The magic of Augmented Reality: Transform your surroundings to learn anytime, anywhere!

Dr. Devika Sharma
Assistant Professor,
Government degree college, khour.
Jammu&Kashmir

"The whole purpose of education is to turn mirrors into windows"

- Sydney J Harris

Abstract

In today's classrooms, teachers need every resource at their disposal to attract the attention of their students. Augmented reality is like magic!As students are being constantly visually stimulated, the use of imagery in the classroom can be a very useful and effective tool. Images allow students to tap in to their inherent creative nature, while promoting attention to detail, critical thinking, and resourcefulness. It also allows students to process deep and complex issues in abstract, and mentally stimulating ways. It makes sense that every classroom incorporate images in some way, as it is a very efficient method in advancing student learning and achievement.

Education is a vital means for the potentialities of a human being to emerge in a positive direction so that a man can live in society with full of dignity. Overall, the research evidence over the last 40 years about the impact of computer and digital technologies on learning consistently identifies positive benefits. The increasing variety of digital technologies and the diversity of contexts and settings in which the research has been conducted, combined with the challenges in synthesising evidence from different methodologies make it difficult to identify clear and specific implications for educational practice in schools. Studies linking provision and use of technology with attainment tend to find consistent but small positive associations with educational outcomes. However, a causal link cannot be inferred from this kind of research. It seems probable that more effective schools and teachers are more likely to use ICT and digital technologies more effectively than other schools. We need to know more about where and how it is used to greatest effect, then investigate if this information can be used help to improve learning in other contexts. Research findings from experimental and quasi-experimental designs which have been combined in meta-analyses indicate that overall technology-based interventions tend to produce just slightly lower levels of improvement when compared with other researched interventions. The range of impact identified in these studies suggests that it is not whether technology is used (or not) which makes the difference, but how well the technology is used to support teaching and learning. This alignment of

technology and learning is important. There is no doubt that technology engages and motivates young people. However this benefit is only an advantage for learning if the activity is effectively aligned with what is to be learned. It is therefore the pedagogy of use of technology which is important: the how rather than the what. With computer and digital technologies there is a recurrent and specific challenge in understanding and applying the research evidence as it takes time for robust evidence to emerge in education and the rapid pace of change of technology makes this difficult to achieve. With this in mind the findings from the synthesis of the 45 meta-analyses published since 1990 indicates the following overall trends:

Collaborative use of technology (in pairs or small groups) is usually more effective than individual use, though some pupils, especially younger children, may need support in collaborating effectively.

Technology can be used very effectively as a short but focused intervention to improve learning, particularly when there is regular and frequent use (about three times a week) over the course of about a term (5 -10 weeks). Sustained use over a longer period is usually less effective at improving attainment.

- Remedial and tutorial use of technology can be particularly effective for lower attaining pupils or those with special educational needs or those from disadvantaged backgrounds in providing intensive support to enable them to catch up with their peers.

- In researched interventions, technology is best used as a supplement to normal teaching rather than as a replacement for it. This suggests some caution in the way in which technology is adopted or embedded in schools.

- Tested gains in attainment tend to be greater in mathematics and science (compared with literacy for example) though this is also a more general finding in meta-analysis and may be at least partly a measurement artefact. In literacy, the impact tends to be greater in writing interventions compared with reading or spelling.

- Training and professional development for teachers is an important component of•successful approaches. At least a full day's support or on-going professional inquirybased approaches appear the most successful.

One of the biggest concerns of educators across the world, and especially in India, is making the present generation learners future-ready. India is relatively young as a nation with around 28 million youth population being added every year. However, India's high youth population won't be of help to the economy if universal education is not achieved all over India. The main problem India now faces is that all the pedagogical innovations are fit to improve the quality of urban education while the rural learners and their education remain largely neglected. With 65 per cent of the population residing in rural India, education there truly deserves much

more attention, especially when it is plagued with so many problems - dearth of teachers, teacher absenteeism and poor quality of teachers.

