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RESEARCH ARTICLE



The European Society of Cardiology - A Digital Educator

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ABSTRACT

The mission statement of the European Society of Cardiology (ESC) is “to reduce the burden of cardiovascular disease”. The ESC is the leading scientific society for cardiovascular health care professionals across Europe and increasingly the world. Recognising the need for democratisation of education in cardiology, the ESC has for many years embraced the digital world within its education programme. As in all areas of medicine, the COVID-19 pandemic required an agile response to be able to continue to provide not only a digital congress but also education, training and assessment in an almost totally digital world. In this paper we will describe the digital learning activities of the ESC, the successes and the challenges of the transformation that has taken place in the last 18 months as well as an overview of the vision for education, training and assessment in the post-COVID digital era. We understand the need to provide a portfolio of educational styles to suit a diverse range of learners. It is clear that digital CME provides opportunities but it is likely that it will not entirely replace in-person learning. In planning for the future, we regard the provision of digital CME as central to fulfilling our mission.

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The Mission of the ESC as an Educator

The mission statement of the European Society of Cardiology (ESC) is “to reduce the burden of cardiovascular disease”. The ESC is the leading scientific society for cardiovascular health care professionals across Europe and increasingly the world, and is an umbrella organisation, made from the National Cardiac Societies of each of the member countries, including 7 Associations (see list at end) representing subspecialties within cardiology, as well as Councils and Working Groups. The ESC Community has over 100,000 members and in 2019 the Annual Congress attracted 33,000 participants. Education is both central and transversal to delivering the mission of the ESC and underpins many of its activities across all the subspecialties of cardiology. (Figure 1)

Recognising the need for democratisation of education in cardiology, the ESC has for many years embraced the digital world within its education programme. Online/remote learning has been in place for over a decade, and the vast repository of high-quality educational materials provide a library from which

education and training programmes, as well as examinations and assessments have been built. As in all areas of medicine, the COVID-19 pandemic required an agile response to be able to continue to provide not only a digital congress (the largest cardiology congress in the world) education, training and assessment in an almost totally digital world.

In this paper we will describe the digital learning activities of the ESC, the successes and the challenges of the transformation that has taken place in the last 18 months as well as an overview of the vision for education, training and assessment in the post-COVID digital era.

Our (Digital) Activities

The European Society of Cardiology (ESC) has been offering education in a digital format for many years, with most resources accessible to anyone with a smartphone (or personal computer) and internet access. Educational material from ESC Congresses has been available over the internet since 2013, our first webinar

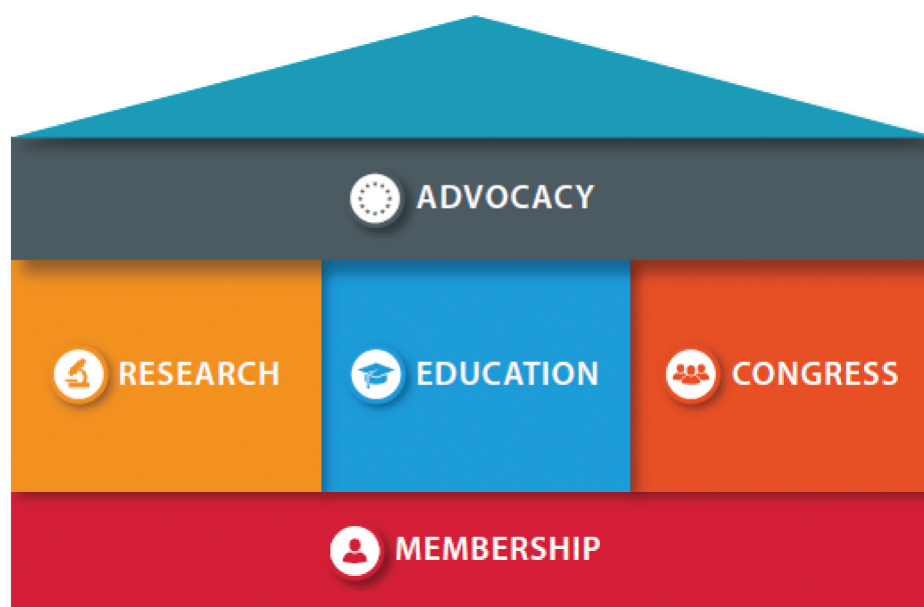


Figure 1. ESC strategy “house”.

