

“Digital Classroom”: An Innovative Teaching and Learning Technique for Gifted Learners Using ICT

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Abstract

Gifted student population is a group of individuals with specific and unique learning needs. Due to their uniqueness, the students always face problems in mainstream educational system. Teachers of gifted students need to be proactive and creative in preparing their teaching plans, methodologies, and materials, in order to ensure that the learning process is going to be effective to the students. This article discusses the concept of “digital classroom”—an innovative technique using integration of information and communication technology (ICT)—used at the “laboratory school” of National Gifted Center, Universiti Kebangsaan Malaysia as teaching and learning strategy for local gifted students. The teachers integrate the use ICT such as the electronic mail, social media applications, and online learning portals as platforms to effectively teach the students. In comparison to the conventional way of teaching, this technique creates a borderless classroom which enables the students to freely explore knowledge without limit or boundary.

Keywords

Teaching and Learning, Gifted Learners, Information and Communication Technology (ICT)

1. Introduction

The life challenges in today’s world require varieties of complex alternatives and solutions. Spencer (2011) in his paper entitled “Global Issues of the 21st Century and United Nations Challenges” had outlined seven salient challenges of the world citizens living in the 21st century comprises of: 1) conflicts and honour; 2) group identity and governance; 3) standard of living and global prosperity; 4) optimization of innovation through STEM and education; 5) human relation and individuality; 6) human rights and obligation; and 7) respect and moral judg-

ment. As such, the world needs leaders, who are visionary, and whose ideas exceed their own life span. Individuals like Albert Einstein, Isaac Newton, Thomas Edison, Winston Churchill, Mahatma Gandhi and even Nelson Mandela are examples of those leaders and visionaries who leave their mark in this world with their creative ideas of saving the world beyond their time. Although, they were never identified as gifted individuals during their time, but the legacy of their works indicate otherwise. The questions to be pondered are:

- a) How do these individuals gain so much knowledge about what is needed for the citizens of the world?
- b) Did their formal/informal education prepare them for what is needed to help the world be a better place?

Gifted individuals are the assets of any nations and civilizations; hence, society will always benefit from the offering of these individuals. When groom from young, these individuals will transcend their giftedness to another level to produce knowledge for the new frontiers that will solve problems of the 21st century such as global issues, financial crisis, and political instability. Gifted individuals are not a homogeneous group of people, and therefore, provision needs to be responsive to their individual needs. Concomitantly, in term of learning, gifted individuals need access to broad, balanced and challenging curriculum as well as pedagogical approaches that have the potential to change their lives and prepare them to face challenges lie ahead (Davis, Rimm, & Siegle, 2011; Goodhew, 2009; Gosfield, 2008; Smutny, 2003; Eyre & Lowe, 2002).

Research works that examine the effectiveness of special educational program for gifted learners have provided evidences to show that such programs benefited them, especially when the programs are developed based on strong theoretical and empirical foundations (Ng & Nicholas, 2010; Kevin, 2005; Van Tassel-Baska, 2005; Bernal, 2003; Castellano & Diaz, 2002; Shore & Delcourt, 1996; Olenchak & Renzulli, 1989; Epstein, 1979). When given nurturing learning environments, these students developed talents in various areas besides from their academic talents. Researches have also shown that these special individuals benefited from special teaching approaches. Strategies such as the “differentiated” teaching approaches or the computer-assisted independent learning approaches have been said to intensify the learning capacity of the gifted learners (Van Tassel-Baska et al., 2006; Gross & Van Vliet, 2005; Van Tassel-Baska, 2003). In other words, the traditional approaches to teaching or the “chalk and talk” classroom-based teaching is seen as unhelpful and has adverse effect in the teaching and learning processes of gifted students.

Generally, effective teaching and learning brings out the satisfaction of all members of the learning community. Regardless of whether one is teaching students with an average IQ or teaching students with extremely high IQ, the satisfaction derived from the teaching processes is achieved when the strategies or approaches used are able to alleviate students’ academic potentials, instill curiosity to deepen their knowledge, and heighten their thinking process. Studies have also shown that effective teaching strategies have rippling effects on students’ academic performance (Wenglinsky, 2011; Ames & Archer, 1988). The findings also suggested that effective teaching strategies promote creative learning among the students. Learning not only takes place within a creative classroom environment, but the learning processes also expanded beyond the four walls using various teaching strategies including computer-assisted learning technologies and “open laboratory” approach of various subjects (Pintrich & De Groot, 1990). Such creative approaches to teaching will alleviate students’ interest in the subject matter, develop critical and innovative thinking in problem solving, and develop students’ intrinsic motivation/aspiration to learn (Maimun et al., 2011; Noriah et al., 2010). In other words, creative teaching and learning approach will support holistic development of students’ identity.

