Role of 21st Century Schools *in* Promoting Health Literacy

Tami Benham Deal
University of Wyoming

Bonni Hodges
SUNY Cortland

NEAHIN
NATIONAL EDUCATION ASSOCIATION
HEALTH INFORMATION NETWORK

According to the Institute of Medicine [IOM] (2004), the education system is one of three potential points of intervention for developing a health literate population. In many schools today there are current structures in place that can contribute to improved health literacy, either directly or indirectly. Classroom based health education, sometimes called comprehensive school health education, can directly impact students' health literacy through instruction and formative assessment. Schools also can support the achievement of health literacy through the implementation and use of the Coordinated School Health Program approach (CSHP; Centers for Disease Control and Prevention (CDC, n.d.). This approach involves a process of systematic engagement of different components of both the educational institution and the community to promote good health and academic achievement. The purpose of this paper is to more fully examine how classroom-based health education and the CSHP approach can impact students' health literacy. We will explore current initiatives in health education and identify gaps in our understanding. Recommendations for future programming and research will also be provided.

Health Literacy Defined

In its publication, Health Literacy – A Prescription to End Confusion, the IOM (2004) adopted the following definition:

> The degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions (Ratzan & Parker, 2000).

This definition emphasizes the importance of students developing skills necessary to navigate the health care system, including the ability to access and use valid sources of health information, products and services and the ability to make healthy decisions. Dr. Rima Rudd of the Harvard School of Public Health (Proceedings of the Surgeon General's Workshop on Improving Health Literacy 2006) contends that health literacy includes basic literacy skills related to reading, writing, speaking, and listening; basic mathematical skills; and conceptual knowledge skills. She stresses the importance of the "ability to read, understand, and act on health information in everyday life" (Proceedings of the Surgeon General's Workshop on Improving Health Literacy 2006). This is consistent with the World Health Organization's view that health literacy is more than just reading health-related pamphlets and making appointments. Instead, it represents the "achievement of a level of knowledge, personal skills and confidence to take action to improve personal and community health by changing personal lifestyles and living conditions" (Nutbeam, 1998). The development of health literacy is a hierarchical process; that is, it arises from a progression of skills used to function in everyday situations (e.g., reading, writing, numeracy skills), interact and communicate in a dynamic fashion (e.g., applying new information to a constantly changing world), and critically analyze health information and use it to enhance health (Nutbeam, 2000). Crucial to the achievement of critical health literacy is the degree to which people are able to take action and control over their lives and their health.

Modern School Health Programs

Health literacy is an important outcome of the public health care and public education systems. The goals and expectations of 21st century schools in promoting health literacy may vary, however, depending on which perspective is taken (i.e., public health v. public education). The goal of public education is to increase students' knowledge and skills, while a goal of public health is to reduce the burden of mortality and morbidity from disease *(see figure 1)*.

Figure 1. Public education and public health goals

Maintaining and improving health is frequently addressed through three levels of public health intervention (i.e., primary, secondary and tertiary prevention). In this case, primary prevention refers to keeping health problems from occurring; secondary prevention refers to actions that will address health problems and limit further progression, including health-compromising behaviors; and tertiary prevention refers to rehabilitation following a significant health problem. Schools can play a role in both primary and secondary prevention. Lloyd Kolbe (2002, 2005) has

provided a framework for modern school health programs that helps to differentiate these roles. Improving health knowledge, skills, and attitudes that are inherent to health literacy is what Kolbe refers to as Type I goals. He contends that these goals are "a fundamental purpose of schools, irrespective of whether measured health behaviors or health outcomes also improve as a consequence" (p. 6). Primary prevention is achieved through health literacy instruction and practice that takes place in classroom-based health education. Kolbe differentiates this goal from others that are specific to broader school health programs and that serve a secondary prevention role in developing health literacy. He specifies improving health behaviors and outcomes as Type II goals for school health programs. These are the public health goals that initiatives such as Safe and Drug-Free Schools and Coordinated School Health Programs (CSHP) are designed, in part, to achieve. Improving educational and social outcomes are additional goals of modern school health programs and can be achieved through the CSHP approach. Thus, primary prevention occurs through health education instruction and practice at the classroom level and primary and secondary prevention can occur through the coordinated and interdependent efforts of schools and communities.