➤ Non-permanence of teachers is demotivating

Most of the schools in rural areas are run by the government. They appoint ad hoc teachers, instead of permanent ones, who are poorly paid as compared to the huge remuneration of a full-time Trained Graduate Teacher (TGT).

Moreover, promising career prospects, which is quite a motivation booster, is almost nil for the non-permanent teachers. This leads to dissatisfaction, eventually resulting in a dearth of teachers because they move away to more permanent jobs.

➤ Late or blatantly absent

Lack of accountability of teachers and school authorities has raised the rate of absenteeism. School Development and Management Committees (SDMCs), comprising parents and members of the local community, have been entrusted with the responsibility of overseeing teachers and their duties. However, research suggests that the committee has hardly seen success.

➤ Non-teaching duties

Moreover, non-teaching duties like election invigilation often keep teachers away from schools. Furthermore, teachers often have to report for duty far away from their home. With an inadequate transport system in rural India, the distance only adds to their woes and often results in absenteeism.

➤ Exemption from TET

Several states have exempted candidates from Teachers' Eligibility Test (TET) as only 20 per cent of the aspirants clear it. This wrong move, in an attempt to quickly fix the issue of dearth of teachers, has deteriorated the quality of education in the states even further. However, quality of teachers is a major concern not only in these states, but across the entire country.

➤ Lack of quality teacher training

There are many private teacher-training institutes in India, but the quality of the training they provide is unsatisfactory. Continuous professional development is a motivator for teachers, and enough attention is needed in this regard.

Smart Ways To Use Digital Images In The Classroom

1.   **Visual Biographies**

In many aspects of education, a student's true potential shines through when the subject is personal to them. Teachers can tap into this in a variety of ways; such as having students create visual biographies that represent their lives. Students can find powerful images online or through social media, and compile them in a slide show that highlights their past, present, and future.

These images can symbolize important events, people, or places in their lives. They can also be representative of each student's personal goals, interests, and future aspirations. This will not only tap into the student's creative nature, but will also encourage them to think deeply about which images truly embody them, and their aspirations.

Slideshows can subsequently be presented to the class, giving classmates the opportunity to peek into the personalities of their peers. Students can comment on the images, draw similarities to their own lives, and build stronger class camaraderie.

This can be a fun and effective way for students to use imagery as a tool to express themselves, foster creativity, and learn about their classmates.

2.   **Photo Essays**

Visual biographies are not the only way to utilize images in the classroom. Pictures can also be used as a way to represent student understanding of material. Photo essays are an excellent way to accomplish this, and can be applied to any subject.

To achieve this, students can work in teams or independently compile digital images that pertain to a relevant topic. Captions can be added to each photo, explaining the photo's relation to the subject and giving insight into the student's thought process.

This can be a little tricky, as student interpretations are relative to their own personal understanding. Therefore, it is important for educators to use discretion when implementing this tactic, and make sure students make a clear relation between the image and the subject matter.

3.   **Visual Storytelling**

Through incorporating digital images in the class, teachers can encourage students to create narratives for particular pictures. Many students have taken exams or had homework assignments that display an image, and ask the students to write a story describing what is happening. This can be an excellent exercise that not only stimulates student imagination, but tests their focus and attention to detail. Students can brainstorm as a class or in groups, feeding off each other's inductive reasoning. Afterward, students can be instructed write a short reflection based on what they see in the image. This can be a useful exercise that empowers students to use inductive reasoning to tell a story. Each story can be different based on individual interpretation, which empowers students to freely exercise their originality and inductive skills without fearing failure or ridicule.

Teachers may find a photograph online, display it in class, and invite students to create a narrative for the image. Ask students to identify certain details of the image, such as the setting, the characters, and what is happening.

Have students discern the emotions of the characters based on their body language. Are they happy, concerned, upset? Why? Is there a conflict? What can be a resolution?

4.   Photojournalism

In today's society, it is vital that students are aware of what is happening in the world. Therefore, involving students in photojournalism can present a number of benefits, including an appreciation for the education you provide them!

