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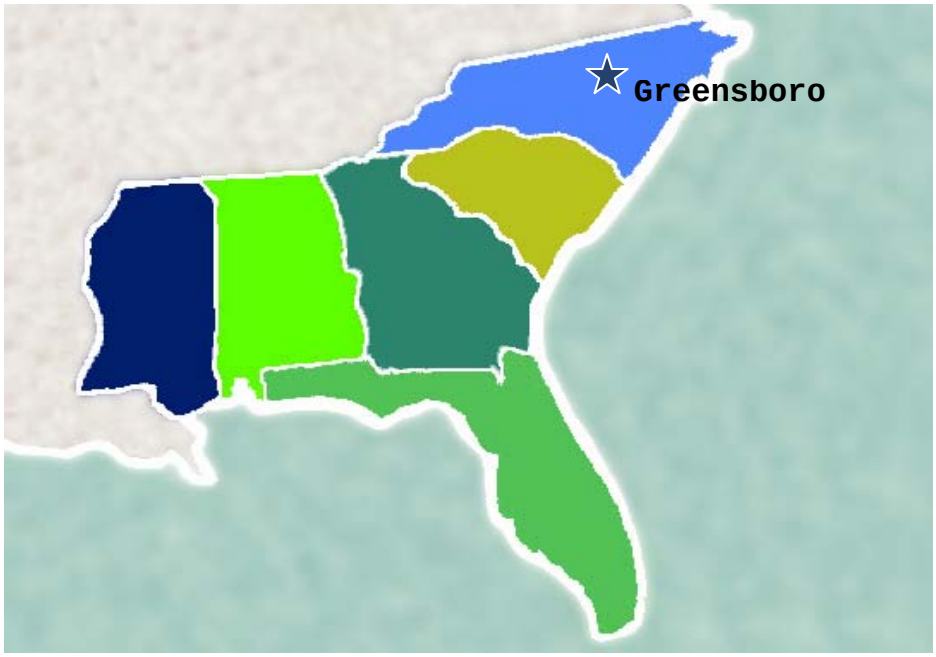
EVIDENCE BASED EDUCATION REQUEST DESK

OUR GOAL

To assist educators and policymakers in their efforts to apply the evidence base to decisions about policies, programs, and practices they encounter.



REQUEST:

Best practices in virtual learning environments for gifted students.

RESPONSE

Gifted students have unique educational needs. Although gifted students are as varied as other students in terms of their learning styles and preferences, all gifted learners have exhibited unusual performance or potential and they have distinctive characteristics, shared by most of these students, which require effective responses from educators. Research indicates that gifted students typically feel responsible for their own learning and often learn best alone; they may not need the structure provided by external organization of content and activities. Gifted students also tend to prefer tactile and kinesthetic learning, and may not respond as well to auditory learning modes. These students understand complex ideas, enjoy theory, and often prefer abstract themes and concepts. Gifted students tend to be open and flexible in their learning and to value logic and objectivity (Thomson, 2010). The characteristics gifted and talented students share present a challenge to educators. They must find ways to help these students learn effectively. Information technology offers a means to meet the challenge by merging research-based best practices for these students with online learning.

If you have any questions regarding this document, please contact the REL-SE, 1-800-755-3277 or RELSoutheast@serve.org

REL SOUTHEAST
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Online learning offers a "viable alternative and innovative means of educating K–12 students" (Holstead et al., 2008). Online courses offer students broader access to advanced courses and varied course offerings and to instructors not typically accessible through traditional classroom study. Technology supports differentiation as teachers integrate principles of gifted education into virtual learning environments based on curricular themes. These learning environments can merge core material with requirements that demand high-level thinking and active use of knowledge, avoiding repetition of mastered material while allowing time for challenging activities (Reis, 2010). They also allow teachers to enrich course offerings, providing learners access to virtual field trips, guest speakers and demonstrations, along with culture-rich experiences (Mulrine, 2007; Olszewski-Kubilius & Thomson, 2010; Reis & Morales-Taylor, 2010). The flexibility of technology based learning environments allows for the support of a range of student needs through the use of multimedia tools. Learning styles and product preferences can be accommodated as students use the Internet, online databases, scanned visuals, video links, and hyperlinks to complete assignments (Mulrine, 2007; Olszewski-Kubilius & Thomson, 2010). Students control the direction of their learning, building independent learning skills and a sense of responsibility for their own learning. Content can be matched to the needs of learners, and students can participate in flexible grouping and learn at an individually appropriate pace (Thomson, 2010). Students and teachers can benefit from well-planned virtual environments.

