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CELEBRATING GIANTS AND TRAILBLAZERS IN CREATIVITY RESEARCH AND RELATED FIELDS

## CHAPTER SEVEN

# HOWARD GARDNER'S MULTIPLE INTELLIGENCES THEORY AND HIS IDEAS ON PROMOTING CREATIVITY

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*This book chapter highlights Howard Gardner's contributions to the areas of education and creativity. It includes an introductory section on his background and accomplishments. The chapter focuses on his theory of multiple intelligences, Gardner's best-known theory, and provides details on how he got the idea for this theory. It offers an explanation of this theory and the implications it has for educators. His theory of human intelligence contradicts the view that there is one type of intelligence that could be measured by standardized tests. Gardner first described seven intelligences and later added an eighth. The chapter also focuses on Gardner's ideas on creativity and offers information on how teachers can implement the kind of teaching that promotes creativity.*

The theory of multiple intelligences has influenced educators from all over the world, encouraging them to envision more effective ways of teaching. This theory was developed over 30 years ago by Howard Gardner, a world-renowned psychologist. In 1983, Gardner transformed the field of education when he published *Frames of Mind: The Theory of Multiple Intelligences*. In this book, he described a new way of thinking about human intelligence, challenging the traditional view that there is one kind of intelligence standardized tests can measure (Strauss, 2013).

### *Howard Gardner's Early Years*

Howard Gardner was born in 1943 in Scranton, Pennsylvania. He was very successful in school. As an early reader and writer, he produced a newspaper when he was in second grade and enjoyed writing it and watching the pages come out of the printer. His parents allowed him to make his own decisions and trusted him (Mineo, 2018). Although he was described as a gifted pianist, he found the responsibilities associated with formal piano instruction burdensome (Gordon, 2005). He even quit after one his teachers told him he had to practice three hours every day (Mineo, 2018). But he never lost his love of music. In fact, his passion for music played a role in his beliefs about multiple intelligences (Gordon, 2005).

His parents were German Jews who came to America to escape the Holocaust. They arrived in New York City with little money and later hid the horrors of the Holocaust from their son, fearing that becoming aware of these atrocities would harm him. They also did not tell him about how his 8-year-

old brother tragically died in a sleigh-riding accident before he was born. When he found out by looking through clippings, Gardner became annoyed because he had not been told about this tragedy, but recently mentioned that he later understood how difficult it must have been for his parents to talk about it (Mineo, 2018).

The death of one of their sons led Gardner's parents to be protective. When he was a child, they took measures to prevent him from participating in sports. It was not until he was in his twenties that he rode a bicycle. Although he was not antisocial, the activities he participated in were predominantly solitary and included reading, writing, and playing the piano. Although he was social with his close friends, he was not gregarious. His parents were eventually warned not to shelter him in excess. And at age seven, he attended camp away from home where he participated in competitive sports. At first, he did not enjoy camp and lacked talent in sports, but after going year after year, he became more enthusiastic (Gardner, 2020).

#### *Career at Harvard University*

Gardner completed his professional training at Harvard University, where he focused on research involving gifted children and brain-damaged adults. During his early career, he developed into a prolific writer. And after he published *Frames of Mind*, his theory of multiple intelligences became popular all over the world (Gordon, 2005).

He first came to Harvard in 1961 and thought about majoring in history. However, after taking history classes during his freshman year, Gardner's aversion of the way historians wrote led him to lose interest in pursuing history as a major. Instead, he majored in Social Relations after being influenced by a teacher who noticed Gardner's interest in psychology and sociology and recommended Social Relations as a major. Although Social Relations—a mix of psychology, anthropology, and sociology—was not viewed as a prestigious major, it interested him (Mineo, 2018).

Several factors led him to write *Frames of Mind*. One of these was Gardner's fondness of writing. He has always enjoyed writing and had written three books by the time he started his postdoctoral work in 1971. He published his fourth book, *The Shattered Mind*, in 1975. This book focused on how different forms of brain damage affect people and how different parts of the brain regulate different cognitive functions. After completing this book, he thought about writing a book on how different human faculties are connected to the brain. In 1976, he wrote an outline for this new book, which was eventually titled *Frames of Mind* (Gardner, 2011a).