In tandem, this article will discuss a specific pedagogical approach in teaching gifted learners that go beyond the traditional teaching approaches of “chalk and talk”. The approach coined as “*digital classroom*”—the concept of learning using the integration of ICT applications in an open laboratory set up—is being implemented at National Gifted Center, Universiti Kebangsaan Malaysia’s “laboratory school”. This ICT-assisted independent learning approach has been recognized as one of the effective teaching and learning technique that can be applied by the educators of gifted students in local educational setting.

2. Learning Characteristics of Gifted Individuals

Debate on defining giftedness has been long and arduous (Renzulli, 2005; Gagné, 2004; Tomlinson, 1999; Gross, 1989). None of the theoretical experts on giftedness has come to an agreement on how to clearly defined giftedness. Renzulli’s (2005) definition of giftedness is defined as the interaction between three factors indicated by the overlay of the three elements (high ability, task commitment and creativity) is seen by many as being too simplistic. On the contrary, Gagné (2004) expressed giftedness as a shift from gift to talent and looking at natural abilities in various forms that can be transformed into talent by systematic training, in which he proposed

four domain areas of giftedness that include intellectual ability, creativity, socio-affective and sensorimotor. De Haan (1957), on the other hand, suggested six domains in which individual might excel including intellectual ability, creative thinking, scientific ability, social leadership, mechanical skills and talent in fine arts.

However, many agreed that to define giftedness from just an intellectual ability or intelligent quotient (IQ) is too linear and one-dimensional. Nonetheless, it is a useful index of the discrepancy/gap which exists between the mental age and the chronological age of gifted learners. Identifying and understanding the IQ of a gifted student will help us understand the mental processing that happened between a normal, moderately and extremely gifted individual. Silverman (1989) suggests that any gifted child with IQ score of 145 and above should be given different educational pathways because it directly affects the nurturing of exceptional talents. It is easy to stereotype and sideline those who may not conform to our own definitions of “normal”. For instance, Thomas Edison, whose teachers said he was not up to learning anything, went on to become one of America’s most prominent inventors and changed the way we live today with his invention of the “electric light bulb”. Inevitably, gifted individuals bring with them ensemble of talents that are rare and not usually identified in their peer group. Many of them have been wrongly diagnose and have received educational provision that is not supporting their learning needs. Thus, it is important that we understand how best to identify these distinctive individuals. Early identification of these individuals, complemented by the right learning environment, support and educational program, could result in them contributing to the betterment of any particular nation or civilization.

The gifted learners are, above all, individuals with unique personalities, interests, and desires. Consequently, these personal unique traits have direct impacts on their learning needs. According to Saylor and Brookshire (1993), one of the earliest indicators for giftedness in children is that they walk and talk at an early age. They also have large and advanced vocabulary, and some started accumulating the large vocabulary at a very tender age. They learn rapidly and easily and read at an early age. These gifted children also demonstrates a great appetite for books and reading and are able to entertain themselves for large blocks of time, reading or staring at a book (an indicator of their interest in the content even before they are able to read by themselves). Furthermore, they are also able to readily retain a large amount of information, to consistently organize, sort, classify and group things, and to name them accordingly, and also possess heightened sense of curiosity (Frasier, Hunsaker, Lee & Mitchell, 1995; Dunn & Price, 1980). All in all, as being summarized by Tuttle and Baker (1980), gifted learners common unique traits are as follows:

- a) Well-developed powers of abstraction, conceptualization and synthesis;
- b) Deep understanding of cause and effect relationships;
- c) Quick understanding of similarities, differences and anomalies;
- d) Fluent thinking, generating possibilities, consequences or related ideas;
- e) Flexible thinking, using many different alternatives and approaches to problem solving.