Research suggests that effective virtual learning environments employ strategies to ensure that they effectively support learning for gifted and talented students. These strategies center around two issues: self-regulation and communication. First, online coursework must be structured to help students direct and regulate their own learning (Thomson, 2010). This means providing clarity in assignments by incorporating clear expectations for performance and group participation, and providing clear instructions, timelines, and deadlines to students while also including flexibility and options for self-pacing as assignments are completed (Thomson, 2010). Teachers should create challenges that include higher-order learning opportunities and are student-centered and focused on authentic problems to spark reflection and enhance student outcomes (Mulrine, 2007). Virtual learning environments for gifted learners also need to support communication and the formation of student-teacher and peer-to-peer bonds. Instructors support communication and the development of community by modeling effective online communication—participating in discussions, monitoring affect, and improving the quality of discussions through encouragement and critical evaluation; opportunities for peer collaboration and peer-to-peer assessment also support strong communication (Thomson, 2010).

Curricula may need to be modified to meet the needs of gifted students (Mulrine, 2007). Gifted learners need content beyond that included in the regular curriculum, with the opportunity to learn at their own rate on projects that support critical and creative thinking and reflect their interests. Opportunities for activities that incorporate "hands-on, discovery-based, problem-oriented creativity generating" projects encourage engagement and motivation (Olszewski-

Kubilius & Thomson, 2010). Strategies for curriculum modification may include curriculum compacting, differentiation and enrichment, independent studies, and mentoring (Mulrine, 2007; Reis & Morales-Taylor, 2010; Thomson, 2010). Timely, frequent, specific feedback is important (Thomson, 2010).

Advocates believe that online learning can fill gaps present in traditional curricula by helping to meet the needs of underserved groups of students (Holstead et al., 2008). "…digital spaces are the contexts in which many gifted …students are spending their time (Hebert & Pagnani, 2010). Educators must understand the role of technology in the lives of today's young people and bring the practices that involve students during their hours outside school into the classroom. However, for technology based education to be effective, quality must follow constructivist principles by teaching and providing independence in terms of learning. Some virtual education is disappointing as it focuses on technological and aesthetic criteria at the expense of good educational practice. Often, high-quality educational principles fall by the wayside as programs and courses are developed (Barbera, 2004). In spite of this, technology based learning has the potential to meet the needs of many gifted students (Thomson, 2010).

Annotated Bibliography

Barbera, E. (2004). Quality in virtual education environments. *British Journal of Educational Technology, 35*(1), 13–20.

Abstract by EBSCO: The emergence of the Internet has changed the way we teach and learn. This paper provides a general overview of the state of the quality of virtual education environments. First of all, some problems with the quality criteria applied in this field and the need to develop quality seals are presented. Likewise, the dimensions and subdimensions of an empirical instrument to improve and assess the quality of online education are examined. This tool has already been applied to several educational contexts; though not definitive, it aims to improve not only specific areas, but also the whole educational approach as a system.

Berger, S. (2007). Online learning: Expanding the possibilities while simplifying the process. *Understanding Our Gifted, 19*(4), 3–5.

