Ignite! Learning
Transforming Classroom Curriculum

The Ignite! Learning Method of Instructional Design

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Introduction

Ignite! Learning is driven by a desire to improve student learning and enable middle school students to learn in the ways they learn best. Informed by educational research on how humans learn, the company was founded on three core beliefs:

1) All students have a gift for learning; they just learn differently.

2) Humans learn best by doing things, applying concepts, and making connections between experiences.

3) Technology can play a vital role engaging students in the ways they learn best.

In designing products that reflect these beliefs, Ignite! Learning seeks to incorporate the strongest ideas from an extensive body of educational research, weaving together a method of instructional design that addresses a broad range of learning styles, captures students' interest, and provides the types of lessons and activities that foster student mastery of knowledge and skills.

Ignite! Learning's middle grade curriculum helps students learn the material and skills specified by state and national academic standards in a teacher-centric, multimedia-rich manner that appeals to a wide variety of learning styles and interests. By integrating a constructivist approach to some of the activities, Ignite! Learning provides the tools and information students need to create their own deep understanding of the material that goes beyond rote memorization. The curriculum's problem-based learning activities challenge students to build their skills and knowledge by applying information, drawing out themes, making connections and solving problems—in other words, not just memorizing facts. Ignite! Learning presents information in contexts that are familiar and engaging for middle grade students in order to reinforce the relevance of what they are learning to their daily lives. The curriculum offers a variety of assessments so that students may demonstrate their learning in different styles and formats, thereby providing students, teachers, and parents with better insight into the student's educational progress. In short, Ignite! Learning provides the tools needed to make learning meaningful, enjoyable, and successful for all students.

People Are Born Learners

Criticizing the current state of education has become a national pastime, and the responsibility of educating children to meet even basic levels of achievement is seen by many as a Herculean task, requiring an iron-fisted approach to instruction, with dire consequences for failing to achieve. While standards and accountability are important factors in educational success, Ignite! Learning does not support the idea that students need to be pressured or forced to learn. Instead, the Ignite! Learning instructional design method takes as its starting point the fact that humans have a natural inclination to learn. Provided that proper conditions are in place, learning will occur naturally.

Looking at how people learn naturally during the first few years of life provides evidence that "humans are predisposed to learn from and adapt to their environment."[1] By the time they enter school, children have already acquired a vast amount of knowledge. They have learned to crawl, walk, and run during the first few years of life, opening up new worlds of experiences and explorations. They have learned to speak and comprehend language, including a vocabulary of literally thousands of words and an understanding of the rules of grammar and intonation, enabling them to express their thoughts and opinions and communicate with those around them.[2, 3] Throughout this development process, children are actively engaged in their learning: they seek out new challenges, and they take great pride in their accomplishments. They demonstrate an insatiable desire for new knowledge, as well as remarkable long-term retention of what they have learned. Incredibly, children accomplish these feats with no formal education and, with rare exceptions, they do so successfully. Indeed, few children enter school feeling that they are "stupid" or poor learners. They are, in truth, born learners. The incredible ability of young children to quickly and easily learn without formal instruction suggests that learning does not need to be coerced.

Learning can be enjoyable, meaningful, and long-lasting, if the conditions are right. To create the right conditions for students to learn "naturally," Ignite! Learning has designed its curriculum to achieve the following instructional principles:

- **Accommodate diverse learning styles.** There are significant differences in how individual students learn most effectively and traditional instructional methods are too narrowly focused on only a small number of learning styles for all to benefit equally. For all learners to have an equal opportunity to learn the material, instructional design must take this diversity into account.
- **Challenge students to "learn by doing."** In their early years, young children learn not simply for the purpose of learning, but in order to accomplish something, such as getting from here to there or communicating with a parent or friend. By actively applying new knowledge to problems and tasks in Ignite! Learning's curriculum, students develop a deeper understanding of the material, and come to recognize its practical usefulness, answering the question "What can I do with this information?" Learning by doing also helps students develop higher-order thinking skills, including being able to pose incisive questions, search for and find specific information, synthesize data from different sources, recognize patterns and similarities, view issues from different points of view, and draw justifiable conclusions.
- **Help students understand standards-required material within the context of crosscutting themes and unifying, big-picture ideas.** Instead of memorizing abstract lists of facts, students will only truly understand and remember those facts as integrated pieces of a larger whole.
- **Help students recognize the relevance of the material to their daily lives.** Information that is relevant to what the student already knows is more easily learned and remembered. For instance, students who recognize how American history relates to their rights and

[1] Abbott, J., & Ryan T. (2001). The Unfinished Revolution: Learning, Human Behavior, Community, and Political Paradox. Alexandra, VA: Association for Supervision and Curriculum Development. (p.5)
[2] Smith, F. (1998). The Book of Learning and Forgetting. New York: Teachers College Press.
[3] Gardner, H. (1991). The Unschooled Mind: How Children Think & How Schools Should Teach. New York: Basic Books.

responsibilities as citizens or to their economic affairs and financial success will learn more quickly and with better understanding than students who see no connection between the material and their own lives.