was offered in 2009 and the ESC educational learning platform was launched in 2013. For some years ESC Textbooks and Journals have been available online

The programme of digital educational content has expanded greatly in the last year in response to the Covid-19 pandemic with a particular focus on the conversion of our Annual Congress to a digital i.e. remote experience. The educational sessions could be watched live, questions could be asked using the “chat” function of the platform, and the recordings were then made available after the event.

Additional digital educational activities which are further expanded through this article include use of social media, and the offering of knowledge-based assessments (exams) through an online home proctored platform. Together this has allowed the continuation and indeed an expansion of our digital educational activities.

- **ESC Congress** We have now held two Digital Congresses (i.e. only on-line attendance possible for delegates) and had the opportunity to evaluate the meeting held in August 2020 [1].

The first Digital Congress was held in 2020. The previous in Paris in 2019 was the largest held with 33,510 registrations.

In view of the circumstances and the fact that this was the first digital annual meeting, it was decided that free registration would be granted to all participants.

Registrations rose fourfold (see [Figure 2](#)) with an increase in younger and female delegates.

Users spent an average of 77 minutes on the platform

The finances of the Congress were very different to previous meetings with 80% related to information technology costs. In view of the concern about capacity to accommodate over 50,000 registrants multiple suppliers were used. According to the post congress digital survey, ESC Congress 2020 was extremely well received with 89% reporting ‘great’ and just 1% ‘poor’ (ESC personal communication)

In August 2021 the ESC Congress was once again held via the internet. On this occasion a fee was charged for registration. Delegate numbers (39 600) remained high and greater than for the in-person Congress of 2019 but substantially lower than the year before when no charge was made. Registered delegates can review the scientific content on demand for 2 weeks after the Congress. Furthermore, professional members and Fellows of the ESC can access the content all year round. Further analysis is planned.

ESC 365 – Our Knowledge Hub

The ESC 365 knowledge hub was launched in 2016. It provides an ongoing resource to ESC members based on material presented at the Congresses. Since its launch it has developed a content of over 4,000,000 resources and has been consulted by over 100,000 unique users. In 2020 alone there were over 33,000

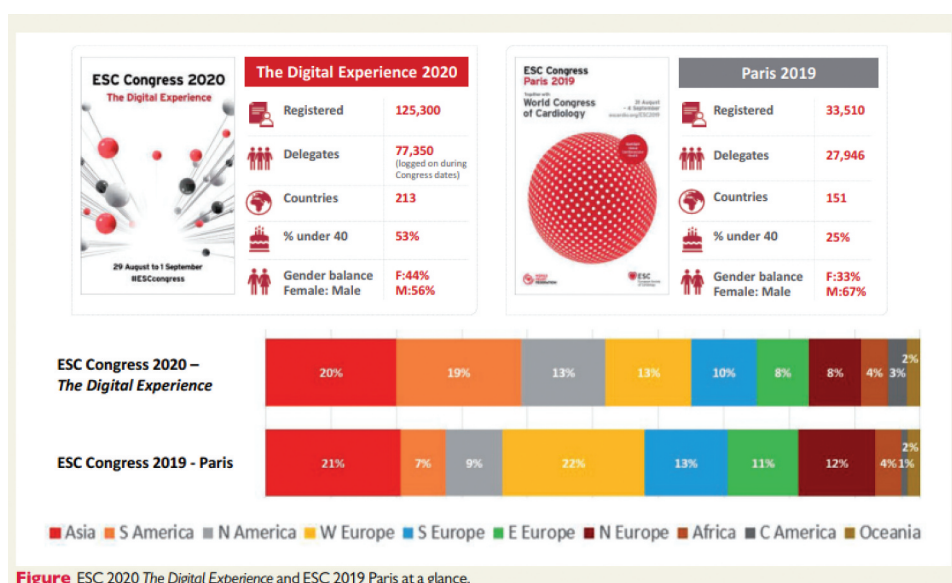


Figure 2. Data from ESC congress 2020.