Several experiences enhanced Gardner's interest in cognitive function. One of these was his work at the Boston Veterans Administration Hospital. After completing his doctorate in Developmental Psychology, he got a fellowship at this hospital, allowing him to observe patients with brain damage. While working there, he continued to work at Project Zero, where he held a position that started shortly after he began his graduate studies. Project Zero was founded in 1967 at the Harvard Graduate School of Education and has focused on exploring learning through the arts. Today, Project Zero also focuses on inquiry through diverse disciplinary perspectives to explore vari-

ous topics including intelligence, creativity, and ethics (Harvard Graduate School of Education, 2016).

His work at Project Zero concentrated on the development of children's artistic thinking. For a certain period, Gardner would be working in the morning with patients with brain damage and in the afternoon with children at Project Zero. These experiences shaped Gardner's concept of multiple intelligences because he noticed how some patients at the hospital were very musical but were not able to use language well. And he observed a similar pattern when working with kids (Mineo, 2018).

### *Multiple Intelligences*

In addition to his previous interest in and work on cognitive abilities, Gardner's participation in a research project funded by the Bernard van Leer Foundation contributed to the writing of *Frames of Mind*. This project focused on conducting research on human potential. Its principal investigators assigned him to write a book documenting what was known about the connection between human cognition and the biological and behavioral sciences. It was this research that ultimately led to the theory of multiple intelligences (Gardner, 2011b).

The grant from the van Leer Foundation allowed Gardner to synthesize the work he did on brain damage with what he has learning about cognitive development. His studies on cognitive development explored seven ways in which children mastered symbol use and included their singing, drawing, and storytelling abilities. With his colleagues, he used literature from various fields, including psychology and anthropology, to determine the best taxonomy of intellectual capacities (Gardner, 2011b).

Calling the different abilities he identified "intelligences" created controversy, but popularized Gardner's work. He mentioned that had he used another word, he would not have been known all over the world. His theory was not accepted by many psychologists because they generally have different ideas about studying intelligence. For example, his views on intelligence are at odds with those of psychologists like Richard Herrnstein, who believed that IQ is inherited to a great extent (Mineo, 2018). In fact, Gardner was critical of a book Herrnstein co-authored entitled *The Bell Curve*, arguing that the book encourages readers to be sympathetic to the IQ elite and does not provide ideas about how to educate those who do not excel on IQ tests (Gardner, 2001).

According to Gardner, an intelligence involves a person's ability to solve a problem or do something considered valuable in one or more cultures. In the early 1980s, he identified seven intelligences and about a decade later added an eighth after (Checkley, 1997). Table 1 (overleaf) shows the eight intelligences he identified.

Gardner mentioned that the linguistic intelligence appears to be the one most widely shared by humans across the world because without linguistic skills in semantics, phonology, syntax, and pragmatics, people would have difficulty functioning with efficacy in the world. In contrast, the abilities of gymnasts, mathematicians, musicians, and visual artists are often perceived as remote and even mysterious by the average person (Gardner, 2011b).

Table 1

<b><i>Intelligence</i></b>	<b><i>Description of Intelligence</i></b>
<i>Linguistic</i>	<i>People with strong linguistic skills can use their native language, and sometimes other languages, to understand people and express their thoughts. Examples of professionals with above average intelligence levels in this area include writers and orators.</i>
<i>Logical-mathematical</i>	<i>Scientists are examples of people strong in the logical-mathematical intelligence because they can manipulate numbers the way mathematicians do. They tend to have above average logical-mathematical skills also because of their knowledge of causal systems.</i>
<i>Spatial</i>	<i>Spatial intelligence involves the skills people have to represent the spatial world. Spatially intelligent people tend to become painters, sculptors, and architects. Spatial intelligence is used more often in certain sciences like anatomy and topology.</i>
<i>Bodily kinesthetic</i>	<i>This intelligence relates to the ability to use whole or certain body parts to create something, solve a problem, or display skills involving bodily movement at an event. Examples of professionals strong in this intelligence include athletes and dancers.</i>
<i>Musical</i>	<i>People with enhanced musical intelligence have a heightened ability to hear, recognize, and remember patterns. They think in music and cannot get it out of their minds. In <i>Frames of Mind</i>, Gardner indicated that musical intelligence emerges earlier than other intelligences.</i>
<i>Interpersonal</i>	<i>The interpersonal intelligence involves one's ability to understand others. People strong in this intelligence can detect other people's moods, intentions, and desires. This intelligence is especially important for individuals who deal frequently with people like teachers, clinicians, and salespeople.</i>

