The Evolution of Dental Education as a Profession, 1936–2011, and the Role of the *Journal of Dental Education*

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Abstract: This article describes selected changes in dental education from 1936 to 2011 and describes how the *Journal of Dental Education* (*JDE*) has assisted in both reporting and, at times, championing change. The review provides a series of selective contextual milestones as a backdrop and running commentary for the changing profession of dental education. An assessment of the current state of knowledge in this field is articulated, as are some of the drivers of change. The article poses a series of questions in seven categories that define the extraordinary opportunities ahead. A vision of the future of the *JDE* and dental education is described including the use of the journal as a futurist forum to educate, cajole, and advocate for continuous movement toward realizing an enlightened destiny.

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The *Journal of Dental Education* (*JDE*) is celebrating its seventy-fifth anniversary as the primary chronicler of dental education in its broadest context. The *JDE,* however, has proven to be much more than a reporter of news and findings. In its evolution, the journal has, at times, championed the necessity for the dental education enterprise to be rigorous in its research and scholarship; promoted critical thinking and lifelong learning; supported faculty development and improved teaching methods; advocated for a more diverse student body and faculty; shown why students and faculty alike must be thinkers; promoted the integration of basic and clinical sciences; advocated for dental schools to be better integrated with their parent universities or academic health centers; sustained research excellence at every level; presented the case for new models of dental education; demonstrated the value of community-based education for dental graduates; advocated for improved board and credentialing processes; and provided a forum for discussions of ethics and social responsibility.

In short, reading the *JDE* over time results in understanding the evolution of dental education and the profession from a trade to an integral and major component of higher education. Throughout its history, the journal has acknowledged and promoted the need for change and innovation and has remained steadfast as a source of new knowledge and ways to improve the education of dentists, dental hygienists, and other allied and advanced health professionals.[1] The *JDE* has been led by a cadre of superb editors, almost all of whom were distinguished educators and scientists in their own right. The collective group of editors over the past seventy-five years has provided critical leadership to enable the growth of this journal.

The initial publication of the *JDE* was in 1936, and it is instructive to review the first issue. It included three articles: one on preparing students for research or an appreciation of research;[2] one on the correlation of anatomy with clinical dentistry;[3] and a report on The Harvard Conference,[4] a Harvard Graduate School of Education program to offer a course in educational methodology for dental teachers. In addition, the first editor, J.T. O'Rourke,[5] presented an editorial on the correlation of clinical dentistry and medicine. Interestingly, this first issue also provided an outline of the program of the Ninth International Dental Congress, the topics for which included dental education in various countries, a report on the recognition of the dentist as a physician in Japan, and questions regarding whether dentists should be medically qualified. Do these sound familiar? Are they relevant today?

The fiftieth anniversary of the *JDE* was heralded with a special issue. That issue in October 1986

included articles on the future of the dental education system,[6] a psychosocial perspective on the dental educational experience and student performance,[7] and the longevity of restorations in a dental school clinic,[8] along with a brief communication on dental educators' use of curriculum guidelines.[9] All of these issues remain relevant today and describe an evolutionary path for dental education and the profession.

Fast forward to the September 2011 issue. Its contents reflect changes taking place regarding the use of technology in dental education, faculty development, clinical productivity in community-based dental education programs,[10] and a pilot program enabling Australian dental therapists to treat adult patients.[11] In addition, that issue contained an important article on the impact of health literacy in patient-provider interactions[12] and a report on the inclusion of oral-systemic health in the curricula of pharmacy, nursing, and medical schools around the world.[13] Like its predecessors, the September issue addressed contemporary issues in dental education and clinical practice as well as continuing the discussion started in 1936 regarding the integration of dentistry with other health professions, including medicine.

These twenty-five year snippets of the *JDE* and the evolution of dental education reflect the adage that the more things change, the more they stay the same.[1] The lessons learned are that, on the one hand, dental education is continually evolving and reflecting contemporary advances in science, technology, pedagogy, and the current social-behavioral-economic-political milieu, while on the other hand, the conversation has not changed in seventy-five years! Indeed, it is clear that dental educators and organizations recognize the critical importance of changing the educational model and bringing dentistry, the biomedical sciences, and medicine more closely together so that dentists can be an integral part of the emerging new health care team—but, alas, with notable exceptions the progress has been glacial. These issues will be explored later in this article.

Selected Contextual Milestones

To address one of the purposes of this article—that is, to identify changes that have had an impact upon the evolution of dental education as a profession—it is necessary to have an appreciation of some key contextual milestones. This is not meant to be a complete history of dental education in the United States but rather a selected listing of critical events and/or publications that have had a significant impact on its evolution. An excellent source of critical dates of importance to dentistry and dental education can be found in the chapter on the evolution of dental education in the 1995 Institute of Medicine (IOM) study of the profession.[14] Interestingly, the authors of the IOM report described the history of dental education as also being marked by both continuity and change.