- **Challenge students to demonstrate their learning to a variety of ways on a range of tasks, including authentic, project-based assessments.** This multifaceted approach to assessment provides a clearer picture of the student's progress and is a better indicator of whether the student has truly mastered the material.
- **Foster a passion for knowledge.** This seems an obvious objective, particularly given the research evidence on the effect of emotional engagement and motivation on learning,[4] but in the development of traditional course material too little attention is paid to whether students will actually enjoy learning.

In addition to the above principles, coverage of the knowledge and skills required by state academic standards is certainly a core component of Ignite! Learning's educational purpose, but, unlike most other educational products, it is not the company's only goal. *A report by the Carnegie Corporation on improving middle school students' education recommends that curriculum be "grounded in, though not strictly limited to, rigorous, public standards for what students should know and be able to do."[5] The standards are the starting point. What makes the difference is the kind of learning environment that is created to teach those standards.* By meeting the above objectives, Ignite! Learning provides a multifaceted online learning environment that enables teachers to teach more efficiently and empowers students to capitalize on their natural gift for learning.

Accommodating Diverse Learning Styles

Ignite! Learning recognizes that different students learn in different ways, and it develops products that enable all students to learn in the ways they learn best. *Howard Gardner's Multiple Intelligences (MI) Theory has heavily influenced the way Ignite! Learning presents educational content, guiding the company's creation of stories, poems, songs, diagrams, simulations, interactive simulations, and other instructional media.*

Background

At least informally, teachers have long understood that different students learn differently, and that different teaching approaches are often necessary to meet the need of all students in a class. Every teacher has dealt with this reality on an individual case basis—for example, the student who just does not "get" a concept when it is described in a lecture, but quickly understands when a diagram or a picture is drawn. Even outside of school, people sometimes describe themselves as "visual learners," while others need to hear an idea expressed in words, or they need to physically engage in an activity to understand a concept.

In the early 1980s, Howard Gardner offered the educational community new insight into this phenomenon by raising the question of whether people might possess more than one type of intelligence. For decades, people had believed that humans possessed a single kind of intelligence that lay behind all of their thinking and learning, and that it could be accurately measured through testing and expressed as a single number: a person's IQ, or Intelligence Quotient. Alfred Binet helped pioneer this school of thought in the early 1900s by developing the first IQ test and, perhaps due to its simplicity, the idea quickly caught on.

In his research, Gardner noticed that the IQ tests used to measure this intelligence consist entirely of questions that require language and logic skills to answer. He sensed a mismatch between such a

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[4] Abbott & Ryan.

[5] Jackson, A.W., & Davis, G.A. (2000). <u>Turning Points: Educating Adolescents in the 21st Century</u>. New York: Teachers College Press. (p.26)

narrow set of cognitive skills and the incredible diversity of skills that people use to function and succeed in the world: surgeons with their incredible manual dexterity, sailors in history who navigated by the stars with uncanny spatial orientation skills, dancers, choreographers, athletes, musicians, painters, sculptors, and many others whose success cannot be attributed solely to their language and logic skills. Gardner proposed that the definition of intelligence, or the way people understand and interact with the world around them, should be much broader than logic and language—that there are in fact many different intelligences at work in each person's mind.[6]

Drawing from research in fields that did not exist before Binet's time, such as cognitive science and neuroscience, Gardner developed his MI Theory, in which he identified a collection of seven intelligences that every person possesses:

- linguistic
- logical/mathematical
- visual/spatial
- musical
- bodily/kinesthetic
- Interpersonal
- Intrapersonal

To understand what the intelligences look like in practice, it helps to identify their defining characteristics and consider famous individuals who have excelled in each intelligence, as outlined in the following table:[7, 8]