Intrapersonal	<i>An enhanced understanding of oneself is a characteristic of someone strong in the intrapersonal intelligence. A developed intrapersonal intelligence enables people to anticipate how they would react to experiences and how to choose the experiences that can be beneficial. It also helps people be aware of the difficulties they might encounter.</i>
Naturalist	<i>The naturalist intelligence was added to the original seven. It relates to an individual's ability to differentiate among living things. People strong in this intelligence are good at classifying plants, minerals, and animals as well as rocks and grass.</i>

*Note.* The information in this table is adapted from (Checkley, 1997).

### Criticisms of Multiple Intelligences Theory

Although MI theory has received tremendous attention, it has been criticized. In *Frames of Mind*, Gardner mentioned that two books were published with critiques of his theory: *Howard Gardner Under Fire* and *MI at 25*. Gardner has responded to criticisms of his theory. In 2006, for instance, he co-authored an article mentioning that Lynn Waterhouse had misunderstood his theory. One of the problems Gardner and Moran (2006) discussed regarding Waterhouse's idea of MI theory was her belief that it is not grounded in empirical findings. Gardner and Moran responded to this critique, insisting that the origins of MI theory are entirely based on empirical conclusions and that Warehouse was using a naïve perspective of science when making this claim.

In *Frames of Mind*, Gardner summarized some of the common criticisms of his theory and offered his responses. One of the objections critics have involves using the word "intelligence." For instance, critics say that "talent" would be a more appropriate word to describe the ability of a gifted dancer. Gardner's response is that in accepting a narrow definition of intelligence, people regard the abilities that fall outside of this definition as less valuable.

Another criticism of MI theory involves the connections between different faculties. Some scholars believe that since there are correlations between tests of ability, there is a level of general intelligence that people have. However, Gardner has expressed skepticism about these correlations, arguing that almost all tests focus primarily on logical and linguistic faculties. He mentioned that people strong in the logical and linguistic intelligences are likely to perform well on tests that focus on musical and spatial abilities. But those with weak logical and linguistic skills will likely perform poorly even if they have the skills these tests are allegedly measuring. According to Gardner, the extent to which various intelligences are correlated is unknown (Gardner, 2011b).

Other criticisms focus on the similarities between the intelligences and the lists some researchers have published about the different styles people

might display such as learning styles, personality styles, working styles, etc. Although there may be similarities, there are differences between these styles and Gardner's intelligences. Intelligences are content specific, but researchers tend to believe that styles remain the same across content. For instance, people can be viewed as emotive or analytic regardless of the content to which they are exposed. In contrast, Gardner identified his intelligences according to the content in the world, such as numerical and spatial content. A child may be engaged with one type of content but inattentive with another type. Therefore, considering styles and intelligences to be synonymous is problematic (Gardner, 2011b).

### **Implications of the Multiple Intelligences for Educators**

In a 1997 interview, Gardner described the implications of his theory of multiple intelligences for how schools might provide instruction. At the start of the interview, he emphasized that the primary role of schools is to promote the learning of content and to develop the skills students will need and use after they graduate. However, whatever students learn in school will likely be forgotten unless they take an active role. To be active requires them to ask questions, participate in hands-on activities, and recreate and transform information as needed. Unfortunately, exams do not necessarily measure the extent to which students are involved in active learning. Students can do well on an exam by memorizing information, which they will likely forget after a few years. In contrast, students who conduct an experiment, analyze the data, make a prediction, and see the results develop skills and knowledge likely to last for a much longer period (Edutopia, 2009).

Regrettably, American schools have too often failed to encourage the environment needed for students to take the active role that will develop the skills and knowledge they will need after they graduate. One reason for this trend involves the overuse of standardized tests to evaluate schools and teachers. At the start of the 21<sup>st</sup> century, for example, schools began to rely more on these tests to evaluate teachers and schools, leading many teachers to use a style of teaching that focuses on memorization (Morgan, 2016). In December of 2015, the passing of the Every Student Succeeds Act (ESSA) ended the high-stakes consequences previously attached to students' standardized test scores. However, it requires students in grades 3 to 8 to be assessed through standardized tests every year (Wang, 2019).