In essence, over the last century, dental education has evolved from a self-taught and self-proclaimed "profession" to an actual one with formal education and recognized competencies.[14] University-based education at the pre- and postdoctoral levels has replaced the former for-profit dental education programs. During this evolution, the issue of dentistry's relationship (or lack thereof) with medicine and the movement toward lifelong learning, critical thinking, and discovery culminating in an evidence-based approach to education and clinical practice have taken center stage.

Table 1 provides a running account of selected milestones: events or publications that have had a significant impact on the evolutionary process of dental education and the dental profession. These milestones provide the context for the next sections of this article. It is important to point out that Tedesco in her superb 1995 review described in detail many of the milestones listed in this table and their impact on dental curricula development and change.[15] It is also important to note that these milestones were selected on the basis of my view of their impact. To be sure, there are many additional events and publications worthy of note that could be listed here.

Over time, dental education moved from a stage of largely proprietary education to one of science-based education housed within the university and/or academic health center structure. These changes were advocated and promoted by individuals such as William Gies[17] and reports and studies generated by organizations such as the American Dental Education Association (ADEA) and its Commission on Change and Innovation in Dental Education (ADEA CCI), the American Dental Association (ADA), the International and American Association of Dental Research (IADR/AADR), and the National Institute of Dental and Craniofacial Research (NIDCR). Interestingly, at the IADR's seventy-fifth anniversary celebration,

Table 1. Selected contextual milestones in dental education

Year	Milestone	Significance/Comments
1840	Baltimore College of Dentistry	First dental college.
1859	Formation of American Dental Association (ADA)	
1867	Harvard School of Dental Medicine	First dental college connected to a classic university.
1910	Flexner report on medical education[1]	Redefined medical education: underpinnings for the growth of academic health centers and medical specialization; scientific basis of medicine.
1919	*Journal of Dental Research* (*JDR*) founded	Established by William Gies.
1920	International Association for Dental Research (IADR) founded	William Gies largely responsible.
1923	American Association of Dental Schools (AADS) organized	William Gies largely responsible.
1926	Gies report on dental education[2]	Redefined dental education: viewed dentistry as scientifically based health service, and dental education must be comparable to medicine in quality and support.
1935	Blauch Committee report on objectives of dental education[3]	Listed objectives for dental education of specified topics areas.
1936	ADA Council on Dental Education (CDE) established	
1941	O'Rourke and Minor, *Dental Education in the United States*[4]	Curriculum hours and content for dental education described.
1942	All U.S. dental schools are "inspected and approved" or accredited under the aegis of the CDE	
1947	Horner review of approved dental school curriculum[5]	Dental curriculum was overcrowded; clinic transformed from teaching clinics to income generators.
1948	National Institute of Dental Research (NIDR) established as part of the National Institutes of Health; renamed National Institute of Dental and Craniofacial Research (NIDCR) in 1998	
1961	Hollinshead survey of dentistry[6]	Noted little change in curriculum clock hours since 1934; called for vertical integration of curriculum to integrate basic and clinical sciences with early clinical experiences; emphasized the use of preventive dentistry.
1967–68	Clock hour survey of dental education institutions by the ADA CDE and the AADS	
1974	Forsyth experiment in the training of advanced skills hygienists[7]	Advanced training of hygienists demonstrated clinical skills at or above those provided by dentists.
1975	AADS established curriculum guidelines[8]	
1976	CDE study on dental education in the United States[9]	Detailed report on curriculum with baseline information for future comparisons. Provided dental education with recommendations on the education process.
1980	Report of the ADA Special Higher Education Committee[10]	Critiqued the 1976 curriculum study.
1982	National Conference on Dental Education[11]	Redefined methodology to better integrate basic and clinical sciences in the curriculum.
1983	Report of the ADA's Special Committee on the Future of Dentistry	Set the stage for the education of the broadly competent practitioner.
1984	Association of American Medical Colleges report on physicians for the 21st century[12]	Established competencies for the 21st century medical practitioner.

