Participant Perspectives: A Review of Feedback from the Globus Spine Fellows Course (2015-2023)

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Ethical approval: Not required

Summary:

The Spine Fellows Course is a specialised educational program designed by MERC (the education division of Globus Medical) with the aim of advancing the skills and knowledge of surgical fellows, both Orthopaedic and neurosurgeons. Participant feedback from 2015-2023 was collected for analysis within this report. The aim of this analysis is to identify key positives and areas for improvement to enhance the course's overall quality and participant satisfaction.

Overall, the feedback highlights a great level of satisfaction with the course, especially with regards to meeting participants' expectations, instructional quality, and relevance of course content. There were consistent high ratings of the relevance of techniques covered each year by the participants, and the faculty were overall rated as exceptionally skilled. However, a common suggestion for improvement each year regarded the course length and the need for more time in the cadaver lab.

To ensure this course remains a valuable educational resource for the future, it is essential to analyse feedback such an in a report like this to allow continuous improvement year on year to maintain the high standards of this renowned course.

Introduction:

This is a feedback review of the Musculoskeletal Education and Research Centre (MERC) Cadaveric Training Program hosted by Globus Medical. This is a two-day course open to European Spine Fellows located in Audubon, Pennsylvania, USA.

The "cadaveric learning approach is the gold standard for surgical simulation because it demonstrates authentic anatomy and tissue handling" (1,2). This allows surgeons to practice the latest techniques in spine surgery with the latest technology, such as with novel robotics manufactured by Globus Medical like ExcelsiusGPS™ for example, which offers instrument tracking and allows screws to be placed without the need for guide wires (3,4). Cadavers enable trainees to do this in a hands-on way with access to teaching delivered by top surgeons in their field.

The didactic learning aspects of the course deliver relevant education and material in a variety of forms including sawbones, workshops, case reviews, and panel debates (5). Courses such as these which are not part of NHS standardised training are becoming ever more important. One study stated how "the UK has seen a progressive reduction in the time available for surgical training, raising concerns that trainees may not acquire the required competencies during each stage of training" (6-9). These courses allow trainees to better their skills in their own time to avoid this.

It is crucial to collect and analyse feedback from such courses over the years to gauge how effectively the course is delivering teaching, and if the course content, structure and participant experience can be enhanced in any way.

Aims:

To collect and analyse feedback from participants of the Globus Spine Fellows Course from the years 2015 to 2023, identify strengths of the course and areas participants feel need improvement. To also develop an appropriate feedback form for participants of the 2024 course.

Methods:

Based on the course program from the years 2015, 2017, 2018, 2019, 2022 and 2023, a feedback questionnaire was developed using Survey Monkey for the participants to complete. There were a total of 69 questionnaire responses over these six years from participants. Each of the questions from all six questionnaires were written out, allowing all responses for the same/similar questions to be amalgamated under one heading, and for duplicate questions to excluded. Questions regarding surgical techniques that had only one year's worth of responses were excluded, as not enough course participants would have received teaching regarding these topics to be reflective of their true quality. Once the necessary questions were excluded, survey questions were divided into four categories:

1) Rating the teaching of surgical techniques
2) Rating of faculty
3) Rating how time was divided between teaching
4) Rating of participant satisfaction

Whilst many questions between these six questionnaires were different, many questions remained the same or were similar between them. Responses to the same questions across the years were collected, and averages were calculated. Participant responses to similar questions regarding specific techniques, for example, ratings on all sessions in which the ALIF technique was covered, were amalgamated. Average ratings on these commonly covered techniques and topics over the years were calculated, allowing analysis of participants' perspectives on the teaching overall.

The questions for this year's course (2024) were devised by faculty and were made into a Google Form: https://forms.gle/aAFeQ2TXxzuaLj6L7

This has yet to be sent out to this year's participants but will too provide valuable insight into participants 'perceptions of the teaching.

Results:

Surgical Techniques

Over the six years, the participants were asked to rate their comfort level with the lab techniques being taught during the course before the teaching course and then afterwards. A score of one indicates the participant was not comfortable at all with the technique and a score of ten indicates complete comfort with the technique covered. This can be seen below in Figure 1. Prior to attending the course, participants had an average comfort level of 5.66 in the techniques covered. After the course, their average comfort level increased to 8.27.