Abstract by EBSCO: Following on the heels of charter schools, virtual high schools have gradually become more common. Typically, they are technology driven magnet schools with competitive admission. Many are free and actively recruit traditionally underserved students. Parents of highly gifted children often cobble together academic solutions—a college class here, a summer enrichment program there—to meet the needs of their children. Online learning expands the possibilities while simplifying the process. Today, there are options available for those who want to pursue a virtual education from one subject to their entire curriculum. Two

examples geared specifically to gifted students are: (1) Stanford's Education Program for Gifted Youth (epgy.stanford.edu/courses/); and (2) The Center for Talented Youth (cty.jhu.edu/cde/index.html). Today, the Internet empowers students to be more independent and creative—in some instances, changing students from information consumers to media producers. Today, the Internet is a social networking tool, with content contributed by anyone and everyone. People used to call this approach to education "user-centered," "child-centered," or "constructivist" education. Users can upload, view, and share video clips. They can also create blogs, where they share information in the form of commentary on a particular topic. Young people can also create their own websites. Technology has come a long way in the last 10 years. It now offers many more exciting and innovative ways for gifted young people to learn.

Casey, R., Smith, C., & Koshy, V. (2011). Opportunities and challenges of working with gifted and talented students in an urban context: A university-based intervention program. *Gifted Child Today, 34*(1), 35.

Abstract by EBSCO: The article looks at the experience of educators who work with talented and gifted urban students, focusing on an intervention program at Brunel University in Middlesex, England. Gifted students accepted to the program comment on their educational opportunities. The author discusses the criteria for selecting gifted urban students for the program, including those who receive free school lunches and have demonstrated analytical thinking skills.

Dillon, P., Wang, R., & Tearle, P. (2007). Cultural disconnection in virtual education. *Pedagogy, Culture & Society, 15*(2), 153–174.

Abstract by Author: This paper reports a small-scale investigation into the differences in learning behavior exhibited by members of an intercultural group undertaking an online course on educational enquiry in support of doctoral research in education. Differences in learning behavior can be attributed in part to the different cultural and linguistic backgrounds of the participants. As virtual learning environments are seldom designed to accommodate cultural diversity, there is often a disconnection between the intended and the actual experiences of the participants. This study explores the characteristics of this disconnection. It is suggested that virtual learning environments should be designed to take account of the mutual transformation of both learner and environment in educational processes. Some technological developments that may lead to virtual learning environments becoming adaptive are described. However, it is emphasized that inclusivity will depend upon an adaptive dynamic in the virtual learning environment that is essentially social.

Freiman, V., Manuel, D., & Lirette-Pitre, N. (2007). CASMI: Virtual learning collaborative environment for mathematical enrichment. *Understanding Our Gifted, 19*(4), 20–23.

Abstract by EBSCO: Challenging problems can make mathematics more attractive to all learners, including the gifted. Application problems that one still finds in regular textbooks often can be resolved by applying a single mathematical concept, operation, or formula. These problems do not require a higher order of thinking. They are, therefore, less cognitively and metacognitively demanding, and gifted students may find them to be too easy. In fact, the level of mathematical abilities in bright youngsters is often so high that they see solutions right away after reading a problem only once. Research shows that there is a lack of pedagogical resources to engage these students in more complex cognitive activities, hence making them construct new knowledge. Thus, more challenging, open-ended investigative tasks are needed to support genuine learning. While options for developing mathematical talent in and out of the classroom have previously been used, online learning represents a new spectrum of experiences for mathematically gifted students. The NRICH program (nrich.maths.org) is among recent studies reporting a positive effect of virtual problem-based environments on pupils' motivation toward mathematics. The Math Forum (www.mathforum.org) project is built on the idea of interaction between members of a virtual community around participant-generated services and resources. Teachers, mathematicians, researchers, students, and parents learn math and improve math education through the Internet. The CAMI site was created in 2000 at the Faculte des sciences de l'education at the Universite de Moncton, Canada. It provided a place where K–12 children from the French New Brunswick community could solve challenging mathematical problems that were posted online. Their solutions were then sent by email to personal preservice teachers who provided feedback. Enthusiastic about the success of the CAMI project, the authors started a new venture aiming to create even closer community links and provide students with more challenging opportunities. This improved project was named CASMI (Communaute d'Apprentissages Scientifiques et Mathematiques Interactifs). In this article, the authors describe the Virtual Mathematics and Science Problem Solving Community CASMI and present an example of a CASMI problem.

