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Face validity of box trainer ‘ENDODOG’

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Abstract

Introduction: The use of laparoscopic surgery in veterinary medicine has increased dramatically during the past 15 years. In human medicine there are multiple training methods in laparoscopic surgery, whereas developments within veterinary medicine are lacking. A veterinary endoscopic surgery skills training device was developed, ENDODOG, including 6 different skills training tests.

Aim: To evaluate the degree of resemblance between the 'ENDODOG' and the actual laparoscopic procedure by means of a face validity test. This study examines whether differences in appreciation are present between the different groups of subjects.

Materials & Methods: Subjects (N=28) were divided in three groups: novices (inexperienced veterinarians n=15), intermediates (experienced veterinary surgeons without endoscopic surgery experience n=5) and experts (experienced endoscopic surgeons n=9). Participants completed three repetitions of a training program consisting of six basic skill simulations. The performance was compared between groups using a one-way ANOVA. Face validity was determined by using a questionnaire of 46 statements.

Results: The results show an overall high appreciation of the whole protocol by the majority of participants. Furthermore even though significant differences were present within groups the average rating given to each exercise was positive.

Conclusion: The results of this study show an overall high appreciation of the whole protocol by the majority of participants. Not all exercises contained all the skills needed for laparoscopic surgery. The results suggest that it is the combination of exercises of the 'ENDODOG', that resemble the skillset used in laparoscopic surgery.

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Introduction

The use of laparoscopic surgery in veterinary medicine has increased dramatically during the past 15 years.¹ The most important reason for this development is the great decline in post surgery pain compared with conventional open thoracic- and abdominal surgery combined with a shorter postoperative recovery time.

Besides the advantages mentioned above laparoscopic surgery has very few disadvantages such as a steep learning curve. It is assumed that the steep learning curve is the result of working with long surgical instruments with a big fulcrum, which intensifies tremors in the hands, a minimum of haptic feedback, and the difference in perception of depths due to the use of a camera.²

The steep learning curve influences the number of postoperative complications.

Fahlenkamp et al. (1999) stated that occurrence of complications during the first 100 laparoscopic surgeries is four times higher (12,3%) compared to experienced surgeons with more than 100 laparoscopic surgeries (3,6%).¹

In order to gain experience special training is mandatory.

A description of the essential skills in endoscopic surgery is summarised below.

In traditional surgery a camera is not used, which makes a surgeon work in a three-dimensional setting. Laparoscopic surgery, however, uses a camera that produces 2D images. In order to gain experience in laparoscopic/endoscopic surgery a surgeon needs to interpret shadow imaging, different manual positions, and the anatomy of the abdominal cavity including the organs. Surgeons are able to manage this when the camera is held in the correct position. Therefore, handling of the camera and interpretation of depth in the closed abdomen are essential skills for a surgeon to develop when performing laparoscopic surgery.^{3,4}

Another challenge is the fact that surgeons have to cope with handling of long surgical instruments. In case an organ lies in the proximity of the trocar, a relatively small movement of the instrument will result in large movement of the hands. On the other hand, the movement of the hands decrease when an organ lies further away from the entry point of the trocar in the abdominal cavity. This can be explained by the presence of the pivot point, which is located at the point the trocars enter the abdominal cavity.^{3,4}

Besides all mentioned in the previous paragraph, the camera angle influences the way movement is seen, as well the angle surgery on tissues is performed on.

Organs not always present themselves in an ideal position. Unlike standard laparotomy, where tissue manipulation is possible to create optimal working space, laparoscopic surgery makes manipulation harder. A surgeon has to cope with this limitation².

In standard laparotomy organs are mainly manipulated with the dominant hand, whereas in laparoscopic surgery surgeons often need to use their non-dominant hands. Thus it is important to develop bimanual dexterity.³

Despite laparoscopic surgery is harder to master in comparison with standard laparotomy, it has become a popular way of surgery. Nowadays these techniques are more and more used in veterinary medicine.

In human medicine a lot of different exercise models are developed, strongly varying in price, but either way very expensive.⁵⁻⁷ Until now in veterinary medicine these developments are still lacking. So far, with the exception of training of live animals and corpses, there is no manner of training laparoscopic surgery in the Netherlands. This is why research on durable training methods is of great importance in development of these techniques in the near future.

The endoscopic surgery simulator 'ENDODOG' was developed in 2013 as a durable and cheap boxtrainer for ECVS residents. During the current training course of ECVS residents, the training of laparoscopic surgery consists of the 'see one, do one, teach one' principle. This simulator should make the transition from theory to practise easier and decreases the chances of complications during laparoscopic surgery.

The present study is part of a bigger validation study. It evaluates the 'ENDODOG' by means of face validity whether the exercises of the ENDODOG could contribute to improve the skills needed for laparoscopic surgery. When the ENDODOG covers the concept of what it purports to measure, endoscopic surgery skills, this simulator could possibly be implemented in the curriculum of surgical residents.

Goals

The goal of this study is to evaluate the degree of resemblance between the exercises of the 'ENDODOG' and to what extent these resemble the skills needed for a laparoscopic procedure in real life by means of face validity of the 'ENDODOG'. This study also examines whether differences in appreciation are present between the different groups of subjects.

Material and Methods

Participants

For this study three groups of participants were observed: students, surgical residents and board certified surgeons from the faculty of Veterinary Medicine (University of Utrecht) and the faculty of Medicine (University of Utrecht). All participants were also involved in a construct validity study and filled in the questionnaire of the face validity study afterwards. Based on the answers of this questionnaire, the participants ($n=29$) were categorised in three groups, based on their experience in surgery. The demographics are shown in table 1.

Group 1 ($n=15$) existed of students of the faculty of Veterinary Medicine (University of Utrecht) without surgical experience. The second group ($n=5$) existed of a novice group of ECVS residents of the faculty of Veterinary Medicine (University of Utrecht) with experience in surgery, but performed less than 50 laparoscopic surgeries. The final group (3) ($n=9$) was composed of experienced laparoscopic surgeons surgery, who conducted more than 50 laparoscopic surgeries, from both the faculty of Medicine and Veterinary Medicine (University of Utrecht). This limit of 50 laparoscopic procedures is based on a previous study of Schreuder et al.⁴ Due to a small number of experts the group, who firstly only contained veterinary surgeons, was extended with experts in human medicine.

Face validity

Six custom designed exercises (Appendix 1) for the ENDODOG had to be completed three times by every participant. These exercises are:

- Exercise 1: Spool round pole
- Exercise 2: Tread and eye
- Exercise 3: Midget golf
- Exercise 4: Needle and thread track
- Exercise 5: Cutting a circle
- Exercise 6: Letter P (dominant hand)

Face validity is defined as the extent to which the simulator resembles the situation in the real world⁴. The ENDODOG is not designed to look like a lifelike abdomen, but as a boxtrainer. The exercises of the ENDODOG should resemble different situations and cover different skills used in laparoscopic surgery. All exercises together should form a base training to practise visual and motor skills needed in laparoscopic surgery. All participants were given a questionnaire at the start of this study. The first part of this

questionnaire (Appendix, questionnaire part 1) were general questions about the participants to determine demographics.

To investigate the face validity of the ENDODOG, all participants filled in the second part of the questionnaire after completing their final session on the 'ENDODOG'. Here the subjects gave their opinion about the general impression of the 'ENDODOG' on the following statements (Appendix 2, questionnaire part 2):

- Usefulness of developing motor skills
- Practicing depth perception
- Practicing hand-eye coordination
- Bimanual dexterity
- Single hand dexterity
- The difficulty of the exercises
- Clarity of the description of exercises
- Usefulness for students
- Should ENDODOG be standard in the curriculum of surgical residents
- The appreciation of the whole protocol

Furthermore the participants evaluated all 6 individual exercises of the 'ENDODOG' based on 6 parameters (Appendix 2, questionnaire part 3):

- Exterior appearance
- Projection of the exercises on the screen
- Handling
- Possibility of developing motor skills
- Possibility of developing depth perception
- Possibility of developing hand-eye coordination

All different aspects were given a rating on a 5-point Likert scale.²

With evaluation of exercises the score of 1 was insufficient and 5 is very good. In the scoring of the opinion on ENDODOG, 1 totally disagrees and 5 totally agrees with the statement.

By calculating means and standard deviation of these ratings average scores of appreciation within groups and all groups together can be determined. These scores are giving an impression about the agreement of each statement.

Statistical analysis

The results of the questionnaire were calculated in the statistical software programme 'SPSS'. Analysis of variance (one-way ANOVA) was used to determine the difference in face validity between groups. P value <0,05 was set as statistically significant. If p<0,05 significant differences are found between groups.

Results

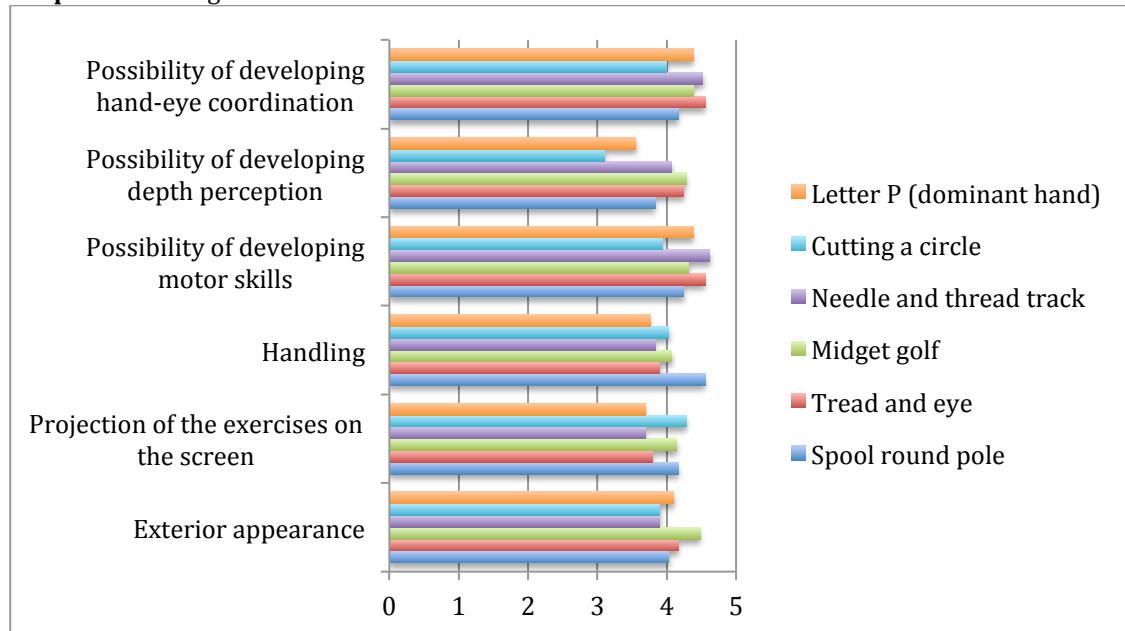
Table 1. Demographics

	Number	Age	Male	Female	Dominant hand: Right	Dominant hand: Left
non-experts	15	25.5 (21-29)	6	9	15	0
novices	5	36.8 (27-55)	1	4	5	0
experts	9	38.6 (29-50)	7	2	9	1

Table 1 contains the demographics of the three groups of participants in this study. All participants are right-handed, and one subject in the expert group was bimanual. This explains why the numbers do not add up.

For this study 15 participants of the faculty of Veterinary Medicine and 14 participants of the faculty of Medicine were used. The gender ratio of the faculty of Veterinary Medicine was 6 males to 9 females and for the faculty of Medicine 8 males to 6 females. The expert group contained 7 males and 2 females, the intermediate group 1 male 4 females.