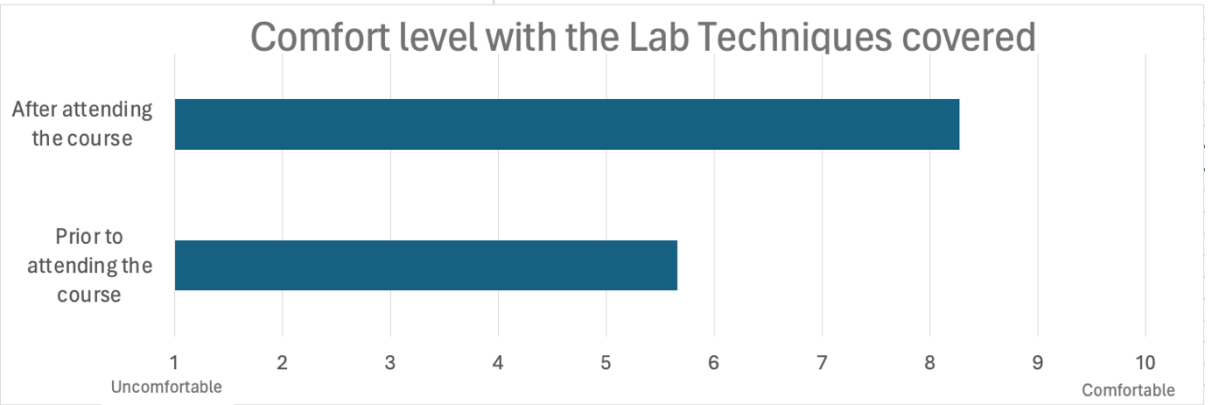

Figure 1. The comfort level in techniques taught before and after the teaching course of the 69 participants from 2015-2023.

The participants were asked to rate the relevance of the techniques and topics covered during each year of the course. The topics covered repeatedly were identified as: MIS TLIF, LLIF, ALIF, TLIF, Osteotomy, and Applying Sagittal Balance. The average relevance, as rated by the participants from 2015-2023 was calculated for these commonly covered subjects, as shown in Figure 2, with one being irrelevant to learn about, and ten being the most relevant. The technique deemed the most relevant to training was ALIF (9.23). MIS TLIF was given an average relevance of 9.16, LLIF 9.06, Osteotomy 8.81, Applying Sagittal Balance 8.64, and TLIF 8.5.

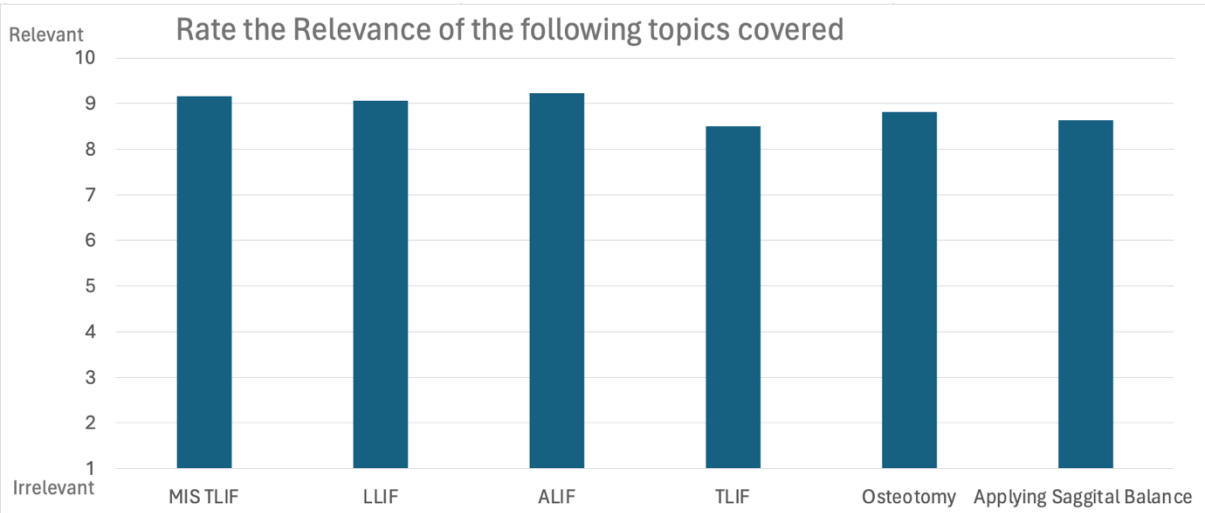

Figure 2. The relevance of repeatedly covered techniques and topics as rated by the 69 participants from 2015-2023.