(continued)

Table 1. Selected contextual milestones in dental education *(continued)*

Year	Milestone	Significance/Comments
1989	O'Neil and Barker, "Pew National Dental Education Program: Developing an Agenda for Change"[13]	Established strategic planning in dental education.
	Solomon and Brown, "Dental School Curriculum: A 50-Year Update"[14]	Found little change in curricular content and clock hours over the past 50 years.
1991	Pew Health Professions Commission report, *Healthy America: Practitioners for 2005*[15]	An agenda for action for U.S. health professions schools.
1993	Pew Health Professions Commission report, *Health Professions Education for the Future*[16]	Report on "schools in service to the nation."
1995	Tedesco, "Issues in Dental Curriculum Development and Change"[17]	Review of the dental curriculum over a 40+-year period.
	Dental Education at the Crossroads: Challenges and Change, an Institute of Medicine report[18]	The definitive treatise on the state of dental education and its future.
2000	*Oral Health in America,* a report of the U.S. Surgeon General[19]	First ever surgeon general's report on oral health of Americans; described the "silent epidemic" of oral disease and health disparities and recommended action plans for the future.
2001	ADA's *Future of Dentistry Report*[20]	
	Hendricson and Cohen, "Oral Health in the 21st Century: Implications for Dental and Medical Education"[21]	
2002–03	Kassebaum et al., "The Dental Curriculum at North American Dental Institutions in 2002–03"[22]	Comprehensive survey of current structure, recent innovations, and planned changes.
2003	U.S. Surgeon General's *National Call to Action to Promote Oral Health*[23]	
	Pearson and Douglass, "Open Wide: Integrating Oral Health and Primary Care"[24]	Arizona Health Futures at www.slhi.org.
2004	DePaola and Slavkin, "Reforming Dental Health Professions Education"[25]	
	Brown and Meskin, *Economics of Dental Education*[26]	
2005	ADEA established the Commission on Change and Innovation in Dental Education (ADEA CCI)[27]	Collaborative forum involving all aspects of dental education; one outcome was revised competencies for the new general dentist.
2006	Pyle et al., "The Case for Change in Dental Education"[28]	Statement from the ADEA CCI on the need for change.
2007	Bailit et al., "Financing Clinical Dental Education"[29]	The case for a new paradigm for clinical education.
2008	Formicola et al., "The Interrelationship of Accreditation and Dental Education: History and Current Environment"[30]	
	New Models of Dental Education: The Macy Study[31]	Report from a three-year study.
2010	Haden et al., "Curriculum Change in Dental Education, 2003–09"[32]	
2011	*Advancing Oral Health in America,* an Institute of Medicine report[33]	
	Training New Dental Health Providers in the United States[34]	Special issue of the *Journal of Public Health Dentistry.*
	Improving Access to Oral Health Care for Vulnerable and Underserved Populations, an Institute of Medicine report[35]	
	Access Report: Phased Strategies for Reducing the Barriers to Dental Care in California, a California Dental Association report[36]	

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Table 1. Selected contextual milestones in dental education *(continued)*

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Jeffcoat noted that dental research, which is closely tied to dental education, had moved through multiple stages: the mechanical stage in which teeth were removed and replaced; the investigative stage in which the pathogenesis of oral disease was studied; the first golden age of prevention characterized by the fluoride story; the second stage of mechanical treatment in which research breakthroughs resulted in new approaches to tissue and tooth repair, replacement, and regeneration; a modern era of investigation leading the way to "rational therapy against disease"; and the stage of collaborative research leading the way to a new age of prevention.[17]

There are some interesting parallels between the stages of research described by Jeffcoat and the evolution of dental education. For example, there have been clear stages from training conducted by an independent, non-educated practitioner to education by a science- and university-based clinical practitioner. In some ways, we have moved from the beginnings characterized as a "dark age," to a curriculum process and prescriptive stage, to a science-related stage, to a competency stage, and now to an interdisciplinary and prevention stage. Most notably, after all these years and significant breakthroughs on both the education and research fronts, there is still a great deal of work to be accomplished for dental education to fulfill the vision of William Gies and others in which research and education are intertwined so that science is the underpinning for modern-day clinical education and practice and the new age of prevention can be realized.

Reports by Solomon and Brown,[18] Kassebaum et al.,[19] and Haden et al.[20] published in the *JDE* illustrate the incremental changes that have occurred in North American dental school curricula over the past seventy-five years. Tedesco[15] in reviewing Solomon and Brown's conclusions noted that, from 1934 to 1989, about half of the curriculum areas had grown to within 1 percent of the hour allocations recommended in 1934. That study illustrated how little things had changed over a fifty-year period. The Kassebaum et al. study[19] found that only 7 percent of the dental schools reported their curriculum in 2002–03 was organized around themes of interrelated topics, suggesting that the silo approach to the basic and clinical sciences remains entrenched. DePaola concluded that, based on these cumulative data, education itself does not appear to be a significant driver of change for many schools.[21] The Haden et al. study of curriculum change in dental education from 2003 to 2009 found that, over that seven-year period, the greatest change was the increased proportion of schools requiring community-based experiences; in addition, there was an increase in interdisciplinary courses especially in the basic sciences with some schools employing problem-based and case-based learning.[20] While the same report suggested that competency-based education seems to be increasingly embraced as the norm, actual implementation of competency-based versus procedure-driven clinical education remains problematic.