users and more than half a million consultations. The resource contains material not just from the ESC Congress but also from the Congresses held by the ESC Associations representing sub-specialties of Cardiology.

The resource gained further importance following the digital congress in 2020 allowing congress registrants access to sessions and materials they had not been able to view live. The resource is developing further by linking to new material including webinars. An associated communication campaign is an integral part of maximising its value. Highlighted sessions and new resources are all advertised through monthly emails, social media, online journals, and communications from the ESC President and wherever possible national cardiac societies.

ESC Distance Learning Platform

The original ESC e-learning platform (ESCeL) represented a huge collaborative effort to produce a comprehensive platform for training and continuing medical education. The ESC and its associations generated large quantities of learning material through online modules which could be accessed either individually or collated into courses as part of qualifications. Learning could be monitored, and it facilitated interaction between trainers and trainees. A number of successes and challenges were apparent during regular evaluations of the platform.

The resource was extensive and an unparalleled repository of learning material. However, the human resource required to generate content was substantial. In part this was mitigated by funding commissioned content. The

platform required significant work to optimise user experience. Maintaining content on the platform in the rapidly changing field of cardiology was also a resource burden.

Drawing on the learning from the ESCeL platform the ESC is now commissioning a new ESC Distance Learning Platform which will provide an even more comprehensive experience for learners in training or practice. The new platform is planned to launch in 2022.

ESC-U Introduced Last Year

The ESC University was launched last year in response to the pandemic changes and their impact on education for cardiology trainees. It's collated materials from the ESC knowledge base including ESC 365 to generate a series of modules covering the key sections of the ESC training curriculum in core cardiology. The resource was created in less than 4 weeks and launched in April 2020. Since its launch it has been accessed by over 400 users.

Our Exams and Certifications

The ESC offers cardiology specialists and trainees a range of certification options to test knowledge, skills and performance in acute cardiac care with the Association for Acute Cardiovascular Care (ACVC), heart failure with the Heart Failure Association of the ESC (HFA), heart rhythm with the European Heart Rhythm Association (EHRA), imaging with the European Association of Cardiovascular Imaging (EACVI), intervention with the European Association of Percutaneous Cardiovascular

Interventions (EAPCI) and Core Cardiology (the European Examination in Core Cardiology - EECC) in association with the Union of European Medical Specialists, Cardiology Section (UEMScs). These certifications differ in applicants, scope, format, delivery, and usage, but all use in-person computer delivery, either in dedicated testing centres or at international meetings. With the pandemic, physical delivery of exams with multiple candidates in a single location became impossible and the associations had to consider alternatives.

The EECC tests knowledge of Core Cardiology, as defined in the 2020 Core Curriculum for the Cardiologist [2], in 120 best-of-five multiple choice questions delivered over 3-hours. It is provided as a service to National Cardiology Societies. Since its start in 2012, it has been delivered in local testing centres around Europe and wider, but by March 2020, it was clear that the scheduled delivery in June could not take place as planned. The EECC 2020 could not be cancelled as it is used as a requirement of training in many countries, so was postponed. By August 2020, it was clear that in-person delivery would not be possible, and on-line delivery methods were investigated. These were successfully deployed by the specialist societies in October 2020, and the decision was taken to deliver the EECC 2020 on-line with remote proctoring in March 2021, leaving time for any unsuccessful candidates to re-sit the examination on the planned date in June 2021.