Geddes, K. A. (2011). Academic dishonesty among gifted and high-achieving students. *Gifted Child Today, 34*(2), 50.

Abstract by EBSCO: The article discusses research regarding academic dishonesty in gifted students. A study in 2009 at a small, religion-affiliated university revealed that 75% of the surveyed students participated in cheating. Students surveyed at three suburban high schools cited unfairness or incompetence of the teacher as causes for cheating.

Hebert, T. P., & Pagnani, A. R. (2010). Engaging gifted boys in new literacies. *Gifted Child Today, 33(*3), 36–45.

Abstract by EBSCO: This article illustrates the serious challenge of engaging boys in reading and writing which has become more complex and even influences the lives of gifted adolescent males. This article attempts to address this concern. In order to do so, the authors examine the scholarly literature on boys' reading preferences and report findings from that work. This is followed by a discussion of the role of new literacies—digital technologies—as new ways to capture the reading and writing interests of males to develop their abilities in these domains. They then discuss specific strategies and methods for getting gifted boys more engaged in literacy activity. They conclude their discussion with a listing of recommended reading materials for elementary and middle school males, as well as resource materials and websites to support educators.

Holstead, M., Spradlin, T., & Plucker, J. (2008). ***Promises and pitfalls of virtual education in the United States and Indiana.*** **Center for Evaluation and Education Policy,** ***6*****(6).**

Abstract by Author: This policy brief will examine the main aspects of virtual education to provide a summary of the current status of virtual education in the United States. Although there are many issues that surround virtual education, this policy brief will focus on the primary issues of funding, program and teacher quality, and administrative oversight and accountability. Finally, policy recommendations are offered for education leaders and policymakers to consider as a means to moving virtual education forward in the state of Indiana.

Hull, D. F., Bull, K. S., Montgomery, D., May, J. R., & Overton, R. (2000). ***Designing an online, introductory gifted education course.*** **Capitalizing on Leadership in Rural Special Education: Making a Difference for Children and Families: Alexandria, VA.**

Abstract by EBSCO: Rural teachers are often undertrained in the identification and education of gifted students. This paper describes the principles and development of an online introductory course in gifted education that could meet the need for rural teacher training. Using the philosophy that learners construct their own knowing, the system for developing an online course must be consistent with the idea of authentic problem-solving. Learners are then able to transform information into knowledge. To promote active learning, the instructional system contains primary source materials, support, and information to manipulate. Content is presented from diverse perspectives via multiple modes of representation. The teacher coaches and helps students analyze learning and problem-solving strategies. Tasks are accessible to learners when they are ready for them and have patterns that can be transferred to future tasks with scaffolding. The design is holistic and spiral, allowing learners to return to the content at successively higher levels of understanding. E-mail, a listserv, and interactive databases encourage the development of a collaborative learning community; 15 characteristics of such a community are listed. Course development included development of the syllabus, with instructions and links to other course

components; a threaded discussion database for asynchronous student interaction; a database of products and projects created as part of course requirements; a multigenerational archive; and the home page.

Jefferson, R. N., & Arnold, L. W. (2009). Effects of virtual education on academic culture: Perceived advantages and disadvantages. *US-China Education Review, 6*(3), 61.

Abstract by Author: The perceived advantages and disadvantages of courses taught in online and face-to-face learning environments were explored for students taking an accounting and a data-collection and analysis course. Both courses were taught in a face-to-face learning environment at the main or satellite campus. It was hypothesized that there would be statistically significant differences in the perceived advantages and disadvantages of courses taught in online and face-to-face learning environments. Results showed statistically significant differences between perceived advantages and disadvantages for both learning environments. Findings suggest that there are differences between the perception of advantages and disadvantages for online and face-to-face learning environments.

Lovett, P. (2011). Solutions for Jay and other underrepresented gifted minority students. *Gifted Child Today, 34*(1), 55.

