

Dental education 2026: A scenario exploration

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Abstract

Purpose: The purpose of the following papers is to explore plausible alternative futures for dental education. The COVID-19 pandemic, challenges emerging from racism in the US, and social unrest were the precipitating factors leading to this consideration of academic dentistry in approximately 5 years.

Methods: In 2020–2021, five teams of six individual followed a seven-step process to develop five different scenarios of dental education in 2026. Four of these scenarios are constructed by considering a range of uncertainties associated with economic sustainability and educational innovation. A fifth scenario describes the optimal case for dental education's role should another pandemic occur.

Results: Each scenario is presented as a narrative in three parts: scenario highlights (summary), life in the scenario (fictional case), and scenario details (a description of significant factors within the envisioned future of the scenario). As a strategic tool, these scenarios will assist leaders, institutions, and stakeholders to anticipate and prepare for different futures, identify key indicators that a particular future is emerging, and guide decision-making to create the most desirable future in a changing environment.

Conclusion: Institutions are encouraged to incorporate these scenarios into their strategic and contingency planning efforts and to use them to generate dialogue during faculty development initiatives. This study provides institutions with a process and model they can follow to create scenarios at the institutional level. The final paper in this collection is a guide that provides ideas and instructions for using the scenarios in curricular and extracurricular activities with faculty members and students.

KEYWORDS

future of dental education, information technology, managing change, pandemic, strategy

1 | INTRODUCTION

The COVID-19 virus caused widespread and immediate changes in higher education as institutions adapted to the worse pandemic in a century, putting the existence of many colleges and universities in question. By September 2020, the American Council on Education estimated that the

financial impact of the pandemic on higher education had already exceeded \$120 billion.¹ While a March 2021 survey of college presidents found growing confidence in the financial stability of their institutions over the next decade, in part due to the economic aid provided by the Biden administration to higher education, these academic leaders were not as optimistic about the short term. According

to *Inside Higher Education*, just over half of college presidents indicated they are extremely to moderately concerned about their institutions' financial stability.²

While considerable information exists on the impact of the events of 2020 on higher education, much less is known about their effect on the future of dental education. Like their parent universities, academic dental institutions engaged in a number of pivots to sustain their missions. The changes reported by the American Dental Education Association (ADEA) in the spring of 2020 included the following:

1. Students sent home for a period of time with a plan to periodically evaluate schools' return strategy.
2. Didactic courses moved online and conducted via synchronous or asynchronous delivery of content.
3. Continuing preclinical simulation exercises (in some institutions) while adhering to social distancing.
4. Closing the clinic doors for elective dental care and limiting care to urgent and emergency needs.
5. Cancellation of external rotations and travel by students and faculty.
6. Cancellation and rescheduling of dental licensure exams.
7. Graduation ceremonies moved online, rescheduled, or cancelled.³

Elangovan and colleagues reported on early lessons learned from the pandemic and implications for dental education.⁴ Others have examined the psychological impact of the pandemic on students.⁵⁻⁷ Santos and colleagues conducted the first systematic review of publications on emergency remote teaching during COVID-19.⁸ Spielman and Sunavala-Dossabhoj provided a synopsis of the effect of pandemics on education over the past eight centuries.⁹ While there is much speculation about the long-term impact of the pandemic, no one has modeled the potential future of dental education based on changes accelerated by the COVID-19 crisis.

2 | BACKGROUND AND PURPOSE OF SCENARIO PLANNING

Scenarios are descriptions of possible futures generated by the exploration of a variety of known factors and critical uncertainties or change drivers. Scenario planning is a strategic tool, but it differs in important ways from strategic planning. Most strategic plans proceed on the premise that institutions can forecast the future based on the past. The result of the effort is a vision of a desirable state of affairs with a set of goals necessary to realize it. Scenario planning, in contrast, creates a series of alternative futures

in place of a single forecast. These alternative futures are written in narrative form looking backward from a specific time in the future.