Faculty

From 2015-2023 19 members of faculty were involved in delivering the teaching to the fellows during the course. Each year the majority of the faculty changed, with only one surgeon having been present for all six of the courses. The teaching faculty was comprised of between a minimum of five and a maximum of seven individuals each year. The faculty delivered teaching in two methods: either as a didactic session of teaching or teaching participants within a cadaveric lab. Separate ratings of each method of teaching were calculated as an average of those participants who were taught by each surgeon, as well as an average rating of each faculty member across both styles of teaching they delivered, this can be seen in Figure 3 and 4 below, with the exact ratings in Table 1 and 2. A rating of one indicates a poor experience of teaching by that member of faculty, and a score of ten indicates excellent teaching by that individual.

Table 1. The quality of teaching delivered by each member of faculty in both didactic and lab sessions rated by participants from 2015-2023.

Rate the Faculty:	**Didactic sessions**	**Cadaveric lab**
Mr Michael McCarthy	9.36	9.14
Dr. Martin Gehrchen	9.19	9.45
Dr. Gerd Bordon	9.50	9.46
Dr. Jeffrey McConnell	8.97	9.15
Dr. Victor Chang	9.50	9.77
Dr. Rakesh Patel	9.29	9.67
Dr. Giuseppe Sciarrone	7.38	10.00
Prof. Nicolai El Hindy	9.57	9.62
Dr. Stefan Renaud	9.31	9.09
Mr. Magnum Tsegaye	9.30	9.60
Miss Maggie Lee	9.43	9.31
John Kelleher, MD	8.50	9.20
Dr. Rohit Vasan	9.41	9.50
Dr. Christopher Maulucci	9.71	9.79
Mr. Navin Vergese	9.07	9.44
Dr. med. Tjark Tassemeier	8.42	8.71
Jake Timothy	9.10	9.43
Dr. Timothy Moore	9.57	9.62
Paul Davies	9.00	9.43

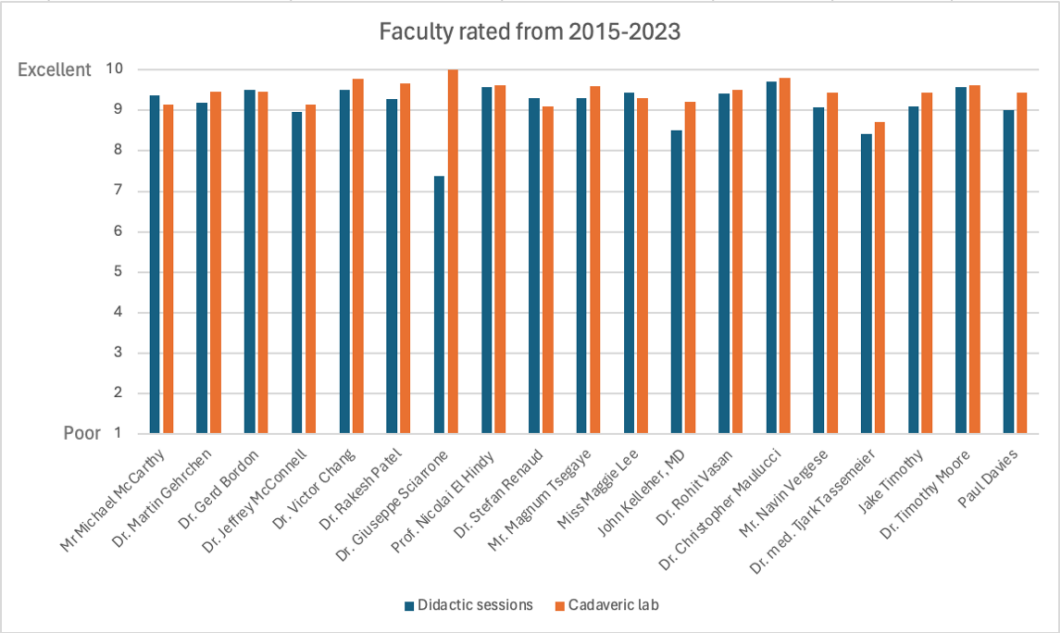

Figure 3. The quality of teaching delivered by each member of faculty in both didactic and lab sessions rated by participants from 2015-2023.

Table 2. The average quality of teaching delivered by each member of faculty rated overall by participants from 2015-2023.

