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The Certificate of Advanced Studies (CAS) course adapted to a pandemic

Restructuring the CAS course at the University of Zürich during the COVID-19 pandemic. Challenges and learnings for future change in the delivery of cardiovascular education

On 28 February 2020, while preparing to welcome to Zurich 30 international participants to a post-graduate course, we realized that the Pandemic risk was real. Therefore, we were confronted with a difficult decision: postpone, cancel, or restructure the course. While we still strive to react to unexpected emergencies, this experience brought a light of hope, in time of severe trouble and insecurity: *together we can solve any crisis; nothing can stop us from keep in touch and sharing our knowledge.*

The CAS in Cardiac Structural Interventions

The Certificate of Advanced Studies—Cardiac Structural Interventions (CAS-CSI) of the University of Zürich (UZH) embodies a portfolio of post-graduate educational courses designed to build a new generation of Heart-Team specialists, focused on cardiac structural interventions.¹

Advances of catheter-based structural interventions (transcatheter aortic valve implantation, Mitraclip, etc.) have ignited rapid changes in our standards, introducing profound structural and organizational revolutions. While our institutions have rapidly adapted to this change, education pathways have to be updated to break cultural barriers among specialists.

Under these principles, three CAS-CSI courses started in October 2017: CAS Aortic interventions, CAS Mitral and Tricuspid interventions, and CAS Imaging for Structural intervention. Each certification course includes four full-immersive modules of five days at University Hospital Zürich (USZ), over two semesters. The courses are open to cardiologists, cardiac surgeons, cardiac anaesthesiologists, and imagers, with established expertise in the field of structural interventions. Following the concept of 'adult learning', the modules include group activities, simulation-based cross training, live-case transmissions, communication skills training, non-fortal lectures, and much more. Physical presence in Zurich is mandatory and allows for active engagement, fosters interpersonal communication among participants and training team, which results in optimal acquisition of knowledge, fruitful team building and establishes an international network (Alumni of the CAS). Definitively, social interaction is the main value of the courses.

The COVID outbreak at the time of the CAS courses

The first cases of COVID-19 were reported in Europa at the beginning of the year.²⁻⁵ End February we felt that further spread of the outbreak required an immediate reaction. An emergency meeting defined the immediate future of the new CAS-CSI modules, to reduce the risk for

the students and the faculty traveling from five different continents, while preserving the opportunity to obtain certification.

Contingency plan

Six days before the Week 4 of CAS-CSI Aortic, the course underwent major reorganization, from *on-site* to an *on-line* structure as following.

Reorganization of the CAS week activities from physical presence to on-line virtual presence

The lessons schedule was updated, and the agenda was shared online (Excel file) with CET timing. The students have been instructed to be online independent of time zones (some students joined the courses at night time).

To ensure smooth flow of the course, to allow interaction between faculty and students, we introduced a new role: the Digital Moderator (DM).

New rules for online activities for participants, speakers, and DMs were established. All participants were trained prior to the modules to ensure smooth processes during the learning activities. Communication among participants took place via multiple channels (dedicated chat line, audio/video, WhatsApp,⁶ LinkedIn,⁷ etc.). Digital moderators efficiently coordinated and regulated the communication flow between students and faculty.

Information technology and logistics were centralized: a digital manager supported a help-line, broadcasting, and training. New assessment modalities were put into practice (proof of presence, online evaluation of activities, program feedback) to adapt for the new version of the courses.

New e-learning and remote connection platform

Regular sessions used GoToMeeting Business⁶; live cases were streamed on a dedicated Private YouTube CAS channel. All sessions were recorded and stored on secure servers. A UZH E-learning platform, already active before the crisis, provided shared resources, e-testing, and feedback modules.

Communication

As soon as the decision was made before the official travel restrictions from Governments, the participants were instructed not to travel to Zürich, but encouraged to keep to the agenda.

Close networking with the CAS students (via WhatsApp Chat group, LinkedIn, and e-mail) was used to inform and to instruct how to join the course online.



Figure 1 Figure shows online live discussion participants, including live chat comments.

Challenges

First, nobody was ready for this. . . Faculty and Students were confronted with unprecedented challenges. Rapid decisions were taken, accepting compromises and imperfect solutions. The main concern was to protect us from the risk of infection, while maintaining educational standards in a new CAS-CSI format, reorganized on an emergency basis. We were constantly driven by the need to keep the feeling of community that so strongly brands our educational experience.

The challenges for the faculty

Fast decisions were followed by doubts and fears. Transparent communication with the participants, the local and international faculty and the industry partners prior, during and after the week course was crucial to the success of the restructured process.