Given the definition and the characteristics of these gifted learners, it is then fair for them to receive education that will meet their unique needs. Research works on gifted learners in mainstream education system found out that their classroom experiences were claimed to be too slow, full of repetitions, focused on memorizing instead of mastering the knowledge, and lacked of opportunity to explore anything out of the syllabus (Abu Yazid, 2014; Kanevsky & Keighley, 2003; Gallagher, Harradine & Coleman, 1997). As mentioned earlier, gifted learners will not benefit from the traditional teaching approach of “chalk and talk”. Such techniques allow limited amount of information to flow from the teacher to the students, and the flow is very linear in fashion (Grasha, 1996). This limitation can be frustrating to gifted learners whose capacity to absorb information surpass their normal peers and even average adult. Their continuous hunger for knowledge and they capability to consistently seek new information to meet their level of curiosity demand that we offer them a different kind of teaching and learning experiences. Teachers of gifted learners need to readjust their teaching techniques that might involves the shift of pedagogical paradigm from the traditional approaches to probably one that is electronically or technology-based. Hence, in the era of information and communication technology (ICT), the teaching and learning strategies for gifted learners shall incorporate all of the recent technologies available in order to optimize their potential to the fullest.

3. “Digital Classroom” as Teaching and Learning Technique for Gifted Learners

The era of globalization spurs information overload, since information can be downloaded from different sources regardless of geographical location. One only has to google to find information on various topics that would answer any questions about the world and the elements surrounding it. This online world’s constant flux

of information is seen as kingdom of knowledge for gifted learners whose ability to learn independently requires knowledge search beyond the textbook. However, the propensity of benefiting from the vast knowledge of information is limited when students are involved only in the traditional method of learning vis-à-vis learning using computer technology that promotes academic satisfaction among these gifted learners.

Traditional teaching methods such as the “talk and chalk” technique, and classroom lecture, might only allow limited amount of information to flow from teachers to students depending on the amount of knowledge acquired by teachers. This flow of teaching identified as linear teaching by Grasha (1996), put the burden for seeking the knowledge and imparting it to the students, on the teachers as its main source of information. The more knowledge the teachers acquires, the more information will be disseminated to the students. However, the human mind (in this case, the teachers) can only store certain amount of information and this limitation can be very frustrating to gifted students who constantly seek vast amount of new information to meet their learning needs. Gifted students’ ability to learn also varies with their intelligence quotient (IQ)’s levels. As such, teachers will have to constantly gather new and varied information and diversify their sources of information. Thus, both teachers and students will feel the pressure in terms of:

a) It will overburden the teachers who constantly have to seek new information beyond the text books when they also have management, supervision and advising activities to do.

b) The teachers (as an individual) will not be able to think of all the information and the source of that information, and as such, will miss some of the information that is required for the learning process; inevitably, they will revert back to the text book or reference books (because it is the easiest thing to do!).

c) Students will develop passive learning and wait for teachers to provide the information; thus, they will not be able to develop higher order thinking and will lack the ability to critically analyse and manage information, necessary skills for today’s learning process.

d) Students will not develop ownership towards learning, whereby learning becomes premeditated process rather than a creative process that brings joy to the inner curiosity of one’s learning needs.

e) The students’ potential will not be pushed to its optimum.

The points mentioned above demarcate the need for teachers to adjust teaching technique that involves expanding their classroom beyond its four walls. However, the paradigm shift in the pedagogical context requires complex adjustments and substantial re-thinking of the ways in which classroom is defined, the many ways classroom is physically organized, the amount of time spend for teaching and learning, the teaching and learning skills for both teachers and students, teaching materials, and the choice of teaching strategies.

Traditional classroom has always been defined as a learning set up involving a provided space within the four walls of a learning environment. Effective learning is said to take place within this confined space and learning is done in a linear fashion. Students are not allowed to explore beyond the space for fear of distraction to themselves or others. This traditional classroom will not go well with the learning behaviours of any gifted learners whose explorative behaviours require them to venture beyond the point of the four walls.