Abstract by EBSCO: The article looks at the lack of representation of minority students in gifted child education programs, focusing on the experience of an African American student named Jay. Factors that can inhibit the participation of culturally diverse students in gifted child education programs are reviewed. The author comments on how Jay's school provided him with counseling and found a mentor to help him with his studies.

Ma, L., Vogel, D., & Wagner, C. (2000). Will virtual education initiatives succeed? *Information Technology & Management, 1*(4), 209.

Abstract by Author: “The use of information technology to enhance teaching and learning processes has been practiced for a number of years now. However, the rapid growth in the use of the Internet has led to a new dimension in interactive and collaborative learning anytime and anyplace dynamically. With the explosion of "virtual education initiatives," the question of the feasibility and success criteria for such projects quickly arises. To address the question in an organized way, we propose a project assessment based on critical success factors. Hence, in this article, we draw on a widely recognized critical success factor framework. We (slightly) adjust the framework to fit the special characteristics of virtual education initiatives and apply to one case study, namely the virtual education initiative at the Faculty of Business at the City University of Hong Kong. The results suggest that the past success of the case is due to the

adherence to the large majority of critical success factors. However, it also outlines some areas of concern. The paper concludes with a discussion on the strength and limitations of virtual learning environment as well as future directions."

Moyo, S. (2003). Distance learning and virtual education for higher education in Africa: Evaluation of options and strategies. *African & Asian Studies, 2*(4), 497–521.

Abstract by Author: "This paper briefly reviews the status of distance education and virtual education in the higher-education sector in Africa. The key issues affecting distance education in Sub-Saharan Africa (SSA) are identified and discussed. An analysis of the major issues facing distance education in SSA is made. It is noted that the full range of opportunities offered by information and communication technology (ICT) for higher education in Africa is largely underexploited. Factors responsible for this situation are identified and a range of strategies is recommended for resolving this situation. Finally, a model of distance education that can potentially enhance the use of ICT in higher education in SSA is proposed."

Mulrine, C. F. (2007). Creating a virtual learning environment for gifted and talented learners. *Gifted Child Today, 30*(2), 37–40.

Abstract by EBSCO: This article illustrates how teachers can infuse best practices from both gifted and talented education and information technology to benefit gifted and talented students through the creation of a virtual classroom learning environment. The author has used this assignment in an assistive technology course as an assignment for teacher preparation candidates. It is important to prepare teachers to not only use technology but also to integrate it into instruction. This type of activity can be used by teachers of gifted and talented students to merge their subject matter with the Internet.

Olszewski-Kubilius, P., & Thomson, D. L. (2010). Gifted programming for poor or minority urban students: Issues and lessons learned. *Gifted Child Today, 33*(4), 58.

Abstract by EBSCO: This article reports on gifted education programs for poor and minority students in urban schools. The article discusses achievement gaps in poor students and the socioeconomic factors that cause disparities. Information is provided on school funding, curriculum planning, and the availability of programs for gifted students to address their psychological and social needs.

Reis, S. M., & Morales-Taylor, M. (2010). From high potential to gifted performance: Encouraging academically talented urban students. *Gifted Child Today, 33*(4), 28.

Abstract by EBSCO: This article reports on the education of gifted students in the Northeastern U.S. in terms of programs, resources, and private schools. The article discusses urban gifted children and how many programs to address their education are unfunded because resources are directed at low-achieving students instead. Information is provided on the Renzulli Academy in Hartford, Connecticut, and its curriculum, policies, and philosophy.

Schneider, J. (2009). Besides Google: Guiding gifted elementary students onto the entrance ramp of the information superhighway. *Gifted Child Today, 32*(1), 27–31.

Abstract by EBSCO: For gifted students, the power of the Internet is its vastness. Students can access extensive resources that far exceed the collections in their classrooms or school library. Especially with the rapid growth of the Internet during the last decade, the gateway to a rich array of sophisticated resources is literally a click away. Curriculum content can be differentiated by complexity and depth, and those gifted students with the ability to process large amounts of information quickly (Siegle, 2004) can race down the information highway at breakneck speeds. "The Internet is the single most significant technology available to gifted and talented students."