The well-known 1995 report of the Institute of Medicine on dental education at the crossroads reached two important conclusions: first, dental education should be more closely integrated with medicine (a clarion call from earlier educators); and second, dental educators should be immersed in the totality of academic health centers.[14] Unfortunately, the progress in integrating basic, biomedical, and clinical science with medicine has been tedious, slow, or non-existent, at a time when breakthroughs in science and technology are fueling a reinvigorated clinical and translational application to clinic education and practice. The concept of transformative change, like that espoused by Gies, has still not taken root in dental education. Throughout its seventy-five-year history, the *JDE* has been the leading journal reporting all these events and providing a forum for continuing discussion on them. Change, always a constant, occurs slowly but inexorably.

What We Know About Dental Education

The obvious questions after reviewing these contextual milestones and some of their implications include the following: What do we know about dental education today? What are the lessons learned? And where does dental education go from here? In a 1994 article, DePaola reflected on the issue of what we know about dental education and identified seventeen statements that illustrated the then-current knowledge base.[22] Table 2 summarizes the knowledge base in 2011. Note that the number of statements has grown from seventeen to thirty, but many are the same—confirming that although change is occurring, it still has a long way to go to capture the vision of Flexner, Gies, and the initial editorial by O'Rourke in the 1936 issue of the *JDE*.

Table 2. What we know about dental education at the end of 2011

1. Disease patterns are changing.
2. Knowledge and technology are exploding.
3. Demographics are changing, but diversity in dental education remains stagnant.
4. Dental education remains inflexible.
5. Health disparities are prevalent.
6. Access to care is a serious public health problem.
7. The mouth is connected to the body.
8. A new science of medicine and dental medicine is here!
9. Current dental practice is self-limited.
10. Dentistry is left out of primary health care.
11. Dental students cannot process overwhelming current curriculum content.
12. Costs of dental education are higher than any other health professions education.
13. Health care cost is increasing at an alarming rate.
14. Moving towards a new health care system!
15. The dental reimbursement system is archaic.
16. Support for education is diminishing.
17. Extramural focus is limited but improving.
18. Competencies for clinical practice need to be redefined.
19. There is a shortage of faculty members, so faculty recruitment and development are necessary.
20. Research, critical thinking, and the scientific method are not yet integral to the fabric of education and clinical practice.
21. Dental education human resources are diminishing.
22. Competency-based clinical assessment is not prevalent.
23. Basic and clinical sciences are still not integrated.
24. Transfer of scientific discovery to education and practice is too slow.
25. Allied health professions need expanded opportunities.
26. New workforce models are here.
27. Movement to open new dental schools.
28. Silos remain the hallmark of most health professions education.
29. National boards and licensing remain an impediment to education and practice reform.
30. Education is what is left after the facts are forgotten!

While Table 2 is a synopsis of what we know today about dental education, it also provides an opportunity to reflect on why the change has been so slow, especially given the powerful argument for change in the 1995 IOM report, the case for change in many areas issued by the ADEA CCI starting with Pyle et al.'s article,[23] and the U.S. surgeon general's call for change in 2000[24] and subsequent call for action in 2003.[25] Simply stated, we know what to do as evidenced by the IOM study and *JDE* articles dating back to 1936, where, for example, there is universal agreement regarding an overcrowded curriculum. Yet as Tedesco points out, there is movement and experimentation but little change![15] So, what are we tripping over? There are two main reasons for a lack of change. One, we have not convinced many dental educators, the profession, and the consumer that a crisis exists, such that change is necessary for survival; and two, we have not provided a compelling vision for the future.[21] We know clearly what needs to be done, but we need to find the will and the fortitude to create transformative change. Importantly, the *JDE* has both reported and advocated for these changes over its history. It should be noted that, through it all and in spite of the criticism about the pace of change, there is evidence that dental education is beginning to embrace a future that may be markedly different from what it is today.