ESSA is a policy that is more harmonious with Gardner's views on the type of learning that benefits students because it encourages teachers to meet the needs of students by implementing innovative methods such as differentiated instruction. Under No Child Left Behind (NCLB), the policy ESSA replaced, schools did not have this option, and schools that continuously failed to meet their state's annual achievement targets faced the possibility of being shut down (Klein, 2015). The pressure teachers were under led many of them to teach to the test, using the kind of teaching that Gardner mentioned should be avoided.

While ESSA will likely reduce the type of teaching based on memorization that NCLB encouraged, some states have continued to use test scores



to hold teachers accountable (Close, Amrein-Beardsley, & Collins, 2019). This trend is unfortunate because some systems of education do not use standardized tests to evaluate teachers to avoid the problems associated with this practice. For example, Finland's education system has received tremendous attention because its approach to education differs greatly from the methods many other nations implement and does not involve the use of standardized tests to evaluate teachers. Although standardized tests are used in Finland, they are implemented *only* for curricular decisions and university admission (Morgan, 2018).

Since students vary greatly in the intelligences Gardner identified, teachers need to differentiate instruction to be effective for *all* their students. If they teach to develop several intelligences as they neglect others, they end up discriminating against the students who are strong in the intelligences they neglect but weak in those teachers choose to develop. It may seem impossible to adjust instruction according to the differences in intelligence levels among students in a given class. For example, how can a teacher achieve this goal in a class containing a student with a very hands-on way of learning, a learner with strong visual intelligence, and a pupil with highly developed linguistic skills? Gardner addressed this question, mentioning that the teacher can provide resources, materials, and software that present content in ways for each child to use her or his intelligences productively (Edutopia, 2009).

One of the problems of using standardized tests to assess students is that such tests usually do not measure many of the intelligences Gardner identified including the interpersonal, intrapersonal, musical, and bodily kinesthetic. Instead, these tests focus only on two: the linguistic and mathematical intelligences (Morgan, 2016). And when teachers are evaluated in part on how well their students perform on standardized tests, they often feel pressure to develop the intelligences these tests measure and ignore the others. Although ESSA reduced the use of standardized tests, it maintained many of the testing mandates the No Child Left Behind Act required (Blad, 2021).

In addition to the importance of having students do well on standardized tests, schools may avoid implementing instruction according to multiple intelligences (MI) theory based on the false belief that uniform instruction is fair. It may seem fair to assess all students in the same way and provide instruction uniformly because everyone is receiving the same treatment. However, this approach to instruction is based on the assumption that all students learn in a similar way. But according to MI theory, students weak in one intelligence will not learn as well if teachers deliver instruction only through the intelligence students may be weak in. For example, a child with weak verbal skills will likely perform less well than one with strong verbal skills if a teacher uses an instruction style that focuses primarily on learning through words and language. But if the child with weak verbal skills has strong spatial skills and if the teacher uses plenty of pictures, images, photos, and drawing activities, this child will have a much better chance of making academic gains.

According to Gardner (1999), teachers may ignore certain intelligences and focus primarily on providing instruction through language and logic for several reasons. First, they may be unaware that different students have different types of minds. Second, they may have a set of students who

vary greatly in the intelligences they are strong in and may feel incapable of accommodating each student. Third, they may be convinced that although students are different, they need to learn to be more alike to become members of a community. Teachers who ignore the intelligences students are strong in as they acknowledge the intelligences students are weak in are not only providing instruction unfairly but making certain students feel stupid (Gardner, 1999).

In a recent interview, Gardner expressed the importance of using students' strong areas when introducing them to topics in the traditional curriculum. Teachers who avoid proceeding this way as they focus primarily on pupils' weak areas increase the chances for students to develop low self-esteem (Hunter, 2021). It is crucial to allow students to develop the areas in which they are talented. In his recent interview, Gardner used physics to show how providing instruction through the intelligences commonly ignored may be achieved by teaching this subject using a method other than one focusing on a textbook. For example, students could understand physics topics through their bodily intelligence (Hunter, 2021).

### *Personalized Learning*

Since uniform instruction is detrimental, one alternative for improving the teaching environment is to implement personalized instruction. This type of instruction involves a type of teaching that matches the different kinds of minds students have. Teachers who use this approach must first gain awareness of the types of minds their students possess by learning about students' interests, anxieties, goals, and strengths without stereotyping them (Gardner, 1999).