Classroom-based Health Education

Classroom-based health education is the nucleus for developing health literacy in today's children and adolescents. National health education standards (NHES) for classroom-based health education have been developed in an effort to identify what students should know and be able to do in order to be health literate (Joint Committee on National Health Education Standards, 1995, 2007). They include skills such as accessing valid sources of health information, products, and services; the process of decision making; analyzing factors that influence health decisions and setting goals as a product of those decisions; and interpersonal communication and advocacy *(see figure 2)*. A majority of states (75%) have adopted policy that requires schools to follow either the NHES or state health education standards (Kahn, Telljohann, & Wooley, 2007), and health literacy is often identified by states as the intended outcome. The Council of Chief State School Officers (CCSSO) State Collaborative on Assessment of Student Standards (SCASS) Health Education Assessment Project (HEAP) is a group of state and local education agencies that provide guidance to schools in their states about classroom-based health education assessment and instruction. Since its inception, 40 states have belonged to the HEAP at one time or another. This organization contends that the goal of school health education is to develop students who are health literate by equipping them with the knowledge and skills they need in order to make responsible decisions that lead to lifelong healthy behavior (CCSSO, 2006; Marx, E., Hudson, N., Benham-Deal, T., Pateman, B., & Middleton, K, 2007). This goal is consistent with the World Health Organization (WHO) definition of health education:

> Consciously constructed opportunities for learning that involve some form of communication designed to improve health literacy, including improving knowledge, and developing life skills which are conducive to individual and community health (Nutbeam, 1998, p.353).

The WHO distinguishes between health education and health promotion. Health promotion is viewed more broadly in that it is a "process of enabling people to increase control over the determinants of health" (Nutbeam, 1998, p. 351), which includes modifiable factors such as health behaviors and lifestyles. The Joint Committee on National Health Education Standards (2007) and the American Association of Health Education (2008) recognize health literacy as the intended outcome of the standards, but specify the adoption and maintenance of healthy behaviors as the goal of school health education, a position advocated by some in school health education (Governali, Hodges, & Videto, 2005). This has left some in the field to wonder if there has been a shift in philosophy away from health literacy as the goal of health education toward the public health promotion goal of behavior change. Current federal legislation that governs education

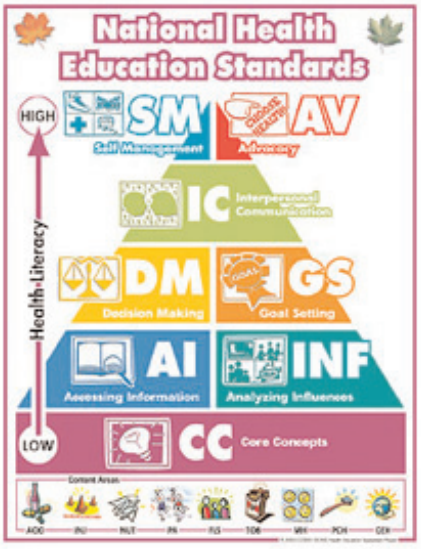

Figure 2. Achieving health literacy through the National Health Education Standards

(i.e., NCLB) requires schools to offer curricula that are aligned to rigorous state standards that delineate what students must know and can do and to develop accountability systems that show the effectiveness of schools in helping students achieve the standards. Given this mandate and the pressure it places on schools to demonstrate accountability, it is not surprising that concern has been raised about the possible misalignment between public health goals related to health behavior and education goals of increasing knowledge and skills (Benham-Deal & Hudson, 2006).

