

DC Institute's Measurable Video-based Endodontic Program Boosts Dentists' Confidence

DC Institute

Best Use of Video

July 2022



Company Background



DC INSTITUTE

Furthering Excellence in Dentistry

Company-at-a-Glance	
Headquarters	Toronto, ON, Canada
Year Founded	2016
Employees	Six
Global Scale	Canada
Customers/Output, etc.	Customers are dental care professionals across Canada, services offered are continuous dental education, learning and development.
Industry	Healthcare
Website	www.dcinstitute.ca

Budget and Timeframe

Budget and Timeframe	
Overall budget	\$15,000
Number of (HR, Learning, Talent) employees involved with the implementation?	Eight
Number of Operations or Subject Matter Expert employees involved with the implementation?	One
Number of contractors involved with implementation	Two
Timeframe to implement	Six months
Start date of the program	Nov. 1, 2020

Business Conditions and Business Needs

Endodontics, commonly referred to as root canal treatment, is a complex and challenging area of dental practice that requires a high level of training and skill. Comprehensive training is required to be able to locate canals efficiently and treat them effectively to arrive at predictable treatment outcomes.

While root canal procedures are often performed by specialists, General Practitioners (“dentists”) across the country are becoming increasingly interested in providing these types of treatments to their patients. However, in many cases, the dentists are lacking skills or confidence to perform root canal procedures.

Patients who contact their dentist with root canal issues are typically experiencing a high level of pain and discomfort. These patients require urgent diagnosis and treatment to eliminate pain. If the patient is coming to the practice in pain, dentists want to be able to reassure the patient that they will be able to treat them, rather than refer them to a specialist. Such reassurance, when paired with successful treatment, enhances patient experience, and helps build trust between the patient and their dentist.

To be able to offer endodontic treatment, dentists typically require extensive hands-on training that develops their skills and enhances their confidence to perform these complex and challenging procedures. With the challenges of the COVID-19 pandemic including the need for social distancing and shutdowns, an alternative approach to learning was required.

Overview

Dentistry is always evolving and to be able to perform dental procedures successfully, dentists require training on the new techniques and technology. Staying current allows the dentist to provide comprehensive patient care with predictable outcomes.

To achieve the required business outcomes, the learning solution must:

- Be a comprehensive, end-to-end program that covers all the key processes and procedures in root canal treatment.
- Present a variety of state-of-the-art technologies available for each key stage of the endodontic treatment process.
- Be modular to be practical in terms of time spent learning in a series of flexible sessions.
- Be interactive to increase learning retention especially with a video-based format which is typically a completely passive engagement for the learner.
- Be distributed through a learning management system to enable completion tracking, CE credit distribution, collection of learner feedback through program evaluations and a system for distributing certificates for learners who have completed the program.
- Act as a temporary substitute for live, hands-on learning due to the COVID pandemic restrictions.

DC Institute developed a video-based program that meets the described business needs. It provided instruction and best practices on state-of-the-art tools and technologies involved in the diagnosis and treatment of root canals. In order to accommodate learners, who are typically busy dentists, the video was broken into short pieces each corresponding to a step in endodontic treatment. After completing the program, the learning materials are available on an on-going basis to provide sustainment learning.

In measuring the effectiveness of the training solution, DC Institute has confirmed that the program is effective in not only demonstrating the basic steps involved in each root canal procedure but also in increasing dentist's confidence in performing the procedures (before/after program measurements). Many of the dentists who participated in the program have indicated that not only has their confidence in treating root canals increased, but they are also now more confident in diagnosing and treating more complex (three or more root canals) endodontic procedures.

Having dentists more skilled and confident in performing complex endodontic procedures results in reduction of referrals of patient cases to the specialists, enhances patient experience and has immediate impact on dental revenue.

Design

Each of the stages of endodontic treatment requires a comprehensive understanding of the biological processes, materials, equipment, procedures and potential risks to the patient. Subject matter expert Dr. Gary Glassman provided a thorough review of the procedures, materials and leading-edge medical equipment to support the treatment process.

The design of the training program included a video recording of a live lecture with the visual support of PowerPoint and footage of each procedure captured through an electronic microscope. In this way, DC Institute was able to successfully build a learning experience that would demonstrate each step of endodontic treatment and serve as an on-the-job resource for dentists.

The program was divided into three main sections, including pre-learning, main course content and post-learning materials.

The 11 pre-learning materials were background materials provided by Dr. Glassman to enable the learner to enter the main series of learning modules with a strong foundational knowledge of the key concepts and tools used in the endodontic treatment including file systems, irrigation technology, endodontic file reciprocation physics, restoration and obturation systems. The materials were a combination of written articles and eLearning modules.