Searson, M., Jones, W. W., & Wold, K. (2011). Reimagining schools: The potential of virtual education. *British Journal of Educational Technology* [Editorial], *42*(3), 363–371.

Abstract by EBSCO: The article summarizes a presentation on virtual education given by the director of the U.S. Department of Education's Office of Educational Technology, Karen Cator, during the National Technology Leadership Summit, held in Washington, D.C., on September 30 and October 1, 2010, and recommendations from the Summit for action by the U.S. federal government. Topics include an overview of kindergarten (K) –12 virtual education, the impact on advances in virtual education from lack of an informed research base and proactive thinking, and the importance of teacher training in advancing quality virtual education.

Thomson, D. L. (2010). Beyond the classroom walls: Teachers' and students' perspectives on how online learning can meet the needs of gifted students. *Journal of Advanced Academics, 21*(4), 662–712.

Abstract by Author: Online learning programs have the potential to provide gifted students expanded access to advanced courses, but little research has been conducted on how well or in what ways the online environment is a good match for gifted students. The study presented here

is an in-depth qualitative and quantitative investigation of the perceptions and experiences of academically talented students and their teachers about courses offered through an online program designed specifically for gifted students. Participants in this study included 28 instructors currently teaching at least one online course and 65 students in grades 3–12 currently enrolled in at least one online course offered by a supplemental school offering both online and face-to-face programming for gifted students. According to the gifted students and teachers interviewed and surveyed in this study, the online format is conducive to a more individualized and differentiated learning experience than is often possible in a regular classroom. Students are able to work at a pace consistent with their rate of learning, have more time to reflect, to feel more in control of the learning process, and to engage in more self-directed and independent learning. These benefits and others indicate the online programming can be an effective means of meeting the needs of many gifted students.

Thongprasert, N., & Burn, J. (2003). Identifying strategies for effective virtual education delivery in Thailand. *PACIS 2003 Proceedings.* **Paper 23. http://aisel.aisnet.org/pacis2003/23**

Abstract by Author: Increasingly, universities in Thailand are shifting towards virtual education delivery (VED) using information and communication technology to facilitate knowledge sharing and to gain competitive advantage. Little however is known about the way in which Thai society will adapt to the use of online instruction both from the teaching and learning communities. This study was designed to examine the critical success factors for implementing VEDs in Thailand, and to identify ways to facilitate such adoption and lead to effective outcomes. The study incorporated an analysis of three specific factors related to Thai culture: high power distance "Bhun Khun," uncertainty avoidance "Kreng Jai," and collectivism "Kam Lang Jai." This paper reviews the development of the research model, describes the conceptual underpinning of the cultural model, and presents the preliminary findings of the study.

Versluis, A. (2004). Virtual education and the race to the bottom. ***Academic Questions, 17*****(3), 38–51.**

Abstract by EBSCO: Article Discusses the implications of virtual education for the quality of higher education in the U.S. Comparison between virtual education and traditional higher education; Threat posed by online universities to traditional universities; Criticisms against the efforts of the World Bank in promoting a corporate model for universities; Role of educational corporations in driving the deregulation of higher education.

White, G., Lare, D., Mueller, S., Smeaton, P., & Waters, F. (2007). The virtual education academy: A novel approach to engaging at-risk students. *Kappa Delta Pi Record, 44*(1), 13–17.

Abstract by EBSCO: Current efforts to encourage students to persist are not stemming the tide of drop-outs. Estimates of the high school dropout rate range from 10–30 percent (Hardy, 2002). The impact of having no high school diploma causes these students to experience economic and social struggles throughout the time in life that should be their most productive. One group of students at risk of dropping out includes those who receive homebound instruction because of extended illness, psychological problems, or serious behavioral issues. Traditionally, these students have been taught via expensive one-on-one instruction. The number of homebound students has been increasing, and districts are anxious to explore alternatives to reduce expenses and meet the needs of these students. With the goal to keep students in school until graduation and address the complex needs of excluded and homebound at-risk secondary students, a partnership was forged among two school districts, faculty members from a small state university, and a university-based technology company specializing in distance education. Supported by a U.S. Department of Education Fund for the Improvement of Education Earmark Grant, the partnership designed an online educational program, the Virtual Education Academy (VEA), for homebound and excluded secondary students. Here, the development, implementation, and impact of this partnership are described.