It is possible that what appears to be a shift in direction of health education goals is really just a product of differences in terminology used in public education and in public health. In educational language, goals are specific statements that outline what students will learn. These are generally articulated in knowledge, skills and attitudes that are measureable and used to determine academic success and accountability. In contrast, educational aims are general statements that provide direction to more specific actions (such as curriculum design) and often are used to articulate life or work outcomes, but are not easily measured. Using this framework, developing students who make healthy decisions and engage in healthy behaviors throughout their lifetime would be the general aim of health education. In order for students to develop those lifelong behaviors, they must first develop the "capacity to obtain, interpret, and understand basic health information and services and the competence to use information and services in ways that enhance their health" (Joint Committee on National Health Standards, 2007, p. 119). In other words, they must become health literate. The American School Health Association (2008) suggests that differences in terminology may be a product of "ideological gaps" between professionals in education and those associated with health promotion and school health programs. A national conversation that focuses on adopting common terminology is needed to determine if there is consensus or disagreement about the educational aims and goals of health education, both at the classroom level and at the school and community level.

Traditionally, health education curriculum has been problem-based. Instructional units were organized around health risk behaviors associated with content such as nutrition, alcohol and other drugs, tobacco, and family life and sexuality. Some experts are now proposing that to improve health literacy, a redesign of curriculum and instructional delivery is warranted. Benham-Deal & Hudson (2006) have proposed that a skills-based approach better lends itself to the development of health literacy. Techniques for fostering health literacy through skill instruction are beginning to appear in the professional literature (e.g., Brey, Clark, & Wantz, 2007, 2008). In this approach instructional units are organized around the health skills that lead to improved health literacy, and core concepts about health are used as the context with which these skills are learned and practiced. This approach is consistent with Nutbeam's (2008) proposal that health literacy should not be viewed as a problem to be solved, but as "an asset to be built, as an outcome to health education and communication that supports greater empowerment in health decision-making" (p. 3). His conceptual model of health literacy as an asset holds great promise for guiding the field into a new era of health education curriculum development and delivery. One step in this direction is to tailor health education instruction to meet the developmental needs of students, which in part requires teachers to recognize the hierarchical nature of health literacy. Nutbeam (2000) has described these in terms of what they allow us to do – to function in everyday situations by using basic reading and writing skills (i.e., basic/functional literacy), to communicate and transfer meaning to new situations by using advanced cognitive, literacy, and social skills (i.e., communicative/interactive literacy), and to critically analyze information and use it to control our actions (i.e., critical literacy). It also requires teachers to focus on the development of self-efficacy so that students are confident and empowered to make healthy decisions.

Developing the capacity to read and understand health information and the competence to use that information in health enhancing ways is dependent upon basic reading, writing, and numeracy literacy. Research shows that learning occurs best when classroom discussions and activities are meaningful and functional (Greeno, 1998) and that it is enhanced when teachers provide opportunities for students to apply their cognitive skills to a personal issue or problem (Darvin, 2006). Many children's books contain authentic context and messages about health concepts and situations and could be used to support the development of basic reading, writing, and health literacy. With curriculum re-design, educators also must be cognizant of the growing number of adolescents who are unable to read at grade level (National Center for Education Statistics, 2007), the need for educational materials to be reading level appropriate and the influence media has on the actions of adolescents (Manganello, 2008). Often health-related documents such as pamphlets, consent forms, and instructions are written at reading levels that are beyond

the adolescents' ability (El-Ibiary & Youmans, 2007; King, Winton, & Adkins, 2003; Kirksey, Harper, Thompson, & Pringle, 2004). Failing to develop basic literacy needed to read and understand these materials will be a barrier to ultimately achieving critical health literacy. The CCSSO-SCASS-HEAP has developed an innovative Web-based tool that may help to overcome this barrier. This Web-based assessment system provides teachers with the ability to search a database of 1,800 assessment items for those that align with students' reading levels and to examine how assessment prompts can be modified to elicit different levels of cognitive complexity. This system also allows teachers to search for children's books that can be used to enhance health literacy and to view strategies for integrating instruction in health literacy and basic reading and writing literacy.