To achieve its purpose, the main course was divided into topic-based modules focused on each of the key treatment stages:

- Diagnosis
- Anesthesia
- Isolation
- Access
- Clearing the pulp chamber
- Locating the canal orifices on the pulp chamber floor
- Establishing the working length of the canal
- Creating a glide path for the file to full working length
- Shaping the canals using a series of specialized files
- Irrigating the canal with sodium hypochlorite and EDTA
- The obturation of the canal using gutta-percha
- The restoration of the crown

Segmenting the learning in this way enabled the dentist working in an environment that often involves being constantly interrupted to access and comprehend the material in a self-paced manner and in a logical sequence as it relates to the process.

Each of the modules has its own learning objectives, typically involving comprehension and analysis of the steps involved in that stage of the treatment. Each module has built-in content and interactivity (typically several multiple-choice questions) that allows the learner to reach the stated learning objectives.

During the lecture videos the learner is challenged with pop-up multiple choice questions that test recall of information, its comprehension and analysis.

Figure 1: Module Interface

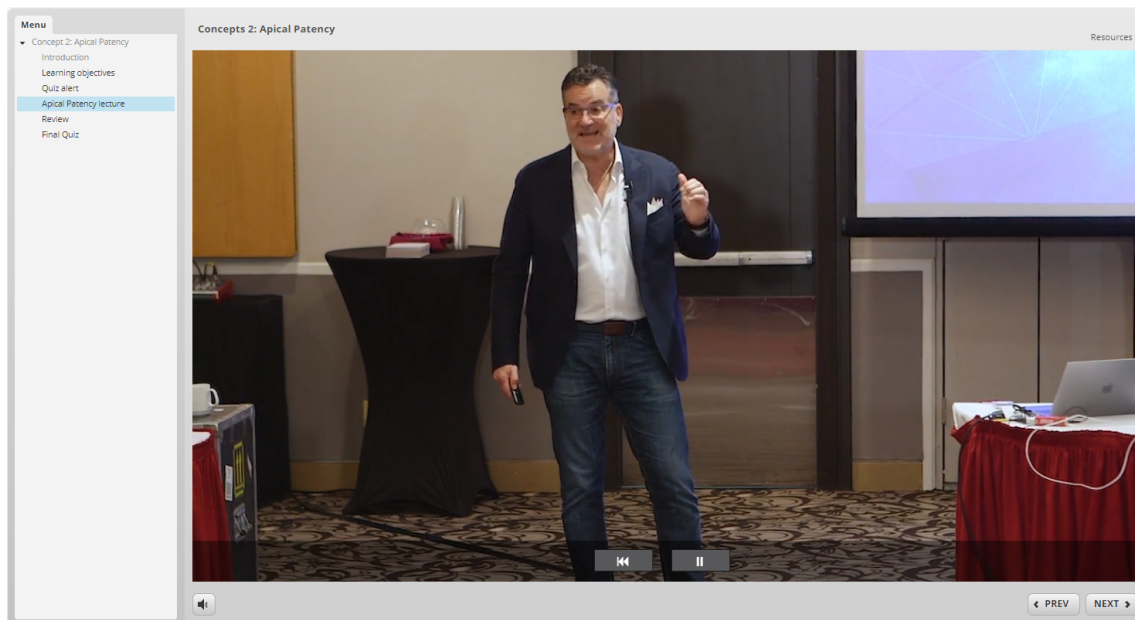
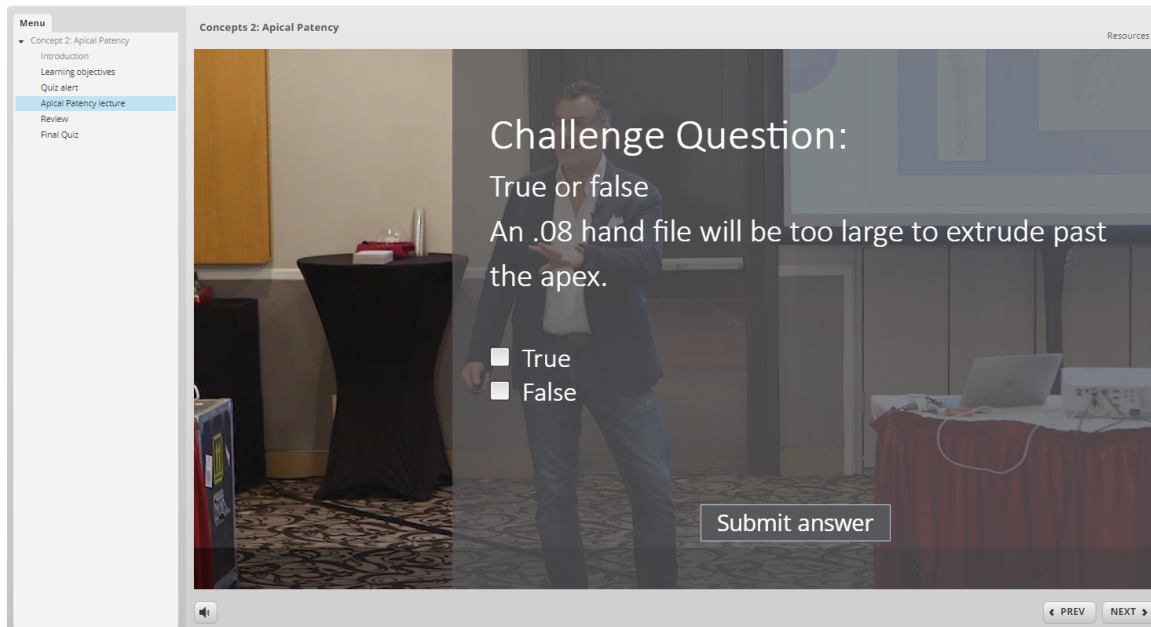
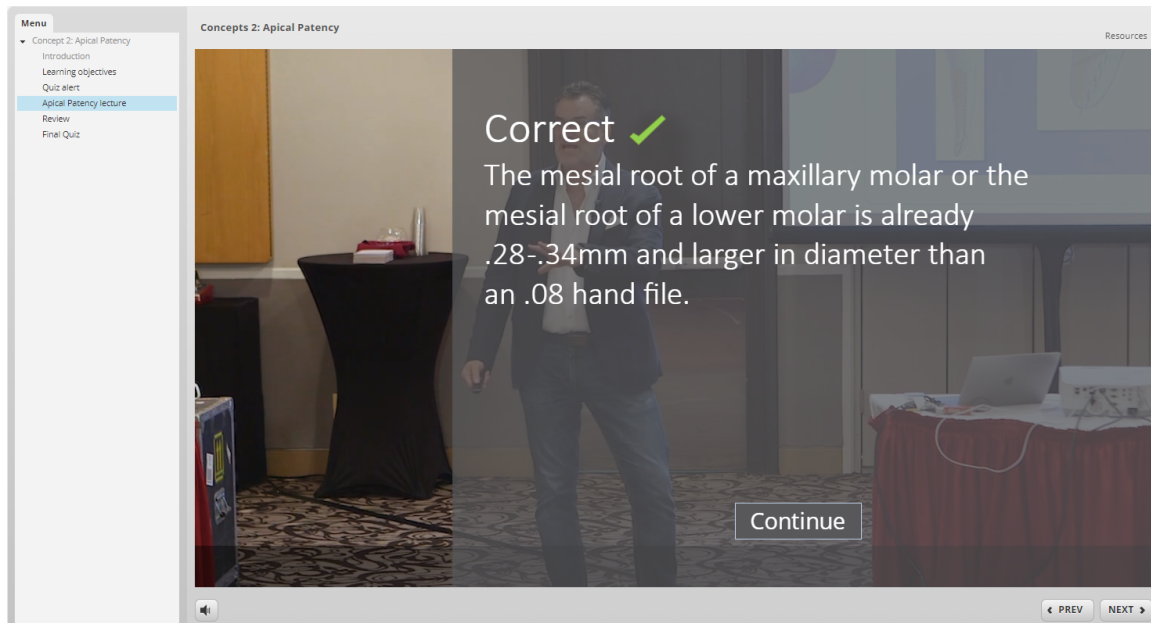


Figure 2: Challenge Question Overlay — Video Paused

The screenshot shows a video player interface. On the left is a 'Menu' sidebar with a tree view containing: Concept 2: Apical Patency, Introduction, Learning objectives, Quiz alert, Apical Patency lecture (highlighted), Review, and Final Quiz. The video player title is 'Concepts 2: Apical Patency'. The video content is paused, showing a man in a suit in a lecture hall. A semi-transparent overlay contains the text: 'Challenge Question: True or false An .08 hand file will be too large to extrude past the apex.' Below this are two radio button options: 'True' and 'False'. A 'Submit answer' button is at the bottom right of the overlay. The video player controls at the bottom include a volume icon, a 'PREV' button, and a 'NEXT' button.