Intelligence	Characteristics	Famous Individuals
Linguistic	Sensitivity to the sounds and meanings of words, and to rhythms and inflections. Skill in using words to communicate, persuade, and entertain, and appreciation for stories, word games, and poetry.	• Martin Luther King, Jr. • William Shakespeare • Virginia Woolf
Logical/Mathematical	Skill in identifying patterns, causal chains, and other logical and numerical relationships. Strong inductive and deductive reasoning abilities, facility with numbers and calculations, and interest in logic games, experimentation and figuring out how things work.	• Madame Curie • Albert Einstein • Blaise Pascal
Visual/Spatial	Ability to form accurate mental images of objects in 2-D and 3-D and use them to skillfully navigate, manipulate, or construct.	• Leonardo da Vinci • Pablo Picasso • Frank Lloyd Wright
Musical	Sensitivity to rhythm, pitch, timbre, tone, and musical patterns. Ability to recognize, compose, and perform music.	• Leonard Bernstein • Wolfgang Amadeus Mozart • Stevie Wonder

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[6] Gardner. (1991).

[7] Ibid.

[8] Armstrong, T. (2000). Multiple Intelligences in the Classroom (2nd Edition). Alexandria, VA: Association for Supervision and Curriculum Development.

Bodily/Kinesthetic	Physical coordination and dexterity, and the ability to think in terms of bodily movement, including goal-directed and expressive actions	• Babe Ruth • Martha Graham • Tiger Woods
Interpersonal	Ability to read the emotions and intents of others and respond and interact effectively.	• Lyndon Baines Johnson • Nelson Mandela • Ann Sullivan (Helen Keller's "miracle worker")
Intrapersonal	Clear understanding of one's own feelings and emotions	• Mohandas Gandhi • Sigmund Freud • Socrates

Gardner noted that while all intelligences are present in each person, "individuals possess varying amounts of these intelligences and combine and use them in personal and idiosyncratic ways. Just as we all look different and exhibit different personalities, we all possess different kinds of minds."[9]

Gardner and others quickly realized the implications of MI Theory for education. In particular, in was clear that, like the IQ test, schools were focusing too much on linguistic and logical/mathematical intelligences and too little on the others, with severe consequences for many students. "By minimizing the importance of other intelligences…, we consign many students who fail to exhibit the 'proper' blend [of intelligences] to the belief that they are stupid, and we do not take advantage of ways in which multiple intelligences can be exploited to further the goals of school and the broader culture."[10]

Indeed, MI Theory both reveals education's shortcomings and offers a clear direction for improvement. Gardner suggests that "an education built on multiple intelligences can… make the standard curriculum accessible to a wider range of students."[11] *He points out that for students who are struggling with a particular concept, presenting that concept through a range of intelligences offers students a "secondary route" to understanding,* "perhaps though the medium of an intelligence that is relatively strong for that individual."[12] For example, if a student is unable to comprehend a mathematical relationship when presented with mathematical symbols and terms, presenting the same concept through an analogy to interpersonal relationships or through the manipulation of objects would, by playing to that student's strengths, help remove what would otherwise be a frustrating barrier to success in school.

How Ignite! Learning Integrates Multiple Intelligences

Ignite! Learning weaves MI Theory into the fabric of its curriculum to create engaging and effective learning experiences for all types of learners. Students learn the subject matter by exploring the library of thousands of pieces of multimedia instruction, including animations, songs, videos, graphics, virtual manipulatives, and interactive images which are correlated to grade level state standards or divided and grouped into separate units and topics for content areas. For each key concept that students must learn, Ignite! Learning provides multiple pieces of media to convey the information in different ways, with each piece emphasizing a different set of intelligences. For example, in its *Early American History* course, the concept of triangular trade is presented in a rap song (emphasis on linguistic and musical intelligences), as a flowchart with symbolic icons representing the goods and people that were traded (emphasis on logical/mathematical and visual/spatial intelligence), and as a three-dimensional animation (emphasis on visual/spatial intelligence). This multiple-path approach is applied to every concept required by academic standards.

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[9] Gardner. (1991). (p.81)
[10] Ibid. (p. 81)
[11] Ibid. (p. 81)
[12] Gardner, H. (1993). Multiple Intelligences: The Theory in Practice. New York: Basic Books. (p. 33)

This rich multimedia environment allows us to more easily integrate MI Theory into learning than traditional, print-based instructional materials. In particular, multimedia presents a broad and rich array of choices for presenting information in ways that capitalize on different intelligences. From the same interface, a student may access music, an interactive flowchart or timeline, a simulation that allows the manipulation of objects in virtual space, audio of a narrated story or poem, a time-lapsed animation of a process that is usually hidden from view, or any combination of these or countless other means of communication. For each concept, students can then find the media piece, or pieces, that best speaks to their MI strengths.