Rate the Faculty:	**Average**
Mr Michael McCarthy	9.25
Dr. Martin Gehrchen	9.32
Dr. Gerd Bordon	9.48
Dr. Jeffrey McConnell	9.06
Dr. Victor Chang	9.64
Dr. Rakesh Patel	9.48
Dr. Giuseppe Sciarrone	8.69
Prof. Nicolai El Hindy	9.60
Dr. Stefan Renaud	9.20
Mr. Magnum Tsegaye	9.45
Miss Maggie Lee	9.37
John Kelleher, MD	8.85
Dr. Rohit Vasan	9.46
Dr. Christopher Maulucci	9.75
Mr. Navin Vergese	9.26
Dr. med. Tjark Tassemeier	8.57
Jake Timothy	9.27
Dr. Timothy Moore	9.60
Paul Davies	9.23

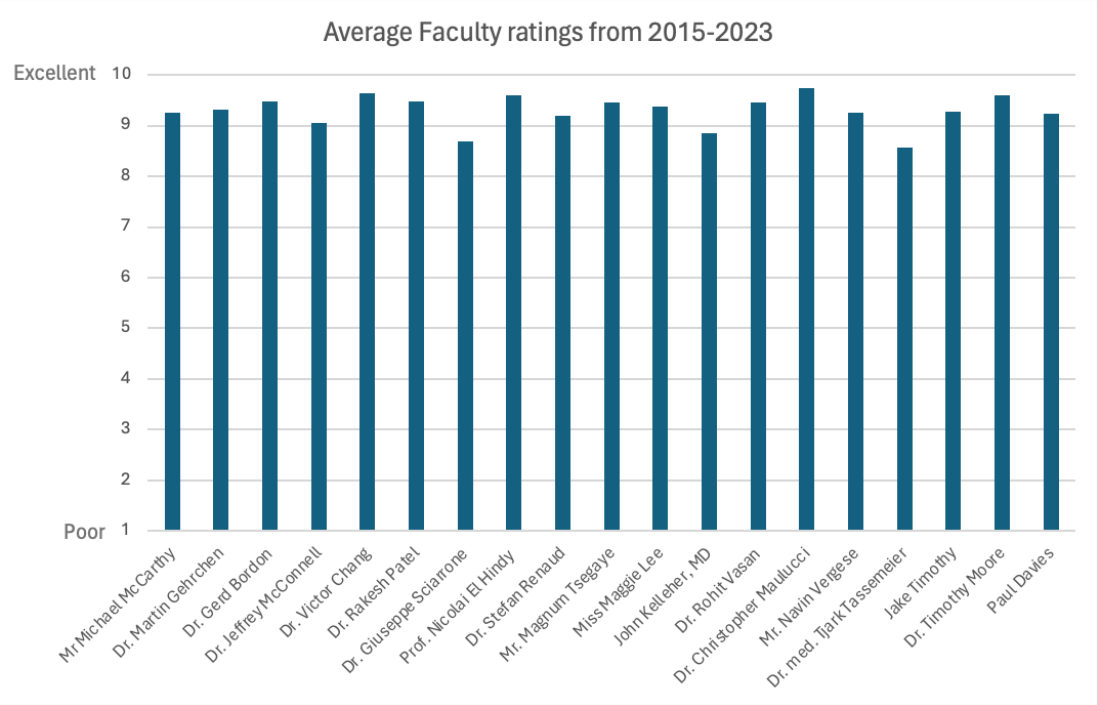

Figure 4. The average quality of teaching delivered by each member of faculty rated overall by participants from 2015-2023.

Time Utilised

Various forms of teaching were delivered during the two days of each course. Each participant was asked to rate how much time was spent during the four main teaching forms on a scale of 'Not enough' to 'Excessive'. This feedback was amalgamated, and average ratings were calculated for the six years overall based on how participants felt, this is displayed in Figures 5-8 and Tables 3-6.

Table 3. Average rating of the time spent on didactic teaching sessions during the course from 2015-2023.