Much has been written over the years of the "silos" that characterize dental education and most

of health professions education. It is necessary now more than ever to banish the silos in order to create a practicing dentist who

- Is comfortable interacting professionally with other health care providers,
- Understands and practices evidence-based dental medicine,
- Understands and utilizes risk assessment tools,
- Is prevention-minded,
- Embraces and utilizes changing technology for improved patient care,
- Appreciates and utilizes research and discovery advances in biomedical and social, behavioral sciences for patient diagnosis and interventions,
- Is a broad thinker,
- Understands dentistry's commitment to ethics and social contract with society,
- Is embedded in primary care and comprehensive health care,
- Participates in interdisciplinary and interprofessional education and clinical care,
- Looks to the university, academic health center, or dental school as a primary source of information,
- Understands and implements preventive, personal, predictive, and participatory medicine,
- Understands the oral-systemic health bi-directional linkages,
- Is willing to function as part of a "health home,"
- Evaluates literature, is a critical thinker, and embraces lifelong learning, and
- Functions as an integral member of a primary health care team.

It is critical to note that the ability to recruit, retain, and/or re-educate faculty members to lead dental education into the future is integral to the future success of dental education and the profession. The capability of the faculty to continue to be viewed as scholars and clinicians by the parent university or academic health centers is a necessary key to unlocking the silos and advocating for interprofessional and interdisciplinary education. In fact, the development of dental faculty members as educators was championed as early as The Harvard Conference, noted in the 1936 initial issue of the *JDE*,[4] by which degrees in education were offered to faculty members. Some of today's dental schools are doing the same, but not enough. Importantly, however, more and more educators are enrolling in teaching and learning programs like the annual ADEA-Academy for Academic Leadership programs. Perhaps the next as yet undefined stage of dentistry and dental education will be an illumination stage.

Lessons Learned and Where Do We Go From Here?

An important lesson to be learned is that the roles of dental education and the *JDE* are critical to the achievement of educating a dentist with the competencies to function as an integral member of an interdisciplinary health care team and a member of a health home. Simply stated, dental education is all about the quality of the faculty members and their willingness to lead transformative change. Although the profound factors that influence dental education are not always under the control of the faculty or the institution, they can be powerful drivers of change. These factors include demographics, the media, science and technology, economics, public policy, the dental and biomedical science industries, insurers, consumerism, university and/or academic health center expectations, and regulatory bodies (from OSHA and the FDA to accreditation and licensure boards). The management of these potential drivers requires faculties that are broad-based and comprised of individuals who are competent in their discipline, who embrace faculty development, who are enthusiastic in communicating with external stakeholders, and who possess the willingness to provoke change when necessary. This is where "out of the box" big thinking wins the day.

The opportunities as chronicled in the *JDE* and other scholarly reports and journals are boundless as dental education moves toward a better future. Like always, there are choices, however. The two major choices are simple: one, more of the same; or two, transformative change. The nature of this article and its space limitations do not enable a robust discussion of all the future possibilities that could and probably will be explored as the evolution continues. Therefore, I have elected to codify the possibilities into seven distinct categories, under which are questions reflecting a potential future extraordinarily rich in science, education, communications, patient care, collaborative education and care, cultural integration, and moral imperative to improve the public health. The categories and questions, many of which are interrelated, are as follows:

1. **Workforce Models/Models of Care Delivery**
   - Are we experiencing a new breed of students and faculty members?
   - Can we create a dental school that reflects the cultural and ethnic face of the United States?
   - Will the future bring a new, unimagined workforce?
   - How does dentistry fit into the development of health homes?
   - Is the future paradigm a form of personalized, participatory, preventive, and predictive medicine?
   - Can dental education embrace self-care and shared responsibility for health?
   - Will we change the health care system so that it pays for what works and not just for doing things?
   - Can dental education embrace new dental schools?
2. **Access to Oral Health Care**
   - Is dental education addressing access, cost, and quality of care for real?
   - Do dental education and the dental profession possess the willingness and capacity to address society's needs?
   - Do dental education and the dental profession address the needs of vulnerable populations and patients with special needs?
   - When will we, as a profession, embrace Medicare?
   - Are we addressing health care disparities aggressively?
   - Are dental schools an appropriate safety-net?
   - Is the school-based pediatric oral health therapist on the short-term horizon?
   - Are we coming into the era of the mid-level provider in dentistry?
   - Is a two-tier system of oral health care here now?
   - Are we exercising our social contract with society?
   - Are new workforce models being implemented and carefully evaluated in real-world clinic and reimbursement settings?
3. **Research/Technology**
   - What are research advances that will spark spectacular changes in the health care delivery system?
   - Can dental education embrace innovative use of technology to create, deliver, and assess education and clinical care across undefined boundaries?
   - Are dental education and the dental profession embracing and advocating for comparative effectiveness research?
   - Are we working toward developing effective and efficient health outcomes using the best current and future technologies?
   - Is research in its broadest sense woven into the fabric of dental education and clinical practice?
   - Is dental education developing the research infrastructure to support collaborative research across disciplinary boundaries?
   - Is dental education establishing financial priorities to construct and/or rebuild education-related research?
   - Is dental education supporting and advocating for research that confirms oral-systemic health relationships?
4. **Finances**
   - Is dental education embracing new, innovative models to finance dental education?
   - Where does the community-based finance model stand?
   - Are there incentives for regional sharing and consolidation of student, faculty, and curricular resources to make dental education efficient and fiscally sound?
   - Can dental education and the profession create flexibility in the credentialing and reimbursement systems as antecedents to transformation?
   - Where does the electronic record fit?
5. **Interdisciplinary and Interprofessional Education**
   - Will dental education and the profession embrace true interdisciplinary and interprofessional education and clinical care?
   - Is there movement of basic, biomedical, and clinical sciences toward an integrated system of clinical care?
   - Is there evidence of the development of transdisciplinary wellness clinics that focus on primary care and an integrative approach to risk assessment, prevention, and therapy?
   - Can dental education and the health professions create an educational system that integrates allied dental, pre- and postdoctoral dental students, medical residents, nursing students, and pharmacy students into a side-by-side model of primary care?
   - Are more and novel dual-degree programs a part of the future?