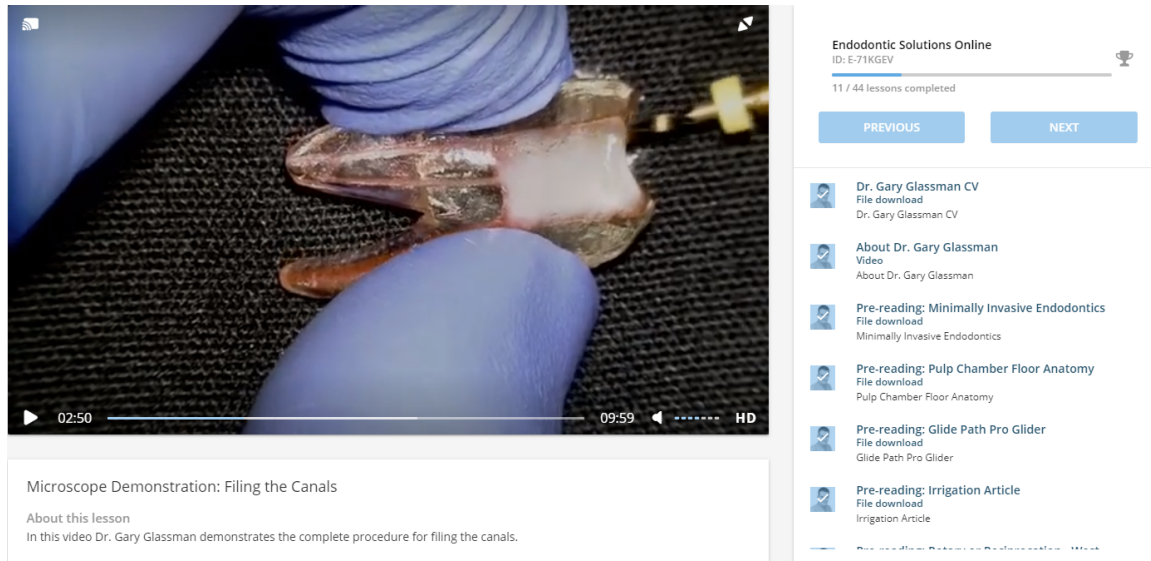
Figure 3: Feedback Overlay After Answer Submission

The screenshot shows the same video player interface as Figure 2. The video content is still paused. The overlay now displays: 'Correct' with a green checkmark icon. Below this is the text: 'The mesial root of a maxillary molar or the mesial root of a lower molar is already .28-.34mm and larger in diameter than an .08 hand file.' A 'Continue' button is at the bottom right of the overlay. The 'Menu' sidebar and video player controls remain the same as in Figure 2.

The post-learning consists of a microscope demonstration of a root canal procedure in a transparent 3D printed molar tooth allowing the learner to see the progressive use of files and technique for achieving the proper shaping of the root canal. An additional three modules are provided and serve as supplementary learning for dental assistants. This

provides the dentist with support and ensures that the person they work most closely with is calibrated and can anticipate their needs. This typically results in the procedures running more smoothly with less misunderstanding between the clinical team members, which results in more predictable treatment outcomes. The supplementary modules include learning on dental photography, isolation, and radiography.

Figure 4: Video Demonstration — Root Canal Filing



Endodontic Solutions Online
ID: E-71KGEV
11 / 44 lessons completed

PREVIOUS NEXT

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The modules are followed by a Level 2 (knowledge) assessment, which allows the learner to check their progress against the stated learning objectives. At the end of the program, learners are asked to complete a short Level 1 (reaction) assessment allowing them the opportunity to provide feedback on the program.

The learners can access the program anytime, anywhere on any device and take the entire program or access one of its modules.

Delivery

This program was hosted on DC Institute's learning management system (Docebo) and accessed by learners using a member account. Specific learners were auto-enrolled through a direct link to the program which was sent via email. Others located it by either searching or as a direct link from DC Institute's public web site (dcinstitute.ca). To make the program more searchable, the team developed hashtag words related to each endodontic procedure that were incorporated into the description of the program.

The LMS tracked completion of each of the three courses within the program and only enabled access to each successive course on completion. However, once the learner completed all modules, they were able to access any video at any time thereafter.

At the needs assessment stage of the project, dentists identified that they wanted to be able to:

- Start and stop the course at any given point in time.
- Easily access each video after completing the course.

To meet this need, DC Institute decided to separate each video into small (5- to 6-minute) sections that deal with a specific step in endodontic procedure.

The team used Articulate Storyline to assemble the video pieces into a cohesive eLearning program where learners are presented with a table of contents representing each indexed step.