The goal of achieving critical health literacy is consistent with the skills students will need to master in order to succeed in work and life in the 21st century. The Partnership for 21st Century Skills (n.d.), a leading advocacy group that focuses on infusing 21st century skills into education, has identified three types of skills that are essential for students to master: (1) learning and innovation skills (e.g., critical thinking/problem solving, communication/collaboration), (2) information, media, and technology skills (information literacy, media literacy, information-communications-technology literacy), and (3) life and career skills (e.g., initiative and self-direction, social and cross cultural skills, leadership and responsibility). These 21st century skills are inherent to the skills-based approach to teaching health education. In the skills-based classroom, students evaluate printed and electronic sources of health information and services to determine the validity of those sources. They analyze internal and external influences on their health choices and behaviors. They learn how to make appropriate health-related decisions and set appropriate health goals. They also develop skills that enable them to manage their health behaviors and reduce their health risks. They practice engaging in interpersonal communication and advocating for personal and community health. In order to achieve critical health literacy, it is essential that teachers incorporate higher levels of cognitive demand in their instructional activities and formative assessment practices, as well as their benchmark and summative assessments.

St Leger (2007) suggests that the traditional structure and function of schools, teachers' practices and skills, and time and resources are challenges that must be overcome if the goal of critical health literacy is to be achieved. These challenges can be addressed through education reform initiatives such as secondary school redesign, especially by way of theme teaching across the curriculum and the development of career cluster courses. The Partnership for 21st Century Skills (n.d.) contends that schools should promote understanding of academic content at much higher levels by weaving 21st century interdisciplinary themes such as health literacy throughout the entire school curriculum. If courses are developed that have critical literacy (including reading, writing, health, media, numeracy, financial, and global literacy) as the endpoint, health education can play an integral role in the academic planning of secondary schools.

21st Century Classroom-Based Health Education – Future Agenda

Scientific research that examines the effectiveness of literacy-based health education on students' functional, interactive, and critical health literacy, along with funding to support that research, are needed. Before examining the effectiveness of health literacy instruction, however, we need to understand more about health literacy in children and adolescents. The limited health literacy of American adults has been well documented (see Paasche-Orlow, Parker, Gazmararian, Nielsen-Bohlman, & Rudd, 2005, for systematic review), but research on health literacy in youth is limited, if non-existent. In part, this may be because funding for research and health education programming in the United States historically has been through funding streams that are content or behavior driven (e.g., health risk behaviors, obesity and physical activity, HIV-AIDS, etc.). Health literacy has become a funding stream from the National Institutes for Health, and this may produce data to help us better understand the status of youth health literacy. However, more support for applied and action research is needed. Valid instruments that measure and delineate the different levels of health literacy are needed (Nutbeam, in press; Chisolm & Buchanan, 2007) and Web-based assessment systems such as the one developed by the CCSSO-SCASS HEAP should be explored as a means for conducting statewide and nationwide data collection and analysis. Once these measurement tools are available, research can be conducted on the implementation and effectiveness of classroom-based health education in developing the important knowledge, skills, and self-efficacy that students need in order to be health literate.

Supporting professional development, either through pre-service education or in-service training, also is key to

improving the health literacy of students. University and college teacher preparation programs have been criticized for the apparent disconnect between coursework and practical applications (American Federation of Teachers, 2007). If health literacy is the goal of classroom-based health education, then health literacy instruction and assessment practices should be integral to teacher preparation programs in health education and elementary education. Health education teacher certification requirements and examinations also should focus on teaching and assessing health literacy.

Coordinated School Health Programs (CSHP)

Since 1998 it has been clear to health education professionals that a Coordinated School Health Program approach is important to the success of health education in the K-12 schools (Marx , Wooley, &, Northrup, 1998). CDC's eight-component Coordinated School Health Program [CSHP] *(see figure 3)* approach provides infrastructure for the development and practice of health literacy and includes parts of all

Figure 3.
The CDC Coordinated School Health Program

three of the IOM's health literacy intervention points: culture and society, the health system, and the education system. When the CSHP is fully implemented the components (health education; physical education; nutrition services, faculty/staff wellness and health promotion; counseling and psychological services; health services; healthy school environment; and community and family involvement) work together within and outside of the education system to develop and support health literate individuals and systems.