6. **Community Partnerships**
   - Is there evidence that dental education is creating learning communities?
   - Do dental education and the dental profession have the willingness to engage the consumer and build a new capacity for health and oral health literacy?
   - Does dental education have the ability to work across disciplines and establish innovative public-private partnerships for the common good?
7. **Education/Curriculum/Pedagogy**
   - Do we have the right leaders?
   - Are not all of these possibilities about effective leadership for the common good?
   - Does dental education understand the notion of disruptive innovations?
   - Does dental education have the facilities to accommodate interprofessional and interdisciplinary education?
   - Can we develop regionalized, nationalized, or global curricula?
   - Is dental education teaching and living the principles of "learning how to learn," critical thinking, and lifelong learning?
   - Do we need new models of faculty recruitment, retention, and development?
   - Are dental education and the dental profession developing an expanded capacity for problem-solving, information management, understanding and employing evidence-based science and medicine, teamwork, collaboration, and leadership?
   - Is there evidence that dental education is embracing comprehensive care, competency assessment, and the elimination of procedural requirements?
   - Does the dental education system result in a humanistic learning environment?
   - Are we developing a continuous quality improvement model for dental education that eschews the status quo?
   - Is dental education working to develop an educational paradigm that is truncated in length but rich in quality assessment and accountability?
   - When will dental education eliminate the lockstep approach to education?
   - Is the elimination of live patients on clinical board examinations a reality?
   - Will dental education and the dental profession ensure portability of licensure and credentialing?
   - Will dental education and the health professions learn that ethics trumps all?

This myriad of opportunities for growth and development of dental education and the professorate will require an uncommon process of thinking, well beyond that of today's academic, clinical, and fiscal constraints. Rather, it will require collaborative thinking and novel actions across a spectrum of disciplines, professions, public and private sectors, organized medicine and dentistry, the dental and biotechnology industries, insurers, community leaders, academic scholars, allied dental leadership, and all oral health care stakeholders. Over the next few years, what expectations can we have that this list of potential opportunities will be refined, revised, and, most importantly, acted upon in a substantive manner? It is imperative that these opportunities continue to be explored in the *JDE,* which serves a critical function in providing forums for new thinking and action. Therefore, a major question pertains to the journal itself: is there a new role for the *JDE* in stimulating transformative change in dental education and clinical practice?

If we are not willing to think big and embrace transformative change, we will likely continue to recruit and graduate dentists in our own image. If that is the case, the problems dental education is experiencing today will be magnified, and the progress made over the last seventy-five years will diminish. Will we have the leadership and courage to create oral health care practitioners who will not look and act like any of us?

Concluding Thoughts and a Glimpse of the Future

In a recent address to the 2011 Dean's Summer Institute, noted futurist William Rowley described the future health care system.[26] Rowley's assertion was that health care's greatest challenges lie in these areas: the quality and value of care, medical errors and adverse events, the payers of health care (employer, government, personal), the unsustainability of national health care expenditure, and the declining health of the American public (increase in obesity, premature death due to diabetes prevalence, sedentary lifestyle, etc.).[26] These issues are particularly relevant to oral-systemic health linkages. Rowley further asserted that the key components of an improved health care system are the following:

1) efforts at staying healthy (lifestyle, nutrition, wellness programs, environment, exercise); 2) care that works (evidence of effectiveness and providing transparency); 3) care that is of high value (changing payment for doing things to payment for what works; creating systems and collaborations using the electronic health record; supporting a culture of continuous improvement and accountability); 4) easy access to care; 5) management of chronic disease; 6) move towards personalized, predictive, participatory, preventive medicine focus on pre-disease; 7) consensus on shared responsibility; 8) understanding the power of disruptive innovations; and 9) new focus on self-care, virtual care, and auto health.