Graphic 1. Average scores



Graphic 1 shows the mean values of the scores of the statements made of each individual exercise for both individual groups and for the groups all together. Lowest scores were given to the possibility of developing depth perception in exercise 5 (3.1), the projection of the exercise on screen (3.7) of exercise 6 and the possibility of developing depth perception (3.6) in exercise 6. This means that the participants were mildly enthusiastic about those statements.

All exercises were found useful ($\text{mean} \geq 4.0$) for practicing hand-eye coordination. Apart from exercise 5 all were found useful for developing motor skills. Exercise 2, 3 and 4 were found useful for developing depth perception. Exercise 1, 3, 5 and 6 proved to be

found useful to practise handling skills. The participants thought the projection on screen of exercise 2, 4 and 6 could be better and also thought the exterior appearance of exercise 4 and 5 could be improved.

Table 2. Significant differences 'statements exercises'

Exercise	Statement	All groups (P=)	Groups 1+2 (P=)	Groups 2+3 (P=)	Groups 1+3 (P=)
1	Possibility of developing motor skills	0,047		0,019	
	Possibility of developing depth perception	0,005		0,001	0,030
2	Projection of the exercises on the screen	0,044		0,046	0,013
	Handling			0,044	
	Possibility of developing hand-eye coordination		0,029		
3	Handling			0,024	0,025
	Possibility of developing motor skills	0,050		0,028	
4	Handling	0,043	0,047		0,022
5	Handling	0,007		0,001	0,024
	Possibility of developing motor skills	0,000		0,001	0,001
	Possibility of developing depth perception	0,021		0,042	0,008
6	Handling	0,023	0,015		0,023
	Possibility of developing motor skills	0,042		0,036	0,025
	Possibility of developing depth perception	0,047			0,012
	Possibility of developing hand-eye coordination	0,001		0,000	0,001

Shown in Table 2 are the statements that had significant differences in scoring between groups. Out of 36 statements 15 of them had significant differences in scoring between groups. The majority of those differences were between groups 1+3 and 2+3. This resulted also in a significant difference within all groups together. The expert group were giving a higher rating than both other groups when a statement was significant different.

Between male and female participants significant differences were found in exercise 4, possibility of developing depth perception ($p=0.041$) and exercise 5, handling ($p=0.039$). Between the faculties of Medicine and Veterinary Medicine a couple of significant differences were found. These differences were found in exercise 1, handling ($p=0.043$), exercise 2, possibility of developing hand-eye coordination ($p=0.013$) and exercise 6, projection of the exercises on the screen ($p=0.048$), possibility of developing motor skills ($p=0.007$). For all these significant differences the faculty of Veterinary Medicine scored higher than the faculty of Medicine.

Table 3. Significant differences 'general impression'

Statement	All groups (P=)	Groups 1+2 (P=)	Groups 2+3 (P=)	Groups 1+3 (P=)
Single hand dexterity		0,046		0,019
Appreciation whole protocol	0,040		0,025	

The general impression (Appendix 2, questionnaire part 2) shows the mean values of the scores of the statements made of the general impression of ENDODOG. The highest scores were given to the usefulness of developing motor skills (4.6), practicing hand-eye coordination (4.7), the clarity of the description of the exercises (4.52), usefulness for

students (4.67) and the appreciation of the whole protocol (4.55). The lowest scores were given to the difficulty of the exercises (3.86) and whether ENDODOG should be in the curriculum (3.47). These lower scores are well above average on the 5-point Likert scales.

Table 3 shows the statements that had significant differences in scoring. Out of 10 statements 2 were scored significant different between groups. Here the intermediate group gave much lower ratings than both other groups.

No significant differences were found between male and female participants. Also no significant differences were found between participants from the faculty of Veterinary Medicine and the faculty of Medicine.

Discussion

The aim of the present study was to evaluate the extent to which the exercises of the 'ENDODOG' resemble the different aspects of the laparoscopic procedure in the real world by means of face validity. This study also examines whether differences in appreciation are present between the different groups of participants. Fact is that face validity is based on opinions and not on objective measurements. This could give this study a bias.

Initially this study had of an insufficient number of veterinary laparoscopic experts and ECVS residents. Subsequently it was impossible to make any valid conclusions, because the statistical power was too low. Additional subjects, acquired of the faculty of Medicine (University of Utrecht), were included in this study.

The intermediate and expert group both have experience in laparoscopic surgery. The distinction between both groups is the number of laparoscopic procedures a subject conducted. The limit was set on 50 procedures. This limit of 50 laparoscopic procedures is based on a previous study of Schreuder et al.⁴

In this study males were overrepresented in the expert group, whereas females were overrepresented in the intermediate group.

Although not all exercises were fit to assess all skills (camera use, depth perception, coping with the fulcrum effect and bimanual dexterity) essential for laparoscopic surgery, the combination of all six exercises covers all skills necessary.

The questions about the general impression show positive results. All questions, except the difficulty of the exercises and whether 'ENDODOG' should be in the curriculum, scored ≥ 4.0 .

Overall difficulty scored 3.9 on average, with little deviation between groups. The question that raises here is: 'Should the difficulty of exercises of 'ENDODOG' be increased?'. On one hand if exercises are too hard, it is difficult to increase skills and motivation of training with 'ENDODOG' can disappear. On the other hand, if exercises are too easy, the learning curve will decrease. As this score is so close to 4.0, which means agreeing with the statement, the difficulty should be sufficient.

Participants also thought 'ENDODOG' was a useful tool for ECVS residents (mean 4.6), but should not consequently be in the curriculum of ECVS residents (mean 3.5). Possibly most participants thought 'ENDODOG' is a good tool to practice with, but should not be tested in the curriculum of ECVS residents.

Participants of the expert group were more enthusiastic of the ENDODOG being in the curriculum of ECVS students, than both the novice and intermediate group.

There was a significant difference in the statements about the appreciation of the protocol as a whole, and the possibility to develop single hand dexterity. Here the intermediate group rated these statements a 0.5 point lower than both other groups. For the statements about the general impression no significant differences were found between males and females, and between faculties.

In the statements about the individual exercises more significant differences were found between groups. These differences were found in all exercises. Remarkably the expert group gave higher average ratings than both other groups.

There were significant differences in two statements when comparing males and females. These differences can not be explained.

Finally there were four significant differences in statements when comparing faculties. There could be a small bias in the group of participants from the faculty of Veterinary Medicine, as this group gave significant higher ratings to four statements about the individual exercises. Possibly the participants of the faculty of Medicine gave lower ratings, due to the more advanced box-trainers they are used to practise with in their faculty. This group is experienced with simulators that are far more advanced and expensive than 'ENDODOG', for our simulator is low budget.

It is remarkable that the expert groups gave higher ratings than both other groups, when a statement was significantly different. This could be explained by the overrepresentation of males in the expert group. Males are supposed to have better visual-spatial abilities compared to women and possibly like these exercises better than women. Furthermore the expert group should have more insight about the skills needed for laparoscopic surgery and subsequently see more use in these exercises than both other groups. This could also explain why the intermediate group, which is overrepresented by women, often gave lower ratings than both other groups.

In conclusion, the results show an overall high appreciation of the whole protocol by the majority of participants. Furthermore even though significant differences were present between groups, the average rating given to each exercise was positive. Not all exercises contained all the skills needed for laparoscopic surgery according to our participants. The results suggest that it is the combination of exercises of the 'ENDODOG', that resemble the skillset used in laparoscopic surgery.

Appendix 1

Oefening 1 Klos om paal

Zet de oefening (zie figuur 1) in de simulator. Zorg ervoor dat de oefening goed in de houder staat en niet meer kan bewegen.

Instrumenten: Twee paktangen 'Auto Suture ENDO DISSECT'

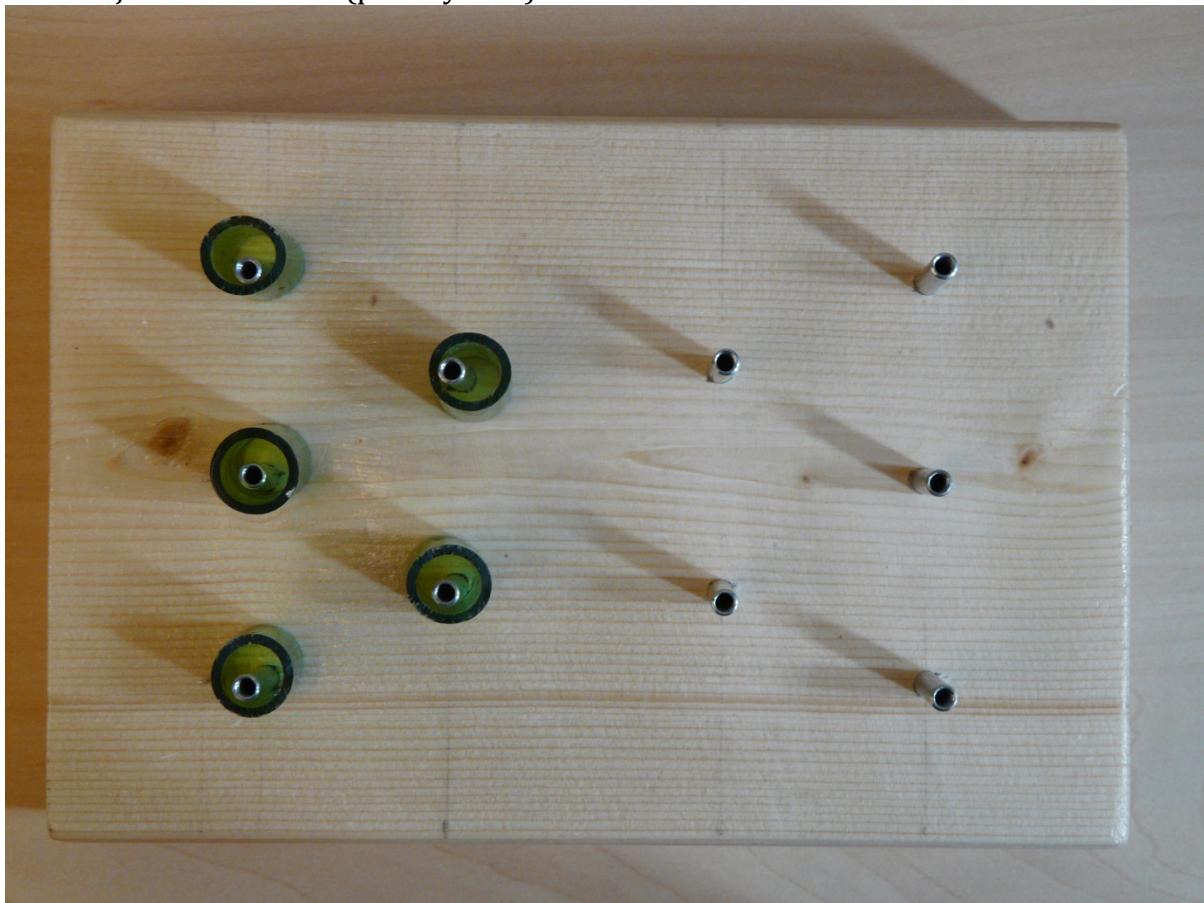
Oefening: Probeer zo snel mogelijk de klosjes om de paaltjes te plaatsen. De klosjes moeten van het paaltje worden opgepakt en vervolgens worden overgegeven aan de andere paktang voordat ze op het lege paaltje worden geplaatst.

Start: De tijd start vanaf het moment dat het eerste klosje wordt opgepakt.

Einde: De tijd stopt zodra het vijfde klosje op het laatste paaltje is gezet.