James Keefe (2007), a former high school principal, mentioned that personalized learning develops the entire range of human talents but that schooling is rarely personalized. This trend can contribute to catastrophic results. It can also lead the most creative people to be miserable in formal schools. For example, people like Charles Darwin, Sir Isaac Newton, Louis Pasteur, Orville Wright, Albert Einstein, and Marlon Brando failed to thrive in their schools (Keefe, 2007).

Personalized learning involves tailoring students' learning experiences according to their individual needs, skills, and interests. It allows students to follow an optimal learning path based on various types of instructional methods, which include group projects, instructional software, and individual and small-group time with teachers. This approach differs from the traditional way of teaching, which emphasizes leading the whole class to learn a common lesson (Childress & Benson, 2014).

Schools and teachers can personalize instruction in many ways. And there is no one optimal way to achieve this goal. Different views also exist about personalized learning. For some educators, it means adding a personal touch when dealing with students. For others, it involves modifying instruction based on their needs. The differences in ideas about personalizing instruction have led to confusion. Many educators know little about this approach or think that it is too difficult to implement. And others perceive it as a fad that will disappear like other ones that come and go quickly (Keefe, 2007).

These views are unfortunate because when implemented well, personalized learning can help students make strong academic gains. For instance, after providing support to teachers in differentiating instruction, the Summit Public Schools in California experienced impressive success in enhancing students' academic progress. Six of Summit's charter schools improved their reputation as institutions that prepare students well for college, although they served a considerable number of pupils from low-income families (Childress & Benson, 2014).

After analyzing data on the students who went to college, Summit administrators discovered that many pupils were not ready for college level math. This problem led to a need to explore ways to enhance math preparation. Summit teachers then personalized learning by developing a blended math model with Khan Academy (Childress & Benson, 2014). Blended learning consists of a combination of different models of teaching and modes of delivery (Gonzales & Vodicka, 2012). This approach combines face-to-face and online instruction to customize learning for each student and makes content more accessible. When implemented well, it usually involves student choice or agency in their own learning (Pierce, 2017).

Fortunately, approaches based on personalized learning have increased considerably in recent years. ESSA is partly responsible for this trend because it authorizes Congress to provide funding for professional development. Districts can use this funding for supporting teachers to integrate technology into the curriculum to personalize instruction and implement blended learning (Center for Digital Education, 2017). It was recently estimated that at least three-fourths of U.S. school districts have used some form of blended learning (Pierce, 2017).

One of the ways teachers can implement blended learning is by converting their classrooms into "flipped classrooms." This approach to teaching personalizes instruction to a certain extent because it permits students more chances to learn at their own pace. Students learn at a level that matches their abilities because they receive instruction through a video at home rather than through a face-to-face setting. When teachers provide instruction through a traditional approach, they usually deliver content too slowly for some students and too quickly for others. However, when students have access to the content on a video they view at home, they can view difficult material over and over and spend little time on content they easily understand. When lecturing, teachers typically have little information on which content students understand, because they normally get this feedback after reviewing students' homework. In contrast, in a flipped classroom, students do much of their "homework" at school, allowing the teacher to provide more guidance to students who have difficulty, while offering more challenging work for those who find it easy (Morgan, 2014a).

Blended learning can be implemented in a variety of ways. But regardless of how teachers use this approach, it requires more time to plan. The planning involves preparing the variety of activities that will match students' abilities and appeal to their learning preferences. Although teachers may be intimidated by having to design different lessons based on students' needs, the progress students typically make is usually worth the extra effort teachers put forth (Pierce, 2017).

To plan well for personalizing or differentiating instruction, teachers need to have a strong understanding of the theories behind this approach to learning. As previously mentioned, Howard Gardner's theory of multiple intelligences is crucial for understanding how to provide instruction based on the different minds people have. Another critical theory for knowing how to personalize instruction is Lev Vygotsky's zone of proximal development.

### *Lev Vygotsky's Zone of Proximal Development*

Gardner's theory of MI is similar in some ways to Lev Vygotsky's zone of proximal development. Indeed, differentiated instruction has been described as an approach to teaching based on both Gardner's MI theory and Lev Vygotsky's zone of proximal development (Morgan, 2014b). These two theories are alike in that they have similar implications in regard to teaching according to a level that matches students' abilities. As previously mentioned, Gardner indicated in one of his books that if teachers continuously teach students according to the intelligences they are weak in, students will feel stupid. Vygotsky's theory also suggested that if there is a mismatch between teachers' instructional methods and the skills of their students, negative outcomes will likely occur (Morgan, 2014b).