In class, educators can use photos to inform students of current events and also invite them to do their own research on the images. By projecting an image in the class, teachers can provoke deep thought from students as they ponder the issues the image represents.

Teachers can encourage students to ask questions, write a reflection, or procure their own photos or political cartoons to present to the class as weekly assignment.

Photojournalism can be a very powerful way to engage students in deep and complex issues. It is also an effective way for students to communicate their own opinions, and encourages them to choose images that draw attention to issues that are important to them.

5.   Vocabulary Building

In any language arts course, images can be a useful tool for students to build on vocabulary and word association. By presenting a carefully selected group of images, teachers provide a tangible example of the words they are trying to teach. Furthermore, it makes it easier for student to remember new words, as they are automatically associated with the visual representation.

Educators can also experiment in exercises that allow students to draw vocabulary from images. One can present a selected group of images to the class, and allow students to work together to extract as many adjectives as they can out of the image.

This is a simple, but effective way to get kids thinking creatively about what they see in images. Educators may even transform the exercise into a game, assigning points to students who come up with the most creative descriptions or analogies.

The novelty of AR experience together with its ability to immerse the user in a fantasy world makes it a potent tool to be used in the education sector. Unlike gaming and VR environments, AR does not separate individuals from their immediate environment; it rather uses the reality and transforms it into something magical. Technology, on its part, has the potential to positively affect the quality of education, and also to break the digital divide plaguing our system. Many remedies such as surprise school inspections, teacher-training courses etc. have been attempted to salvage the rural education scenario. Without being dismissive of any of these, I would like to point out the effectiveness of digital aids in battling the challenges plaguing our education system:

Government initiatives

- E-basta aims to make digital education via tablets and computers accessible to learners in rural areas. Digital learning can help develop critical thinking skills. The project aims not only to benefit learners in learning concepts, but also to make them comfortable with technology.

Steps are already being taken to introduce digital aids in preschools. Though digital aids can never really replace teachers, initiatives of these kinds can make quality content available to them.

➢ Again, Rashtriya Madhyamik Shiksha Abhiyan (RMSA), in partnership with state governments, is dedicated to enhance the capacity of all teachers in Information and Communications Technology (ICT).

➢ eVidyaloka, a non-profit organisation, . The eVidyaloka team organises Skype classes according to the availability of volunteers and batch sizes it connects rural learners and teaching volunteers through digital classrooms. The passionate teachers are a varied bunch, consisting of housewives, IT professionals and retired defense personnel.

Augmented reality in textbooks?

Besides the ones already mentioned, there are multiple ways in which AR can be incorporated into the learning process. While augmented books with virtual graphics superimposed on the pages are a great visual treat, experiencing AR even on regular books is also a possibility.

What can be used in schooling:

- While both Virtual Reality (VR) and AR are in vogue, let us find out which is best suited for schooling:

- While VR creates a whole new artificial environment, AR overlays new information on the existing environment and provides the learners with an enhanced experience.

- Most importantly, AR is more cost-effective than VR. Although there are VR headsets starting from Rs. 2000 in the market, the prices of good ones are exorbitant. On the other hand, AR apps are supported on smartphones, which is easily available in almost all households, and no additional costs are involved.

References

Allen, K. P. (2010). Classroom management, bullying, and teacher practices. *The Professional Educator, 34*(1), 1–15.

Aronson, J., Zimmerman, J., & Carlos, L. (1998). *Improving student achievement by extending school: Is it just a matter of time?* San Francisco: WestEd.

ASCD. (2012). *Annual Conference 2012: Harvey Silver and Art Costa*. Retrieved from http://edge.ascd.org/_Annual-Conference-2012-Harvey-Silver-and-Art-Costa/video/1673031/127586.html

Aud, S., Hussar, W., Johnson, F., Kena, G., Roth, E., Manning, E., … & Zhang, J. (2012). *The condition of education 2012* (NCES 2012-045). Washington, DC: U.S. Department of Education, National Center for Education Statistics. Retrieved from http://nces.ed.gov/pubsearch

Bangert-Drowns, R., Hurley, M., & Wilkinson, B. (2004, Spring). The effects of school-based writing-to-learn interventions on academic achievement: A meta-analysis. *Review of Educational Research, 74*(1), 29–58.