Modern scenario planning is often credited to the work of Herman Kahn in the 1950s at RAND Corporation. As a military strategist and systems theorist, Kahn advocated for thinking the unthinkable about the effects of military actions, particularly nuclear war.¹⁰ Because of Kahn's influence, scenario thinking emerged in politics and business, with Royal Dutch Shell becoming a celebrated case of scenario planning. Shell responded effectively and profitably when oil prices collapsed in the 1980s because the company had envisioned this possibility years earlier and prepared in advance for the event.¹¹ Scenario planning has also been used in education and healthcare.¹²⁻¹⁴ Soon after the COVID-19 pandemic began, strategists turned to scenarios to explore the future of higher education and the social sector.¹⁵⁻¹⁷

The COVID-19 pandemic is a paradigm case for scenario planning. The world, and higher education with it, was caught unprepared for the catastrophic changes precipitated by the novel coronavirus. Few could fathom in March 2020 that the virus would infect nearly 160 million people by May 2021 or that nearly 600,000 US citizens would die of COVID-19 within 14 months.¹⁸ No one anticipated the nearly *en masse* movement of students to virtual classrooms—or how quickly faculty, students, and institutions would adapt. In response to the novel coronavirus, the rapid development of multiple vaccines to counter a virus such as COVID-19 seemed almost impossible prior to the pandemic.

Looking forward, scenario planners ask hypotheticals without assuming the future will be like the past. For example, *what if*:

- The economy experiences record growth after the pandemic.
- The economy falters, and the US or the world experiences an economic recession or depression.
- Through technology and new perspectives, virtual learning becomes the norm in the way students are educated.
- After the pandemic, institutions return to traditional ways of educating students.
- There is another pandemic. What role will dentistry play?

As a strategic tool, scenario planning helps leaders and institutions anticipate and prepare for alternative futures, identify key indicators that a potential future is becoming reality, and through informed decision making, create the most desirable future in a rapidly changing environment. As an instrument for anticipating contingencies, scenarios create space for greater flexibility and agility.

3 | METHOD

As a part of the ADEA Leadership Institute experience, members of each class contribute to team projects. The nature of these projects has varied over the years, but they include research that results in a manuscript. The uniqueness of the events of 2020, from the pandemic to racism and sharp political divisions, raised multiple “what if?” questions about the future of dental education. In an environment of many uncertainties, the Class of 2020–2021 focused its project on developing scenarios to describe alternative futures for academic dentistry. The 30 institute fellows worked in teams, also designated as peer groups, of six individuals to create five different scenarios. All work was accomplished virtually using email, Zoom or other virtual conferencing platforms, and ADEA Connect. Each peer group followed a seven-step process.

Step 1. Environmental scan

All five groups conducted a literature review of relevant publications and other information about the impact of the pandemic on higher education, dental education, and dental practice. Because this initial research began in May 2020, most of these resources came from news articles and websites that monitored the pandemic’s impact.

The environmental scan also included a series of interviews with key decision makers at the Fellows’ home institutions, in organized dentistry, and in state legislatures. These interviews resulted in just over one hundred senior university leaders and approximately 50 legislative and organized dentistry leaders. Prior to the interviews, each group developed a protocol of five to seven questions focused on the roles and responsibilities of the interviewee, with two to three questions related directly to the leaders’ opinions about the future of the institution, higher education, and academic dentistry. Interviewees received the questions prior to the interview. Each member of the peer group submitted interview notes, and the groups summarized their findings. Interviewee titles and positions were included in summary reports, but individual names were omitted. Each peer group had access to all five summary reports.

Step 2. Strengths, weaknesses, opportunities, and threats analysis using four frames

Informed by the environmental scan, each peer group conducted a modified strengths, weaknesses, opportunities, and threats (SWOT) analysis of dental education. The process incorporated Bolman and Deal’s four orga-

nizational frames model: structural (goals, rules, policies, procedures), human resource (recruitment, development, retention), political (resource allocation, stakeholder relationships, advocacy), and symbolic (culture, rituals, image).¹⁹ Peer groups conducted a SWOT analysis within each of the four frames to create a more comprehensive evaluation of dental education.