Penalty: Elke keer als er een klosje valt of naast het paaltje wordt neergezet. Vijf penalty's als het klosje van de houten plaat afvalt en er niet meer mee verder kan worden gespeeld.

Score: tijd in seconden + (penalty x 10)



Defening 2 Draad en oog.

Zet de oefening (zie figuur 2) in de simulator. Zorg ervoor dat de oefening goed in dehouder staat en niet meer kan bewegen.

Instrumenten: twee paktangen 'Auto Suture ENDO DISSECT'

Oefening: Probeer zo snel mogelijk het touw door de oogjes te halen op dezelfde manier als aangegeven in figuur 3. Beginnend links onderin bij het oogje met de oranje ondergrond en eindigend links bovenin bij het oogje met de gele ondergrond. Bij het door het oog halen van de naald is het de bedoeling dat de naald met de andere tang wordt overgepakt. Let op! De oogjes zijn op verschillende hoogtes aangebracht.

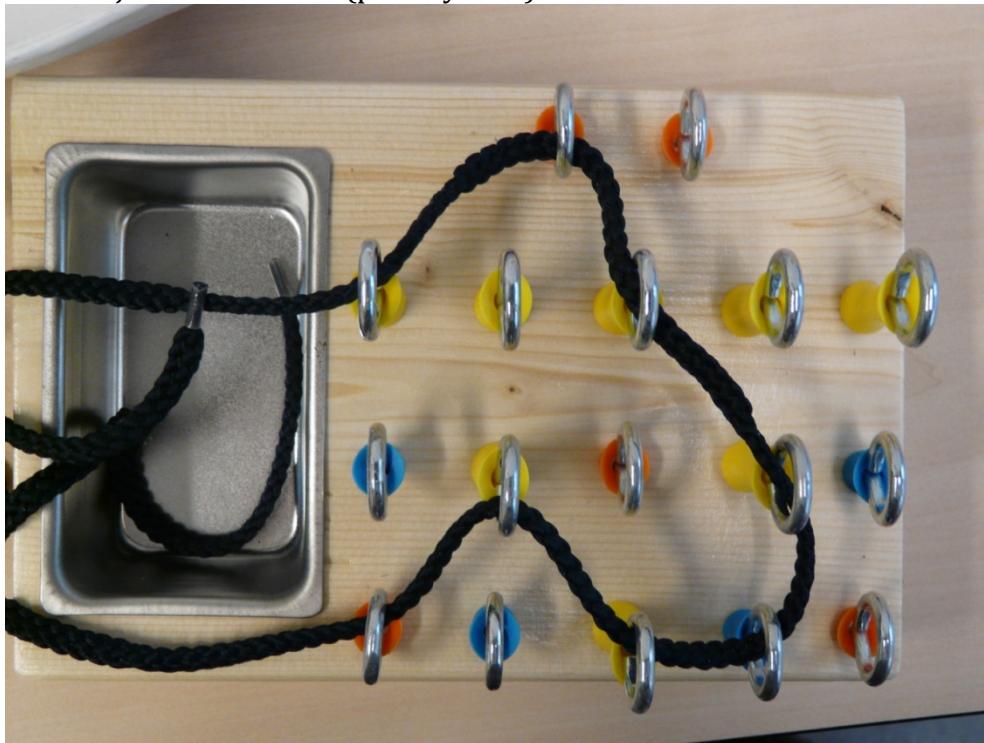
Tip: Trek het touwtje voldoende door na elk oog zodat er geen spanning op komt.

Start: De tijd start vanaf het moment dat het touwtje wordt opgepakt

Einde: De tijd stopt zodra het touwtje door het oogje linksboven is gestoken en overgepakt.

Penalty: Elke keer als het touwtje valt.

Score: tijd in seconden + (penalty x 10)



Oefening 3 Minigolf

Zet de oefening (zie figuur 3) in de simulator. Zorg ervoor dat de oefening goed in dehouder staat en niet meer kan bewegen en dat het bakje met de kralen zich aan de linkerkant bevindt.

Instrumenten: Twee paktangen 'Auto Suture ENDO CLINCH II 5 mm'

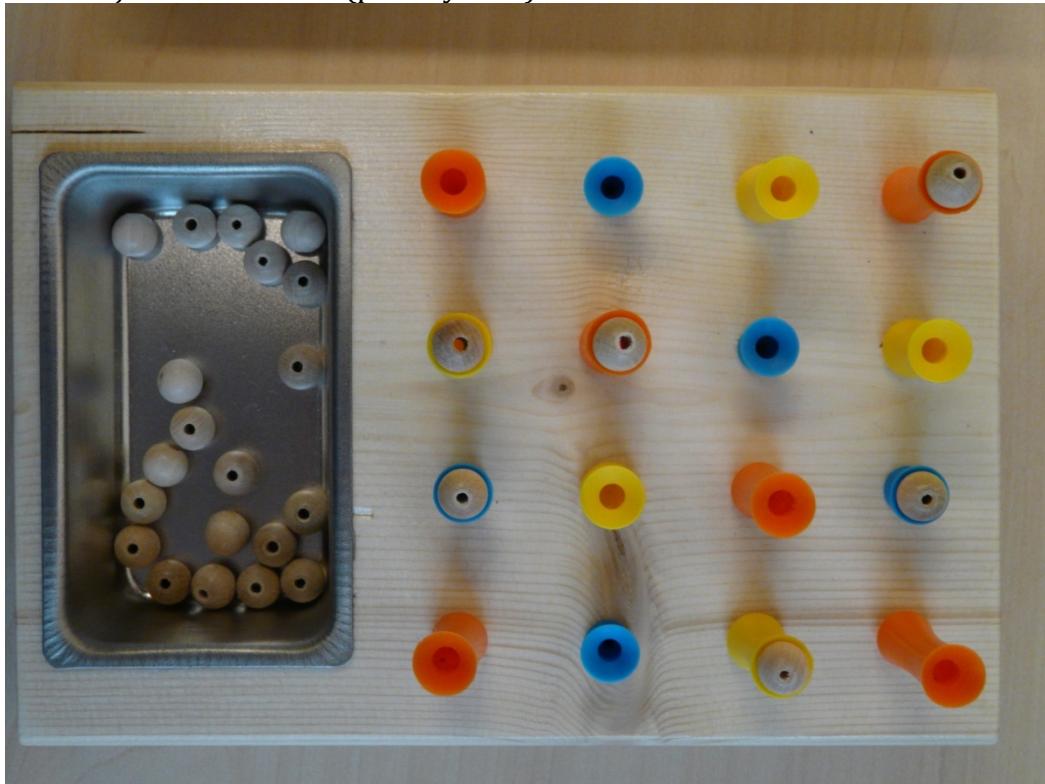
Oefening: Probeer zo snel mogelijk alle houdertjes te voorzien van een kraaltje en maak hierbij zo min mogelijk fouten. Deze oefening wordt gedaan met de dominant hand. Als er een kraaltje valt zijn er twee opties: 1 het kraaltje rolt van de oefening af. In dit geval wordt er een nieuw kraaltje gepakt. En optie 2 het kraaltje blijft op de oefening liggen. In dit geval wordt er verder gespeeld met hetzelfde kraaltje. De 2 linker rijen worden met links neergelegd. De twee rechter rijen worden met rechts neergelegd.

Start: De tijd start vanaf het moment dat het eerste kraaltje wordt opgepakt.

Einde: De tijd stopt zodra het laatste kraaltje is neergelegd of de tijdslimiet van 15 min is overschreden.

Penalty: Elke keer als er een kraaltje valt.

Score: tijd in seconden + (penalty x 10)



Defening 4 Naald en draad parcours

Zet de oefening (zie figuur 4) in de simulator. Zorg ervoor dat de oefening goed in dehouder staat en niet meer kan bewegen.

Instrumenten: twee paktangen 'Auto Suture ENDO DISSECT' + PDS Plus 0 (naald en draad).

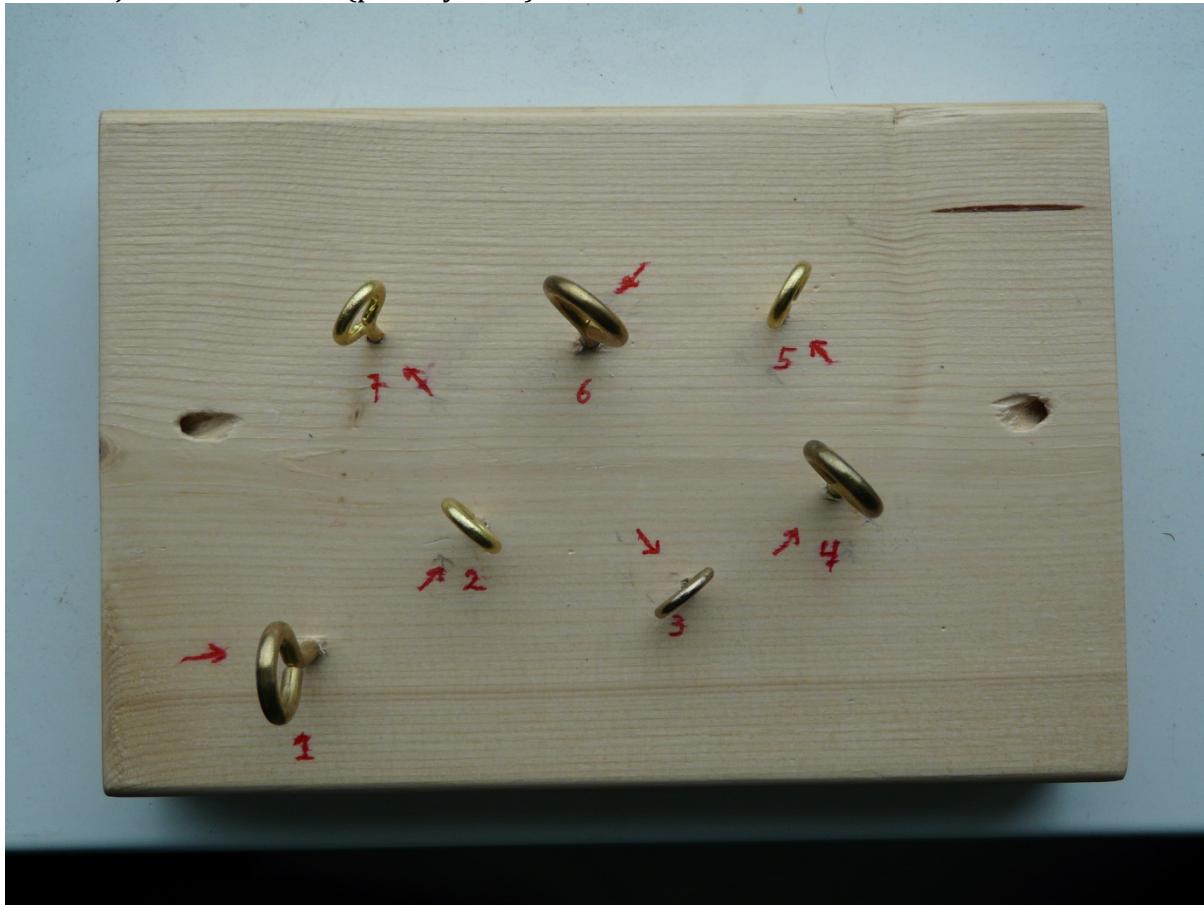
Oefening: Probeer zo snel mogelijk en met zo min mogelijk fouten het parcours af te leggen gebruik makend van twee paktangen. Bij het door het oog halen van de naald is het de bedoeling dat de naald met de andere tang wordt overgepakt.

Start: De tijd start vanaf het moment dat de naald wordt opgepakt.