Average Time spent on sessions	Didactic sessions
Not enough	6.01%
Sufficient	88.87%
Excessive	4.52%

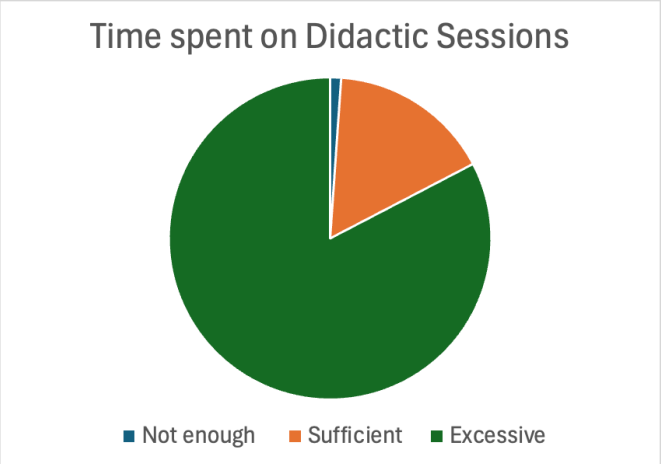

Figure 5. Average rating of the time spent on didactic teaching sessions during the course from 2015-2023.

Table 4. Average rating of the time spent on Lab teaching sessions during the course from 2015-2023.

Average Time spent on sessions	Lab sessions
Not enough	32.09%
Sufficient	63.47%
Excessive	22.22%

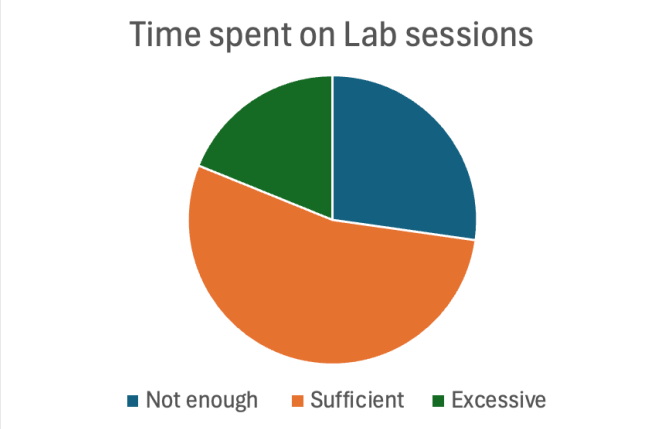

Figure 6. Average rating of the time spent on Lab teaching sessions during the course from 2015-2023.

Table 5. Average rating of the time spent in Breakout sessions during the course from 2015-2023.

Average Time spent on sessions	Breakout sessions
Not enough	12.33%
Sufficient	88.45%
Excessive	10.00%

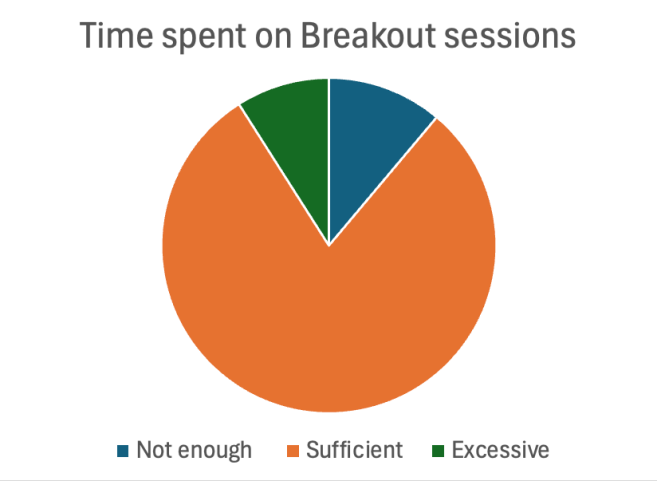

Figure 7. Average rating of the time spent in Breakout sessions during the course from 2015-2023.

Table 6. Average rating of the time spent on Case Study sessions during the course from 2015-2023.

Average Time spent on sessions	Case studies
Not enough	16.50%
Sufficient	83.50%
Excessive	0.00%

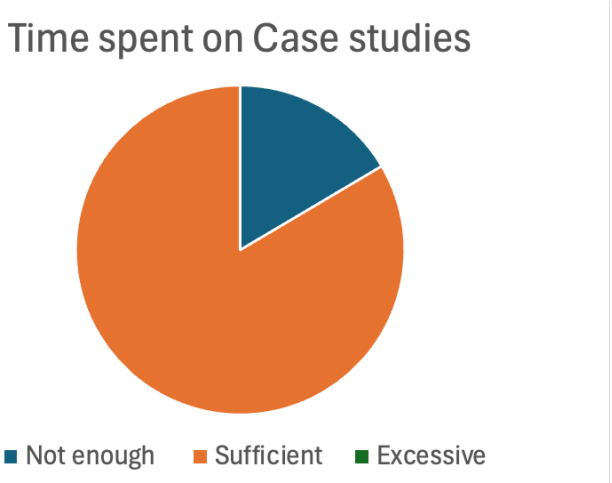

Figure 8.Average rating of the time spent on Case Study sessions during the course from 2015-2023.