According to Lev Vygotsky, the zone of proximal development involves the level at which a learner can achieve a task with the guidance from a more capable peer or an adult (Vygotsky, 1978). According to this theory, teachers need to teach students having difficulty understanding a concept in a way that will allow them to comprehend the concept and proceed at their own pace. One way to fulfill this goal is by providing instruction through the intelligences students may be strong in for the purpose of developing their weak intelligences. For example, as noted earlier, children with weak verbal skills but strong spatial skills will much more likely improve their verbal skills if their teachers use plenty of pictures, images, photos, and drawing activities. But if their teachers insist that these students can learn as well as those with more advanced verbal skills without such visual aids, those with weak verbal skills will likely feel frustrated.

Research on the chemicals the brain releases when students learn supports the idea that teachers need to instruct students according to students' abilities. If students are frustrated or bored because the instruction their teachers provide is too difficult or easy, their brains will likely release too much or too little of the chemicals needed for learning. As a result, they may experience a sense withdrawal or behave inappropriately (Morgan, 2014b).

Teaching according to a level that matches students' abilities does not necessarily mean relying on the intelligences not commonly used during classroom instruction. Students can be taught according to the zone of proximal development simply by adjusting instruction so that it is neither too challenging nor too simple. However, in many cases, when teachers provide instruction through a wide variety of intelligences rather than a few, they make content easier for students who would otherwise have difficulty understanding it (Morgan, 2014b).

When teaching math, for example, teachers can make content easier to learn by allowing students to use manipulatives, which are physical objects such as pens. Such an approach creates opportunities for students to interact

physically with objects to learn new content (Carbonneau, Marley, & Selig, 2013). By using this method, teachers permit students to learn in part through their bodily kinesthetic intelligence. The use manipulatives also encourages students to connect concrete experiences to abstract concepts and usually makes math fun to learn (Tichenor, 2008).

### **Ideas on Enhancing Creativity**

Personalizing instruction is not the only topic Gardner discussed regarding how the education of students might be improved. He also covered topics involving creativity and provided examples of how certain people developed their creative potential using each of the intelligences he identified. These people are important to study because they shared certain qualities allowing them to be creative. Educators, therefore, might attempt to promote the development of these qualities to enhance student creativity. Gardner also offered his ideas about what educators might do to promote creativity.

Before exploring some of the individuals he identified as exemplars in the area of creativity and his views on the approach most likely to promote creativity, it is important to explore his understanding of creativity. Gardner indicated that creativity occurs when someone produces something new that first seems odd but becomes accepted by people who have knowledge about it. The decisive test involves whether the domain the invention is associated with becomes changed as a result of the invention (Schreuder, 1997).

Another important aspect involving creativity is that it differs from intelligence. In fact, psychologists often perceive people with creative potential as those who think divergently. However, intelligent people are often perceived as those who think in a narrower way. Rather than generate a large number of possible answers, intelligent people tend to be thought of as those who can figure out the right one. Although creativity is correlated with intelligence, people can be highly intelligent with unimpressive creativity skills or be much more creative than intelligent (Gardner, 2011c).

#### ***Individuals with Extraordinary Creative Skills***

Gardner (1995) chose examples of people who had extraordinary skills in each of his intelligences. These people consisted of T. S. Eliot (linguistic), Sigmund Freud (intrapersonal), Pablo Picasso (spatial), Albert Einstein (logical-mathematical), Igor Stravinsky (musical), Mahatma Gandhi (interpersonal), and Martha Graham (bodily-kinesthetic). In thinking about the creativity of these individuals, he considered the interaction of three constituents:

1. The individuals themselves with their styles and needs.
2. The area of knowledge each person specialized in.
3. The collection of people who offered awards and training and who made judgments regarding the products the individuals produced.

He noted that it makes no sense to think that creativity emerges by thinking about the individual without considering the field and the domain: “the possibility of creativity emerges only when an individual carries out work within a

domain and the field ultimately comes to value that work” (Gardner, 1995, p. 35).