Furthermore, Ignite! Learning's media is delivered in recognizable templates, each leaning toward a particular intelligence or learning style. Users can tell from the thumbnail that the media will teach with a compare-and-contrast style toward a visual intelligence, a narrative style toward a musical intelligence, a sequential style toward a mathematical-logical intelligence, or many other combinations. As students discover how they learn best by seeing which template best relates to their intelligences and learning styles, they grow more confident in their studies. That growing familiarity with template intelligence and style yields a learner who is prepared for *how* they are going to be taught.

The table below provides examples of how Ignite! Learning addresses each of the multiple intelligences in its curriculum.

Intelligence	Examples from Ignite! Learning Curriculum
Linguistic	• Extensive use of text and the spoken word • Text subtitles for audio pieces • Poetry and rap • Narratives of events
Logical/Mathematical	• Flowcharts, graphs, tables, and symbols • Mathematical relationships and numbers • Descriptions of cause-and-effect relationships
Visual/Spatial	• Video with dramatic editing and digital effects • Striking and evocative images • Diagrams • Animations, including cartoon depictions of events
Musical	• Songs in a range of genres, including: rhythm and blues, rap, folk, rock and roll, gospel, reggae, and opera • Background music that conveys the emotions of an issue or event
Bodily/Kinesthetic	• Student manipulation of objects in virtual space • Depictions of complex or high energy physical activities
Interpersonal	• Dramatizations of discussions and arguments between people • Students collaborate to complete group projects, have class discussions, compete in teams for whole-class activities, and find solutions in the Future Leaders of Problem Solving (F.L.I.P.S.) challenges
Intrapersonal	• Reflective and insightful first-person descriptions of personal experiences • Student creation of presentations that describe the student's own beliefs and emotions on a topic

Gardner points out that, in practice, intelligences are rarely applied in isolation—all but the simplest activities require multiple intelligences to work together in concert.[13] Thus, each media piece that

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[13] Ibid. (p. 17)

Ignite! Learning produces combines a number of the characteristics listed above in order to emphasize two to three "strong" intelligences—those that are used heavily to engage the learner and communicate the content.

By designing content that speaks to a range of intelligences and learning styles, Ignite! Learning opens up new avenues to confident learning for many students who have long been frustrated by the limited focus on linguistic and mathematical/logical ways of seeing the world.

Learning by Doing

Ignite! Learning provides students with opportunities to learn new knowledge by *applying* it. By performing tasks, accomplishing goals, and practicing new skills, students construct a deeper understanding of the material and its relevance to the world around them.

Background

There is an often-cited observation of what works in education: *"Tell me and I forget. Show me and I remember. Let me do it and I understand." There is, in fact, a great deal of evidence to support the idea that doing something is a superior way to learn it.* From John Dewey, who over a century ago advocated for allowing children to "construct, create, and actively inquire" in their education,[14] to countless other educational researchers and cognitive scientists over the decades, there is a general agreement that learning by doing leads to deeper understanding of material and a greater ability to apply what has been learned to solve real problems and achieve real goals.[15, 16]

There are many examples in daily life of the value of learning by doing. Certainly, the early learning activities of children support this view. Through their efforts to communicate with others and navigate their worlds, children quickly develop impressive skills in language and mobility. Later in life, in learning situations where the consequences could be life or death, such as learning to safely drive a car or learning to pilot an airplane, learning by doing plays a central role in instruction. Teenagers learn to drive not simply by reading about the rules of the road, but also by actually getting behind the wheel and practicing. No one would ever board an airplane knowing that the pilot had aced the written part of the exam but had never actually taken the controls of a plane.

In school, placing learning in the context of a real-world goal helps to motivate students by demonstrating to the student the value of knowledge. *Students often wonder how what they are learning could possibly be of use to them. In learning by doing, students see for themselves how knowledge can be applied to accomplish a task or achieve a goal. It answers the question "Why should I learn this?" with the answer "Because it will allow me to do that."* Learning by doing makes the purpose of learning clear to the learner and reinforces the learner's motivation to succeed.