Bangert-Drowns, R. L., Kulik, C., Kulik, J., & Morgan, M. T. (1991). The instructional effect of feedback in test-like events. *Review of Educational Research, 61*(2), 213–238.

Barron, B. J. S., Schwartz, D. L., Vye, N. J., Moore, A., Petrosino, A., Zech, L., & Bransford, J. D. (1998). Doing with understanding: Lessons from research on problem- and project-based learning. *Journal of the Learning Sciences, 7*(3–4), 271–311.

Cross, L. H., & Frary, R. B. (1999). Hodgepodge grading: Endorsed by students and teachers alike. *Applied Measurement in Education, 12*(1), 53–72.

Csikszentmihalyi, M., Rathunde, K., & Whalen, S. (1993). *Talented teenagers: The roots of success and failure*. New York: Cambridge University Press.

Dean, C., Hubbell, E., Pitler, H., & Stone, B. (2012). *Classroom instruction that works* (2nd ed.). Alexandria, VA: ASCD.

Deci, E. L., Ryan, R. M., & Koestner, R. (1999). A meta-analytic review of experiments examining the effects of extrinsic rewards on intrinsic motivation. *Psychological Bulletin, 125*(6), 627–668.

de Crespigny, R. C. (2012, July 21). This is your captain speaking. *The Australian*. Retrieved from http://www.theaustralian.com.au/news/features/this-is-your-captain-speaking/story-e6frg8h6-1226427134015

Ford, B. (2010). A skating legend finally gets his due. *ESPN.com*. Retrieved from http://sports.espn.go.com/olympics/winter/2010/figureskating/columns/story?columnist=ford_bonnie_d&id=4927139

Ford, H., & Crowther, S. (1922). *My life and my work*. New York: Doubleday.

Fryer, R. (2010). *Financial incentives and student achievement: Evidence from randomized trials*. Cambridge, MA: Harvard University.

Fryer, W. (2009, March 27). The Thursday folder and worksheet measured learning [Blog]. *Moving at the Speed of Creativity*. Retrieved from http://www.speedofcreativity.org/2009/03/27/the-thursday-folder-and-worksheet-measured-learning/

Furgeson, J., Gill, B., Haimson, J., Killewald, A., McCullough, M., Nichols-Barrer, I., … & Lake, R. (2011). *Charter-school management organizations: Diverse strategies and diverse student impacts*. Princeton, NJ: Mathematics Policy Research and Center on Reinventing Public Education.

Hobson, J. A., & McCarley, R. (1977). The brain as a dream state generator: An activation-synthesis hypothesis of the dream process. *American Journal of Psychiatry, 134*, 1335–1348.

Howell, R. J. (2011). Exploring the impact of grading rubrics on academic performance: Findings from a quasi-experimental, pre-post evaluation. *Journal on Excellence in College Teaching, 22*(2), 31–49.

Howley, A., Kusimo, P. S., & Parrott, L. (2000). Grading and the ethos of effort. *Learning Environments Research, 3*(3), 229–246.

Hummel, J., & Huitt, W. (1994). What you measure is what you get. *GaASCD Newsletter: The Reporter*, 10–11.

Hunter, M. (1969). *Improved instruction*. Thousand Oaks, CA: Corwin Press.

Hurley, W. L. (2006). Teaching students to solve complex problems based on large bodies of information. *Scholarship of Teaching and Learning*. Retrieved from https://www.ideals.illinois.edu/bitstream/handle/2142/9619/UIRetreat_06_poster.pdf?sequence=2

Hyde, T. S., & Jenkins, J. J. (1969). Differential effects of incidental tasks on the organization of recall of a list of highly associated words. *Journal of Experimental Psychology, 82*, 472–481.

