Museums and Cultural Institutions**

Often, however, the buyer is not the end user. For instance, museums, other cultural institutions, as well as government agencies (federal, state or provincial, local) often fund tourism-related Location-based Learning edugame projects. Nonprofits offer apps as a means to enhance the visitor experience and create affinity with their organization. The apps are typically, but not always, delivered to consumers free of charge.

For example, Eduweb is a St Paul, Minnesota developer of over 200 "digital learning games and activities" for K-12, college-age students, and adults. The company reports that they work almost exclusively with nonprofits and government agencies.

Eduweb designed and built the mobile app called A Sailor's Life for Me for the USS Constitution Museum in Boston, Massachusetts. Funding came from a Museums for America grant from the Institute of Museum and Library Services, with additional support from the United States Navy Office of Commemorations, Navy History & Heritage Command. Originally designed as an online game, the mobile iPad app is free on iTunes.

Loic Tallon, Director of Pocket-Proof, reported in his "Mobile Strategy in 2013: an analysis of the annual Museums and Mobile Survey" (551 survey respondents) that the most popular of the 16 objectives for a mobile project is not revenue generation, but visitor engagement. The most common audience are those seeking a more "in depth" visitor experience (45%) and younger visitors, age 18-35 (42%), followed closely (41%) by "Tech-savvy visitors."

According to the 2013 survey, in spite of advances in technology in the last three years, the top objectives have changed little; the most popular objective for an institution is experimentation in visitor engagement. The second is "to make accessible additional interpretative content" and the third is "to provide a more interactive experience." A growing number of cultural institutions have found that edugames satisfy those objectives.

Institutions use Mobile Learning to "attract new visitors" and "to raise the profile of the institution." Presumably, the latter could have endowment or fundraising value.

The Mobile Strategy 2013 survey confirmed Ambient Insight's contention that museums are shifting away from investing in simple audio tours to offer interactive and social experiences, including options to link to social networking sites and visitor's social media profiles. The more interactive and social mobile experiences are more likely to be free, rather than fee-based. Museums predominantly create iOS products first, then add Android apps.

Some museums create their own apps, but most pay commercial suppliers who provide a range of custom content development services. Often, tasks such as project planning, marketing, content management and distribution/management of the mobile experience are handled in-house. Outsourced tasks usually include technical/software development, publishing to app stores, and publishing to devices.

In 2012, the Metropolitan Museum of Art launched Murder at the Met: An American Art Mystery edugame for smartphones or tablets. Visitors try to solve the fictional cold case of John Singer Sargent's Madame X, murdered at the museum in the American Wing in 1899. Green Door Labs' artists and game designers worked with artists and developers at the Met and Toursphere, creator of interactive mobile tours.

Surprisingly, the size of an institution is not an influencing factor in which aspects of a project are outsourced or developed in-house. Revenue sharing is not uncommon, with the developer charging a low price for the custom service in exchange for a percentage of sales.

Art institutions logically tend to create mobile experiences for permanent rather than temporary exhibits, thus prolonging the life of the edugame product.

We have seen more and more museums offer positions such as "director of mobile strategies and initiatives," "director of new media," "director of social media," and the like. Shelley Bernstein, vice director for digital engagement & technology at the Brooklyn Museum, is one of the new pioneers who initiated edugame projects such as the Gallery Tag edugame and other "community-oriented missions."

Many museums, such as the Smithsonian, have announced mobile strategies that include interactive edugames. A 2011 show called The Artist in Dialogue 2 at the Smithsonian's National Museum of African Art provided a mobile tour in English and Brazilian Portuguese that included the opportunity for visitors to learn more by joining conversations between a curator and artists via Twitter and to experiment with artists' techniques in a mobile game.

Another related trend is cultural institutions hosting game jams that bring game developers and professional staff together. These events produce some edugames or at least prototypes, but they also draw attention to the opportunity for game designers to collaborate with scientists and staff of cultural institutions and produce consumer-interest edugames. In this, they are furthering the edugame industry.

- The US National Aeronautics and Space Administration (NASA) held its first game jam at its Ames Research Center in March 2013. NASA supplied digital assets and photos.

The Science Game jam at the Field Museum included research scientists on staff and an expert in the educational merits of particular game designs from the Chicago Quest middle school who offered pedagogical advice.