Interestingly, dental education and oral health care were left out of Rowley's initial considerations, but is not the mouth connected to the body and do we not belong in both the conversation and the solution to today's education and health care challenges? In this same regard, in an address[27] at the 2011 Forsyth Symposium, Barry Bloom, former dean of the Harvard School of Public Health, made the case for the same issues as Rowley, beginning with defining health in its broadest context based on the World Health Organization (WHO) definition: "Health is a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity."[28] Bloom also advocated for the principle of a patient-centered medical home to include philosophical principles (team-centered, coordinated care, patient-centered), structured elements (electronic health records, disease registries, enhanced access, quality improvement), and payment models (primary care capitation, mixed payment, accountability for quality).[28]

Since this article addresses dental education, it seems that there are multiple issues embedded in Rowley's and Bloom's presentations that could have a profound impact on dental and health professions education. At the very least, dental education and oral health care should have a "home within the health home." Figure 1 is an adaptation of the "health home" concept, incorporating many of Rowley's and Bloom's principles with the addition of oral health and dental education components. The implication is that as the health home develops, oral health and dental education must be included on the front end because they will affect who we educate, how we educate, with whom we communicate, how we assess competence, how we measure success, and how our schools will be designed or re-engineered.[26,27]

In this context, there may be a golden opportunity for the *JDE* in its next phase to provide a "futurist forum" for its constituents. There are some interesting and important ways that the journal could add the function of futurist forum to its portfolio. For example, it could publish special issues devoted to critical issues in the health professions such as the health home concept,[29] the impact of new dental schools on education, development of novel financing models, faculty recruitment and retention, community-based education, and the oral health workforce. The journal could make a special effort to engage other health professions to contribute as authors with or without collaborations with dental faculty colleagues.[29] The *JDE* could also be a provocateur in encouraging educational research in futuristic thinking. Similarly, the journal could provide the impetus for discussions of how new and developing technologies can be incorporated into curriculum design and of how advances in science and technology can be disseminated to faculty members, students, and administrators. In the same way, as a futurist-oriented publication, the *JDE* could use web-based tools and social marketing venues to effectively and interactively communicate new educational research across academic dentistry and the other health professions.

As chronicled in the *JDE* throughout its illustrious history, there have been countless calls for dental education to change, yet we appear to be in a "petrified state"[15] when it comes to curriculum change and innovation. By and large, we have an education program based on a century-old model that takes an inordinate amount of time to complete, especially when adding postdoctoral education and specialty training to the mix; that uses outdated pedagogical practices; that is very slow to embrace new financing models; that is behind the curve in utilizing technology for education and clinical practice; that has expectations for graduates to practice prevention that are not commensurate with the reimbursement system; that still uses procedures rather than competencies; that is limited in interprofessional and interdisciplinary education; that is stifled by political interference from outside agencies and organizations; and that does not embrace integration of research into its fabric.

At the same time, the context in which dental education lives—including much of the population lacking access to care (while other health care professionals such as pediatricians are providing oral health care to children), coupled with a growing knowledge base linking oral and systemic health and the establishment of new dental schools and new workforce team members—suggests that it is past