The EECC 2020 exam questions had been written, selected, and standard set before the decision to postpone. However, in parallel with the delivery of the 2020 exam, the 2021 exam had to be developed. Fortunately, the exam uses an on-line database for question writing, selection and standard setting, so using the same tools, the face-to-face meetings were replaced with videoconferencing. The question editing meeting was shortened from 2-days to 1, with writers submitting 6 questions each, instead of the usual 12. The format was highly successful and achieved the same level of scrutiny and high-quality questions as in previous years. Similarly, the question selection and standard setting meetings produced the same high-quality exam and metrics as previously, with the same duration of meetings, but less time commitment overall because of reduced travel.

The EECC was delivered on-line with remote proctoring for the first time on 9 March 2021, for 539 candidates, and the EECC 2021 on 15 June 2021 with 642 candidates from 32 countries. 18 registered candidates (2.7%) did not attempt the exam and 10 (1.5%) had technical difficulties such that they could not complete the exam, 2 of whom had not completed the required pre-test of their computer and internet connection.

The EECC continues to work with its suppliers to reduce the likelihood of candidates being unable to take the exam, but these figures are reassuring in that the number of affected candidates is consistently lower than the number experiencing difficulties in previous years at in-person testing centres. Again, using on-line meetings, the EECC was able to determine the pass mark on 2 July 2021, approximately 3-weeks earlier than in previous years. There was no evidence of any misconduct, and feedback from the candidates was positive, regarding the relevance and quality of the questions, and fairness of the overall process. The sub-specialty exams were similarly successful.

These experiences show that the ESC certification exams can be successfully developed and delivered on-line with significant cost savings due to the removal of travel costs. Furthermore, on-line delivery is essential if we are to achieve our goal of expanding access to certification across the world. However, we recognise that both team-working and the continuing professional education of the question writers, is enhanced by formal and informal face-to-face interactions, and we plan to establish a hybrid, face-to-face and on-line, model of question review for the future.

Webinars, Case Reports, Social Media for Brief CME

The ESC has been offering webinars for over 10 years. Both the main ESC and its associations offer programmes of webinars across the spectrum of cardiology and targeted to a broad range of cardiovascular health care professionals and scientists

Webinars are available as part of the membership package of the ESC or its associations. Each webinar follows a production outline which includes a full rehearsal prior to the live transmission. Pre and post webinar evaluations of knowledge and learning are integrated as part of the commitment to ensure these are effective Continuing Medical Education (CME).

They are interactive during the live presentation and also available through the ESC website for subsequent viewing.

In the first 6 months of 2021, over 40 webinars were produced and offered. Typical live audiences for an ESC webinar, based on analysis of the 83 webinars delivered in 2020, have been over 400 with a year on year increase in audiences of 30% (ESC personal communication).

The ESC has embraced social media for communicating with its membership with over 112 000 Followers on Twitter (handle @escardio) and over 238 000 Facebooks

'Friends'. The ESC activities can also be followed on LinkedIn, Instagram and YouTube.

These are used to announce new publications, guidelines and cardiovascular news stories as well as to advertise events and encourage interaction within the membership.

Social media has become a critical adjunct to our Congress to disseminate new knowledge, encourage debate, and improve interactivity. We are exploring the development of the concept of brief CME for these learning interactions

ESC Clinical Practice Guidelines

ESC Clinical Practice Guidelines are highly respected and influential. Their preparation can take up to 2 years involving, for each guideline, a large task force of experts drawn from across the world. The four updated guidelines launched at the ESC Congress in 2021 were prepared entirely through on-line interaction. The quality of the interaction within the task force was not diminished and preparation and publication ran to the previously agreed timelines.

Challenges and Opportunities for the Future

The ESC is a global educator. Therefore, it has to provide educational materials for a wide range of users who seek different educational experiences. It also has to support trainers and healthcare professionals in all aspects of their work. It publishes a core curriculum for trainees [1], and education based around this.