Step 3. Formation of a Steering committee

Peer groups selected five individuals, one from each group, to serve on a scenario planning steering committee. The steering committee coordinated efforts, facilitated communication among the peer groups, and served as a liaison to the director of the ADEA Leadership Institute. Throughout the scenario planning process, the steering committee contributed to the overall development and writing of the scenarios through email exchanges and virtual meetings.

Step 4. Identification of strategic priority areas

Each peer group utilized its SWOT analysis to develop a set of strategic issues, long-term challenges, and opportunities facing dental education. Strategic issues require an institution or profession to make fundamental choices affecting mandates, mission, values, policies, stakeholders, and management. Strategic issues affect many people, involve significant financial commitment or risk, require the engagement of senior leaders, are politically sensitive and have significant consequences if not addressed.

Strategic issues were initially developed as questions. Each of the five peer groups identified what it considered the five most important issues, provided a written rationale explaining its choice of each, and submitted its list and rationale to the steering committee and Institute director. Based on a qualitative analysis, the steering committee and Institute director grouped a total of 26 submitted issues into six strategic priorities:

- Financial sustainability
- Educational models
- Interprofessional education and collaborative practice
- Faculty recruitment, retention, and development
- Academic environment
- Advocacy and legislation

Step 5. Selection of two critical uncertainties

Critical uncertainties are variables that are likely to have the biggest impact on dental education. In scenario planning, these key drivers can produce the most significant

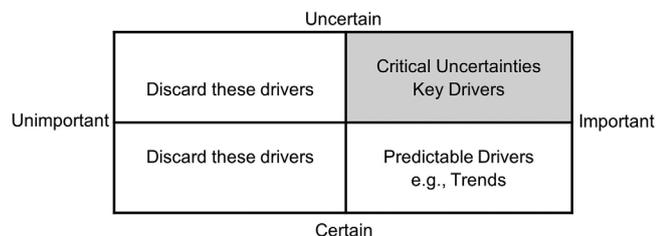


FIGURE 1 Focusing scenario planning on critical uncertainties

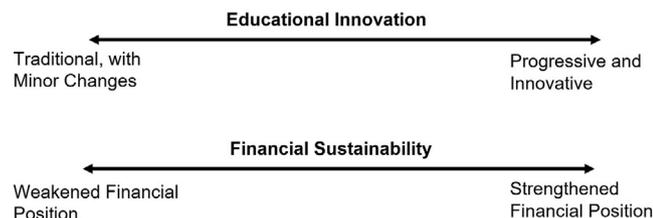


FIGURE 2 Critical uncertainties as drivers of change

alternatives—those that have the greatest potential to change dental education (Figure 1).

Peer groups were polled through the steering committee to identify the two most critical uncertainties from among the six strategic priorities. By consensus, the steering committee designated the two most critical uncertainties or drivers of change as educational innovation and financial sustainability. These drivers represent a continuum of uncertain conditions as indicated by the poles of each driver (Figure 2).

Step 6. Construction of the scenarios

A common approach to building scenarios is to create a 2 × 2 matrix at the intersection of the axes of the key drivers. Figure 3 shows the model used by the Institute to create four scenarios. Because there were five peer groups, the steering committee identified a fifth, complementary scenario focusing specifically on dental education’s role in the event of a future pandemic.

Peer groups were randomly assigned to one of the five scenarios in the model. Peer groups wrote the scenarios independently, with communication facilitated across the groups by the steering committee. Each peer group used as a template the Institute for Alternative Futures scenario report on public health in 2030.¹⁴ Each scenario narrative is structured as follows:

- Scenario Highlights: A synopsis of the scenario.
- Life in This Scenario: A brief case written from the viewpoint of stakeholders 5 years in the future.