Learning by doing challenges students to examine new information and construct, or piece together, their own understanding of a concept. Espoused by Dewey and many others since, and supported by recent evidence from the neurosciences, the *constructivist approach to education maintains that "the human brain is driven to make sense of those things that matter to it by continuously relating new ideas to old assumptions."[17] According to constructivism, knowledge is not simply conveyed to, and received by, the student. Instead, the learner takes an active, participatory role in the learning process.* When students are challenged to make sense of a situation, to interpret information and take action, they actively engage in the process of learning. Learning, as opposed to memorization, results from having students think for themselves and come up with creative conclusions and solutions.

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[14] Dewey, J. (1900, 1990). "The School and Society" and "The Child and the Curriculum". Chicago: University of Chicago Press.
[15] Bruer, J.T. (1997). Schools for Thought: A Science of Learning in the Classroom. Cambridge, MA: MIT Press.
[16] Abbott & Ryan.
[17] Abbott & Ryan. (p. 37)

Providing students with opportunities to learn by doing also serves to further the goals of state academic standards. In addition to listing facts that students must learn, most of these standards call for students to develop "higher-order thinking skills," which include the ability to make comparisons, analyze data, and draw conclusions. By requiring that these skills be taught, the standards are essentially calling for students to be able to *use* knowledge to some purpose and that they be able to demonstrate this ability. These are skills that are developed only through frequent, guided practice—in other words, by *doing.*

How Ignite! Learning Integrates Learning by Doing

In each of its courses, Ignite! Learning provides students with periodic opportunities to learn by doing. Learning by doing can be time consuming, and there are not enough days in the school year to cover the entire curriculum through a learn-by-doing approach. By allowing students to apply their knowledge from time to time, however, Ignite! Learning accomplishes a number of goals:
- students get to practice and develop their higher-order thinking skills
- their motivation to learn is bolstered by witnessing for themselves the usefulness of the material they are learning (thus answering the too-common question: "Why am I learning this?")
- by grappling with the complicated issues, they integrate new knowledge with what they already know, thereby constructing a deeper (and longer-lasting) understanding of the material

After exploring the library of media pieces in a science or social studies unit, students are challenged to use the information in those media pieces to complete a creative unit challenge. These projects provide exploratory, open-ended theses that encourage students to practice higher-order thinking skills and discover underlying principles, themes, and relationships within the material. For instance, after studying media on the pre-revolutionary period of American history, students might choose a side in the debate between British control and colonial self-rule and state their case at a colonial town meeting, using information from the media pieces as evidence to support their arguments. Students are challenged with a clear, practical goal—persuading the audience that their side is right and the other side is wrong—that goes beyond simply memorizing what conditions were like during this period of history. To succeed, they must analyze the information in the media and use it both to anticipate the beliefs and concerns of their audience, and to formulate and support their position.

In another unit challenge, focusing on the Constitution, students might choose to take on the problem of voter apathy and create a compelling argument stating why it is important to vote. Drawing on media that outlines how the U.S. government is structured and what powers are granted to elected officials, students would create a presentation that addresses the reasons people choose not to participate in the democratic process. They would delve through the media pieces, not simply to memorize their contents, but to evaluate their relevance and identify what information is most pertinent to their position. By doing something with this information—searching through it, analyzing it, and weaving it into a persuasive argument—students gain both a stronger understanding of the material *and* develop critical communication and higher-order thinking skills.

Within each math unit, students are given Future Leaders In Problem Solving (FLIPS) challenges that place content from the unit in unusual contexts and ask students to creatively find solutions to the dilemmas. These appear as part of the media and in the extensive print components. Students are encouraged to cooperatively, inventively, and constructivistly solve the problems however they feel most confident. Often, these higher-order thinking challenges will have more than one correct answer and students are encouraged to explore myriad thought processes to find an answer. For example, in *Course 5*, students are given descriptions of swim times and have to analyze those swim times against one another and build an accurate number line to accommodate all swim times.

In addition to fostering learning by doing in the creative project of each unit challenge, Ignite! Learning uses individual media pieces to support learning by doing by modeling for students different

ways of interpreting and manipulating information. For example, *Early American History* media pieces demonstrate how to interpret data, how to look at history in terms of casual chains of events, how the same issue can be interpreted in different ways by taking different perspectives, and many other skills. Mathematics media pieces in *Course 5* demonstrate how to recognize patterns and solve problems, interpret data, measure elapsed time, and many other skills. These demonstrations alone do not teach students these skills, but they provide guidance for when students are challenged to complete projects on their own later in the assignment.