Iyengar, S. S., & Lepper, M. R. (2000). When choice is demotivating: Can one desire too much of a good thing? *Journal of Personality and Social Psychology, 79*, 995–1006.

Jang, H., Reeve, J., & Deci, E. (2010). Engaging students in learning activities: It is not autonomy support or structure but autonomy support and structure. *Journal of Educational Psychology, 102*(3), 588–600.

Jensen, E. (1998). *Teaching with the brain in mind*. Alexandria, VA: ASCD.

Johnson, S. (2011). *Where good ideas come from: The natural history of innovation*. New York: Riverhead Books.

Ramos, P. H., & De La Paz, S. (2009). Learning history in middle school by designing multimedia in a project-based learning experience. *Journal of Research on Technology in Education, 42*(2), 151–173.

Rathunde, K., & Csikszentmihalyi, M. (2005). The social context of middle school: Teachers, friends, and activities in Montessori and traditional school environments. *Elementary School Journal, 106*(1), 59–79.

Rebora, A. (2010, July 1). News flash: High school students are bored. *Education Week Teacher Blog*. Retrieved from http://blogs.edweek.org/teachers/teaching_now/2010/07/news_flash_high_school_students_are_bored.html

Reddy, R., Rhodes, J. E., & Mulhall, P. (2003). The influence of teacher support on student adjustment in the middle school years: A latent growth curve study. *Development and Psychopathology, 15*, 119–138.

Richardson, W. (2012). *Why school? How education must change when learning and information are everywhere*. TED Conferences.

Richland, L., Stigler, R., & Holyoak, K. (2012). Teaching the conceptual structure of mathematics. *Educational Psychologist, 47*(3), 189–203.

Rimm-Kaufman, S. (2011). *Improving students' relationships with teachers to provide essential supports for learning*. American Psychological Association. Retrieved from http://www.apa.org/education/k12/relationships.aspx

Ripley, A. (2010, April 8). Should kids be bribed to do well in school? *Time*. Retrieved from http://www.time.com/time/magazine/article/0,9171,1978758,00.html

Rivkin, S. G., Hanushek, E. A., & Kain, J. F. (2005). Teachers, schools, and academic achievement. *Econometrica, 73*(2), 417–458.

Rosenthal, R., & Jacobson, L. (1992). *Pygmalion in the classroom*. New York: Irvington.

Rutter, M., Maughan, B., Mortimer, P., & Ouston, J. (1979). *Fifteen thousand hours: Secondary schools and their effects on children*. London: Open Books.

Ryan, S., & Frazee, D. (2012a). *Common Core standards for middle school English language arts*. Alexandria, VA: ASCD.

Ryan, S., & Frazee, D. (2012b). *Common Core standards for high school English language arts*. Alexandria, VA: ASCD.

Sawyer, R., Laing, J., & Houston, M. (1988). *Accuracy of self-reported high courses and grades of college-bound students* (ACT Research Report No. 88-1). Iowa City, IA: ACT.

Scherens, J., & Bosker, R. J. (1997). *The foundations of educational effectiveness*. New York: Elsevier.

Schmidt, P. (2007, March 9). High-school students aim higher without learning more, federal studies find. *Chronicle of Higher Education*. Retrieved from http://chronicle.com/article/high-school-students-aim/29057

Schmoker, M. (2011). *Focus: Elevating the essentials to radically improve student learning*. Alexandria, VA: ASCD.

Schneider, M. (2010). *Finishing the first lap: The cost of first-year student attrition in America's four-year colleges and universities*. Washington, DC: American Institutes of Research.

Seligman, M. E. P. (1990). *Learned optimism: How to change your mind and your life*. New York: Pocket Books.

Semb, G. B., & Ellis, J. A. (1994). Knowledge taught in school: What is remembered? *Review of Educational Research, 64*(2), 253–286.