To gifted learners, ideal classroom is a borderless classroom. For instance, they might want to communicate with a Nobel Award winners in the United States of America, or discuss and share findings of their research with a professor from Harvard University, or even discuss certain issues of their interests with another gifted learner from another country. In this digital age, such communication can easily be done using emails or any forms of social media applications such as Facebook, Whats App, Twitter, Instagram, and many more. Moreover, regardless of their geographical locations, gifted learners may also have interest to explore courses offered by top universities all over the world, and they can do this by having access to online learning portals such as the Massive Open Online Course (MOOC) portal which offers them opportunity to learn subjects of their choice, at their own paces. Likewise, the existence of online learning platform such as the Khan Academy portal will also allow both gifted students and their teachers to literally learn via virtual portal without even going into the class. It allows teachers to have a virtual classroom, select topics that help students understand the subject better, monitor students’ progress, and assess students understanding. It even gives answers to students’ assignments. These portals also offer videos that discuss topics in various subject matters. In other words, it is like having your own classrooms in your own homes. And best of all, the online learning programs are provided for free.

Integrating all the ICT applications mentioned above, the National Gifted Centre, Universiti Kebangsaan Malaysia has adopted the “digital classroom” concept as its pedagogical approach when it started its’ “laboratory school” in 2011. This concept of expanding the classroom beyond the four walls is depicted in **Figure 1**. Philosophically, the “digital classroom” setting supports both synchronous and asynchronous communication

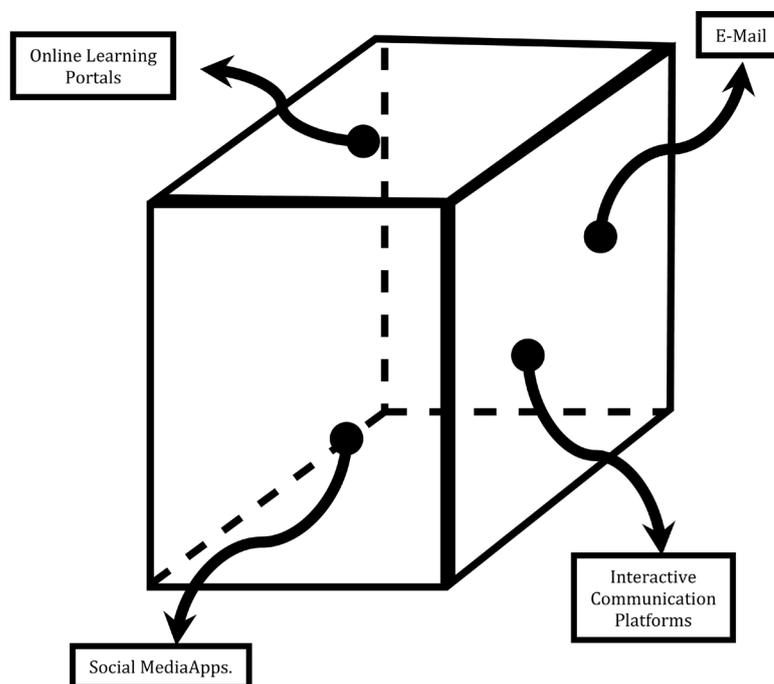


Figure 1. The “Digital Classroom” concept as teaching and learning technique for gifted learners.

(Noriah & Abu Yazid, 2014; Noriah et al., 2002). Synchronous communication reflects communication between two or more people that are connected to each other via internet, and communicating at the same time with each other. On the other hand, asynchronous communication reflects a communication where only one person can communicate at a time (for examples, via telephone answering machine or e-mail) in different combinations such as when one person is working alone accessing information, or when one person is communicating with many others, and when many people are communicating with many other people at different times. Moreover, synchronous communication through Webinar or Web conferencing or interactive conferences, allows students from various geographical locations to discuss and share information. It allows real time point-to-point communications as well as multicast communications from ne sender to many receivers. Webinar offers data streams of text-based messages, voice and video chat to be shared simultaneously, across geographically dispersed locations.

4. Conclusion

The 21st century learning community has taken the learning process to another level beyond the physical classroom environment. It is now a common practice for learners, gifted and non-gifted, to search information through the computer or other technological gadgets. Hence, by integrating the ICT into classroom environment, the interaction expands beyond the allotted time and geographical boundaries. Because of their unique ability to absorb vast amount of information and process the information in a very quick manner, gifted learners would normally need knowledge more than what the standard curriculum to offer. Undeniably, the use of ICT apparatuses as part of the source of teaching and learning become compulsory element to today’s classroom learning features.