Einde: De tijd stopt zodra de naald na het doorhalen van het laatste oog is overgepakt.

Penalty: Elke keer als de naald valt.

Score: tijd in seconden + (penalty x 10)



Oefening 5 Cirkel knippen

Zet de oefening (zie figuur 5) in de simulator. Zorg ervoor dat de oefening goed in dehouder staat en niet meer kan bewegen. Indien er nog geen oefenplaatje over de oefening is gespannen kunt u er een nieuwe over spannen. Er kan een leukoplasthouder worden gebruikt om de cirkel te tekenen.

Instrumenten: Eén paktang en één schaar 'Auto Suture ENDO DISSECT en Auto Suture ENDO MINI- SHEARS'

Oefening: Probeer zo snel mogelijk de cirkel uit te knippen, het is hierbij de bedoeling dat er op de lijn wordt geknipt.

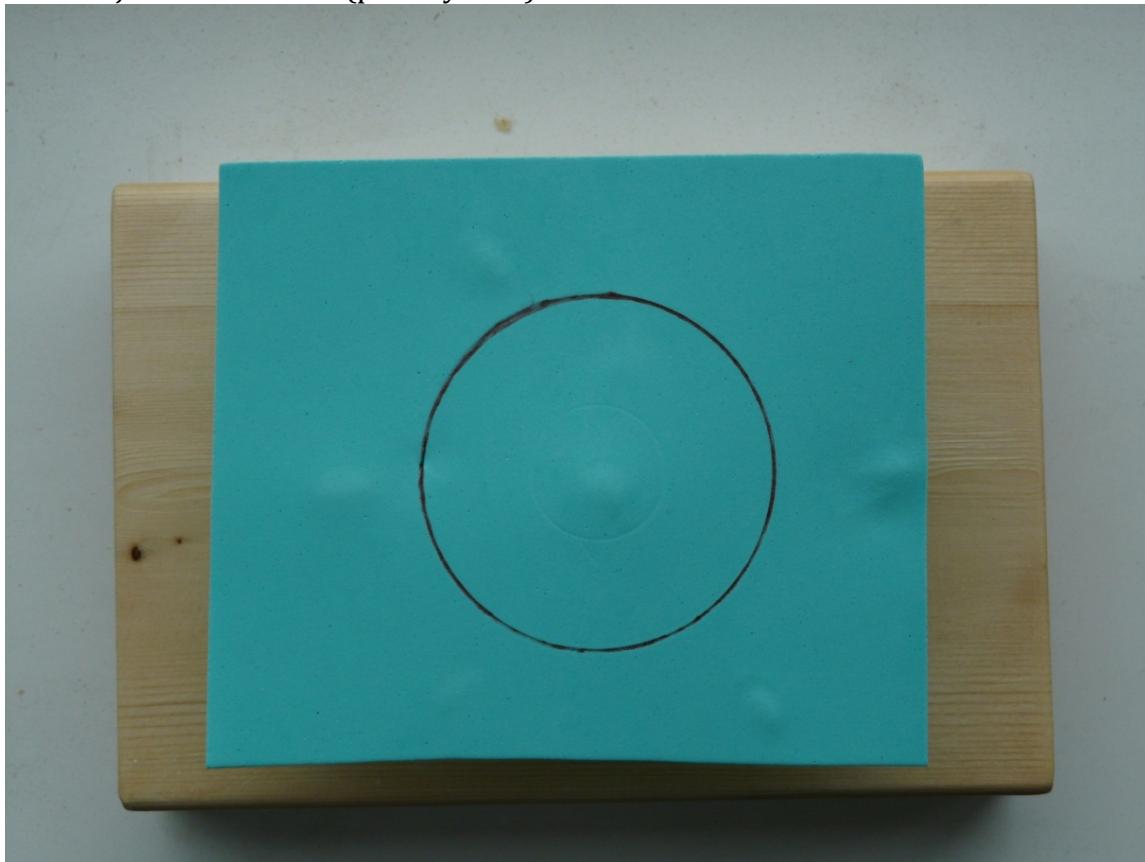
Tip: Prik eerst een gaatje met de schaar en ga van daaruit verder met knippen.

Start: De tijd start vanaf het moment dat de schaar de handschoen raakt.

Einde: De tijd stopt zodra de cirkel geheel los is van de handschoen.

Penalty: de oppervlakte in mm die wordt afgeweken van de lijn.

Score: tijd in seconden + (penalty x 10)



Defening 6 Letter P (met dominante hand)

Zet de oefening (zie figuur 6) in de simulator. Zorg ervoor dat de oefening goed in dehouder staat en niet meer kan bewegen.

Instrumenten: Twee paktangen 'Auto Suture ENDO DISSECT'

Oefening: Probeer zo snel mogelijk de letter P zoals aangegeven in figuur 6 neer te leggen. Het is de bedoeling dat de kraaltjes worden opgepakt met de dominante hand maar de niet-dominante hand mag helpen bij het positioneren. Het maakt niet uit waar op het bord de P wordt neergelegd als deze maar de zelfde vorm heeft als op figuur 6. Tussendoor mag een kraaltje ook willekeurig op het bord worden neergelegd om deze over te pakken naar een makkelijkere stand om deze vervolgens alsnog op de juiste plaats op het bord te zetten

Start: De tijd start vanaf het moment dat het eerste kraaltje wordt opgepakt

Einde: De tijd stopt zodra laatste kraaltje is neergelegd en de letter P vormt.

Penalty: Elke kraal dat je laat vallen buiten het witte opzetvlak.

Score: tijd in seconden + (penalty x 10)



Appendix 2

Questionnaire part 1

Naam:

Leeftijd:

Man/Vrouw

Links/rechtshandig

Ervaring met box-trainers (aantal keren) nooit/ 1-5x/ 6-10x/ 11-20x/ >20x/
 >50x

Ervaring met box-trainers (aantal uren) nooit/ 1-5/ 6-10/ 11-20/ >20x/ >50x

Laparoscopische ervaring Nee/ 1-10x/ 11-20x/ >20x/ >50x

Type chirurgie laparoscopie/ thoracoscopie/
 arthroscopie/ andere
 tracheo-
 diagnostische endoscopie (rhinoscopie,
 bronchoscopie, gastroduodenoscopie.....)

	Nooit	1-5	5-10	10+
Hoeveel keer heeft u meegekeken met een laparoscopische operatie?				
Hoeveel keer heeft u een laparoscopische handeling geassisteerd?				
Hoeveel keer heeft u zelfstandig een laparoscopische operatie uitgevoerd?				
Hoeveel uur heeft u op een laparoscopische trainer getraind?				
Hoe veel filmpjes heeft u gekeken waarin een laparoscopische operatie werd uitgevoerd?				

	Nooit	1-3	3-5	5-8	8+
Hoeveel uren heeft u in het afgelopen jaar gemiddeld per dag gegamed?					
Hoeveel uren heeft u in de afgelopen 5 jaar gemiddeld per dag gegamed?					
Hoeveel uren heeft u in de periode daarvoor gemiddeld per gegamed?					

Wat voor soort games speel(de) je meestal? (battles/autoracen/sport/ etc.)

.....

Met welk syteem heeft u gegamed? (toetsenbord, controller, joystick, WII, Kinetic, ...)

.....

Questionnaire part 2

Enquête na afronden van de oefeningen. De vragen gaan over het gehele pakket aan oefeningen en worden gescoord aan de hand van een waardering oplopend van 1 tot 5.

	1	2	3	4	5
Geschikt voor het leren van motorische vaardigheden?					
Geschikt voor het oefenen van diepteperceptie?					
Geschikt voor oefenen oog-handcoördinatie?					
Geschikt voor oefenen samenwerking tussen handen?					
Geschikt voor oefenen handen individueel?					
Moeilijkheidsgraad oefeningen?					
Duidelijke beschrijving van de oefeningen?					
Zijn de oefeningen geschikt voor studenten?					
De oefeningen zouden standaard in het curriculum verwerkt moeten worden?					
Waardering gehele protocol					

Questionnaire part 3

Oefening 1 Klos om paal



	1	2	3	4	5
Uiterlijk					
Projectie van oefening op scherm					
Hanteerbaarheid					
Mogelijkheid tot ontwikkelen motorische vaardigheden					
Mogelijkheid tot ontwikkelen diepteperceptie					
Mogelijkheid tot ontwikkelen oog-handcoördinatie					

Oefening 2 Draad en oog



	1	2	3	4	5
Uiterlijk					
Projectie van oefening op scherm					
Hanteerbaarheid					
Mogelijkheid tot ontwikkelen motorische vaardigheden					
Mogelijkheid tot ontwikkelen diepteperceptie					
Mogelijkheid tot ontwikkelen oog-handcoördinatie					

Oefening 3 minigolf



	1	2	3	4	5
Uiterlijk					
Projectie van oefening op scherm					
Hanteerbaarheid					
Mogelijkheid tot ontwikkelen motorische vaardigheden					
Mogelijkheid tot ontwikkelen diepteperceptie					
Mogelijkheid tot ontwikkelen oog-handcoördinatie					

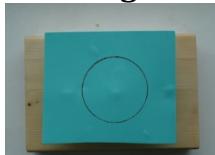
Oefening 4 Naald en draad parcours



	1	2	3	4	5
Uiterlijk					
Projectie van oefening op scherm					

Hanteerbaarheid					
Mogelijkheid tot ontwikkelen motorische vaardigheden					
Mogelijkheid tot ontwikkelen diepteperceptie					
Mogelijkheid tot ontwikkelen oog-handcoördinatie					

Oefening 5 Cirkel knippen



	1	2	3	4	5
Uiterlijk					
Projectie van oefening op scherm					
Hanteerbaarheid					
Mogelijkheid tot ontwikkelen motorische vaardigheden					
Mogelijkheid tot ontwikkelen diepteperceptie					
Mogelijkheid tot ontwikkelen oog-handcoördinatie					

Oefening 6 Letter P dominante hand



	1	2	3	4	5
Uiterlijk					
Projectie van oefening op scherm					
Hanteerbaarheid					
Mogelijkheid tot ontwikkelen motorische vaardigheden					
Mogelijkheid tot ontwikkelen diepteperceptie					
Mogelijkheid tot ontwikkelen oog-handcoördinatie					

Appendix 3

Descriptives individual exercises

Descriptives									
	N	Mean	Std. Deviation	Std. Error	Lower Bound	Upper Bound	Minimum	Maximum	
01 Uiterlijk	0	15	3,87	,915	,236	3,36	4,37	2	5
	1	5	4,20	,837	,374	3,16	5,24	3	5
	2	9	4,22	,972	,324	3,48	4,97	2	5
	Total	29	4,03	,906	,168	3,69	4,38	2	5
01 Projectie van oefening op scherm	0	15	4,07	,961	,248	3,53	4,60	2	5
	1	5	4,20	,837	,374	3,16	5,24	3	5
	2	9	4,33	,707	,236	3,79	4,88	3	5
	Total	29	4,17	,848	,157	3,85	4,49	2	5
01 Hanteerbaarheid	0	15	4,53	,516	,133	4,25	4,82	4	5
	1	5	4,60	,548	,245	3,92	5,28	4	5
	2	9	4,56	,527	,176	4,15	4,96	4	5
	Total	29	4,55	,506	,094	4,36	4,74	4	5
01 Mogelijkheid tot ontwikkelen motorische vaardigheden	0	15	4,07	,594	,153	3,74	4,40	3	5
	1	5	4,00	,707	,316	3,12	4,88	3	5
	2	9	4,67	,500	,167	4,28	5,05	4	5
	Total	29	4,24	,636	,118	4,00	4,48	3	5
01 Mogelijkheid tot ontwikkelen diepte perceptie	0	15	3,40	,910	,235	2,90	3,90	2	5
	1	5	3,60	1,140	,510	2,18	5,02	2	5
	2	9	4,67	,500	,167	4,28	5,05	4	5
	Total	29	3,83	1,002	,186	3,45	4,21	2	5
01 Mogelijkheid tot ontwikkelen hand-oog coördinatie	0	15	4,13	,640	,165	3,78	4,49	3	5
	1	5	4,00	,707	,316	3,12	4,88	3	5
	2	9	4,33	,500	,167	3,95	4,72	4	5
	Total	29	4,17	,602	,112	3,94	4,40	3	5
02 Uiterlijk	0	15	4,20	,561	,145	3,89	4,51	3	5
	1	5	3,80	,837	,374	2,76	4,84	3	5
	2	9	4,33	,707	,236	3,79	4,88	3	5
	Total	29	4,17	,658	,122	3,92	4,42	3	5
02 Projectie vn oefening op scherm	0	15	3,60	1,056	,273	3,02	4,18	1	5
	1	5	3,20	,837	,374	2,16	4,24	2	4
	2	9	4,44	,726	,242	3,89	5,00	3	5
	Total	29	3,79	1,013	,188	3,41	4,18	1	5