Learning in Context

Learning in context can mean many different things. Related to learning by doing, it can refer to seeing the practical application of knowledge to some purpose or task, addressing the question "What can I *do* with this information?" In addition, learning in context can mean understanding material in terms of broad, organizing themes—seeing the "big picture" instead of a collection of unrelated facts.

Background

According to the Carnegie Corporation's report on *improving middle school education, people learn information better—with deeper understanding, longer retention, and greater ability to use that information—when it is learned in the context of broad themes and ideas.* Studies of what it means to be an "expert" in a given field show that rather than remembering long lists of facts, experts organize their knowledge around overarching concepts, such as the laws of physics, or historical patterns and precedents.[18]

A student of colonial American history who simply memorizes a series of historical events and their dates in isolation from each other will not have learned the material as successfully as a student who understands those same events as part of a repeating pattern of British taxation, colonial resistance, and escalating tension. The latter student may not always recall the exact dates of each event, but she will be better able to explain the importance of those events and their impact on American history.

How Ignite! Learning Integrates Learning in Context

Ignite! Learning isolates data in its related context through its taxonomy. By following a path from course to unit to topic to media piece, students are able to pinpoint data in its associated context. *Beyond just a strictly linear approach, the index function shows how context is fluid. One item of data can have multiple contexts, whether that is ratios in math, convection in science, or Eli Whitney in social studies. Students can view the same idea from multiple contexts.* For example, the learner can see the theory of convection as heat transfer transform into the very observable fact of convection in heating and cooling systems, the lithosphere, the water cycle, ocean currents, and wind. The graphics used to teach convection in all its varied contexts are always similar, becoming a visual mnemonic for students. Students can view data vertically through the taxonomy or horizontally across the course through the index. Furthermore, teachers can show how the Ignite! Learning content is applicable across courses, such as probability in both math and genetics in *Life Science*; percents, ratios, and fraction in math and the Civil War in *Early American History*, or important scientists throughout history. A third means of creating new context with data is with Ignite! Learning's enrichment activities, which demand higher-order thinking to successfully fulfill the tasks. Students are asked to apply the content they have learned in a new setting and analyze that application in the offline material. A final means of creating deeper context is with Ignite! Learning's integral offline print components where students document their comprehension of the content and thought processes in tackling the subject matter. Throughout the course, there are repeated and varied opportunities for students to record their understanding of the material in the ways they best express themselves. Ignite! Learning offers students multiple contexts with which to understand content and this creates intellectual scaffolding that allows the students to quickly access the information. Each varied interaction with that data further cements it to memory and makes recall easier, creating knowledge structures for the student, by which the student can ascend Bloom's intellectual taxonomy, from knowledge to evaluation. By viewing the same information from multiple contexts, students are treading new neural pathways of access to that data, making the recollection of that data more immediate. By giving data deep familiarity and repeated context, the learner has a greater intimacy and confidence with that information. These repeated interactions, rich contexts, and knowledge structures allow students greater opportunities for success.

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[18] Jackson & Davis.

Ignite! Learning provides students with overarching themes to help organize and make sense of the facts through the use of narrative storytelling, flowcharts, compare and contrast, and other strategies in its media pieces, and through projects that pose provocative questions and challenge students to explore the content as it relates to an organizing idea.

Learning in context can also mean understanding the material as it relates to issues with which students are already familiar—explaining new knowledge through its similarities to the interests, issues, and problems students deal with in their daily lives. One of the most difficult questions for today's students to answer about what they are asked to learn is "What does it have to do with me?" The material found in textbooks is often light years away from the interests, issues, and concerns of the average student, and often the only answer students can find to this question is "because it's on the test." However, research shows that making the material relevant to students' lives—pointing out similarities and connections to what students are already familiar with—is a powerful way to both increase student motivation *and* enhance learning.[19] Constructivist theory tells us that real learning requires the integration of new information with current knowledge.[20] James Beane argues that "personal and social concerns are likely to frame the way young people already organize their knowledge and experiences," and that framing new information within those concerns will make "integration all the more probable and meaningful."[21] Viewing historical events through the perspective of issues that are central to teenagers' lives—such as peer relations (and in-group/out-group mentalities), conflict and mediation, rules and authority, family, leadership, or money—helps students identify "hooks" in their current knowledge to which they can attach new information about history. In science, teaching content in familiar frameworks—such as the small to large ascension in the component structure of living organisms, the duality of comparing and contrasting the seemingly similar concepts of meiosis and mitosis, or the zooming powers-of-ten approach of understanding Earth's position in the universe—creates recognizable and relatable intellectual scaffolding for students. In mathematics, applying abstract concepts to realistic contexts—money, food, work, time, sports, or sharing—shows not only how math is practical, but how students already use the math they are learning.

