By Annemarie Timmerman

# It's Magic

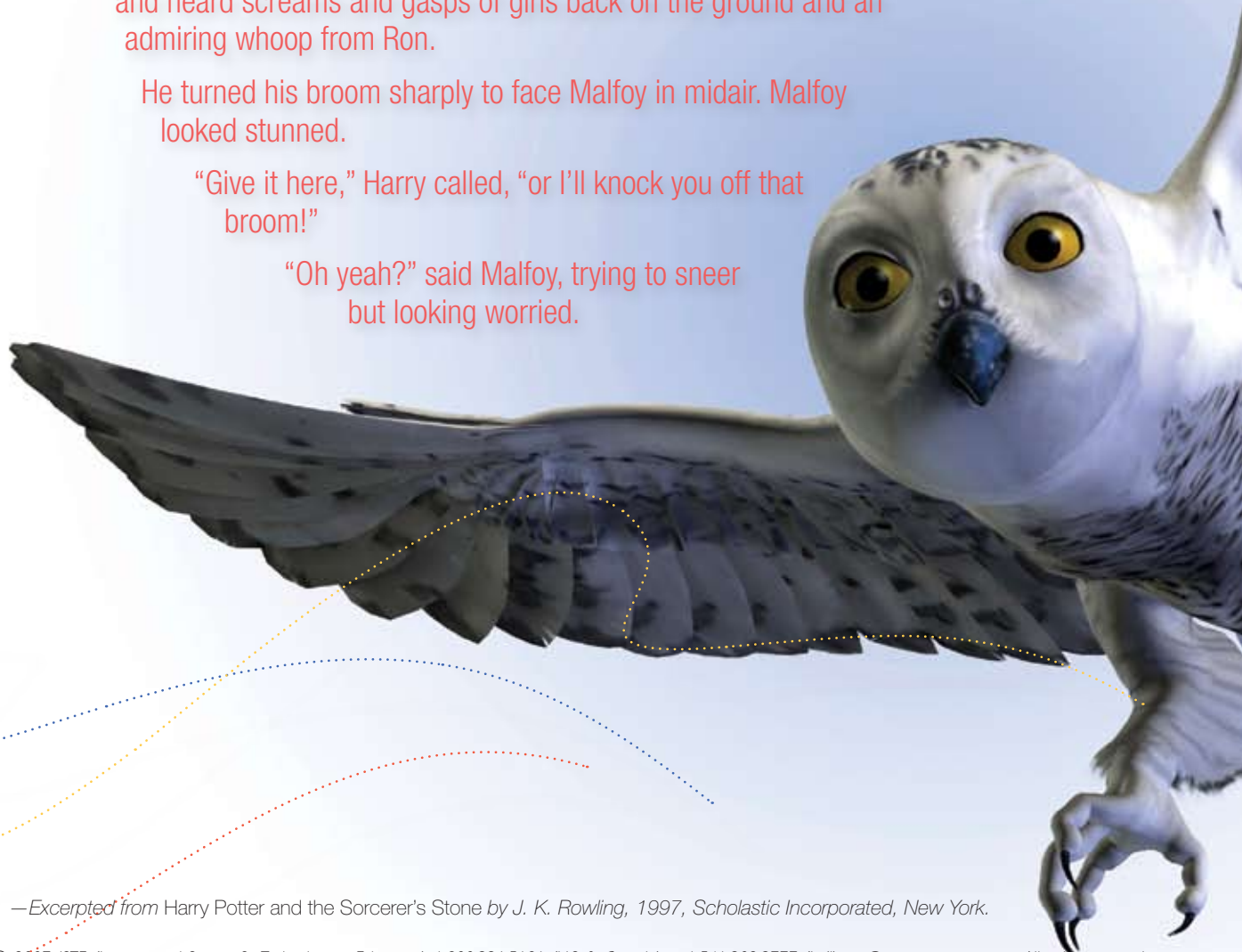
"Give it here!" Harry yelled, but Malfoy had leapt onto his broomstick and taken off. He hadn't been lying, he could fly well. Hovering level with the topmost branches of an oak he called, "Come and get it, Potter!"

Harry mounted his broom and kicked hard against the ground and up, up he soared; air rushed through his hair, and his robes whipped out behind him—and in a rush of fierce joy he realized he'd found something he could do without being taught—this was easy, this was wonderful. He pulled his broomstick up a little to take it even higher, and heard screams and gasps of girls back on the ground and an admiring whoop from Ron.

He turned his broom sharply to face Malfoy in midair. Malfoy looked stunned.

"Give it here," Harry called, "or I'll knock you off that broom!"

"Oh yeah?" said Malfoy, trying to sneer but looking worried.