Sexton, J. (2012, July 22). A hero's stress fracture. *[Sydney] Sunday Telegraph*. Retrieved from http://www.news.com.au/travel/news/a-heros-stress-fracture/story-e6frfq80-1226431568002

Shohamy, E. (1984). Does the testing method make a difference? The case of reading comprehension. *Language Testing, 1*(2), 147–170.

Shute, V. J. (2008). Focus on formative feedback. *Review of Educational Research, 78*(1), 153–189.

Sinek, S. (2009). *Start with why: How great leaders inspire everyone to take action*. New York: Penguin Books.

Smith, D. A. (1996). *A meta-analysis of student outcomes attributable to the teaching of science as inquiry as compared to traditional methodology*. (Unpublished doctoral dissertation). Temple University, Philadelphia.

Smith, L. K. C., & Fowler, S. A. (1984). Positive peer pressure: The effects of peer monitoring on children's disruptive behavior. *Journal of Applied Behavior Analysis, 2*(17), 213–227.

Stage, S. A., & Quiroz, D. R. (1997). A meta-analysis of interventions to decrease disruptive classroom behavior in public education settings. *School Psychology Review, 26*(3), 333–368.

Stigler, J. W., & Hiebert, J. (2004). Improving mathematics teaching. *Educational Leadership, 61*(5), 12–17.

Stough, L. M. (1993, April). *Research on multiple choice questions: Implications for strategy instruction*. Paper presented at the Annual Convention of the Council for Exceptional Children, San Antonio, TX.

Tomlinson, C. A. (1999). *The differentiated classroom: Responding to the needs of all learners*. Alexandria, VA: ASCD.

Twenge, J. M., & Campbell, W. K. (2008). Increases in positive self-views among high school students: Birth-cohort changes in anticipated performance, self-satisfaction, self-liking, and self-competence. *Psychological Science, 19*(11), 1082–1086.

Urquhart, V., & Frazee, D. (2012). *Teaching reading in the content areas: If not me, then who?* (3rd ed.). Alexandria, VA: ASCD.

Urquhart, V., & McIver, M. (2005). *Teaching writing in the content areas*. Alexandria, VA: ASCD.

Vos Savant, M. (1995). *I've forgotten everything I learned in school: A refresher course to help you reclaim your education*. New York: St. Martin's Press.

Wadlington, E., & Wadlington, P. (2011). Teacher dispositions: Implications for teacher education. *Childhood Education, 87*(5), 323–326.

Walberg, H. J. (1984). Improving the productivity of America's schools. *Educational Leadership, 41*(8), 19–27.

Wang, M. C., & Stiles, B. (1976). An investigation of children's concept of self-responsibility for their school learning. *American Educational Research Journal, 13*, 159–179.

Wiggins, G. (2012). Seven keys to effective feedback. *Educational Leadership, 70*(1), 10–16.

Wiggins, G., & McTighe, J. (2005). *Understanding by design*. Alexandria, VA: ASCD.

Wiliam, D. (2007). Content then process: Teacher learning communities in the service of formative assessment. In D. B. Reeves (Ed.), *Ahead of the curve: The power of assessment to transform teaching and learning* (pp. 183–204). Bloomington, IN: Solution Tree.

Wiliam, D. (2011). *Embedded formative assessment*. Bloomington, IN: Solution Tree.

Willingham, D. T. (2003). How we learn: Ask the cognitive scientist. Students remember … what they think about. *American Educator, 27*(2), 37–41.

Willis, J. (2006). *Research-based strategies to ignite student learning: Insights from a neurologist/classroom teacher*. Alexandria, VA: ASCD.

Woodruff, D. J., & Ziomek, R. L. (2004). *High school grade inflation from 1991 to 2003*. Iowa City, IA: ACT.

Yazzie-Mintz, E. (2010). *Charting the path from engagement to achievement: A report on the 2009 High School Survey of Student Engagement*. Bloomington, IN: Center for Evaluation and Education Policy.

Zmuda, A., Kuklis, R., & Kline, E. (2004). *Transforming schools: Creating a culture of continuous improvement*. Alexandria, VA: ASCD.

.