Participant Satisfaction

Whilst the quality, relevance and usefulness of teaching was rated by participants, the logistical attributes of the course were also rated by participants across the questionnaires in order to assess how smoothly the course ran each year and if there are any improvements that could be made in the future. Ratings were based on a scale of one (strongly disagree with the statement in question) to ten (strongly agree with the statement in question). The ratings were averaged out across the years 2015-2023.

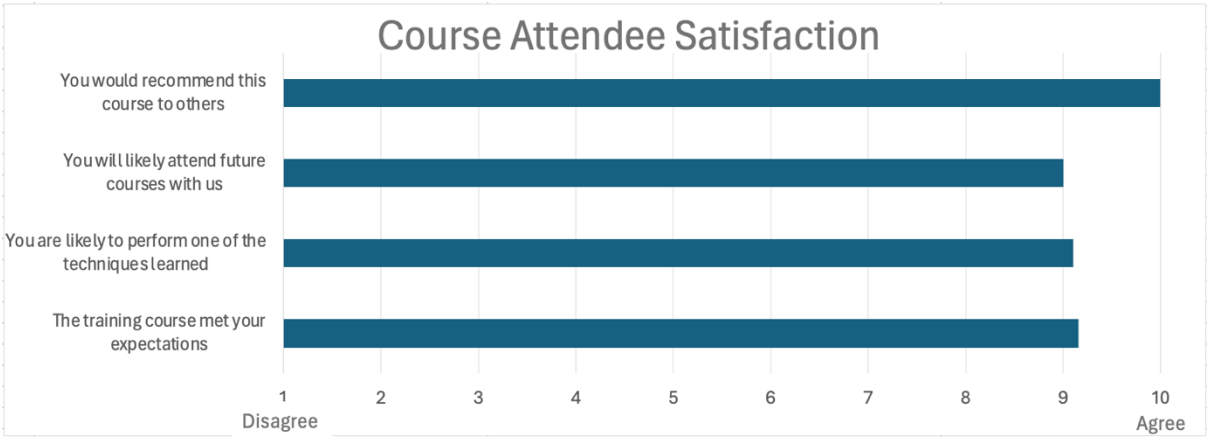

Figure 9. Average course attendee satisfaction from 2015-2023.

Table 7. Average course attendee satisfaction from 2015-2023.

Course Attendee Satisfaction	The training course met your expectations	You are likely to perform one of the techniques learned	You will likely attend future courses with us	You would recommend this course to others
	9.16	9.10	9.00	10.00

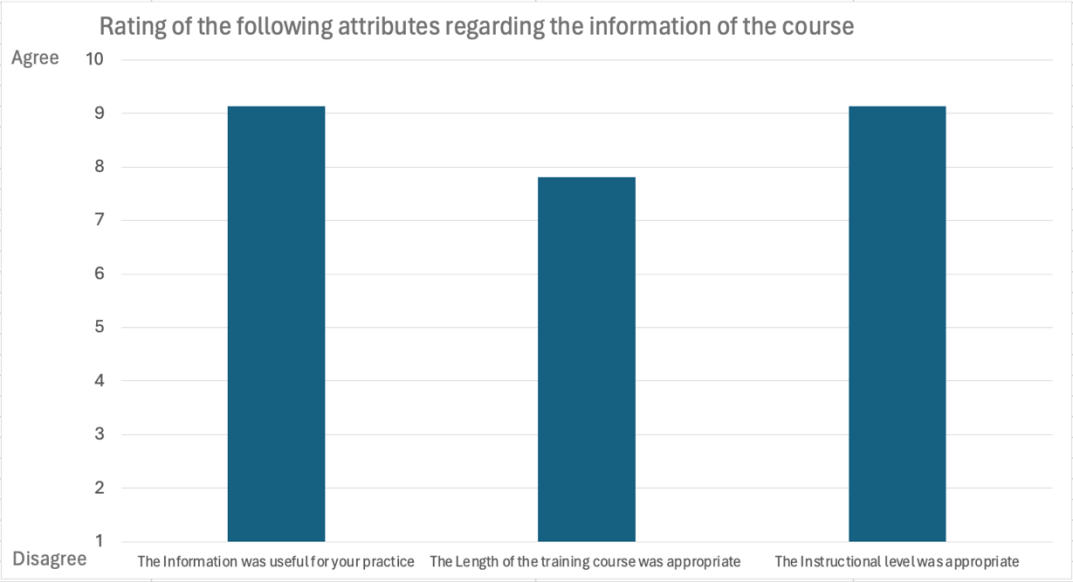

Figure 10. Average quality of the information of the course from 2015-2023.