—*Excerpted from* Harry Potter and the Sorcerer's Stone *by J. K. Rowling, 1997, Scholastic Incorporated, New York.*

# An Educator's Vision of the Future

**Click.** When Margaret Johnson stopped the movie adaptation of *Harry Potter,* the chatter from the classes in Kentucky, Florida, and Texas struck like thunder over the audio as they returned to the projection screens that surrounded the conference room. (Even though it was more than 20 years old now, that movie was definitely worth the royalty fees to show it in class.) Dr. McGonagall, a scientist from the Jet Propulsion Laboratory in California, returned to the screen at the front of the room.

Returning order to the conferencing session, Johnson stood up from her chair as she spoke, "Aircraft fly because of the well-established Bernoulli principle of air pressure and wingspan surface, but our flying machines have no wings." Johnson smiled slightly as she asked her next question, "So how did you build a flying broomstick?"

Right away, Linda, a 15-year-old from Kentucky, piped, "My flying broom is based on the concept of vacuum energy." Immediately Linda displayed her theoretical broomstick on the visualizer. Her 3-D model showed two rectangular plates bounded by solid metal hinges floating in a vacuum-sealed clear plastic case. "At the point of departure," Linda went on, "the two electromagnetic plates collapse. The inertia caused by the collapse causes a propulsive force that launches the broom into flight."

Larry, who was sagging in the seat beside Johnson, quipped, "You won't get me on that broom. As soon as the plates collapsed you would fly off the broom like a cannonball from an artillery weapon." Mrs. Johnson liked the reference to the Civil War. She hoped Charlie Sawyer, the civics studies facilitator, had caught it.

"This is an interesting idea, Linda," observed McGonagall, "Your idea illustrates the Casimir effect, used to describe the difference in energy density inside empty space and the energy density that surrounds empty space." Johnson caught Larry's arm before he made the obvious gibe about empty space.

Back in her office, Johnson was waiting on her cherub, Sarah, to arrive. Her electronic display read 2:10 P.M., March 16, 2026. She still had some time before Sarah arrived at 2:30. She decided to prepare for her next facilitation of the Science of Harry Potter class. Many ideas for building a flying broomstick had been presented in conferencing. All the students decided to build variations of the broomstick around the principles of the Casimir effect rather than experiment with different theories of propulsion, gravity, or aerodynamics.

Everyone from North Carolina, Kentucky, Texas, and Florida agreed to work in the propulsion labs on their school campus to begin creating their broomsticks. The class decided to meet the following week to discuss their progress. The group of students Johnson facilitated onsite in North Carolina anxiously decided to meet later the same day in the propulsion lab. The students felt much like Harry—"he'd found something he could do without being taught—this was easy, this was wonderful." Johnson speculated to herself, the students didn't need to know the truth—learning was hard work.

Reflecting on the day's class, Johnson remembered when the classic *Harry Potter* books were first published around the turn of the century. She had just started teaching school

and there was a crisis in education at the time. Schools were still governed by mandatory attendance laws and when students reached the age of choice—16—many would swiftly quit school without being ready to work and take care of themselves in the "real world." Although 16 is not an unusual age today for students to move to the next developmental module, it wasn't the recommended age at the time.

During the 21st Century Instructional Revolution, as this period in history is called, school leaders and the democracy were struggling with redesigning the educational sytem. The very design of the physical structure of the school building was impeding the progress of educational development. The traditional school building did not suffice for the pedagogical reform that needed to occur. When education visionaries finally began to look at the environments where science took place, such as the Jet Propulsion Laboratory, the famous Massachusetts Institute for Technology, or the natural world, the design of the school edifice and instruction itself began to change. Of course, the Instructional Revolution was itself propelled by the rapid-fire advancement in information and communications technology. The revolution probably would not have evolved with such breakneck speed had the advancement of technology not progressed in a similar whirlwind. The technology allowed teachers to transform education rather than just automate old ways of learning.

Just as Johnson was remembering the old touch-dial telephones she used as a child, Emily Stone, Sarah's mother, visualized on the electronic display, "Margaret, are you in?"

"Well hi, Emily, I am waiting for Sarah to arrive any minute," Johnson responded.

"That is why I am visualizing, Margaret," said Stone. "Sarah may be a little late. Her autocopter needed a new energy cell, and Sarah didn't replace it before she lost all power. You know it takes a little time for those cells to charge the autocopter before it will run on the autorail."

"Thank you for letting me know, Emily," replied Johnson. "Did Sarah tell you about the Socratic seminar on the global community?"

"Yes," answered Stone, "Sarah is definitely the philosopher on the human condition and habitat. She will love it. Keep me informed on your little cherub's progress." Stone devisualized and the display returned to the personal information module.