The CSHP approach looks at schools and districts as "communities" that can organize around health assets and needs (Hodges, 2008). It clearly provides the structure (Blackwell & Colmenar, 2005) in which education, health, social service professionals, community members, and parents work collectively, strengthen connections, increase community competence in confronting health problems, and develop new standards and expectations for health literacy. It builds upon existing relationships within and beyond school buildings and is sensitive to the particular needs and assets of schools and districts. The healthy school and district teams that coordinate a CSHP include representatives from all eight components. These teams set priorities, and they develop and facilitate the implementation of school and district-wide health-related programs that marshal and utilize the unique strengths and capabilities of each component to create synchronized approaches to health issues. One of the hallmarks of the CSHP approach is that changes and actions in one component affect and are affected by the others, and when all components are acting in unison, powerful environmental support and community building for health literacy can be achieved.

Taking a broad view, the CSHP represents a microcosm of the larger community in which the districts and the schools are located, and includes education (e.g. health education, physical education), health care (e.g. health services, psychological and counseling services) environmental, and socio-cultural systems interacting within the micro-system. The CSHP approach can foster community building around health literacy, strengthening the health literacy skills not only of youth and children in the schools, but also of its adult community. The role of school health education is to foster health literate individuals empowered to work toward seeking and maintaining their own health and the health of others. The CSHP structure encourages and supports the practice of health literacy skills by students and other community members, reinforcing its importance and creating an environment in which health literacy is developed, supported, and expected. Skills taught through classroom-based health education are practiced through interactions with the other components (e.g. visits to the school nurse and guidance counselors; advocating for healthier school lunches), and the involvement of parents and other community members in health initiatives can include educational activities for improving their health literacy.

It is strongly recommended that schools and districts conduct the Centers for Disease Control and Prevention's

School Health Index (SHI) (CDC, 2004) to assess readiness for or implementation of CSHP. The SHI is a self-assessment and planning guide that assists schools in identifying strengths and weaknesses of health and safety policies and programs. It consequently enables the schools to develop action plans for improving the CSHP and ultimately students' health. It is recommended that schools utilize the SHI and use the resulting action plans as a resource for developing and improving school health and safety programs and policies at their schools. While not explicitly assessing functional health literacy of the CSHP components, the SHI process has resulted in discussions of and action plans around improving health-related communications and access within and among the eight components (Videto & Hodges, 2008).

The broader educational system, disciplines beyond health and physical education, and the health care system within schools and districts are also key players in fostering health literacy (Nutbeam, 2000; *see figure 4*), but those systems themselves, and the individuals who are part of these systems, need to be health literate The interactive, multidirectional CSHP approach can move all of these systems toward health literacy. For example, CSHP can foster collaboration among health education, mathematics, English/ESL, and social studies where they all use diet and nutrition as a framework for developing discipline-related, NHES, and 21st century skills. Using the CSHP approach, a healthy school or district team would have identified obesity as a priority area in need of being addressed and

Figure 4.
All academic disciplines have a role in building health literacy.