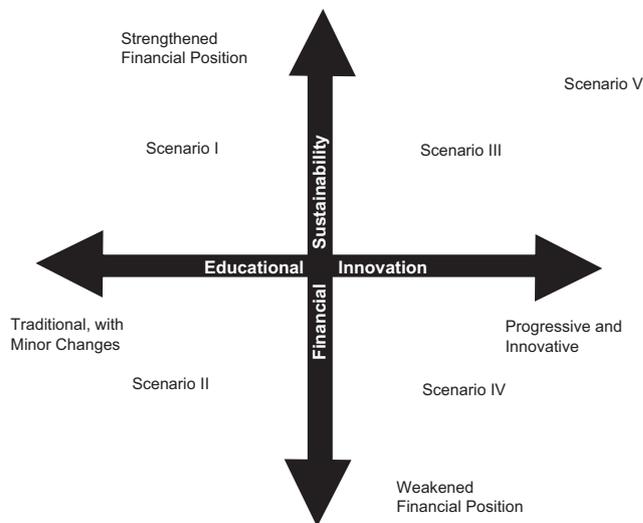


FIGURE 3 Framework for the scenario plans

Scenario Details: A description of the significant factors within the envisioned future in that particular scenario.

Step 7. Incorporation of feedback from 2021 ADEA annual session symposium

As a final part of the process, fellows engaged with attendees at a special virtual symposium during the 2021 ADEA annual session to discuss the five scenarios. A brief presentation by a steering committee member followed by 20- to 25-min breakout sessions resulted in a series of five rounds for discussion of each scenario. Approximately 90 people participated in the symposium, including the 2021 ADEA Leadership Institute Fellows. Discussions focused on two questions: (1) What are the threats and opportunities in this scenario? (2) What are your recommendations to either actualize this scenario or avoid it? Peer group members compiled notes from the sessions and used this input to revise each of the scenarios.

4 | OVERVIEW OF THE FIVE SCENARIOS

Figure 4 shows four scenarios, their titles, and their place along the continua of the critical uncertainties or key drivers. All scenarios are written with a perspective of 5 years into the future.

- Scenario I. Opportunity lost
- In this scenario, academic dentistry experiences a strengthened financial position over the next 5 years,

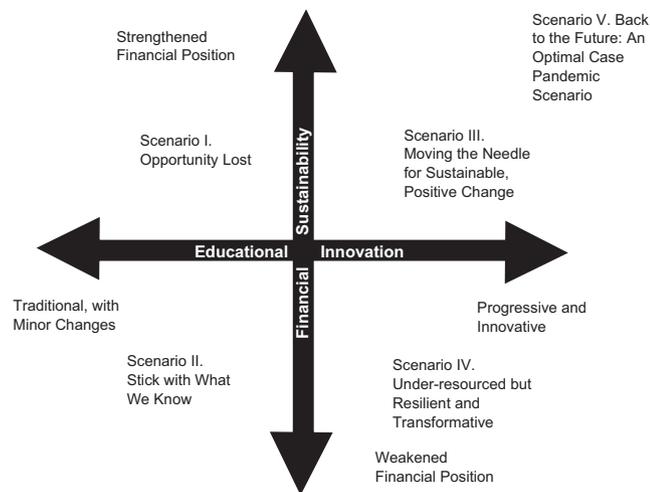


FIGURE 4 Dental education 2026: Five scenarios

but educational innovation loses momentum after the pandemic. Tradition wins over innovation and prevents growth and sustainability of initiatives precipitated by the pandemic.

- Scenario II. Stick with what we know

Scenario II is built on the assumptions that academic dental institutions will experience a weakened financial position by 2026 and that dental education will remain much as it was pre-pandemic. The safe position under these circumstances is to maintain the status quo.

- Scenario III. Moving the needle for sustainable, positive change

Perhaps the most optimistic scenario, Scenario III finds dental education financially well-resourced and with a culture of change and innovation. In such an environment, academic dental institutions make great strides in inter-professional education and collaborative practice as well as diversity, equity, and inclusion.

- Scenario IV. Under-resourced but resilient and transformative

Educational innovation in Scenario IV comes not as an option but as a necessity. In this scenario, academic dental institutions suffer reduced financial resources but choose change and innovation in response. Strong relationships within the university and with other professions allow for pooling resources, result in improved access to care, and lead to collaborative research activities.