Many of the media pieces and lesson plans found in Ignite!' Learning's courses use the interests and concerns of teenagers as jumping off points for teaching new information. For example, an animated cartoon examining life on the frontier compares the first-person stories of a Native American child and the child of a settler family, and describes what it is like to deal with uncertainty and adventure as a young member of a family. Elsewhere in the *Early American History* course, students can choose a unit challenge in which they use the example of America's Declaration of Independence to present their own "declaration of independence" from some controlling authority in their lives. Another project challenges students to imagine what the founders of the United States would think about the America that students live in today. By building on what students are familiar with and interested in, Ignite! Learning helps students answer the question, "What does this have to do with me?"

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[19] Ibid.
[20] Abbott & Ryan.
[21] Beane, J.A. (1997). Curriculum Integration: Designing the Core of Democratic Education. New York: Teachers College Press. (p. 15)

Frequent and Varied Assessment

Assessment is a critical element of any learning experience. It provides important feedback to both the teachers and student about the student's progress and mastery of the material, which can then be used to identify and remediate gaps in knowledge. Ignite! Learning integrates a wide variety of standards-based assessment tools that are administered throughout the learning experience/

Background

In order to provide the most accurate and complete picture of a student's achievement, the Carnegie Corporation's guidelines for improving middle school education recommends that curricula include a number of assessment methods, tied closely to the academic standards, and ranging from informal self-checks (for students to gauge whether they are getting the important points) to formal quizzes and tests to performance-based tasks and projects (also known as authentic assessment).[22] The report also recommends that assessments be administered frequently, so that teachers and students can closely monitor progress and make any adjustments or provide remediation on an immediate, as needed basis, rather than waiting until the end of a lesson (at which point there is little or no time to provide additional instruction).

Though they are less-frequently used in schools, the research literature places a great deal of value on authentic assessment, in which students are asked to use their knowledge to perform a task or create a product that is similar to what adults do in their daily and professional lives. Gardner points out "when individuals are assessed in situations that more closely resemble 'actual working conditions,' it is possible to make much better predictions about their ultimate performance."[23] He also notes that while "such exercises may not be as easy to design as the standard multiple-choice entry… they are far more likely to elicit a student's full repertoire of skills."[24] This repertoire includes the types of higher-order thinking skills that are required by state academic standard. Completing an authentic assessment can be, in itself, a learning experience, since the same kinds of learning-by-doing activities described earlier in this paper can also serve as real-world demonstrations of content mastery.[25, 26]

How Ignite! Learning Integrates Frequent and Varied Assessment

Ignite! Learning includes interactive media, daily lesson plans, formal tests, enrichment activities, and authentic assessment activities throughout its curriculum to provide constant feedback on students' mastery of standards required content. A typical user path in one of the courses involves multiple means of practice and assessment. All of Ignite! Learning's courses have highly integral offline print components to practice and reinforce content ideas. In the science course, for example, a unit may begin with an offline unit challenge requiring students to discuss and take notes, then a multimedia introduction, a topic containing two content media pieces including informal interactive assessments, a two-part topic lesson plan to go along with each topic, a formal unit test that models standardized assessments, a *Reality, Inc.* enrichment activity, and finally the offline print components to go along with the *Reality, Inc.* activity.

The creative unit challenge in science and social studies serves both as a learning-by-doing activity and as an authentic assessment. At the start of the unit, students are challenged with a thesis to keep in mind as they explore the media in each topic. As the student works on the project, he is prompted to document his thinking so that his teacher gets a clear understanding of the student's reasoning skills and the depth of comprehension. For example, the Force unit challenge in *Physical Science* asks

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[22] Jackson & Davis.
[23] Gardner. (1993). (p. 175)
[24] Ibid. (p. 178)
[25] Ibid.
[26] Fischer, C.F., & King, R.M. (1995). Authentic Assessment: A Guide to Implementation. Thousand Oaks, CA: Corwin Press.

students to look at the physics of three common objects. Students are asked to consult one another in groups, take notes, and prepare a presentation. This provides an overarching theme that helps students organize the information they encounter in the unit and allows them to prove what they learned.