Arguably, a useful classification of those who access the ESC's on-line material would be to consider them either "learners", "achievers" and/or "networkers". Learners would include trainees but also those seeking continuing professional development. Achievers will be more senior professionals who are trainers, teachers and lecturers for whom an updated educational resource is essential. Finally, there are networkers, who use the ESC digital platforms as part of their networking activities to support both their clinical and, perhaps more importantly, their research activities. Most users will access ESC digital materials for all three purposes, albeit in varying amounts.

In the same way that most universities offer a holistic educational experience so the ESC must do the same in a virtual environment. In the future it seems increasingly likely that the stand-up lecture to a large auditorium will no longer be the main feature of in-person congresses. There will be a greater focus on practical and small group activity with a high degree of interaction. Increasingly the digital environment can offer these types of educational experiences.

The ESC is exploring new models of digital education to replace small group active learning, for example through virtual simulation.

We must understand that education in a virtual world "looks" slightly different from traditional educational offerings: people wish to have a high-quality digital experience that is visual rather than text heavy, and expect it to be engaging and also interactive.

The ESC has learned that talks have to be shorter than before, and more than just a PowerPoint experience. Lessons have been learned from the "Instagram generation", and social media only amplifies short, but high impact, pieces of information which are often best when there is a visual summary. Signposting is now also seen as an important part of education, so that not everything has to be covered in one session, but additional resources can be identified for the "viewer". Discussions between experts, and the opportunity to ask questions virtually are also key to engagement.

The field of digital cardiac education is competitive. Other large professional associations around the world are embracing the same challenges. In the modern digital world, with 24/7 connectivity, even a small professional society or educational organisation can reach a worldwide audience for its educational offerings – so the degree of competition has likely increased.

Although the digital ESC Congresses have received exceptionally high approval ratings and potentially greater global audiences, as well as being more environmentally friendly than the in-person congress, the longer-term impact of not meeting in person needs to be understood.

The ESC is a professional society relying largely on the voluntary work of a very large number of healthcare professionals supported by a permanent team at the European Heart House. It has evolved over three decades to work through a number of committees and working groups. The organisation will only succeed if it engages its members and remains relevant to their professional educational needs. The committees have continued their work through the pandemic using web-based interaction platforms, and this has improved attendance and engagement in many cases due to this voluntary commitment being less time consuming and with lower opportunity cost for busy healthcare professionals. It remains to be seen if new committee members can be encouraged to contribute when the interaction is most likely only virtual.

The ESC community and the ESC brand is strengthened through congresses, which largely serve educational and networking functions, and these may be more difficult to sustain in a purely virtual environment. Face-to-face meetings are likely to remain a significant

component of ESC activities after the pandemic, although exactly how the blend of face-to-face with virtual will play out is currently unclear, as it is for many other businesses.

Conclusions

The ESC is a committed and effective digital provider of Continuing Medical Education for healthcare professionals working in the cardiovascular area. Remote, digital education has been provided for many years but with a marked acceleration due to the constraints on face-to-face interaction during the COVID-19 pandemic. We understand the need to provide a portfolio of educational styles to suit a diverse range of learners. We continue to evaluate and develop our educational offerings both for their effectiveness and also the resource utilisation. It is clear that digital CME provides opportunity for learners (and educators and communicators) but it is likely that it will not entirely replace in-person learning. In planning for the future, we regard the provision of digital CME as central to fulfilling our mission *to reduce the burden of cardiovascular disease*.

List Of ESC Associations

Association of Cardiovascular Nursing & Allied Professions (ACNAP), Association for Acute CardioVascular Care (ACVC), European Association of Cardiovascular Imaging (EACVI), European Association of Preventive Cardiology

(EAPC), European Association of Percutaneous Cardiovascular Interventions (EAPCI), European Heart Rhythm Association (EHRA), Heart Failure Association (HFA).

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Disclosure Statement

No potential conflict of interest was reported by the author(s).

Permissions

Permission to reproduce [Figure 2](#) has been obtained from the European Heart Journal Digital Health

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