Wiskow, K., Fowler, V., & Christopher, M. M. (2011). Active advocacy: Working together for appropriate services for gifted learners. *Gifted Child Today, 34*(2), 20.

Abstract by EBSCO: The article describes schools' frequent lack of support for gifted students and how parents and teachers can advocate for them to meet their special needs. According Gallagher's advocacy model, it is critical that advocates have a working knowledge of the decision-making process of the school or university that their child attends, and must carefully refine a message about what they want to accomplish for gifted students.

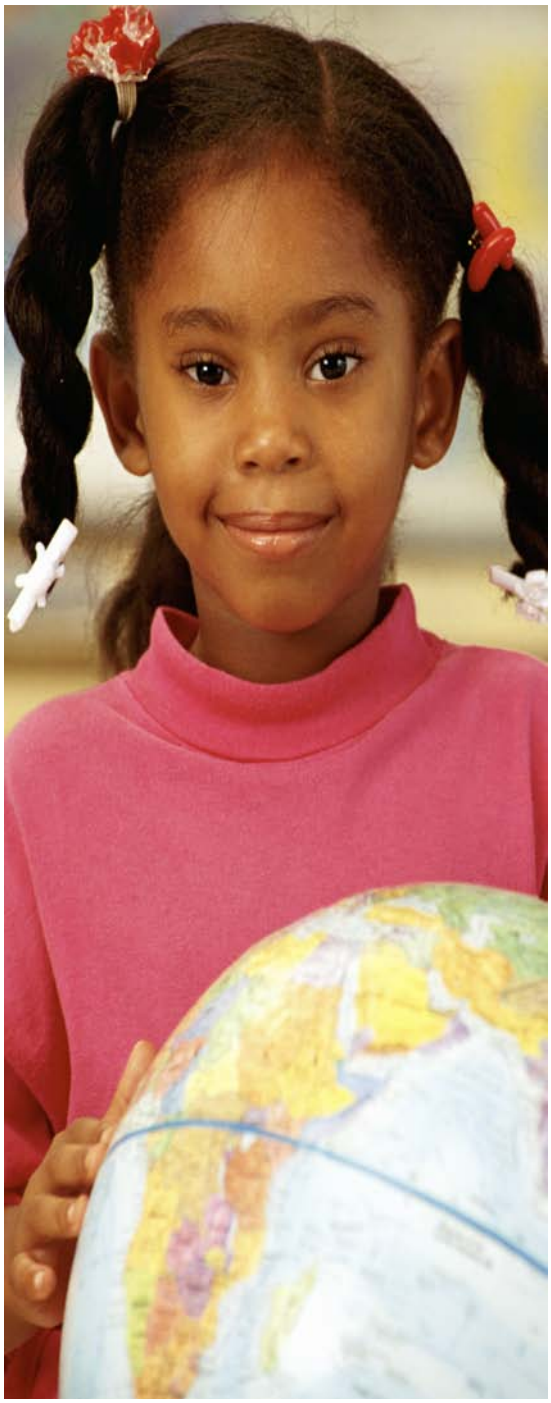
Methodology

This document is based on a search of the following resources, using the indicated search terms.

Databases used:
Google; Google Scholar; Academic Search Premier; ERIC; EBSCO Premier Databases

Search terms used:
Gifted and on line
Gifted and technology
Gifted and virtual learning

Gifted and virtual learning environments
Gifted education
Gifted and e learning
Gifted and high achievement
Gifted and electronic
Gifted and high performing



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Karla Lewis
1.800.755.3277
klewis@serve.org

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