- Scenario V. Back to the future: An optimal case pandemic scenario

While outside of the quadrants created by the change drivers of financial sustainability and educational innovation, Scenario V asks how academic dental institutions and the dental profession would respond should another pandemic occur in 5 years. This scenario explores the optimal future based on lessons from the COVID-19 pandemic. The scenario envisions dentists on the front line in meeting the challenges of a new pandemic.

5 | DISCUSSION

As a strategic tool, scenario planning is available to any institution that wishes to consider alternative futures based on critical uncertainties. The axes formed by any two uncertainties will drive change in different directions and produce new insights about possible futures. Among other uses, scenarios are helpful to institutions as they engage in strategic planning. Institutions should consider how their strategic plans would fare in each of the five scenarios.

For those involved in developing strategic plans, institutional vision should be informed by a range of alternative futures, with a focus on strategies to achieve the optimal future. Scenarios also inform contingency planning around a set of hypotheticals about the future; for example, if X occurs, then the institution will respond with Y. As in the Royal Dutch Shell example, anticipating contingencies through scenario planning is a means to ensure the institution is prepared to maintain its mission, change, and innovate in the best possible way in whatever environment emerges.

The continua represented by the axes shown above can be customized with specifics that are relative to each institution, thereby creating a set of mileposts. For example, along the financial sustainability continuum, institutions should consider their specific economic drivers such as tuition, state and federal funding, philanthropy, and related indicators of an evolving future. Educational innovation will also vary among institutions, raising questions about such matters as innovations that will remain or disappear post-pandemic; the parent university's investment in and plans for new uses of technology; and strategic partnerships to foster innovation. Institutions can quantify many of these mileposts and use them as indicators for the direction in which the institution is headed.

While the pandemic is the central theme running through all five scenarios, 2020 brought many other challenges to the world and nation. Racism and social injustice

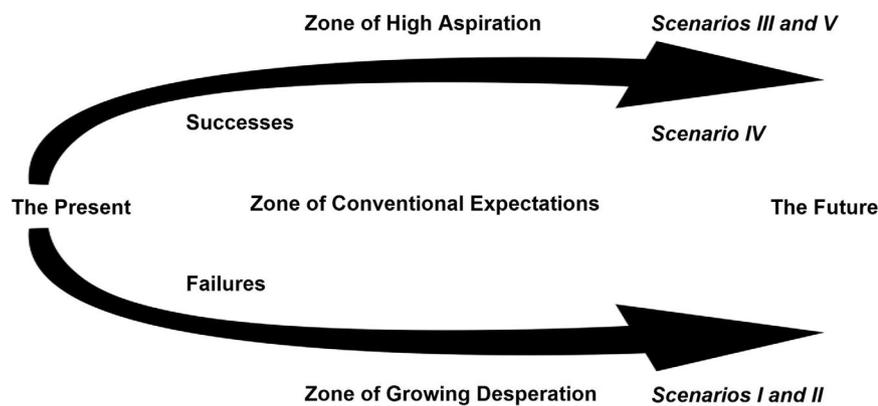


FIGURE 5 Aspirational futures approach¹⁴

as well as bitter political division were other “pandemics” with far-reaching consequences. These and other considerations associated with the six priorities listed above are explored in the scenarios. Table 1 presents a synopsis of how these areas might change based on each of the five scenarios. The intent of Table 1 is not only to anticipate the future of these critical influences on dental education but also to identify strategic areas that all academic institutions should consider in their planning efforts.

Although the pandemic created new threats for academic dental institutions, it is not the case that dental education was without challenges prior to COVID-19. Scenarios I and II describe dental education as returning to a pre-pandemic status quo in 5 years. The pandemic also presents a rare occasion to change academic dentistry in important ways, as described in Scenarios III, IV, and V. Academic dental institutions can use the five scenarios to foster dialogue about these changes, as a means to assess what they have learned and how to prepare for the future. Institutional leaders should consider how their school or program would adapt to each scenario and how to optimize their own best-case scenario. Taking a lesson from the events of 2020, institutions should consider how and why these scenarios could develop, without prejudging or dismissing any given scenario based on pre-pandemic trends and experiences.