Typically, a topic begins with a video followed by interactive media. This allows students to immediately practice or apply what they just learned in the video. For example, Ignite! Learning's topic on gas exchange in *Life Science* shows students a video teaching the path of oxygen intake and carbon dioxide output in the body and then asks students to sequence that path in the subsequent interactive media. The media itself serves as an informal assessment to check students' comprehension before moving on to the next topic.

Each of Ignite! Learning's courses have long-form, whole class, first-person, immersive-environment, enrichment activities designed to be completed within a full class period. Students may be divided into competitive teams or they may express themselves through a unified voice to the program. By learning to work together, students prepare themselves for realistic work scenarios where colleagues typically collaborate to solve a problem, rather than work in isolation. Students are tasked with a problem, research that problem, and then solve the problem, fulfilling their responsibility. These activities are designed to regard mistakes as learning opportunities, rather than failures. When students select incorrect answer they are shown the consequences of their actions and are asked to try again. This mimics the reality of authentic, real-world error. Very rarely is an error simply a failure. More likely than not, errors have consequences from which you can learn to do a better job next time. For example, in one of the science enrichment activities, a *Reality, Inc.* activity on the organ systems of the body, students are tasked with exploring the organ systems, choosing which molecule goes to which organ in the body, to get to the liver. There are multiple ways to get to the liver, so students have multiple chances for success, though some paths are more efficient than others. As with most of Ignite! Learning's media, there is an offline print component to these enrichment activities where students chart their progress and justify their decisions.

Finally, because most students and schools are held accountable by their performance on standardized tests, Ignite! Learning's products also include unit tests, taken at the end of each unit, that emulate the style and format of such accountability tests. These tests are carefully designed to assess not just students' recall of facts, but also more advanced thinking skills such as identifying cause-and-effect relationships, interpreting data, and distinguishing fact from opinion. These tests serve both to document students' mastery of the content and to prepare them for the official standardized tests at the end of the school year.

Motivation and Engagement

Every teacher dreams of leading a class where every student is fascinated by the curriculum and passionately engaged in the work at hand, but too often the instructional materials teachers have to work with are simply not designed to captivate students' interests. A true passion for learning is seen as something that would be nice to have but not likely to happen. Instead, the extrinsic motivation of grades and test scores are imposed as a way to spur student motivation to learn.

Unfortunately, a passion for knowledge (not just for getting good grades) is not an optional ingredient in effective education. In fact, emotional engagement plays a pivotal role in successful learning. Citing recent research in neuroscience, Abbott and Ryan suggest that emotion is far more powerful than reason or logic in "driving attention span, shaping action, and aiding memory retention."[27] In other words, people who have an emotional investment in learning will learn much better than those who try to learn simply because they are told to learn.

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[27] Abbott & Ryan. (p. 13)

How does one get students emotionally invested in learning? Many of the characteristics of Ignite! Learning's curriculum described through this paper can help. By designing educational material for different learning styles and intelligences, Ignite! Learning removes a common hurdle and source of frustration for students whose strengths are not in the linguistic and mathematical realms. Media pieces that make connections between curricular content and the interests and concerns of students' daily lives make it easier for students to relate to and comprehend the material. Projects that emulate real-world tasks and challenge students to use their creativity to accomplish a goal appeal to the desire of teenagers for greater autonomy, exploration, and personal expression.[28]

Beyond these characteristics, Ignite! Learning takes that extra step to engage students on an emotional level. By using music and video-editing styles that reflect what students listen to and watch outside of school, and by using references to adolescent culture and somewhat irreverent language to pique students' interest and make the material more accessible, Ignite! Learning creates a learning environment that is designed to fit the attitude and style of middle school students.

Increased student motivation and engagement builds student confidence. By allowing students to experience how they learn best and giving them opportunities to succeed in open-ended assessments, students feel more confident with their abilities. For students who have previously fallen to the wayside in a typically linguistic and mathematical teaching structure, they may feel empowered to showcase their non-linguistic and mathematical abilities.

Conclusion

By the time they enter school, all students have already demonstrated an incredible capacity to learn. The question, then, is not *whether* students can learn, but under what conditions they learn best. Ignite! Learning was founded with the goal of creating the right conditions for successful learning. By drawing on evidence from decades of educational research, Ignite! Learning has developed an instructional design method that respects the individual strengths and interests of students, challenges them to develop a deep understanding of material and the skills to apply their knowledge, and helps them to rekindle their passion for learning.

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[28] National Middle School Association. (undated). NMSA Research Summary #5: Young Adolescents' Developmental Needs. Online article: http://www.nmsa.org/research/ressum5.htm