- In August 2013, the Royal Ontario Museum hosted their first three-day game jam that produced prototypes such as a 3D pottery simulator, a touchscreen calligraphy game, and pyramid builder controlled by a Super Nintendo gamepad.
- In Chicago, the Field Museum of Natural History's Biodiversity Center and the game developer Important Little Games held their first science game jam July 26-28, 2013 that brought together eight science researchers and 28 game designers, artists, and programmers.

The number of mobile augmented reality edugames and QR codes in museum and gallery mobile guides will continue to increase, even though these technologies are at opposite ends of the sophistication spectrum.

Ambient Insight includes associations in the nonprofit buyer segment. Associations may partner with suppliers to showcase edugames, but infrequently create or buy custom content services. The exception are cultural or heritage associations.

## **Healthcare**

"Game thinking gives people permission to fail, and that is new and important in healthcare." Dr. Yan Chow, Kaiser Innovation Center.

The healthcare segment is an amorphous cluster of buyers, rather than a simple vertical. The ecosystem includes healthcare providers (hospitals, clinics, healthcare and emergency response professionals), payers (insurance companies), pharmaceutical companies, and more recently: medical device makers. And the ecosystem is changing:

- Payers see their business change from simply managing risk to providing new services
- Pharmaceuticals moving from drug units sold to improving health outcomes
- Providers need educational tools to improve efficiencies and lower costs
- Device makers need deeper customer engagement to increase sales and improve compliance.

As the trend in healthcare moves towards outcomes, it will enhance opportunities for Game-based Mobile Learning. According to Don Jones, Vice President of Wireless Health Global Strategy and Market Development, Qualcomm Labs, "applying game theory [gamification] to health apps, you can capture the consumer's imagination and engage them in their own health."

There is ample evidence of support for "games for health" from the medical community in the appearance of new game-related accelerators (Rock Health), a medical journal (Game for Health: Research, Development, and Clinical Applications), and health organizations (Canada's Centre for Wireless and Digital Health Innovation).

Consumers are the primary users of health and wellness edugames, and pharmaceutical companies and healthcare device makers are still the dominant buyers by far of all health-related apps, which they provide to consumers free of charge. However, investors, government agencies, or health-related brands (including hospitals and insurance companies) now fund many health and wellness apps. For example, the Children's Hospital of Wisconsin developed a game for kids about how to stay safe around the house.

Healthcare is one of many professions that require licensure and/or certification in North America. Suppliers have met the need for studying for re-certification or re-licensing tests with edugames, which are purchased by individuals as consumers not by health organizations.

### **Corporate Buyers**

Corporations are not avid buyers of Game-based Mobile Learning products, except to promote brand awareness. They have seven other learning technology types to choose from, and classroom instruction and blended learning still dominate training programs.

In addition, the lingering effects of the recession continue to dampen budgets for corporate training, even though compliance requirements have not shrunk. In general, businesses believe that game development is more expensive than online learning development.

For business use, corporate buyers are more likely to fund video games and role-play simulations than mobile edugames. Another inhibiting perception is that mobile games are fun, but business is serious. Serious games within a business context continue to make slow headway in North America.

The corporate segment does fund development of mobile edugames as a means of brand enhancement—to attract and retain target customer groups. For example, in July 2012, the financial institution ING (now Capital One) rolled out STRUCT, a free mobile game app designed for consumer education “and to turn players into ING U.S. clients.”

According to Jillian Verspyck, ING director of marketing communications, “We know Americans need to do more when it comes to preparing for retirement yet industry data suggests there are more people in the United States who meet the definition of active gamers than those who save for retirement – 141 million gamers versus 61 million savers.” Verspyck noted that the skills needed to succeed at the game “parallel the concepts of risk, diversification, goals and achievement.”

Tablet use for business in Canada is still relatively low at 8%, according to the CBC's Media Technology Monitor.