The traditional classroom also provides limited space for learning, where students can only interact with their course-mates and the lecturer who teaches them. This space can only be expanded if the students themselves take the initiative to interact with people outside the learning boundary. However, “digital classroom” naturally provides the extra space for gifted learners to interact within dividuals outside the classroom via chat room, e-mail, online conferencing or Webinar, video conferencing, and other computer mediated communication methods. This promotes diversity in knowledge gain, and inevitably will deepen the students’ understanding on the subject matter. It also helps the students to manage information appropriately and thus making 21st century learning more effective.

References

- Abu Yazid, A. B. (2014). Depression, Anxiety, Stress and Adjustments among Malaysian Gifted Learners: Implication towards School Counseling Provision. *International Education Studies*, 7, 6-13.
- Ames, C., & Archer, J. (1988). Achievement Goals in the Classroom: Students' Learning Strategies and Motivation Processes. *Journal of Educational Psychology*, 80, 260-267. <http://dx.doi.org/10.1037/0022-0663.80.3.260>
- Bernal, E. M. (2003). To No Longer Educate the Gifted: Programing for Gifted Students beyond the Era of Inclusionism. *Gifted Child Quarterly*, 47, 183-191. <http://dx.doi.org/10.1177/001698620304700302>
- Castellano, J. A., & Diaz, E. I. (2002). *Reaching New Horizons: Gifted and Talented Education for Culturally and Linguistically Diverse Students*. Boston, MA: Allyn & Bacon.
- Davis, G. A., Rimm, S. B., & Siegle, D. (2011). *Education of the Gifted and Talented* (6th ed.). Boston, MA: Pearson.
- De Haan, R. F. (1957). Identifying Gifted Children. *The School Review*, 65, 41-48. <http://dx.doi.org/10.1086/442374>
- Dunn, R. S., & Price, G. E. (1980). The Learning Styles Characteristics of Gifted Students. *Gifted Child Quarterly*, 24, 33-36. <http://dx.doi.org/10.1177/001698628002400107>
- Epstein, C. B. (1979). *The Gifted and Talented: Programs That Work*. Arlington, KY: National School Public Relations Association.
- Eyre, D., & Lowe, H. (2002). *Curriculum Provision for the Gifted and Talented in the Secondary School*. New York, NY: David Fulton Publishers.
- Frasier, M. M., Hunsaker, S. L., Lee, J., & Mitchell, S. (1995). *Core Attributes of Giftedness: A Foundation for Recognizing the Gifted Potential of Minority and Economically Disadvantaged Students*. Storrs, CT: National Research Center on the Gifted and Talented.
- Gagné, F. (2004). Transforming Gifts into Talents: The DMGT as a Developmental Theory. *High Ability Studies*, 15, 119-147. <http://dx.doi.org/10.1080/1359813042000314682>
- Gallagher, J. J., Harradine, C. C., & Coleman, M. R. (1997). Challenge or Boredom? Gifted Students' Views on Their Schooling. *Roepers Review*, 19, 132-136. <http://dx.doi.org/10.1080/02783199709553808>
- Goodhew, G. (2009). *Meeting the Needs of Gifted and Talented Students*. London: Continuum International Publishing Group.
- Gosfield, M. W. (2008). *Expert Approaches to Support Gifted Learners*. Minneapolis, MN: Free Spirit Publishing Inc.
- Grasha, A. F. (1996). *Teaching with Style: A Practical Guide to Enhancing Learning by Understanding Teaching and Learning Styles*. Pittsburgh, PA: Alliance Publishers.
- Gross, M. U. M. (1989). The Pursuit of Excellence or the Search for Intimacy? The Forced-Choice Dilemma of Gifted Youth. *Roepers Review*, 11, 189-193. <http://dx.doi.org/10.1080/02783198909553207>
- Gross, M. U. M., & Van Vliet, H. E. (2005). Radical Acceleration and Early Entry to College: A Review of the Research. *Gifted Child Quarterly*, 49, 154-171. <http://dx.doi.org/10.1177/001698620504900205>
- Kanevsky, L., & Keighley, T. (2003). To Produce or Not to Produce? Understanding Boredom and the Honor in Underachievement. *Roepers Review*, 26, 20-28. <http://dx.doi.org/10.1080/02783190309554235>
- Kevin, B. (2005). Using Public Relation Strategies to Advocate for Gifted Programming in Your School. *Gifted Child Today*, 28, 32-37.
- Maimun, A. L., Abdullah, A. L., Melor, M. Y., Shah, N. S., Noriah, M. I., & Tajul, A. M. (2011). The Use of ICT in Teaching Islamic Subjects in Brunei Darussalam. *International Journal of Education and Information Technologies*, 5, 79-87.
- Ng, W., & Nicholas, H. (2010). A Progressive Pedagogy for Online Learning with High-Ability Secondary School Students: A Case Study. *Gifted Child Quarterly*, 54, 239-251. <http://dx.doi.org/10.1177/0016986209355973>
- Noriah, M. I., & Abu Yazid, A. B. (2014). Counseling Services for Malaysian Gifted Students: An Initial Study. *International Journal for the Advancement of Counselling*, 36, 372-383. <http://dx.doi.org/10.1007/s10447-014-9213-4>
- Noriah, M. I., Melor, M. Y., Saemah, R., & Zuria, M. (2010). Effect of Fun Learning Enrichment Program on At-Risk Low-Achievers' Motivation and Aspiration to Learn. *Procedia Social and Behavioral Sciences*, 7, 122-129.
- Noriah, M. I., Siti, R. A., Rosseni, D., & Aidah, A. K. (2002). Expanding the Traditional Classroom through Computer Technology: Collaborative Learning in Graduate Social Science Courses. *Jurnal Teknologi (Sains Sosial)*, 37, 17-28.
- Olenchak, F. R., & Renzulli, J. S. (1989). The Effectiveness of the School Wide Enrichment Model on Selected Aspects of Elementary School Change. *Gifted Child Quarterly*, 33, 36-46. <http://dx.doi.org/10.1177/001698628903300106>
- Pintrich, P. R., & De Groot, E. V. (1990). Motivational and Self-Regulated Learning Components of Classroom Academic Performance. *Journal of Educational Psychology*, 82, 33-40. <http://dx.doi.org/10.1037/0022-0663.82.1.33>
- Renzulli, J. S. (2005). The Three-Ring Conception of Giftedness: A Developmental Model for Promoting Creative Produc-