6 | RECOMMENDATIONS

In its approach to scenario planning, the Institute for Alternative Futures described three different aspirational futures (Figure 5)¹⁴:

- The zone of conventional expectation builds on the past, current trends, and what stakeholders assume is most likely. The circumstances in Scenario IV reflect this zone. However, Scenario IV describes transformations

precipitated by unfavorable circumstances. In so doing, Scenario IV straddles conventional expectations with high aspirations.

- The zone of growing desperation is based on a set of reasonable challenges that an organization or a discipline such as dental education may face. This challenging future is described in both Scenarios I and II, with Scenario I underscoring a lost opportunity in spite of increased resources.
- The zone of high aspiration provides best case scenarios in which stakeholders rally together to make lasting and impactful change. It is the zone of surprising success. Scenarios III and V describe best these high aspirations, with Scenario III doing so in the most favorable economic conditions.

The following recommendations are cut across all five scenarios with the intent of moving dental education toward a highly aspirational future.

1. Use the scenarios to foster dialogue about the future of academic dentistry

The five scenarios that follow are intended to create a structure for rich conversation about the future of academic dentistry. Each scenario reflects a variety of realistic variables that could have a significant impact on institutions and dental practice. The scenario user’s guide that accompanies the scenarios describes a workshop for using these five different visions of the future with faculty, administrators, and students.

Institutions can also use the scenarios as a test of their current strategies and plans. For example, leaders might explore how their current vision, mission, strategic goals, and operations would fare in each of the scenarios. The scenarios present an opportunity to discuss topics that might not arise from typical strategic planning and review processes.

TABLE 1 Impact of each scenario across other strategic priorities

Strategic priority	Scenario I	Scenario II	Scenario III	Scenario IV	Scenario V
Interprofessional education and collaborative practice	Education and research opportunities increase in community-based clinics.	Collaboration across other health professions remains minimal.	Dental and medical education smoothly integrate with prevalence of interprofessional collaborative practice models.	Collaborative care teams improve personalized health care to use resources more effectively.	Oral health providers play significant roles on interprofessional teams addressing systemic health.
Diversity, equity, and inclusion	Initial enthusiasm is followed by resistance from some who are happy with how things were.	Little progress is made in recruitment and retention of diverse faculty and students.	Proportional racial representation of faculty, staff, and students learning exists within inclusive dental school environments.	Nationally standardized diversity, equity, and inclusion curriculum improves the support of historically underrepresented minority groups.	Academic dental institutions assume new roles in reducing healthcare disparities through community partnerships.
Research and scholarship	Only research-intensive schools sustain funding and maintain their research enterprise.	Funding remains static and little protected time to conduct research.	The quality and quantity of funded research and clinical innovation improves.	Collaborative research initiatives expand significantly through the National Institutes of Health.	More effective reach tools develop for non-invasive health monitoring, disease assessment, and testing.
Policy and advocacy	Institutional infighting slows meaningful action.	Individual and organizational advocacy efforts decrease.	National student debt loads are reduced; live patient clinical exams are eliminated.	Combining the first didactic year within the entire medical enterprise dramatically reduces costs.	Policy changes result in closer relationships among local, state, and federal governments.
Faculty recruitment, retention, and development	Increased faculty compensation improves recruitment and retention.	Faculty burn-out is high and few applicants to fill open positions.	Tailored contracts allow faculty members to pursue research and clinical interests, which improves retention.	Implementation of virtual faculty development significantly enhances faculty satisfaction and retention.	Faculty recruitment and retention is enhanced as faculty lead broader initiatives in primary care.
Relationship to the parent institution	Return on investment of dental programs is reassessed and questioned.	Some dental schools close and others struggle to survive.	Improved collaboration and resource sharing between units result in transparency and reduced operating costs.	Institutions capitalize on shared faculty inter- and intra-institutionally to optimize available resources.	The visibility of academic dental institutions to parent universities is enhanced as academic dentistry plays a broader role in healthcare.
Access to care	Slow acceptance of midlevel providers ultimately decreases community engagement.	Access to care has not changed over the past 5 years, but fewer patients are seeking care.	Increased rates of dental services provide internal and external to dental schools, with improved student learning experiences.	Extramural rotations and outreach programs are enhanced and help to lower educational costs (students educated in extramural clinics).	The practice of teledentistry has a significant impact in reaching underserved patient populations.
Accreditation	The Commission on Dental Accreditation makes incremental changes and allows some curriculum flexibility.	Patient-based licensure exams continue, and no nationalized system for credentialing exists.	Technology improvements streamline data tracking and reporting and virtual visits reduce costs of accreditation.	Commission on Dental Accreditation site visit teams include individuals from other health professions for a more diverse perspective.	Accreditation standards give more directive guidance for interprofessional education and collaborative care.