Table 8. Average quality of the information of the course from 2015-2023.

Quality of the Course	The Information was useful for your practice	The Length of the training course was appropriate	The Instructional level was appropriate
	9.13	7.81	9.14

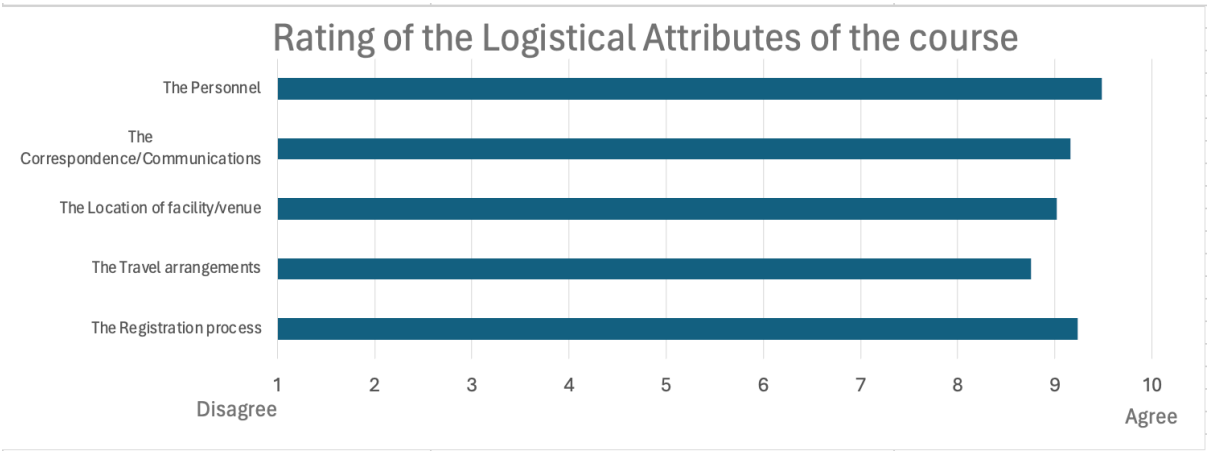

Figure 11. Average rating of the Logistical Attributes of the course from 2015-2023.

Table 9. Average rating of the Logistical Attributes of the course from 2015-2023.

Rating of the Logistical Attributes	The Registration Process	The Travel Arrangements	The Location of facility/venue	The Correspondence/ Communications	The Personnel
	9.23	8.75	9.02	9.16	9.48

Discussion:

The feedback collected from the course participants over the years 2015 to 2023 provides valuable insights into the strengths and areas for improvement. This discussion will interpret these results, identifying key trends and their implications for future iterations of the course.

Participant Satisfaction

Overall, participant satisfaction with the course has been exceptionally high, with average ratings consistently above 9 out of 10 across multiple dimensions. Participants rated the course's ability to meet their expectations at 9.16, the likelihood of performing techniques learned at 9.10, the likelihood of attending future courses at 9.00, and the likelihood of recommending the course to others at a perfect 10.00. These high ratings reflect a strong endorsement of the course's content, teaching quality, and overall structure. This is in keeping with how cadaveric training programs are generally perceived, with "both trainees and assessors holding them in high regard, with the feel that they help to improve operative skills" (10) and have a "positive effect on their training" (11).

Attendees all stating that they would 100% recommend the course to others highlights the perceived value and effectiveness of the course among attendees. The increase in comfort level in techniques by 2.61 to a score of 8.27 reflects this. One study stated the importance of cadaveric training programs in "promoting confidence in techniques in surgeons, leading to a reduction in time spent performing live surgical procedures by trainees" (12). This efficiency and confidence in technique is necessary in high-risk surgeries and leads to better patient outcomes.

Quality of Information and Instruction

The course's instructional quality was rated highly, with participants finding the information useful for their practice (9.13), and the instructional level appropriate (9.14). However, the length of the training course received a comparatively lower rating (7.81). This suggests that while the content and delivery were highly effective, there may be room for optimizing the duration of the course to better suit participants' needs.

