Supplement 9 Results of the differentiated consideration of motivation, learning objectives, course evaluation, and teaching materials

Original question	**Control group** n = 57 MW ± SD	**Study group** n = 52 MW ± SD	**p-Value**
T1			
Please state to what extent the following learning media motivate you to learn or attend a course.			
Well-prepared lecture notes	6.1 ± 0.8	6.1 ±0 .8	0.95
Textbooks	4.0 ± 1.4	3.8 ±1.5	0.52
Interactive e-learning	5.9 ± 1.1	5.6 ± 1.4	0.34
Combination of script and e-learning	6.1 ± 1.0	5.9 ± 1.3	0.56
Please state whether the visual design of a learning medium influences you.	6.5 ± 0.8	6.3 ± 0.8	0.16
Please state your motivation for taking part in the echocardiography course.	6.4 ± 0.8	6.6 ± 0.6	0.22
Please state to what extent you hope to achieve the following learning objectives by participating in the course.			
Total score personal learning goals and the achievement	6.4 ± 0.6	6.5 ± 0.5	0.29
Gain theoretical knowledge about ultrasound	6.1 ± 1.0	6.2 ± 0.9	0.54
Gain theoretical knowledge about echocardiography	6.2 ± 0.9	6.1 ± 1.0	0.86
Gain practical skills in the use of ultrasound devices	6.7 ± 0.6	6.9 ± 0.3	0.04
Gain practical skills in echocardiography	6.7 ± 0.6	6.8 ± 0.6	0.19
Gain spatial-visual ability	6.2 ± 0.9	6.2 ± 0.9	0.85
Gain sonoanatomical classification and organ visualisation abilities	6.3 ± 0.8	6.5 ± 0.7	0.27
Gain knowledge of physiological normal findings	6.3 ± 1.0	6.5 ± 0.7	0.47
Gain competence in recognising and interpreting pathological findings	6.5 ± 0.8	6.5 ± 0.9	0.98
T2			
Please state to what extent you have achieved the following learning objectives in preparation for the course.			
Total Score personal learning goals and the achievement	4.2 ± 0.9	4.5 ± 0.8	0.27
Gain theoretical knowledge about ultrasound	5.0 ± 1.1	5.7 ± 1.0	0.07
Gain theoretical knowledge about echocardiography	5.4 ± 1.1	5.64 ± 1.12	0.83
Gain practical skills in the use of ultrasound devices	3.1 ± 1.6	3.8 ± 1.0	0.08
Gain practical skills in echocardiography	2.9 ± 1.6	3.5 ± 1.1	0.17
Gain in spatial-visual ability	4.5 ± 1.2	4.91 ± 1.0	0.20
Gain sonoanatomical classification and organ visualisation abilities	4.8 ± 1.2	5.1 ± 0.8	0.46
Gain knowledge of physiological normal findings	4.8 ± 1.1	4.8 ± 1.2	0.75

Gain competence in recognising and interpreting pathological findings	3.2 ± 1.4	2.7 ± 1.28	0.33
T3			
Learning goals			
The learning objectives before and during the course were clear	6.0 ± 1.0	5.8±1.2	0.18
Please state to what extent you have achieved the following learning objectives by participating in the course.			
Total score personal learning goals and the achievement	5.8 ± 0.7	5.8 ± 0.6	0.87
Gain theoretical knowledge about ultrasound	5.6 ± 1.1	5.8 ± 1.1	0.23
Gain theoretical knowledge about echocardiography	6.2 ± 0.9	6.2 ± 0.9	0.90
Gain practical skills in the use of ultrasound devices	6.4 ± 1.0	6.4 ± 0.7	0.52
Gain practical skills in echocardiography	6.5 ± 0.7	6.4 ± 0.7	0.64
Gain spatial-visual ability	6.0 ± 0.9	6.0 ± 0.8	0.85
Gain sonoanatomical classification and organ visualisation abilities	5.9 ± 0.8	5.85 ± 0.8	0.67
Gain knowledge of physiological normal findings	5.9 ± 0.9	5.9 ± 0.9	0.68
Gain competence in recognising and interpreting pathological findings	4.0 ± 1.5	4.1 ± 1.3	0.70
Motivation after the course			
Please state how the course has contributed to my continued interest in ultrasound: I will use the teaching media provided to follow up the course.	6.4 ± 0.8	6.4 ± 0.7	0.93
Please state how the course has contributed to my continued interest in ultrasound: I will endeavour to acquire further skills in ultrasound through my clinical training (e.g. clerkship).	6.5 ± 0.7	6.6 ± 0.6	0.74
Preparation and work assignments			
The possibilities for preparation were appropriate.	5.9 ± 1.1	5.8 ± 1.1	0.35
The tasks were clearly formulated in the course.	6.3 ± 0.9	6.1 ± 1.0	0.24
The time given was appropriate for the work tasks and learning objectives.	5.8 ± 1.3	5.7 ± 1.1	0.30
On which topic would you have liked accompanying lectures?			0.17
Ultrasound technology	2	3	
Ultrasound practice	12	12	
Normal findings	11	12	
Pathologies	22	23	
Evaluation of the flipped-classroom concept			
Total score	6.3 ± 0.5	6.5 ± 0.4	0.19
Integration of ultrasound teaching into studies	6.9 ± 0.5	7.0 ± 0.2	0.40
Integration of ultrasound teaching into the compulsory curriculum	6.5 ± 1.0	6.9 ± 0.3	0.09
Course Overall	6.0 ± 0.6	6.3 ± 0.6	0.09
Teaching materials	5.7 ± 0.8	5.7 ± 1.0	0.74

Specialist competence of the tutors	6.2 ± 0.5	6.4 ± 0.9	0.15
Didactic competence of the tutors	6.3 ± 0.6	6.4 ± 0.9	0.22
Evaluation of the teaching material			
Total Score	5.7 ± 0.8	5.7 ± 1.0	0.74
Organisation and structure	5.8 ± 1.0	5.6 ± 1.6	0.33
Extent	6.1 ± 0.9	6.0 ± 0.1	0.30
Font size	6.4 ± 0.7	6.6 ± 0.6	0.27
Graphic size	5.8 ± 1.3	5.5 ± 1.3	0.16
Relation (text/graphic)	6.1 ± 1.0	6.4 ± 0.8	0.09
Design and colour scheme	5.7 ± 1.4	6.0 ± 1.1	0.16
Learning success	5.0 ± 1.2	5.1 ± 1.3	0.86
Recommendation	5.0 ± 1.8	5.2 ± 1.5	0.58