In exploring the lives of the seven individuals, Gardner noticed some similarities in their personalities and in the way they lived their lives. One similarity was that they tended to reject standard practices and desired to try new things. For instance, Einstein rejected the paradigms of the physics of his time (Gardner, 2011c). These creative people also needed cognitive and affective support. Those who provided them with affective support loved them and assured them they were not crazy. And those providing cognitive support realized they were in the process of making an important discovery (Gardner, 1995).

Gardner found that these individuals had above average ability in more than one intelligence. For instance, Einstein had outstanding logical-mathematical skills as well as excellent spatial skills. And Freud not only had notable personality skills but also had excellent linguistic skills. These extraordinarily creative people were also difficult, demanding people at some point of their lives. Although it might be misleading to describe some of them as workaholics during their youth, all of them became so absorbed in their work to a degree that nothing else was more important. Gardner indicated that great creators are responsible for a number of breakthroughs during their lives and that it takes about 10 years for them to achieve each one (Gardner, 1995).

There were also differences among these people. For example, the breakthroughs they were responsible for reflected different ways of thinking. Freud’s achievements and thought processes differed from Einstein’s. For this reason, Gardner mentioned that there are various forms of creativity (Gardner, 2011c).

#### *Environment for Promoting Creativity*

One of the questions parents and educators may want to ask themselves is whether or not they want their children or students to grow up to be like one of the creative people just mentioned. When children stand out from others for doing things differently, they frequently get rejected (Schreuder, 1997). Considering that the creative people Gardner identified endured significant pressures and challenges, some adults may not perceive the experiences these individuals had as the ideal ones for their children. Fortunately, students can be creative as educators attempt to minimize the challenges associated with being creative. Promoting creativity is therefore a goal that educators generally consider worthy and desirable to achieve. An environment encouraging discovery learning tends to be more motivating as well (Stapleton & Stefaniak, 2019).

The results of a nationally representative study conducted by Gallup and designed to explore the outcomes of assignments that promote creativity indicated that such assignments contribute to many benefits. Teachers who frequently assign creative activities were more likely to feel that their pupils show important components of learning such as the development of problem-solving and critical thinking skills. The majority of parents and teachers participating in the study felt that the most important educational strategies were those that promote creativity. Unfortunately, the study’s findings indicated

that although creative work contributes to many academic benefits, such work is too often not assigned (Gallup, 2019).

Encouraging students to develop some of the qualities the seven creative people Gardner identified shared can allow educators to provide the kind of environment students need to be creative. So what did Gardner mention about the characteristics of people who achieve breakthroughs? First, such people know their domain well. For example, without knowledge of music, it is impossible to write music. Creative people are also risk takers who are not easily subdued. And they invent something at a time when there is a need for it. For instance, Einstein's theory would have been harder to accept had he developed it a century earlier than the time he came up with it (Schreuder, 1997).

Unfortunately, the encouragement of creativity is usually a low priority in many schools. Students who take risks and reject standard practices are likely to contribute to a disruptive environment. Gardner suggested that most teachers would probably prefer for the development of creativity to occur during extracurricular activities after school rather than deal with such an environment on a regular basis (Gardner, 1995). He suggested that the development of creativity is often considered a luxury, which progressive schools might promote. Wealthy parents who can provide more than a basic education for their children may be able to offer an environment that promotes creativity, but it is unrealistic to expect the average school to provide it. Schools may have good reasons for not emphasizing the development of creativity. In addition to the possibility of having to deal with a more disruptive environment, teachers need to teach various subjects and to encourage civility (Gardner, 1995).

However, as noted earlier, a creative environment usually contributes to many benefits. To provide such an environment, Gardner mentioned a few strategies. First, children need to know that taking chances is fine. They need to be supported because doing things in a different way increases the chances of being rejected. Children also need to know that there are limitations to the chances they can take. Although encouraging creativity requires educators to accept more responsibilities, they experience a strong sense of fulfillment when they guide someone who goes on to make an important contribution to society (Schreuder, 1997).

#### *Importance of Developing Creativity at an Early Age*

Children display works showing their creativity at an early age. Such works consist of the scribbles early drawers create and the stories young children tell. These examples constitute the willingness to take risks that characterize great inventors. Gardner discussed that adults may even draw upon these early activities when they are involved in creative endeavors (Gardner, 1991).

To develop into one of the seven creative people Gardner identified, young people need to have the basic skills of the domain they will use to create new products and ideas. Gardner discussed that it is in the middle years of childhood that children are most suited to develop skills in a domain and that adolescence is the best time to combine these skills with the creativity that they often display during earlier years (Gardner, 1991).