Johnson smiled at Emily's reference to her little cherub. *Cherub* was a term coined at the beginning of the Instructional Revolution to describe the counseling component, another reform that transformed education. When every student entered the concrete operational developmental module of the education system, they were paired with a mentor. It was based on the Big Brother/Big Sister organization concept of the late 20th century. The counseling department used personality tests and profiles to match students/cherubs with a developmental mentor. The mentor helped students select their course of development modules once they left the primary cognitive modules of early childhood. Mentors worked with their cherubs to determine their interests and learning style. The mentor and cherub remained together until the student reached the Active Experimentation module (young adulthood). In reality the mentor and cherub usually maintained their relationship for life. It was a rewarding venture. Johnson had two other cherubs besides Sarah. Jessica was 12 years old. Virginia, her new cherub, was 10. Johnson was one of the last teachers to work in the old educational system, where one teacher worked with 20 students for only one year. She wondered what those students she had taught were doing now.

Sarah came bouncing into Johnson's office, "I already heard about the Socratic seminar. I want to join it. What historical personality should I create?"

Johnson laughed, "Well, it needs to be someone who in your eyes has played an important role in the progress of humankind and is," how could she say this discreetly, "visually unique."

The Socratic seminar was an absolutely fascinating class. Infrastructure bandwidth had finally expanded to exabyte capacity. With ether speed this fast, students could create life-size interactive holographic persons. Full lifelike interactive worlds were still on the horizon but the global civics class took full advantage of the expanded bandwidth, which allowed enough data to transmit interactive figures through the ether.

The seminar took place from the virtual design centers on school campuses. Students from across the globe designed a holographic replication of a historical personality native to their home country. It could be anyone from any time period in history. Students had to learn everything about this person to create the personal gestures, physical nuances, and dress of the character. Once students had completed the historical retrospect and virtual mechanics segment of class, the holographic characters met in a life-size virtual conference room. Students wore virtual projection suits to manipulate their characters within the virtual conference, and were expected to respond and participate in the seminar not as themselves, but as the characters they created. The instructional strategy employed total immersion methods to teach cultural

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studies and explore the survival of the human environment.

Sarah chimed, "I could be Lindy Boggs."

"I'll never forget the seminar between Joan of Arc and C. Everett Koop," chuckled Johnson. She thought about the pre-Instructional Revolution era. The personal computer, handheld devices, graphics applications, and mobile communications had evolved at the end of the 20th century. Even today's constructivist style of teaching and learning were founded in the early 20th century by the father of education philosophy, John Dewey.

It was the ever-increasing capacity of bandwidth that enabled the global education community to become a dynamic, strongly knit neighborhood. With each advancement in the ability to transmit larger amounts of data at faster capacities, digital visual imagery improved. More people and more sites were able to participate in video conferencing. More people from across the globe were able to work simultaneously on the same projects on virtual blackboards. Students from San Jose to Malaysia could cooperatively construct 3-D interactive models of aircraft, atoms, or the human heart. Students across the globe could collect, share, and compare data on air pollution, weather conditions, or geological changes in the earth. Students and classes from any location could communicate with scientists, authors, and mathematicians from anywhere. Teachers and facilitators could interact and communicate visually with parents regardless of proximity on their student/child development.

With the increased capacity in data transmittal, more interactive activities could occur simultaneously from one location. At the beginning of the Instructional Revolution teachers had to schedule bandwidth time to work on projects with other schools. No more. No one ever thought about limitations; they only thought about how to improve the communications and increase the capacity for data transfer.

Johnson hit upon an idea. "Sarah," she speculated, "Why don't you create John Dewey?"

"John Dewey," Sarah questioned, "Who is he?"

After she finished her meeting with Sarah, Johnson returned to her preparation for The Science of Harry Potter class. It reminded her again of the beginning of the Instructional Revolution and student fascination with the *Harry Potter* series. Everyone assumed it was the magic and wizardry in the books that captured students' attention and returned a lost zeal for reading. Looking back, Johnson realized the fascination was with Hogwarts School and not merely the magic. At Hogwarts, Harry learned wizardry through experimentation and doing. The young wizards at Hogwarts fell into trouble not for misbehavior, but for the curious need to know. Students at Hogwarts didn't just receive knowledge, they constructed it. Students knew that Hogwarts was not just a magic school. It was a design for education that could be replicated. Students were the instigators of the Instructional Revolution. With *Harry Potter,* students envisioned schooling as a wonderful, fun activity that allowed all students to reach their potential. Finally, they demanded it.

## Acknowledgement

Many thanks to Roger Highfield and his book, *The Science of Harry Potter,* for generating this idea.

*Annemarie Timmerman is an instructional technology consultant with the North Carolina Department of Public Instruction. She holds in high esteem the educators she works with across the state, whose dedication, hard work, and seeming magic they perform every day enable students to achieve.*