The high ratings for the didactic and lab sessions (ranging from 8.42 to 10.00) indicate that participants found these sessions to be highly beneficial. Faculty members received particularly high ratings, with some individuals, such as Dr Christopher Maulucci and Dr Victor Chang, scoring close to perfect ratings in both didactic and cadaveric lab sessions. This underscores the importance of skilled and experienced faculty in delivering high-quality educational experiences.

However, it is important to note that each year, the majority of the teaching faculty changed. This meant that despite each member's rating being an average, not all of the 69 participants of the course received teaching by each faculty member. This discrepancy could result in some members receiving lower ratings than others, especially if they have been involved in teaching in multiple years. For faculty involved in teaching over multiple years, especially in the earlier years of the course, their ratings

may be lower as with each year improvements are made upon the course according to feedback, so the 2023 course was likely to have been significantly more developed than the 2015 course for example, which would be reflected in participant feedback.

Dr. Giuseppe Sciarrone: Didactic Session	0.00% 0	12.50% 1	0.00% 0	12.50% 1	0.00% 0	0.00% 0	12.50% 1	12.50% 1	25.00% 2	25.00% 2	0.00% 0
Dr. Giuseppe Sciarrone: Lab Session	0.00% 0	0.00% 0	0.00% 0	0.00% 0	0.00% 0	0.00% 0	0.00% 0	0.00% 0	0.00% 0	12.50% 1	87.50% 7

For example, this is a snapshot of feedback from the 2022 course in which eight people completed the survey. Of those eight people, only one person actually received teaching from Dr Giuseppe Sciarrone in the lab session, and highly rated his teaching. However, based on his feedback to his didactic sessions, it is possible that he may not have been as highly rated should he have received feedback on his lab teaching from more individuals. Therefore, a limitation in this review is that these average faculty ratings are not based on consistent teaching over consecutive years delivered to a consistent number of participants. This means that this data should not be used to assess or compare the performance and teaching value of each faculty member, but instead in conjunction with the broader participant feedback.

Logistical Attributes

The logistical aspects of the course were also positively rated. The registration process (9.23), travel arrangements (8.75), location of the facility (9.02), correspondence and communications (9.16), and personnel (9.48) all received high ratings. This suggests that the overall organization of the course is well-managed, contributing to a smooth and professional experience for attendees. However, in the comment boxes of these questionnaires, there were minor complaints regarding the travel arrangements, specifically with regards to the poor communication about flights, train tickets and airport taxi transfers. These complaints were consistent over the years.

Teaching Methods and Time Utilization

Feedback on how the participants' time was divided between various teaching formats revealed that adequate time was spent in didactic sessions (88.87% rated as sufficient) and case study sessions (83.50% rated as sufficient). However, a notable proportion of (32.09%) of participants expressed that there was insufficient time spent in lab sessions, indicating a need for extended lab time to meet participant expectations better. Furthermore, one study found that cadaveric training programs induce "short-term skill acquisition", as opposed to lasting skill acquisition (13,14). Perhaps longer lab sessions during the course could help solidify learning of techniques and make the course more beneficial to each surgeon in the long run.

Relevance of Techniques Covered

Techniques were rated at highly relevant by participants, with ALIF (9.23), MIS TLIF (9.16), and LLIF (9.06) being deemed the most relevant. This feedback reinforces the importance of these techniques in the current spine surgery landscape and suggests a focus on these areas in future courses. Other studies have already shown improvements in trainees performing these techniques, for example trainees on average have become "faster at the MIS-TLIF procedure with clinical outcomes showing satisfactory results. However, the

study advised surgeons learning the procedure should take measures to minimize complications in early cases, such as utilizing novel navigation technology or supervision from more experienced surgeons" (15) which is something this Globus course offers in a highly rated teaching environment. Conversely, 'Applying Sagittal Balance' and TLIF were rated as the least relevant by a small margin, so how these sessions are delivered to provide the most value could be reviewed.

Conclusion:

The average feedback from the six years of the Globus Spine Fellows Course definitely highlights it as an invaluable tool for surgical education by participants. Attendees consistently highly rated the course as meeting their expectations and all attendees since 2015 100% would recommend the course to others. However, areas for improvement were identified, particularly to ensure that participants had enough time to try each surgical technique in the cadaveric lab, as well as ensuring that future travel arrangements are communicated clearly. In the future, the faculty and MERC should continue to leverage the strengths identified but address these minor areas of improvement to enhance the overall participant experience.

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