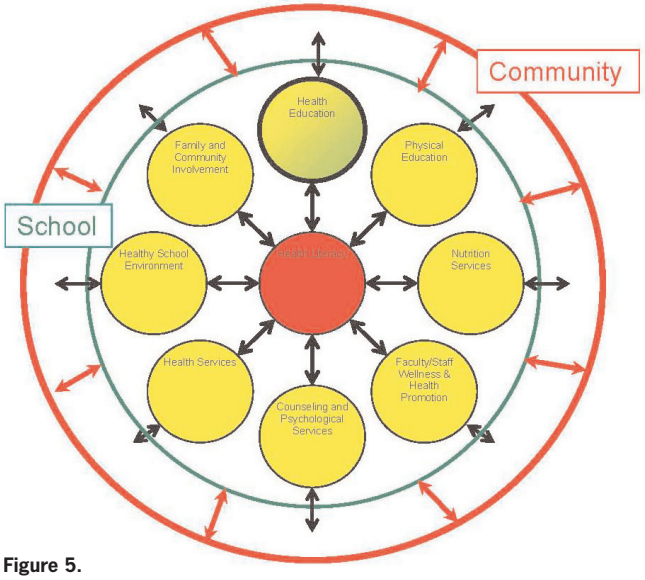

Figure 5.
CSHP impacts beyond the school

worked with the relevant academic areas to plan a coordinated approach to improving knowledge, attitudes, skills, and an environment supportive of health-enhancing behaviors. One way these multiple academic disciplines could address the issue is to provide discipline appropriate activities that reinforce NHES skills such as accessing valid information, analyzing the influence of family, culture, media, technology, and other factors on health behavior, and advocate for personal, family, and community health . As a result of this coordinated initiative in the education system, there is an increase in students visiting the school nurse or school-based clinic, and being referred to a school psychologist; students and their parents organize to advocate for more, and more easily understood and accessible nutrition information about school lunches; and some faculty members begin bringing healthier lunches and organizing nutrition-related workshops. It is conceivable that an outcome of the initiative in the educational system is that health care services becomes aware that it needs to deliver information, and perhaps services, in more than one manner at a literacy level lower than is currently used; there is greater transparency and access to information about school breakfasts and lunches; and that teachers are supporting a healthy eating environment by modeling healthy eating for their students and for one and other. Thus, the CSHP's holistic community encompassing approach provides a means to both assess and improve the health literacy of these systems within schools and districts. However, this impact is designed to go beyond the school/district microsystem into the greater community *(see figure 5)*.

In a recent study by Hodges and Murphy (2008), parents and those working within school systems believed that teachers needed to be role models for health literacy and health-enhancing behaviors, but weren't always. The authors argue that the CSHP approach would facilitate the adoption and maintenance of health literacy and health-enhancing behaviors of school employees through environmental, social, and educational supports.

As students, faculty/staff, parents, and other community members who are part of a school or district using the CSHP approach interact with the wider community, they bring with them their own emerging health literacy and the expectation of finding and using health literate systems in the greater community *(see figure 5)*. Over time, these interactions and expectations can then stimulate and reinforce health literacy within all of the systems within and beyond the schools.

Implementation of the CSHP approach provides a "safe" and supportive environment for children and adolescents to practice emerging health literacy skills, and can enhance the health literacy skills of adults within and beyond the education system. CSHP's health education and physical education components, in particular, form a bridge from the education system to the other systems found within schools linking and expanding the school-based networks available to build health literacy *(see figure 6)*.

Coordinated School Health and Health Literacy – Future Agenda.

As argued above, the structure of the CSHP approach appears to provide a solid foundation for the development of health literate populations. However, investigation of the efficacy of CSHP programs in achieving and supporting health literate outcomes is needed. While small studies have been undertaken (Videto & Hodges, 2008), large scale studies looking at factors affecting fidelity and barriers related to CSHP implementation and institutionalization are needed to provide guidance in getting the greatest benefit out of CSHP. The CDC should consider adding a component to SHI that specifically measures whether the components themselves are health literate from a systems perspective.

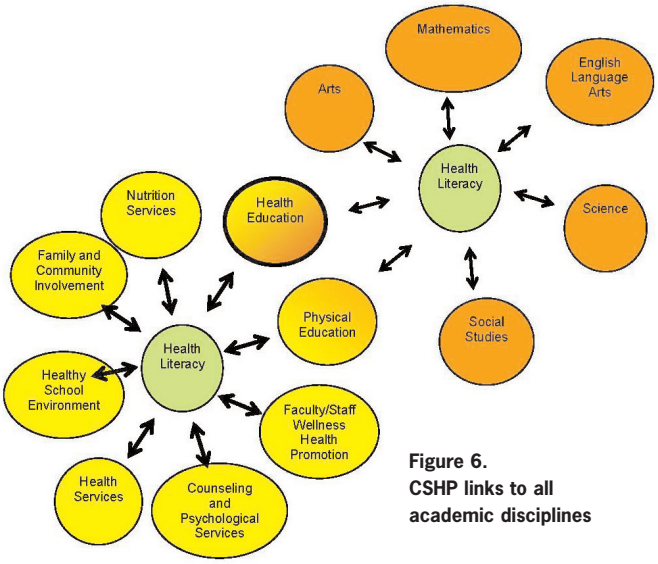

Figure 6. CSHP links to all academic disciplines

Summary

Schools have a fundamental role in the development of a health literate population. Classroom-based health education, as both an independent discipline and a component of coordinated school health programs, is the nucleus for the development of health literacy in today's children and adolescents. Emphasizing essential 21st century skills in the instruction, practice, and assessment that takes place in the health education classroom will likely lead to improved health literacy.