2. Engage in scenario planning at your institution

The process described above can be used readily at the institution or unit levels to consider a range of contingencies and potential changes driven by the axes of two change drivers. Leaders can explore different variables relevant to their institutions along the continua of educational innovation and financial stability. They should also consider other critical uncertainties, and how the intersection of these uncertainties would create completely different scenarios.

Preparedness is one of the main purposes of scenario planning. Institutions should use the process to consider and prepare for a variety of contingencies by asking “What if...?” and creating formal contingency plans to respond in an agile way to ensure the strategic and operational functions of the institution continue. Scenario planning also helps institutions track the signals that a particular future is emerging.

3. Take inventory of lessons from the COVID-19 pandemic

Scenarios I and II caution about the dangers of returning to pre-pandemic practices and norms. Institutions should evaluate practices based on value rather than tradition. They should actively seek to maintain the flexibility and adaptability developed during the COVID-19 crisis and look to establish new norms.

More specifically, as academic dental institutions continue to experience a changing educational landscape, they should work with students and faculty to understand the impacts of changing educational methodologies. Understanding the benefits of online learning, the specific challenges experienced therein, and opportunities for optimization will allow schools to capitalize on the technological gains while keeping the well-being of students and faculty at the center of operations. The only way to fully understand the impacts of changing educational methodologies is to not only track changes in performance quantitatively but to engage in real conversations with stakeholders to understand their perspectives and experiences.

4. Engage in critical conversations with students, faculty, and staff about the status and progress of the institution toward diversity, equity, and inclusion

The pandemic showed disparate health outcomes based on economic and racial factors. Simultaneously, during 2020, the world was again reminded of social injustice and systemic racism. Unfortunately, many institutions that have experienced movement in the wake of racial violence

and injustice will lose momentum, either because of a shift of focus to an overwhelming new challenge, changes in leadership or movement champions, or the perception that they have achieved their goals. As institutions look to the future, scenario planning can assist them with ongoing evaluation and conversations about the reality of the institutional environment, and where improvements should be made.

5. Explore how the scenarios inform interprofessional education and collaborative practice

Dental schools are models of patient-centered, collaborative care, offering the most advanced, efficient, evidence-based oral healthcare available. To develop future members of the healthcare team, academic dental institutions will need to implement interprofessional competencies that embrace other health professions, and that are driven by both individual patient needs and communities of interest.

Three of the scenarios, III, IV, and V, describe new roles for academic dental institutions and oral health providers to work with colleagues from other professions. Dentistry played only a marginal role in addressing the COVID-19 pandemic, but more robust visions of interprofessional education and collaborative practice are described in these three scenarios. Institutions and leaders in the dental profession should consider the action steps necessary to realize the vision of dentistry described in these scenarios.

7 | CONCLUSION

Scenario planning is an underutilized approach in academic dentistry for envisioning and planning to realize the best possible future. The process described above provides institutions with the tools to customize their own scenario plans. Likewise, the five scenarios that follow are opportunities for dialogue among stakeholders, both at the institutional level and national level, to anticipate and meet further challenges and opportunities successfully. The final paper in this collection provides a step-by-step process for using the scenarios in curricular and extracurricular activities with faculty members and students.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest that could be perceived as prejudicing the impartiality of the research reported.

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