## Quantitative Methodology, Scope, and Definitions

Ambient Insight provides quantitative revenue forecasts based on our proprietary Evidence-based Research Methodology (ERM). The ERM is an iterative process based on predictive analytics used to identify revenue opportunities for suppliers. There are four key components of the ERM process:

- Isolate target market via leading and lagging indicators
- Define the potential market revenue boundaries
- Triangulate the baseline market revenue
- Forecast the Total Addressable Market (TAM) for specific products

ERM progresses from general patterns (the big picture) to very precise granular patterns. It is used to create a forecast model comprised of accurate predictors. The forecast model is refined as additional data become available. Ambient Insight triangulates baseline revenues from three analysis vectors that include:

- Supply-side analysis
- Demand-side analysis
- Product and Service category analysis

Ambient Insight gathers market and competitive intelligence from a wide spectrum of information broadly classified as leading and lagging indicators. Economic and market conditions are subject to change and the data in this report are current at the time of publication.

Many of the companies discussed in this report are publicly traded on various international stock exchanges and their financial disclosures provide baseline data for global sales and specific regional business activity. Many private companies, particularly outside the US, report their revenues as a matter of policy. Those financial disclosures also provide baseline data for the demand for specific types of products in particular countries and regions.

### Scope

This report analyzes and provides revenue forecasts for the North America market for Game-based Mobile Learning content products. The report also highlights trends, provides analyses of buying behaviors, identifies market opportunities, and includes references to suppliers as evidence of the development of the market for Mobile Game-based Learning products and services.

The vast majority of Game-based Mobile Learning developers use generic game development tools to build their products; many of those that are specific to creating edugames are free. The market for Mobile Game-based Learning tools is nascent; it is not yet large enough to quantify, therefore this report focuses on packaged content and on content services and does not include revenue forecasts for tools.

The report includes many examples of Mobile Game-based Learning products, but does not include forecasts for Simulation-based Learning or non-mobile Game-based Learning.

There are distinct pedagogical differences between Game-based Learning and Simulation-based learning. Ambient Insight's definitions are based on research by Alessi and Trollip

## ***Product Definitions***

Ambient Insight provides granular definitions of learning technology product types in the free [Ambient Insight's 2014 Learning Technology Research Taxonomy](#) and strongly recommends reading the taxonomy document prior to reading an Ambient Insight report.

Game-based Learning is a knowledge transfer method that utilizes "gameplay," which includes some form of competition (against oneself or others) and a reward/penalty system that essentially functions as an assessment method.

Game-based Learning products or edugames have explicit pedagogical goals. A user "wins" an edugame when he or she achieves the learning objectives of the gameplay.

Simulation-based Learning focuses on two instructional strategies: learning about something (physical and process) and learning to do something (procedural and situational).

Virtual worlds that embed edugames illustrate the difference between Simulation-based Learning and Game-based Learning. The "environment" is indeed simulated but the knowledge transfer method is game-based. In Simulation-based Learning, the simulation itself is the knowledge transfer method.

Ambient Insight has adopted SpongeLab's distinctions between gamification and Game-based Learning. ***Gamification is the application of videogame rules, mechanics and conventions to a non-gaming situation.*** Game elements are often "bolted on" to legacy training products. For example, Badgeville sells gamification add-ons for corporate training.

***In this report, we use the terms "Mobile Edugames," "Game-based Mobile Learning," and "Mobile Game-based Learning" interchangeably.***

## **Knowledge-based Games**

Handheld and mobile knowledge-based edugames are designed to help users learn and memorize concepts, principles, facts, patterns, and rules (such as verb conjugation.) These edugames are usually designed as quizzes, flashcards, or trivia games.

They are relatively easy to design and there are commercial development tools on the market. Players compete for high scores and often the incentive is a race against the clock.

In the current market, the majority of knowledge-based mobile games are designed for the PreK-3 market. They focus predominantly on the "3 R's" to help children learn to recognize shapes, colors, letters, words, and numbers. Test prep edugames for college entry exams are also prevalent.

### **Skill-based Games**

A skill is the ability to apply knowledge in the context of a performance. Skill-based games are designed to improve hand-eye coordination, improve performance on physical tasks, and hone psychomotor skills of players. For example, a math game is considered a skill-based game. Memorizing the rules of math is knowledge-based. Applying that knowledge in calculations is a skill. Memorizing facts for a driver's license written test is knowledge-based, while applying those rules in the car is a skill.

### **Brain Trainers and Brain Fitness Games**

Brain trainer and brain fitness games are based on cognitive science, neuropsychology, and brain-based learning theories emerging from educational psychology and educational neuroscience. It is an instructional method that targets the neuro-physiological processes involved in learning and has little in common with traditional instructional design principles.