References

American Association for Health Education. (2008). Health literacy: A position statement of the American Association of Health Education. *HExtra*. Reston, VA: author.

American Federation of Teachers. (2007). AFT reiterates urgent call for teacher preparation changes: Recommendations made in 2000 remain valid but generally untouched. Retrieved November 21, 2008, from http://www.aft.org/topics/teacher-quality/downloads/TchrPrepChanges050507.pdf

American School Health Association. (2008). Our children, our future: A vision for the American School Health Association. *The Pulse*. Kent, OH: author.

Benham-Deal, T., & Hudson, N. (2006). Are health educators in denial or facing reality? Demonstrating effectiveness within a school accountability system. *American Journal of Health Education, 37*(3), 154-158.

Blackwell, A.G., & Colmenar, R. A. (2005). Principles of community building: A policy perspective. In M. Minkler (Ed.) *Community organizing and community building for health* (436-438). New Brunswick, N.J.: Rutgers.

Brey, R., Clark, S., & Wantz, M. (2007). Enhancing health literacy through accessing health information, products, and services: an exercise for children and adolescents. *Journal of School Health, 77*(9), 640-644.

Brey, R., Clark, S., & Wantz, M. (2008). This is your future: A case study approach to foster health literacy. *Journal of School Health, 78*(6), 351-355.

Centers for Disease Control and Prevention. (n.d.) *Healthy Youth! Coordinated School Health Program*. Retrieved November 13, 2008 from http://www.cdc.gov/HealthyYouth/CSHP/

Centers for Disease Control and Prevention. (2004). *School Health Index (SHI) Introduction*. Retrieved June 13, 2008 from www.cdc.gov/HealthyYouth/SHI

Chisolm, D., & Buchanan, L. (2007). Measuring adolescent functional health literacy: A pilot validation of the test of functional health literacy in adults. *Journal of Adolescent Health, 41*(3), 312-314.

Council of Chief State School Officers. (2006). *Assessment Tools for School Health Education: Pre-service and In-service Edition*. Santa Cruz, CA: ToucanEd Inc.

Darvin, J. (2006). Real-world cognition doesn't end when the bell rings. Literacy instruction strategies derived from situated cognition research. *Journal of Adolescent & Adult Literacy. 49*(5), 398-407.

El-Ibiary, S., & Youmans, S. (2007). Health literacy and contraception: A readability evaluation of contraceptive instructions for condoms, spermicides and emergency contraception in the USA. *European Journal of Contraception & Reproductive Health Care, 12*(1), 58-62.

Governali, J.F., Hodges, B.C., & Videto, D.M. (2005). Health education and behavior: Are school health educators in denial? *American Journal of Health Education, 36*(4), 210-214.

Greeno, J.G. (1998). The situativity of knowing, learning, and research. *American Psychologist, 53*(1), 5-26.

Hodges, B.C. (2008). Coordinated school health programs as community organizing. Manuscript in preparation.

Hodges, B.C. & Murphy, J. (2008, November). *Identifying common ground for school-based obesity prevention*. Presented at the meeting of the American School Health Association. Tampa, FL.

Institute of Medicine. (2004). *Health Literacy: A Prescription to End Confusion*. Washington, DC: National Academies Press.

Joint Committee on National Health Education Standards. (1995). National Health Education Standards: *Achieving Health Literacy*. Atlanta, GA: American Cancer Society.

Joint Committee on National Health Education Standards. (2007). *National Health Education Standards: Achieving Excellence*. Atlanta, GA: American Cancer Society.