02 Hanteerbaarheid	0	15	3,73	,594	,153	3,40		4,06	3	5
	1	5	3,80	,447	,200	3,24		4,36	3	4
	2	9	4,22	,441	,147	3,88		4,56	4	5
	Total	29	3,90	,557	,103	3,68		4,11	3	5
02 Mogelijkheid tot ontwikkelen motorische vaardigheden	0	15	4,47	,640	,165	4,11		4,82	3	5
	1	5	4,40	,548	,245	3,72		5,08	4	5
	2	9	4,78	,441	,147	4,44		5,12	4	5
	Total	29	4,55	,572	,106	4,33		4,77	3	5
02 Mogelijkheid tot ontwikkelen diepteperceptie	0	15	4,07	1,223	,316	3,39		4,74	1	5
	1	5	4,20	,837	,374	3,16		5,24	3	5
	2	9	4,56	,726	,242	4,00		5,11	3	5
	Total	29	4,24	1,023	,190	3,85		4,63	1	5
02 Mogelijkheid tot ontwikkelen hand-oog coördinatie	0	15	4,67	,488	,126	4,40		4,94	4	5
	1	5	4,00	,707	,316	3,12		4,88	3	5
	2	9	4,67	,500	,167	4,28		5,05	4	5
	Total	29	4,55	,572	,106	4,33		4,77	3	5
03 Uiterlijk	0	15	4,40	,507	,131	4,12		4,68	4	5
	1	5	4,20	,837	,374	3,16		5,24	3	5
	2	9	4,78	,441	,147	4,44		5,12	4	5
	Total	29	4,48	,574	,107	4,26		4,70	3	5
03 Projectie vn oefening op scherm	0	15	3,87	,915	,236	3,36		4,37	2	5
	1	5	4,20	,837	,374	3,16		5,24	3	5
	2	9	4,56	,527	,176	4,15		4,96	4	5
	Total	29	4,14	,833	,155	3,82		4,45	2	5
03 Hanteerbaarheid	0	15	3,87	,640	,165	3,51		4,22	3	5
	1	5	3,80	1,095	,490	2,44		5,16	2	5
	2	9	4,56	,726	,242	4,00		5,11	3	5
	Total	29	4,07	,799	,148	3,77		4,37	2	5
03 Mogelijkheid tot ontwikkelen motorische vaardigheden	0	15	4,13	,743	,192	3,72		4,54	3	5
	1	5	4,00	,707	,316	3,12		4,88	3	5
	2	9	4,78	,441	,147	4,44		5,12	4	5
	Total	29	4,31	,712	,132	4,04		4,58	3	5
03 Mogelijkheid tot ontwikkelen diepteperceptie	0	15	4,27	,961	,248	3,73		4,80	2	5
	1	5	4,00	,707	,316	3,12		4,88	3	5
	2	9	4,44	,726	,242	3,89		5,00	3	5
	Total	29	4,28	,841	,156	3,96		4,60	2	5
03 Mogelijkheid tot ontwikkelen hand-oog coördinatie	0	15	4,33	,617	,159	3,99		4,68	3	5
	1	5	4,00	,707	,316	3,12		4,88	3	5
	2	9	4,67	,500	,167	4,28		5,05	4	5
	Total	29	4,38	,622	,115	4,14		4,62	3	5
04 Uiterlijk	0	15	3,93	,704	,182	3,54		4,32	3	5

	1	5	3,60	,894	,400	2,49		4,71	3	5
	2	9	4,00	,866	,289	3,33		4,67	2	5
	Total	29	3,90	,772	,143	3,60		4,19	2	5
04 Projectie vn oefening op scherm	0	15	3,60	1,183	,306	2,94		4,26	1	5
	1	5	3,20	1,095	,490	1,84		4,56	2	4
	2	9	4,11	,928	,309	3,40		4,82	3	5
	Total	29	3,69	1,105	,205	3,27		4,11	1	5
04 Hanteerbaarheid	0	15	3,93	,799	,206	3,49		4,38	2	5
	1	5	3,00	1,000	,447	1,76		4,24	2	4
	2	9	4,11	,601	,200	3,65		4,57	3	5
	Total	29	3,83	,848	,157	3,51		4,15	2	5
04 Mogelijkheid tot ontwikkelen motorische vaardigheden	0	15	4,53	,516	,133	4,25		4,82	4	5
	1	5	4,60	,548	,245	3,92		5,28	4	5
	2	9	4,78	,441	,147	4,44		5,12	4	5
	Total	29	4,62	,494	,092	4,43		4,81	4	5
04 Mogelijkheid tot ontwikkelen diepteperceptie	0	15	3,93	1,223	,316	3,26		4,61	1	5
	1	5	4,40	,548	,245	3,72		5,08	4	5
	2	9	4,11	1,167	,389	3,21		5,01	2	5
	Total	29	4,07	1,100	,204	3,65		4,49	1	5
04 Mogelijkheid tot ontwikkelen hand-oog coördinatie	0	15	4,40	,632	,163	4,05		4,75	3	5
	1	5	4,40	,548	,245	3,72		5,08	4	5
	2	9	4,78	,441	,147	4,44		5,12	4	5
	Total	29	4,52	,574	,107	4,30		4,74	3	5
05 Uiterlijk	0	15	3,80	,941	,243	3,28		4,32	2	5
	1	5	3,60	1,140	,510	2,18		5,02	2	5
	2	9	4,22	,667	,222	3,71		4,73	3	5
	Total	29	3,90	,900	,167	3,55		4,24	2	5
05 Projectie vn oefening op scherm	0	15	4,07	,704	,182	3,68		4,46	3	5
	1	5	4,40	,548	,245	3,72		5,08	4	5
	2	9	4,56	,527	,176	4,15		4,96	4	5
	Total	29	4,28	,649	,121	4,03		4,52	3	5
05 Hanteerbaarheid	0	15	3,87	,516	,133	3,58		4,15	3	5
	1	5	3,40	1,342	,600	1,73		5,07	1	4
	2	9	4,67	,500	,167	4,28		5,05	4	5
	Total	29	4,03	,823	,153	3,72		4,35	1	5
05 Mogelijkheid tot ontwikkelen motorische vaardigheden	0	15	3,73	,594	,153	3,40		4,06	3	5
	1	5	3,20	,837	,374	2,16		4,24	2	4
	2	9	4,67	,500	,167	4,28		5,05	4	5
	Total	29	3,93	,799	,148	3,63		4,23	2	5
05 Mogelijkheid tot ontwikkelen	0	15	3,00	,655	,169	2,64		3,36	2	4
	1	5	2,60	,548	,245	1,92		3,28	2	3

diepteperceptie	2	9	3,56	,527	,176	3,15		3,96	3	4
	Total	29	3,10	,673	,125	2,85		3,36	2	4
05 Mogelijkheid tot ontwikkelen hand-oog coördinatie	0	15	4,13	,743	,192	3,72		4,54	3	5
	1	5	3,40	,548	,245	2,72		4,08	3	4
	2	9	4,11	,928	,309	3,40		4,82	3	5
	Total	29	4,00	,802	,149	3,70		4,30	3	5
06 Uiterlijk	0	15	3,93	,704	,182	3,54		4,32	2	5
	1	5	4,00	,707	,316	3,12		4,88	3	5
	2	9	4,44	,527	,176	4,04		4,85	4	5
	Total	29	4,10	,673	,125	3,85		4,36	2	5
06 Projectie vn oefening op scherm	0	15	3,53	1,060	,274	2,95		4,12	1	5
	1	5	3,40	1,140	,510	1,98		4,82	2	5
	2	9	4,11	1,054	,351	3,30		4,92	2	5
	Total	29	3,69	1,072	,199	3,28		4,10	1	5
06 Hanteerbaarheid	0	15	3,87	,743	,192	3,46		4,28	3	5
	1	5	2,80	,837	,374	1,76		3,84	2	4
	2	9	4,11	,928	,309	3,40		4,82	3	5
	Total	29	3,76	,912	,169	3,41		4,11	2	5
06 Mogelijkheid tot ontwikkelen motorische vaardigheden	0	15	4,27	,594	,153	3,94		4,60	3	5
	1	5	4,00	,707	,316	3,12		4,88	3	5
	2	9	4,78	,441	,147	4,44		5,12	4	5
	Total	29	4,38	,622	,115	4,14		4,62	3	5
06 Mogelijkheid tot ontwikkelen diepteperceptie	0	15	3,53	1,125	,291	2,91		4,16	2	5
	1	5	2,60	,894	,400	1,49		3,71	2	4
	2	9	4,11	,928	,309	3,40		4,82	3	5
	Total	29	3,55	1,121	,208	3,13		3,98	2	5
06 Mogelijkheid tot ontwikkelen hand-oog coördinatie	0	15	4,20	,561	,145	3,89		4,51	3	5
	1	5	3,80	,837	,374	2,76		4,84	3	5
	2	9	5,00	,000	,000	5,00		5,00	5	5
	Total	29	4,38	,677	,126	4,12		4,64	3	5

One way ANOVA individual exercises all groups

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
01 Uiterlijk	Between Groups	,877	2	,438	,516	,603
	Within Groups	22,089	26	,850		
	Total	22,966	28			
01 Projectie van oefening op scherm	Between Groups	,405	2	,202	,267	,768
	Within Groups	19,733	26	,759		
	Total	20,138	28			
01 Hanteerbaarheid	Between Groups	,017	2	,008	,031	,970