The "fitness" metaphor derives from physical exercise concepts. Researchers and suppliers have a growing body of empirical evidence to show that people who use the products can condition and train the brain to improve memory, attention, visual and spatial awareness, auditory processing, linguistic skills, planning skills, and problem solving.

Ambient Insight does not categorize or include in forecasts as brain fitness or brain trainer products those products that are designed for cognitive rehabilitation or for clinical diagnosis.

Brain trainers continue to be popular in the US and Canada. In December 2012, Vancouver-based Vivity Labs launched their brain trainer mobile app in the Apple store and sold one million copies in the first 60 days.

The terms "brain trainer" and "brain fitness" have become interchangeable in the market. ***In this report, for simplicity we will standardize on the term "brain trainer games" to mean mobile edugames.***

#### ***Disclaimer:***

*Ambient Insight analyzes the competitive landscape and supply chain for Cognitive Learning products and is agnostic about claims or criticisms surrounding the effectiveness of the products. We are an integrity-based firm and we do not endorse specific suppliers or products. We do not evaluate, compare, or rank the effectiveness of Cognitive Learning*

*products. We are interested in the on-going research developments from a product marketing perspective and as potential market catalysts and inhibitors, but our primary focus is to track the buying behavior of customers and identify the revenue opportunities for suppliers.*

### **Language Learning Games**

Memorizing foreign words is knowledge-based, while using those words in speech and writing is a skill. Ambient Insight breaks out mobile language learning edugames for suppliers because they are part of the greater language learning market.

There is a growing demand for language learning edugames on mobile devices. This type of mobile edugame has been a staple in the Japanese market and now games like this are being adopted across the planet. The language "coaching" games for the Nintendo devices are good examples of this genre. Speech recognition and real time translation are used in the more sophisticated language learning games.

### **Location-based Learning Games**

Location-based Learning games, one of the "native" types of Mobile Learning, emerged in 2009. Essentially, developers are designing educational game play around physical locations and time.

Location-based Learning suppliers have been leveraging the technology innovations that have been driving location-based services (LBS) from 2-D and 3-D bar-code services to mobile augmented reality technologies; and have taken advantage of proximity marketing—the localized wireless distribution of content. Transmissions can be received by users who have devices capable of and are enabled to receive **time and/or place** specific information, media, or special offers.

RFID chips, GPS chips, barcodes, SMS short codes, image recognition, and augmented reality technologies are often used in Location-based Learning games, particularly in clinical healthcare environments, first responder situations, consumer and patient education, museums, tourist attractions, navigation applications, and in the travel industry.

SCVNGR creates custom games using their own location-based platform.

### **Mobile Augmented Reality Games**

Ambient Insight defines **mobile augmented reality** in this way: Mobile Augmented Reality utilizes images, schematics, audio, multimedia, historical context, location data, and other forms of content overlaid on real-world objects via the device's camera and manipulated by users holding a mobile device.

The augmented elements are triggered by specific objects, print-based markers, and/or by location coordinates.

Mobile augmented reality games emerged in 2010. Ogment, founded in 2009, was one of the first venture-backed companies that went into business to develop and publish augmented reality games.

### **Mobile Learning VAS**

Mobile Learning value-added services (VAS) is another type of Mobile Learning. Ambient Insight defines **Mobile Learning VAS** as a subscription-based or pay-as-you-go product that is primarily sold directly to consumers and organizations and less so to institutions by telecom network operators, device makers, and content suppliers. The content is usually delivered over mobile networks via audio, Short Message Service (SMS), or Interactive Voice Response (IVR); but can also be delivered as web-based or downloadable apps.

Currently, mobile network operators dominate the Mobile Learning VAS market around the world. Nokia and Urban Planet Mobile are examples of non-telecoms that sell Mobile Learning VAS products.

### ***Related Research***

Buyers of this report may also benefit by the following Ambient Insight market research:

- [The 2012-2017 North America Mobile Learning Market](#)
- [The Worldwide Mobile Location-based Learning Market: Forecast and Analysis 2011-2016](#)
- [Ambient Insight's 2014 Learning Technology Research Taxonomy](#)

Although they are very popular worldwide, so far there are very few Mobile Learning VAS available in North America. This represents an untapped market.



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