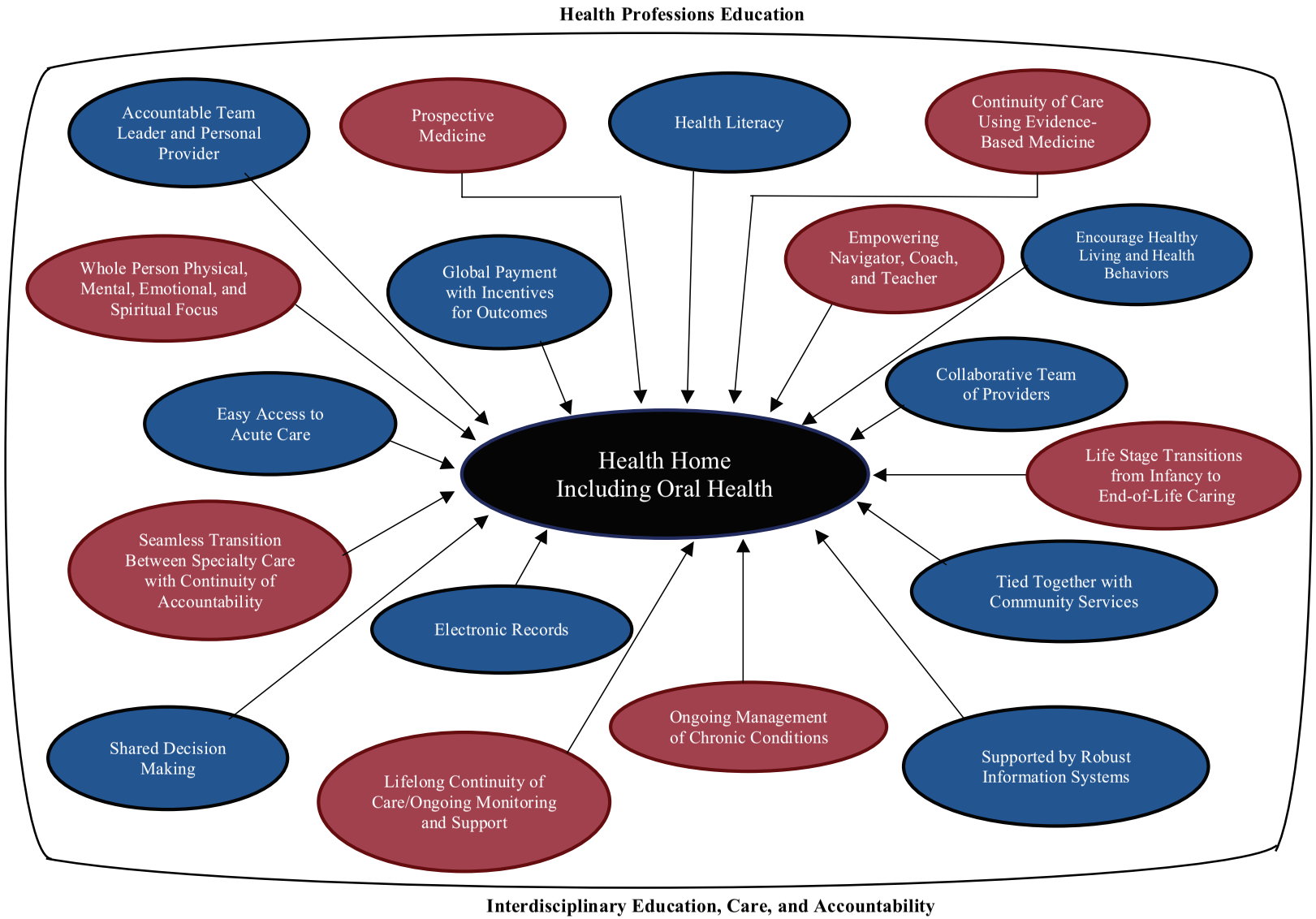

Figure 1. A health home that works

Source: Adapted from Rowley W. The future health care systems. Presentation at the Dean's Summer Institute, Palm Beach, FL, August 5–8, 2011; and Bloom BR. Putting prevention into practice. Presentation at The Forsyth Symposium. Boston, MA, May 5–6, 2011.

time for dental education to lead the way towards transforming oral health care so that it is a full and vital participant in wellness at every level. Is the health home the answer or an answer? Perhaps!

We know what needs to be fixed as evidenced by multiple reports in this journal, and we even have some inkling how to implement and reform dental education; but do we have the will to change and the "vision" of a future worth creating?[26] DePaola and Slavkin[30] proffered a vision based on dental education as a continuum with the notion that "thoughtful stakeholders will be eager to advance an enterprise that serves the society while serving the learners and the professions." Essentially, our vision was that dental schools should aspire to become "learning organizations" as defined by Hendricson and Cohen,[31] in which "there is a high capacity for implementing change and where faculty and administration are comfortable with the process of innovation and discovery."[30] The expectation continues that "thoughtful stakeholders will complete a roadmap for the future complete with benchmarking and measurable outcomes coupled with rigorous assessments," all aimed toward the goal of the dental education enterprise to graduate a caring and competent dental professional committed to improving the health of the public.[30] This is what the *JDE* should be reporting and documenting in the next decade.

In a recent article about inventing the future at the Massachusetts Institute of Technology (MIT), Hockfield commented that "it's all about leadership, vision, creativity, innovation, entrepreneurs, fearlessness to identify and tackle critical problems, nimbleness to cross boundaries in search of new answers and deep expertise."[32] This rings true for dental education as well.

We can hope that the 100th anniversary issue of the *JDE* will not report more of the same but will instead chronicle a twenty-five-year path in which dental education and research lead the profession to a future in which dentistry is a truly integral member of a health care team (embedded perhaps in a health home) and in which the profession fulfills its moral and social contract with society.[33] In the words of Bob Dylan, "The times they are a-changin'"; and the *JDE* should be the portal for innovation, creativity, and extending the frontiers of academic excellence.

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