	Within Groups	7,156	26	,275		
	Total	7,172	28			
01 Mogelijkheid tot ontwikkelen motorische vaardigheden	Between Groups	2,377	2	1,189	3,459	,047
	Within Groups	8,933	26	,344		
	Total	11,310	28			
01 Mogelijkheid tot ontwikkelen diepteperceptie	Between Groups	9,338	2	4,669	6,457	,005
	Within Groups	18,800	26	,723		
	Total	28,138	28			
01 Mogelijkheid tot ontwikkelen hand-oog coördinatie	Between Groups	,405	2	,202	,540	,589
	Within Groups	9,733	26	,374		
	Total	10,138	28			
02 Uiterlijk	Between Groups	,938	2	,469	1,089	,352
	Within Groups	11,200	26	,431		
	Total	12,138	28			
02 Projectie vn oefening op scherm	Between Groups	6,136	2	3,068	3,526	,044
	Within Groups	22,622	26	,870		
	Total	28,759	28			
02 Hanteerbaarheid	Between Groups	1,401	2	,700	2,498	,102
	Within Groups	7,289	26	,280		
	Total	8,690	28			
02 Mogelijkheid tot ontwikkelen motorische vaardigheden	Between Groups	,684	2	,342	1,047	,365
	Within Groups	8,489	26	,326		
	Total	9,172	28			
02 Mogelijkheid tot ontwikkelen diepteperceptie	Between Groups	1,355	2	,677	,630	,541
	Within Groups	27,956	26	1,075		
	Total	29,310	28			
02 Mogelijkheid tot ontwikkelen hand-oog coördinatie	Between Groups	1,839	2	,920	3,260	,055
	Within Groups	7,333	26	,282		
	Total	9,172	28			
03 Uiterlijk	Between Groups	1,286	2	,643	2,101	,143
	Within Groups	7,956	26	,306		
	Total	9,241	28			
03 Projectie vn oefening op scherm	Between Groups	2,693	2	1,346	2,089	,144
	Within Groups	16,756	26	,644		
	Total	19,448	28			
03 Hanteerbaarheid	Between Groups	3,107	2	1,553	2,737	,083
	Within Groups	14,756	26	,568		
	Total	17,862	28			
03 Mogelijkheid tot ontwikkelen motorische vaardigheden	Between Groups	2,918	2	1,459	3,360	,050
	Within Groups	11,289	26	,434		
	Total	14,207	28			

03 Mogelijkheid tot ontwikkelen diepteperceptie	Between Groups	,638	2	,319	,433	,653
	Within Groups	19,156	26	,737		
	Total	19,793	28			
03 Mogelijkheid tot ontwikkelen hand-oog coördinatie	Between Groups	1,494	2	,747	2,081	,145
	Within Groups	9,333	26	,359		
	Total	10,828	28			
04 Uiterlijk	Between Groups	,556	2	,278	,448	,644
	Within Groups	16,133	26	,621		
	Total	16,690	28			
04 Projectie vn oefening op scherm	Between Groups	2,918	2	1,459	1,212	,314
	Within Groups	31,289	26	1,203		
	Total	34,207	28			
04 Hanteerbaarheid	Between Groups	4,316	2	2,158	3,546	,043
	Within Groups	15,822	26	,609		
	Total	20,138	28			
04 Mogelijkheid tot ontwikkelen motorische vaardigheden	Between Groups	,339	2	,169	,679	,516
	Within Groups	6,489	26	,250		
	Total	6,828	28			
04 Mogelijkheid tot ontwikkelen diepteperceptie	Between Groups	,840	2	,420	,331	,721
	Within Groups	33,022	26	1,270		
	Total	33,862	28			
04 Mogelijkheid tot ontwikkelen hand-oog coördinatie	Between Groups	,886	2	,443	1,378	,270
	Within Groups	8,356	26	,321		
	Total	9,241	28			
05 Uiterlijk	Between Groups	1,534	2	,767	,943	,402
	Within Groups	21,156	26	,814		
	Total	22,690	28			
05 Projectie vn oefening op scherm	Between Groups	1,438	2	,719	1,805	,185
	Within Groups	10,356	26	,398		
	Total	11,793	28			
05 Hanteerbaarheid	Between Groups	6,032	2	3,016	6,063	,007
	Within Groups	12,933	26	,497		
	Total	18,966	28			
05 Mogelijkheid tot ontwikkelen motorische vaardigheden	Between Groups	8,129	2	4,064	10,857	,000
	Within Groups	9,733	26	,374		
	Total	17,862	28			
05 Mogelijkheid tot ontwikkelen diepteperceptie	Between Groups	3,267	2	1,634	4,508	,021
	Within Groups	9,422	26	,362		
	Total	12,690	28			
05 Mogelijkheid tot ontwikkelen hand-oog	Between Groups	2,178	2	1,089	1,789	,187
	Within Groups	15,822	26	,609		

coördinatie	Total	18,000	28			
06 Uiterlijk	Between Groups	1,534	2	,767	1,788	,187
	Within Groups	11,156	26	,429		
	Total	12,690	28			
06 Projectie vn oefening op scherm	Between Groups	2,385	2	1,192	1,040	,368
	Within Groups	29,822	26	1,147		
	Total	32,207	28			
06 Hanteerbaarheid	Between Groups	5,888	2	2,944	4,394	,023
	Within Groups	17,422	26	,670		
	Total	23,310	28			
06 Mogelijkheid tot ontwikkelen motorische vaardigheden	Between Groups	2,339	2	1,169	3,582	,042
	Within Groups	8,489	26	,326		
	Total	10,828	28			
06 Mogelijkheid tot ontwikkelen diepteperceptie	Between Groups	7,350	2	3,675	3,434	,047
	Within Groups	27,822	26	1,070		
	Total	35,172	28			
06 Mogelijkheid tot ontwikkelen hand-oog coördinatie	Between Groups	5,628	2	2,814	10,161	,001
	Within Groups	7,200	26	,277		
	Total	12,828	28			

One way ANOVA individual exercises groups 1 and 2

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
01 Uiterlijk	Between Groups	,417	1	,417	,516	,482
	Within Groups	14,533	18	,807		
	Total	14,950	19			
01 Projectie van oefening op scherm	Between Groups	,067	1	,067	,076	,786
	Within Groups	15,733	18	,874		
	Total	15,800	19			
01 Hanteerbaarheid	Between Groups	,017	1	,017	,061	,808
	Within Groups	4,933	18	,274		
	Total	4,950	19			
01 Mogelijkheid tot ontwikkelen motorische vaardigheden	Between Groups	,017	1	,017	,043	,838
	Within Groups	6,933	18	,385		
	Total	6,950	19			
01 Mogelijkheid tot ontwikkelen diepteperceptie	Between Groups	,150	1	,150	,161	,693
	Within Groups	16,800	18	,933		
	Total	16,950	19			
01 Mogelijkheid tot ontwikkelen hand-oog	Between Groups	,067	1	,067	,155	,698
	Within Groups	7,733	18	,430		

coördinatie	Total	7,800	19			
02 Uiterlijk	Between Groups	,600	1	,600	1,500	,236
	Within Groups	7,200	18	,400		
	Total	7,800	19			
02 Projectie vn oefening op scherm	Between Groups	,600	1	,600	,587	,454
	Within Groups	18,400	18	1,022		
	Total	19,000	19			
02 Hanteerbaarheid	Between Groups	,017	1	,017	,052	,822
	Within Groups	5,733	18	,319		
	Total	5,750	19			
02 Mogelijkheid tot ontwikkelen motorische vaardigheden	Between Groups	,017	1	,017	,043	,838
	Within Groups	6,933	18	,385		
	Total	6,950	19			
02 Mogelijkheid tot ontwikkelen diepteperceptie	Between Groups	,067	1	,067	,051	,825
	Within Groups	23,733	18	1,319		
	Total	23,800	19			
02 Mogelijkheid tot ontwikkelen hand-oog coördinatie	Between Groups	1,667	1	1,667	5,625	,029
	Within Groups	5,333	18	,296		
	Total	7,000	19			
03 Uiterlijk	Between Groups	,150	1	,150	,422	,524
	Within Groups	6,400	18	,356		
	Total	6,550	19			
03 Projectie vn oefening op scherm	Between Groups	,417	1	,417	,516	,482
	Within Groups	14,533	18	,807		
	Total	14,950	19			
03 Hanteerbaarheid	Between Groups	,017	1	,017	,028	,868
	Within Groups	10,533	18	,585		
	Total	10,550	19			
03 Mogelijkheid tot ontwikkelen motorische vaardigheden	Between Groups	,067	1	,067	,123	,730
	Within Groups	9,733	18	,541		
	Total	9,800	19			
03 Mogelijkheid tot ontwikkelen diepteperceptie	Between Groups	,267	1	,267	,321	,578
	Within Groups	14,933	18	,830		
	Total	15,200	19			
03 Mogelijkheid tot ontwikkelen hand-oog coördinatie	Between Groups	,417	1	,417	1,023	,325
	Within Groups	7,333	18	,407		
	Total	7,750	19			
04 Uiterlijk	Between Groups	,417	1	,417	,740	,401
	Within Groups	10,133	18	,563		
	Total	10,550	19			
04 Projectie vn oefening op	Between Groups	,600	1	,600	,443	,514

	Within Groups	24,400	18	1,356		
	Total	25,000	19			
04 Hanteerbaarheid	Between Groups	3,267	1	3,267	4,546	,047
	Within Groups	12,933	18	,719		
	Total	16,200	19			
04 Mogelijkheid tot ontwikkelen motorische vaardigheden	Between Groups	,017	1	,017	,061	,808
	Within Groups	4,933	18	,274		
	Total	4,950	19			
04 Mogelijkheid tot ontwikkelen diepteperceptie	Between Groups	,817	1	,817	,664	,426
	Within Groups	22,133	18	1,230		
	Total	22,950	19			
04 Mogelijkheid tot ontwikkelen hand-oog coördinatie	Between Groups	,000	1	,000	,000	1,000
	Within Groups	6,800	18	,378		
	Total	6,800	19			
05 Uiterlijk	Between Groups	,150	1	,150	,153	,700
	Within Groups	17,600	18	,978		
	Total	17,750	19			
05 Projectie vn oefening op scherm	Between Groups	,417	1	,417	,922	,350
	Within Groups	8,133	18	,452		
	Total	8,550	19			
05 Hanteerbaarheid	Between Groups	,817	1	,817	1,345	,261
	Within Groups	10,933	18	,607		
	Total	11,750	19			
05 Mogelijkheid tot ontwikkelen motorische vaardigheden	Between Groups	1,067	1	1,067	2,483	,133
	Within Groups	7,733	18	,430		
	Total	8,800	19			
05 Mogelijkheid tot ontwikkelen diepteperceptie	Between Groups	,600	1	,600	1,500	,236
	Within Groups	7,200	18	,400		
	Total	7,800	19			
05 Mogelijkheid tot ontwikkelen hand-oog coördinatie	Between Groups	2,017	1	2,017	4,063	,059
	Within Groups	8,933	18	,496		
	Total	10,950	19			
06 Uiterlijk	Between Groups	,017	1	,017	,034	,857
	Within Groups	8,933	18	,496		
	Total	8,950	19			
06 Projectie vn oefening op scherm	Between Groups	,067	1	,067	,057	,813
	Within Groups	20,933	18	1,163		
	Total	21,000	19			
06 Hanteerbaarheid	Between Groups	4,267	1	4,267	7,291	,015
	Within Groups	10,533	18	,585		
	Total	14,800	19			

06 Mogelijkheid tot ontwikkelen motorische vaardigheden	Between Groups	,267	1	,267	,692	,416
	Within Groups	6,933	18	,385		
	Total	7,200	19			
06 Mogelijkheid tot ontwikkelen diepteperceptie	Between Groups	3,267	1	3,267	2,809	,111
	Within Groups	20,933	18	1,163		
	Total	24,200	19			
06 Mogelijkheid tot ontwikkelen hand-oog coördinatie	Between Groups	,600	1	,600	1,500	,236
	Within Groups	7,200	18	,400		
	Total	7,800	19			