Kann, L., Telljohann, S., & Wooley, S. (2007, October). Health education: results from the School Health Policies and Programs Study 2006. *Journal of School Health, 77*(8), 408-434.

King, M., Winton, A., & Adkins, A. (2003). Assessing the readability of mental health Internet brochures for children and adolescents. *Journal of Child and Family Studies*, 12(6), 91-99.

Kirksey, O., Harper, K., Thompson, S., & Pringle, M. (2004). Assessment of selected patient educational materials of various chain pharmacies. *Journal of Health Communication, 9* (2), 91-93.

Kolbe, L. (2002). Education reform and the goals of modern school health programs. *The State Education Standard, 3*(4), 4-11.

Kolbe, L. (2005). A framework for school health programs in the 21st century. *Journal of School Health, 75*(6), 226-228.

Manganello, J. (2008). Health literacy and adolescents: a framework and agenda for future research. *Health Education Research, 23*(5), 840-847.

Marx, E., Hudson, N., Benham-Deal, T., Pateman, B., & Middleton, K. (2007). Promoting health literacy through the Health Education Assessment Project. *Journal of School Health,* 77 (4), 157-163.

Marx E. F., Wooley S, & Northrop D, (eds.). (1998). *Health Is Academic: A guide to coordinated school health programs*. New York, NY: Teachers College Press.

National Center for Education Statistics. *The Nations Report Card: Reading 2007*. U.S. Department of Education. Retrieved November 21, 2008 from http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2007496

Nutbeam, D. (in press). The evolving concept of health literacy. *Social Science & Medicine*.

Nutbeam, D. (2000). Health Literacy as a public health goal: a challenge for contemporary health education and communication strategies into the 21st century. Health Promotion International, 15(3), 259-267.

Nutbeam, D. (1998). Health promotion glossary. *Health Promotion International*, 13(4), 349-364.

Paasche-Orlow, M., Parker, R., Gazmararian, J., Nielsen-Bohlman, L., & Rudd, R. (2005). The prevalence of limited health literacy. *Journal of General Internal Medicine, 20*(2), 175-184.

Partnership for 21st Century Skills (n.d.) *Framework for 21st Century Learning*. Retrieved November 21, 2008 from http://www.21stcenturyskills.org/index.php?option=com_content&task=view&id=254&Itemid=120

Proceedings of the Surgeon General's Workshop on Improving Health Literacy: Panel 1. (2006, September 7). Retrieved from http://www.surgeongeneral.gov/topics/healthliteracy/pdf/panel1.pdf

Ratzan, S.C., & Parker, R. M. (2000). Introduction. In C.R. Selden, M. Zorn, S.C. Ratzan, & R.M. Parker, (Eds.), *National Library of Medicine Current Bibliographies in Medicine: Health Literacy*. (NLM Pub. No. CBM 2000-1). Bethesda, MD: National Institutes of Health, U.S. Department of Health and Human Services.

St. Leger L. (2001). Schools, health literacy and public health: possibilities and challenges. *Health Promotion International*. 16(2), 197-205.

Videto, D.M., & Hodges, B.C. (2008). *The use of university/school partnerships for the institutionalization of the Coordinated School Health Program*. Manuscript submitted for publication.

Author Note

Tami Benham Deal
Division of Kinesiology and Health, University of Wyoming; Bonni C. Hodges, Health Department, SUNY Cortland

Tami Benham Deal extends her thanks to Nancy Hudson, Council of Chief State School Officers, for her insightful comments about health literacy and the role of health education in 21st century schools.

Bonni Hodges
SUNY Cortland

Bonni Hodges extends her thanks to Joseph F. Governali and Donna M. Videto of the SUNY Cortland Health Department for their insightful comments, questions, and feedback during this, and many other, projects. Our spirited discussion always challenges me to produce the best work I can.

Correspondence concerning this article should be addressed to Tami Benham Deal, University of Wyoming, Laramie, Wyoming 82070. E-mail: Benham@uwyo.edu
And to Bonni C. Hodges, SUNY Cortland, Cortland, New York 13045. E-mail: bonni.hodges@cortland.edu