In one of his essays, he described what he believed was the best approach to develop creativity during the early years. In this essay, he also mentioned the influence of John Dewey and Jean Piaget on the American education system. According to these Western thinkers, childhood is not just a time of transition to adulthood but a time when children display their genius. The Western view emphasizes that children are born knowing how to solve problems and that those responsible for raising them need to permit children to mature at their own pace. Schools should therefore refrain from strict instruction. Instead, they need to supply an environment that allows children to flourish (Gardner, 1989).

Although many American schools are criticized for their failure to promote creativity, innovation is generally tolerated. Indeed, Gardner mentioned that according to the American view, the ideal method for dealing with a new problem is to offer many chances to investigate it with little instruction from a teacher. This way of exploring is frequently considered the optimal approach for finding out one's competence in relation to a problem. Students who can solve problems in new ways should be praised. However, aid may be appropriate if they become frustrated. In offering aid, educators should refrain from providing answers. Instead, it is best to offer suggestions and hints. Gardner (1989) indicated that those who are responsible for the most innovative achievements tend to proceed in a novel direction and make decisions on their own.

Gardner's views about the ideal environment for learning are in many ways similar to Jerome Bruner's cognitive constructivist approach. In fact, Gardner mentioned that Bruner increased his awareness of many issues (Gardner, 2011b). According to Bruner's constructivist approach to learning, children construct new knowledge by exploring things in the world. The teacher's role during this process involves setting up an environment that will allow students to discover associations between concepts rather than playing the role of an authority figure (Stapleton & Stefaniak, 2019).

Regrettably, it is not unusual to observe teachers instruct students in a manner antithetical to the philosophy of teaching based on the constructivist approach (Ellis, 2010). Such teachers lead students to become dependent and dominate the class instead of playing the role of facilitators. In contrast, teachers who implement a style of teaching based on Bruner's ideas provide students with opportunities to explore. Such teachers create an environment that promotes creativity and motivation. Bruner's approach to learning encourages creativity because it creates opportunities for students to learn actively, creating chances for them to be exposed to new ideas. And active learning not only contributes to motivation but to retention as well (Stapleton & Stefaniak, 2019).

These are some of the reasons it can be important for children to have opportunities to explore at a young age. However, as Gardner noted, in order for creative people to produce valuable outcomes, they need to have the skills and knowledge of a domain. Parents and teachers might ask whether children should be instructed to develop skills first and then have chances to be creative later or whether they should be allowed to explore first and then have opportunities to develop skills later. Gardner believed that the preferred ap-



proach involved devoting the first seven years of children's lives to a creative approach that focuses on exploring and that after this period, instruction could focus on basic skills (Gardner, 1989). He reached this conclusion as a result of his understanding of developmental psychology and his observations in various countries. However, he acknowledged that it is possible to implement an approach focusing on skill development that leads to creative products (Gardner, 1989).

Although Gardner believed that the early years of life needed to focus on an environment emphasizing exploration, he indicated that some skill acquisition during this period was important as well. And he warned of the danger of providing an environment that promotes too much creativity without enough skill building. Also dangerous is an environment that promotes too much skill building without allowing enough opportunities to develop creativity (Gardner, 1989).

### **Conclusion**

Howard Gardner's theory of multiple intelligences has proven to be a crucial theory that sheds light on the different ways students learn and the need to deliver instruction according to their needs. When students are provided with instruction that matches their needs, they tend to learn more and remain engaged. Unfortunately, too many instructors overlook many of the intelligences identified in *Frames of Mind*. This practice is detrimental for several reasons. First, teachers who focus on developing a limited set of intelligences typically fail to take advantage of how students may be gifted in certain areas. Second, developing only a few intelligences oftentimes makes students weak in these intelligences feel inferior and prevents them from learning new content.

Promoting creativity during instruction appears to be as important as personalizing instruction based on Howard Gardner's MI theory. Requiring students to complete creative assignments develops students' problem solving and critical thinking skills. A classroom environment encouraging discovery learning will likely enhance student motivation and develop creativity. Such an environment is believed to allow students to retain new content for a longer period. By personalizing instruction in a manner that allows students to learn through an approach based on discovery learning, instructors can create an environment that benefits students in many ways.

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