One way ANOVA individual exercises groups 2 and 3

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
01 Uiterlijk	Between Groups	,711	1	,711	,811	,378
	Within Groups	19,289	22	,877		
	Total	20,000	23			
01 Projectie van oefening op scherm	Between Groups	,400	1	,400	,520	,479
	Within Groups	16,933	22	,770		
	Total	17,333	23			
01 Hanteerbaarheid	Between Groups	,003	1	,003	,010	,920
	Within Groups	5,956	22	,271		
	Total	5,958	23			
01 Mogelijkheid tot ontwikkelen motorische vaardigheden	Between Groups	2,025	1	2,025	6,425	,019
	Within Groups	6,933	22	,315		
	Total	8,958	23			
01 Mogelijkheid tot ontwikkelen diepteperceptie	Between Groups	9,025	1	9,025	14,599	,001
	Within Groups	13,600	22	,618		
	Total	22,625	23			
01 Mogelijkheid tot ontwikkelen hand-oog coördinatie	Between Groups	,225	1	,225	,640	,432
	Within Groups	7,733	22	,352		
	Total	7,958	23			
02 Uiterlijk	Between Groups	,100	1	,100	,262	,614
	Within Groups	8,400	22	,382		
	Total	8,500	23			
02 Projectie vn oefening op scherm	Between Groups	4,011	1	4,011	4,452	,046
	Within Groups	19,822	22	,901		
	Total	23,833	23			
02 Hanteerbaarheid	Between Groups	1,344	1	1,344	4,558	,044
	Within Groups	6,489	22	,295		
	Total	7,833	23			
02 Mogelijkheid tot	Between Groups	,544	1	,544	1,643	,213

	Within Groups	7,289	22	,331		
ontwikkelen motorische vaardigheden	Total	7,833	23			
02 Mogelijkheid tot ontwikkelen diepteperceptie	Between Groups	1,344	1	1,344	1,176	,290
	Within Groups	25,156	22	1,143		
	Total	26,500	23			
02 Mogelijkheid tot ontwikkelen hand-oog coördinatie	Between Groups	,000	1	,000	,000	1,000
	Within Groups	5,333	22	,242		
	Total	5,333	23			
03 Uiterlijk	Between Groups	,803	1	,803	3,426	,078
	Within Groups	5,156	22	,234		
	Total	5,958	23			
03 Projectie vn oefening op scherm	Between Groups	2,669	1	2,669	4,208	,052
	Within Groups	13,956	22	,634		
	Total	16,625	23			
03 Hanteerbaarheid	Between Groups	2,669	1	2,669	5,899	,024
	Within Groups	9,956	22	,453		
	Total	12,625	23			
03 Mogelijkheid tot ontwikkelen motorische vaardigheden	Between Groups	2,336	1	2,336	5,533	,028
	Within Groups	9,289	22	,422		
	Total	11,625	23			
03 Mogelijkheid tot ontwikkelen diepteperceptie	Between Groups	,178	1	,178	,228	,638
	Within Groups	17,156	22	,780		
	Total	17,333	23			
03 Mogelijkheid tot ontwikkelen hand-oog coördinatie	Between Groups	,625	1	,625	1,875	,185
	Within Groups	7,333	22	,333		
	Total	7,958	23			
04 Uiterlijk	Between Groups	,025	1	,025	,043	,839
	Within Groups	12,933	22	,588		
	Total	12,958	23			
04 Projectie vn oefening op scherm	Between Groups	1,469	1	1,469	1,220	,281
	Within Groups	26,489	22	1,204		
	Total	27,958	23			
04 Hanteerbaarheid	Between Groups	,178	1	,178	,331	,571
	Within Groups	11,822	22	,537		
	Total	12,000	23			
04 Mogelijkheid tot ontwikkelen motorische vaardigheden	Between Groups	,336	1	,336	1,398	,250
	Within Groups	5,289	22	,240		
	Total	5,625	23			
04 Mogelijkheid tot ontwikkelen diepteperceptie	Between Groups	,178	1	,178	,123	,729
	Within Groups	31,822	22	1,446		
	Total	32,000	23			

04 Mogelijkheid tot ontwikkelen hand-oog coördinatie	Between Groups	,803	1	,803	2,468	,130
	Within Groups	7,156	22	,325		
	Total	7,958	23			
05 Uiterlijk	Between Groups	1,003	1	1,003	1,383	,252
	Within Groups	15,956	22	,725		
	Total	16,958	23			
05 Projectie vn oefening op scherm	Between Groups	1,344	1	1,344	3,231	,086
	Within Groups	9,156	22	,416		
	Total	10,500	23			
05 Hanteerbaarheid	Between Groups	3,600	1	3,600	13,814	,001
	Within Groups	5,733	22	,261		
	Total	9,333	23			
05 Mogelijkheid tot ontwikkelen motorische vaardigheden	Between Groups	4,900	1	4,900	15,548	,001
	Within Groups	6,933	22	,315		
	Total	11,833	23			
05 Mogelijkheid tot ontwikkelen diepteperceptie	Between Groups	1,736	1	1,736	4,645	,042
	Within Groups	8,222	22	,374		
	Total	9,958	23			
05 Mogelijkheid tot ontwikkelen hand-oog coördinatie	Between Groups	,003	1	,003	,004	,949
	Within Groups	14,622	22	,665		
	Total	14,625	23			
06 Uiterlijk	Between Groups	1,469	1	1,469	3,531	,074
	Within Groups	9,156	22	,416		
	Total	10,625	23			
06 Projectie vn oefening op scherm	Between Groups	1,878	1	1,878	1,678	,209
	Within Groups	24,622	22	1,119		
	Total	26,500	23			
06 Hanteerbaarheid	Between Groups	,336	1	,336	,506	,484
	Within Groups	14,622	22	,665		
	Total	14,958	23			
06 Mogelijkheid tot ontwikkelen motorische vaardigheden	Between Groups	1,469	1	1,469	4,982	,036
	Within Groups	6,489	22	,295		
	Total	7,958	23			
06 Mogelijkheid tot ontwikkelen diepteperceptie	Between Groups	1,878	1	1,878	1,678	,209
	Within Groups	24,622	22	1,119		
	Total	26,500	23			
06 Mogelijkheid tot ontwikkelen hand-oog coördinatie	Between Groups	3,600	1	3,600	18,000	,000
	Within Groups	4,400	22	,200		
	Total	8,000	23			

One way ANOVA individual exercises groups 1 and 3

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
01 Uiterlijk	Between Groups	,002	1	,002	,002	,96
	Within Groups	10,356	12	,863		
	Total	10,357	13			
01 Projectie van oefening op scherm	Between Groups	,057	1	,057	,101	,75
	Within Groups	6,800	12	,567		
	Total	6,857	13			
01 Hanteerbaarheid	Between Groups	,006	1	,006	,022	,88
	Within Groups	3,422	12	,285		
	Total	3,429	13			
01 Mogelijkheid tot ontwikkelen motorische vaardigheden	Between Groups	1,429	1	1,429	4,286	,06
	Within Groups	4,000	12	,333		
	Total	5,429	13			
01 Mogelijkheid tot ontwikkelen diepteperceptie	Between Groups	3,657	1	3,657	6,095	,03
	Within Groups	7,200	12	,600		
	Total	10,857	13			
01 Mogelijkheid tot ontwikkelen hand-oog coördinatie	Between Groups	,357	1	,357	1,071	,32
	Within Groups	4,000	12	,333		
	Total	4,357	13			
02 Uiterlijk	Between Groups	,914	1	,914	1,613	,22
	Within Groups	6,800	12	,567		
	Total	7,714	13			
02 Projectie vn oefening op scherm	Between Groups	4,978	1	4,978	8,506	,01
	Within Groups	7,022	12	,585		
	Total	12,000	13			
02 Hanteerbaarheid	Between Groups	,573	1	,573	2,919	,11
	Within Groups	2,356	12	,196		
	Total	2,929	13			
02 Mogelijkheid tot ontwikkelen motorische vaardigheden	Between Groups	,459	1	,459	1,998	,18
	Within Groups	2,756	12	,230		
	Total	3,214	13			
02 Mogelijkheid tot ontwikkelen diepteperceptie	Between Groups	,406	1	,406	,694	,42
	Within Groups	7,022	12	,585		
	Total	7,429	13			
02 Mogelijkheid tot ontwikkelen hand-oog coördinatie	Between Groups	1,429	1	1,429	4,286	,06
	Within Groups	4,000	12	,333		
	Total	5,429	13			
03 Uiterlijk	Between Groups	1,073	1	1,073	2,956	,11
	Within Groups	4,356	12	,363		

	Total	5,429	13			
03 Projectie vn oefening op scherm	Between Groups	,406	1	,406	,971	,34
	Within Groups	5,022	12	,419		
	Total	5,429	13			
03 Hanteerbaarheid	Between Groups	1,835	1	1,835	2,441	,14
	Within Groups	9,022	12	,752		
	Total	10,857	13			
03 Mogelijkheid tot ontwikkelen motorische vaardigheden	Between Groups	1,944	1	1,944	6,562	,02
	Within Groups	3,556	12	,296		
	Total	5,500	13			
03 Mogelijkheid tot ontwikkelen diepteperceptie	Between Groups	,635	1	,635	1,224	,29
	Within Groups	6,222	12	,519		
	Total	6,857	13			
03 Mogelijkheid tot ontwikkelen hand-oog coördinatie	Between Groups	1,429	1	1,429	4,286	,06
	Within Groups	4,000	12	,333		
	Total	5,429	13			
04 Uiterlijk	Between Groups	,514	1	,514	,671	,42
	Within Groups	9,200	12	,767		
	Total	9,714	13			
04 Projectie vn oefening op scherm	Between Groups	2,668	1	2,668	2,739	,12
	Within Groups	11,689	12	,974		
	Total	14,357	13			
04 Hanteerbaarheid	Between Groups	3,968	1	3,968	6,912	,02
	Within Groups	6,889	12	,574		
	Total	10,857	13			
04 Mogelijkheid tot ontwikkelen motorische vaardigheden	Between Groups	,102	1	,102	,442	,51
	Within Groups	2,756	12	,230		
	Total	2,857	13			
04 Mogelijkheid tot ontwikkelen diepteperceptie	Between Groups	,268	1	,268	,266	,61
	Within Groups	12,089	12	1,007		
	Total	12,357	13			
04 Mogelijkheid tot ontwikkelen hand-oog coördinatie	Between Groups	,459	1	,459	1,998	,18
	Within Groups	2,756	12	,230		
	Total	3,214	13			
05 Uiterlijk	Between Groups	1,244	1	1,244	1,706	,21
	Within Groups	8,756	12	,730		
	Total	10,000	13			
05 Projectie vn oefening op scherm	Between Groups	,078	1	,078	,273	,61
	Within Groups	3,422	12	,285		
	Total	3,500	13			
05 Hanteerbaarheid	Between Groups	5,157	1	5,157	6,727	,02

	Within Groups	9,200	12	,767		
	Total	14,357	13			
05 Mogelijkheid tot ontwikkelen motorische vaardigheden	Between Groups	6,914	1	6,914	17,286	,00
	Within Groups	4,800	12	,400		
	Total	11,714	13			
05 Mogelijkheid tot ontwikkelen diepteperceptie	Between Groups	2,935	1	2,935	10,291	,00
	Within Groups	3,422	12	,285		
	Total	6,357	13			
05 Mogelijkheid tot ontwikkelen hand-oog coördinatie	Between Groups	1,625	1	1,625	2,411	,14
	Within Groups	8,089	12	,674		
	Total	9,714	13			
06 Uiterlijk	Between Groups	,635	1	,635	1,805	,20
	Within Groups	4,222	12	,352		
	Total	4,857	13			
06 Projectie vn oefening op scherm	Between Groups	1,625	1	1,625	1,384	,26
	Within Groups	14,089	12	1,174		
	Total	15,714	13			
06 Hanteerbaarheid	Between Groups	5,525	1	5,525	6,843	,02
	Within Groups	9,689	12	,807		
	Total	15,214	13			
06 Mogelijkheid tot ontwikkelen motorische vaardigheden	Between Groups	1,944	1	1,944	6,562	,02
	Within Groups	3,556	12	,296		
	Total	5,500	13			
06 Mogelijkheid tot ontwikkelen diepteperceptie	Between Groups	7,340	1	7,340	8,730	,01
	Within Groups	10,089	12	,841		
	Total	17,429	13			
06 Mogelijkheid tot ontwikkelen hand-oog coördinatie	Between Groups	4,629	1	4,629	19,837	,00
	Within Groups	2,800	12	,233		
	Total	7,429	13			