- tivity. In R. J. Sternberg, & J. E. Davidson (Eds.), *Conceptions of Giftedness* (pp. 246-279). New York: Cambridge University Press. <http://dx.doi.org/10.1017/CBO9780511610455.015>
- Sayler, M. F., & Brookshire, W. K. (1993). Social, Emotional, and Behavioral Adjustment of Accelerated Students, Students in Gifted Classes, and Regular Students in Eighth Grade. *Gifted Child Quarterly*, 37, 150-154. <http://dx.doi.org/10.1177/001698629303700403>
- Shore, B. M., & Delcourt, M. A. B. (1996). Effective Curricular and Program Practices in Gifted Education and the Interface with General Education. *Journal for the Education of the Gifted*, 20, 138-154.
- Silverman, L. K. (1989). The Highly Gifted. In J. Feldhusen, J. Van Tassel-Baska, & K. Seeley (Eds.), *Excellence in Educating the Gifted* (pp. 71-83). Denver, CO: Love Publishing Co.
- Smutny, J. F. (2003). *Designing and Developing Programs for Gifted Students*. Thousand Oaks, CA: SAGE Publishers.
- Spencer, C. (2011). Global Issues of the 21st Century and United Nations Challenges. <http://www.global-challenges.org>
- Tomlinson, C. A. (1999). *The Differentiated Classroom: Responding to the Needs of All Learners*. Thousand Oaks, CA: SAGE Publishers.
- Tuttle, F. B., & Becker, L. A. (1980). *Characteristics and Identification of Gifted and Talented Students*. Englewood Cliffs, NJ: National Education Association.
- Van Tassel-Baska, J. (2003). *Curriculum Planning and Instructional Design for Gifted Learners*. Denver, CO: Love Publishing Co.
- Van Tassel-Baska, J. (2005). *Acceleration: Strategies for Teaching Gifted Learners*. Waco, TX: Prufrock Press Inc.
- Van Tassel-Baska, J., Quek, C., & Feng, A. X. (2006). The Development and Use of a Structured Teacher Observation Scale to Assess Differentiated Best Practice. *Roeper Review*, 29, 84-92. <http://dx.doi.org/10.1080/02783190709554391>
- Wenglinsky, H. (2011). Closing the Racial Achievement Gap: The Role of Reforming Instructional Practices. *Education Policy Analysis Archives*, 12, 1-17.