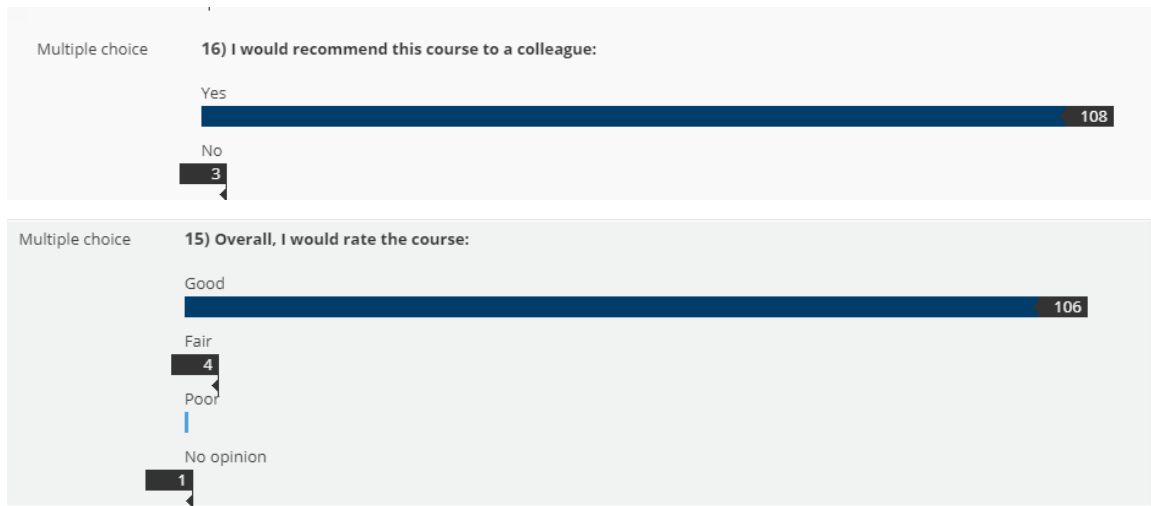
This enabled learners to easily and quickly access specific modules without the need to watch the entire lecture video.

Within five months of its development, 114 dentists across Canada have completed the program and another 311 were in progress.

Measurable Benefits

The benefits of the video-based endodontic program were measured against the overall business objectives for effectiveness, patient outcomes and the number of root canal procedures (both simple and complex) performed since program completion. DC Institute has developed a comprehensive approach to measuring the effectiveness of the program by measuring learner reaction, knowledge, skill transfer and ultimately, impact on the overall dental practice business performance.

Upon completion of the program, learners were required to complete a mandatory Level 1 (reaction) program evaluation. Program evaluation feedback from learners was overwhelmingly positive:

Figure 5: Program Evaluation Feedback from Learners


All illustrations provided by DC Institute

The 90-day survey results from the dentists revealed that there was a sharp boost in confidence upon completion of the program resulting in a dramatic increase in the number of complex cases being treated. In regard to endodontics, this can be seen as an increase in the number of teeth treated that contained a higher number of canals. As revealed in the survey feedback chart below, this produced an increase of 50% more cases for teeth containing three canals. This is an extremely positive result given the complexity of the endodontic procedures.

ANSWER CHOICES	RESPONSES	
One root canal	26.67%	8
Two root canals	36.67%	11
Three root canals	50.00%	15
Four root canals	33.33%	10

The 90-day survey also indicated that on average, doctors have performed 23½ endodontic procedures after completing the program. This is a significant number of endodontic procedures for a General Practitioner dentist.

Overall

The program has been delivered to over 100 General Practitioners (“dentists”) and the following realizations were made regarding the impacts of the learning based on the initial objectives:

- The program content was comprehensive — following the process in detail, resulting in confidence reflected in an increased uptake in procedures.
- Dentists were comfortable adopting the techniques taught for each key stage of the endodontic treatment process.
- The modularity of the learning enabled dentists to complete the program in a series of flexible sessions.
- The inclusion of interactive elements resulted in the increased retention as evidenced by the progress through the program and assessments. Each module was gated and progress could only be achieved by successfully answering multiple-choice questions.
- The digital distribution of the learning as interactive video through the LMS was successful as evidenced by the number of dentists who completed the program as well as “in progress” learners.
- The program successfully acted as a temporary substitute for live, hands-on learning due to the COVID-19 pandemic restrictions as evidenced by the attendance, completion and successful adoption of endodontic procedures.

The outlook for this program will involve performing regular updates to the content of the program to stay current with the latest technology and procedures in endodontics. DC Institute will continue to offer the program while closely monitoring feedback to ensure continuous improvement of the program. DC Institute intends to offer this program as a comprehensive endodontic solution in its dental learning programs, supported by live, hands-on training and mentorship.

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