The course was completed with timely connections, high-quality transmission of educational material, images, live-case videos, and group discussions (Figure 1), although we faced minor bandwidth issues with some participants. The biggest challenge for the faculty was the lack of direct and interpersonal feedback while delivering the presentations online. This isolation feeling required some adaptation to the new educational format. The DM (a totally new job) had to amalgamate students and faculty, managing the chat line and moderate the online discussion (participants were allowed to directly interact, through the DM, who was managing priorities and timing).

The challenges for the students

This was a challenging week for the 26 students. Most of them had booked flight tickets and hotel rooms and had long since reserved free time to participate at the course in Zürich. The information about the

change arrived less than a week before the start of the module; nevertheless, all students were able to participate and to adapt to the new situation. During the sessions, the students were able to communicate with no technical constraints, using the above-mentioned channels. On Friday 13 March (last day of the course), the students posted positive feedback comments on their WhatsApp Group, and LinkedIn videos summarizing the learning (and human) experience during the course.

Each student was able to deliver the final examination, by means of presentation of a mini-thesis, assessed by the Faculty using the same metrics as for the on-site course.

The feedback from the students was obtained via an online survey delivered directly after the course (Table 1). Overall, students were satisfied about the interaction with the faculty before and during the module (76.9% rated the interaction during the course as 'good' or 'excellent'). However, whereas all students found the quality of delivery satisfactory, 53.8% found it worse than face-to-face interaction. In absolute terms, the structure and the quality of the lessons were 'good' or 'excellent' in 92.3%.

Lessons learned

In times of trouble, human beings give their best

Although the latest CAS-CSI module was challenged by the worldwide COVID Outbreak, the certification was accomplished thanks to a team effort. Lack of physical presence was supplemented by an e-platform that allowed all students to participate and to keep in touch during this difficult time. The community feeling of the course was preserved, thanks to the high level of networking already established among students and CAS Faculty prior to the Pandemic.

During this experience, flexibility and improvisation were part of the adapted work, supported by immediate communication between all stakeholders and by an extremely efficient underground network

Table 1 Student survey responses

Communication <i>before</i> the start of the module		Yes	No		
Did the information from the organizers about the disruption on CAS-CSI aortic 2 Week 4 reach you on time to reorganize your travel schedule?		76%	24%		
Was the information sufficient to reorganize your week schedule?		96%	4%		
Were the participant instructions clear and well-structured for you to timely and efficiently connect online?		100%	0%		
Communication <i>during</i> the module		Yes	No	Did not try	
Were the organizers easy to reach during the week?		96.2%	0%	3.8%	
Did the figure of the Digital Moderator help you during the week?		96.2%	3.8%	n.a.	
Did you experience any technical difficulties to connect online during the week?		23.1%	76.9%	n.a.	
How would you characterize the interaction during the week?	Excellent	Good	Average	Poor	Terrible
	11.5%	65.4%	23.1%	0%	0%
Which is your preferred channel for communication during such an online activity (Color online) as CAS- CSI Aortic 2 Week 4?	Audio chat	Video chat	Online text chat	WhatsApp/text messages	E-mail
	30.8%	23.1%	30.8%	15.3%	0%
Satisfaction with the virtual content delivery		Yes	No	Partly	
Did you find the emergently refurbished CAS-CSI aortic 2 Week 4 appropriate for content delivery?		73.1%	0%	26.9%	
Please rate the quality of delivery during the week given the sudden change in format (to virtual).	Not satisfactory	Satisfactory but worse than face-to-face	Satisfactory and equal to face-to-face	Satisfactory and better than face-to-face	
	0%	53.8%	42.3%	3.9%	
How would you rate the <i>structure</i> during the CAS?	Excellent	Good	Average	Poor	Terrible
	34.8%	57.7%	7.7%	0%	0%
How would you rate the <i>quality of contents</i> during the CAS?	42.3%	50%	7.7%	0%	0%
How would you rate the <i>delivery of contents</i> during the CAS?	26.3%	61.5%	11.5%	0%	0%

dealing with technicalities. We learned that an online platform could be used to ensure communication at the highest level, to support an advanced post-graduate educational program. At the end of the week, CAS Students, Faculty, guests, and industry partners were satisfied with the outcome.

The online delivery of CAS-CSI cannot replace live on-site activities, but it has been shown to be helpful when adverse circumstances preclude students and faculty to meet. The recent experience will support future activities, if and when personal presence will not be possible or desirable.

In conclusion, in times of trouble, technology has supported our community to remain connected despite the need for social distancing. Nothing can replace human networking and close social interactions. We still believe in social mixing, cross-fertilization, and crowdsourcing. This is the main strength of the CAS-CSI philosophy: by supporting a community of young and active participants, we hope to be able to foster a new generation of cardiovascular specialists who can fully personify the values of diversity, teamwork and cooperation. COVID-19 forces us to #stayathome but we #keeplearning.

Conflict of interest: none declared.

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References are available as [supplementary material](#) at *European Heart Journal* online.