One way ANOVA Individual exercises between and females

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
01 Uiterlijk	Between Groups	,037	1	,037	,044	,836
	Within Groups	22,929	27	,849		
	Total	22,966	28			
01 Projectie van oefening op scherm	Between Groups	,024	1	,024	,032	,860
	Within Groups	20,114	27	,745		
	Total	20,138	28			
01 Hanteerbaarheid	Between Groups	,072	1	,072	,275	,604
	Within Groups	7,100	27	,263		
	Total	7,172	28			
01 Mogelijkheid tot ontwikkelen motorische vaardigheden	Between Groups	,948	1	,948	2,471	,128
	Within Groups	10,362	27	,384		
	Total	11,310	28			
01 Mogelijkheid tot ontwikkelen diepteperceptie	Between Groups	2,690	1	2,690	2,854	,103
	Within Groups	25,448	27	,943		
	Total	28,138	28			
01 Mogelijkheid tot ontwikkelen hand-oog coördinatie	Between Groups	,347	1	,347	,958	,336
	Within Groups	9,790	27	,363		
	Total	10,138	28			
02 Uiterlijk	Between Groups	,347	1	,347	,796	,380
	Within Groups	11,790	27	,437		
	Total	12,138	28			
02 Projectie van oefening op scherm	Between Groups	,111	1	,111	,105	,749
	Within Groups	28,648	27	1,061		
	Total	28,759	28			
02 Hanteerbaarheid	Between Groups	,290	1	,290	,931	,343
	Within Groups	8,400	27	,311		
	Total	8,690	28			
02 Mogelijkheid tot ontwikkelen motorische vaardigheden	Between Groups	,011	1	,011	,031	,862
	Within Groups	9,162	27	,339		
	Total	9,172	28			
02 Mogelijkheid tot ontwikkelen diepteperceptie	Between Groups	,782	1	,782	,740	,397
	Within Groups	28,529	27	1,057		
	Total	29,310	28			
02 Mogelijkheid tot ontwikkelen hand-oog coördinatie	Between Groups	,011	1	,011	,031	,862
	Within Groups	9,162	27	,339		
	Total	9,172	28			
03 Uiterlijk	Between Groups	,213	1	,213	,636	,432

	Within Groups	9,029	27	,334		
	Total	9,241	28			
03 Projectie vn oefening op scherm	Between Groups	,158	1	,158	,221	,642
	Within Groups	19,290	27	,714		
	Total	19,448	28			
03 Hanteerbaarheid	Between Groups	,000	1	,000	,000	,988
	Within Groups	17,862	27	,662		
	Total	17,862	28			
03 Mogelijkheid tot ontwikkelen motorische vaardigheden	Between Groups	,378	1	,378	,739	,398
	Within Groups	13,829	27	,512		
	Total	14,207	28			
03 Mogelijkheid tot ontwikkelen diepteperceptie	Between Groups	,479	1	,479	,669	,420
	Within Groups	19,314	27	,715		
	Total	19,793	28			
03 Mogelijkheid tot ontwikkelen hand-oog coördinatie	Between Groups	,066	1	,066	,165	,688
	Within Groups	10,762	27	,399		
	Total	10,828	28			
04 Uiterlijk	Between Groups	,290	1	,290	,477	,496
	Within Groups	16,400	27	,607		
	Total	16,690	28			
04 Projectie vn oefening op scherm	Between Groups	,250	1	,250	,199	,659
	Within Groups	33,957	27	1,258		
	Total	34,207	28			
04 Hanteerbaarheid	Between Groups	,805	1	,805	1,124	,299
	Within Groups	19,333	27	,716		
	Total	20,138	28			
04 Mogelijkheid tot ontwikkelen motorische vaardigheden	Between Groups	,066	1	,066	,262	,613
	Within Groups	6,762	27	,250		
	Total	6,828	28			
04 Mogelijkheid tot ontwikkelen diepteperceptie	Between Groups	4,914	1	4,914	4,584	,041
	Within Groups	28,948	27	1,072		
	Total	33,862	28			
04 Mogelijkheid tot ontwikkelen hand-oog coördinatie	Between Groups	,079	1	,079	,234	,632
	Within Groups	9,162	27	,339		
	Total	9,241	28			
05 Uiterlijk	Between Groups	,290	1	,290	,349	,560
	Within Groups	22,400	27	,830		
	Total	22,690	28			
05 Projectie vn oefening op scherm	Between Groups	,003	1	,003	,006	,939
	Within Groups	11,790	27	,437		
	Total	11,793	28			

05 Hanteerbaarheid	Between Groups	2,818	1	2,818	4,712	,039
	Within Groups	16,148	27	,598		
	Total	18,966	28			
05 Mogelijkheid tot ontwikkelen motorische vaardigheden	Between Groups	2,172	1	2,172	3,737	,064
	Within Groups	15,690	27	,581		
	Total	17,862	28			
05 Mogelijkheid tot ontwikkelen diepteperceptie	Between Groups	,333	1	,333	,727	,402
	Within Groups	12,357	27	,458		
	Total	12,690	28			
05 Mogelijkheid tot ontwikkelen hand-oog coördinatie	Between Groups	2,210	1	2,210	3,778	,062
	Within Groups	15,790	27	,585		
	Total	18,000	28			
06 Uiterlijk	Between Groups	,042	1	,042	,090	,767
	Within Groups	12,648	27	,468		
	Total	12,690	28			
06 Projectie vn oefening op scherm	Between Groups	,759	1	,759	,652	,426
	Within Groups	31,448	27	1,165		
	Total	32,207	28			
06 Hanteerbaarheid	Between Groups	2,648	1	2,648	3,461	,074
	Within Groups	20,662	27	,765		
	Total	23,310	28			
06 Mogelijkheid tot ontwikkelen motorische vaardigheden	Between Groups	,999	1	,999	2,744	,109
	Within Groups	9,829	27	,364		
	Total	10,828	28			
06 Mogelijkheid tot ontwikkelen diepteperceptie	Between Groups	2,525	1	2,525	2,088	,160
	Within Groups	32,648	27	1,209		
	Total	35,172	28			
06 Mogelijkheid tot ontwikkelen hand-oog coördinatie	Between Groups	,999	1	,999	2,280	,143
	Within Groups	11,829	27	,438		
	Total	12,828	28			

One way ANOVA individual exercises between faculties

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
01 Uiterlijk	Between Groups	,032	1	,032	,038	,847
	Within Groups	22,933	27	,849		
	Total	22,966	28			
01 Projectie van oefening op scherm	Between Groups	,047	1	,047	,064	,803
	Within Groups	20,090	27	,744		
	Total	20,138	28			

01 Hanteerbaarheid	Between Groups	1,025	1	1,025	4,501	,043
	Within Groups	6,148	27	,228		
	Total	7,172	28			
01 Mogelijkheid tot ontwikkelen motorische vaardigheden	Between Groups	,263	1	,263	,642	,430
	Within Groups	11,048	27	,409		
	Total	11,310	28			
01 Mogelijkheid tot ontwikkelen diepteperceptie	Between Groups	,924	1	,924	,916	,347
	Within Groups	27,214	27	1,008		
	Total	28,138	28			
01 Mogelijkheid tot ontwikkelen hand-oog coördinatie	Between Groups	,805	1	,805	2,328	,139
	Within Groups	9,333	27	,346		
	Total	10,138	28			
02 Uiterlijk	Between Groups	,024	1	,024	,053	,820
	Within Groups	12,114	27	,449		
	Total	12,138	28			
02 Projectie vn oefening op scherm	Between Groups	,168	1	,168	,159	,693
	Within Groups	28,590	27	1,059		
	Total	28,759	28			
02 Hanteerbaarheid	Between Groups	,028	1	,028	,087	,771
	Within Groups	8,662	27	,321		
	Total	8,690	28			
02 Mogelijkheid tot ontwikkelen motorische vaardigheden	Between Groups	1,025	1	1,025	3,396	,076
	Within Groups	8,148	27	,302		
	Total	9,172	28			
02 Mogelijkheid tot ontwikkelen diepteperceptie	Between Groups	2,648	1	2,648	2,682	,113
	Within Groups	26,662	27	,987		
	Total	29,310	28			
02 Mogelijkheid tot ontwikkelen hand-oog coördinatie	Between Groups	1,915	1	1,915	7,126	,013
	Within Groups	7,257	27	,269		
	Total	9,172	28			
03 Uiterlijk	Between Groups	1,051	1	1,051	3,464	,074
	Within Groups	8,190	27	,303		
	Total	9,241	28			
03 Projectie vn oefening op scherm	Between Groups	,158	1	,158	,221	,642
	Within Groups	19,290	27	,714		
	Total	19,448	28			
03 Hanteerbaarheid	Between Groups	,533	1	,533	,831	,370
	Within Groups	17,329	27	,642		
	Total	17,862	28			
03 Mogelijkheid tot ontwikkelen motorische	Between Groups	1,545	1	1,545	3,295	,081
	Within Groups	12,662	27	,469		

vaardigheden	Total	14,207	28			
03 Mogelijkheid tot ontwikkelen diepteperceptie	Between Groups	1,131	1	1,131	1,637	,212
	Within Groups	18,662	27	,691		
	Total	19,793	28			
03 Mogelijkheid tot ontwikkelen hand-oog coördinatie	Between Groups	,737	1	,737	1,972	,172
	Within Groups	10,090	27	,374		
	Total	10,828	28			
04 Uiterlijk	Between Groups	,333	1	,333	,549	,465
	Within Groups	16,357	27	,606		
	Total	16,690	28			
04 Projectie vn oefening op scherm	Between Groups	,378	1	,378	,302	,587
	Within Groups	33,829	27	1,253		
	Total	34,207	28			
04 Hanteerbaarheid	Between Groups	,047	1	,047	,064	,803
	Within Groups	20,090	27	,744		
	Total	20,138	28			
04 Mogelijkheid tot ontwikkelen motorische vaardigheden	Between Groups	,066	1	,066	,262	,613
	Within Groups	6,762	27	,250		
	Total	6,828	28			
04 Mogelijkheid tot ontwikkelen diepteperceptie	Between Groups	3,405	1	3,405	3,018	,094
	Within Groups	30,457	27	1,128		
	Total	33,862	28			
04 Mogelijkheid tot ontwikkelen hand-oog coördinatie	Between Groups	,694	1	,694	2,191	,150
	Within Groups	8,548	27	,317		
	Total	9,241	28			
05 Uiterlijk	Between Groups	,290	1	,290	,349	,560
	Within Groups	22,400	27	,830		
	Total	22,690	28			
05 Projectie vn oefening op scherm	Between Groups	,003	1	,003	,006	,939
	Within Groups	11,790	27	,437		
	Total	11,793	28			
05 Hanteerbaarheid	Between Groups	,032	1	,032	,046	,832
	Within Groups	18,933	27	,701		
	Total	18,966	28			
05 Mogelijkheid tot ontwikkelen motorische vaardigheden	Between Groups	,533	1	,533	,831	,370
	Within Groups	17,329	27	,642		
	Total	17,862	28			
05 Mogelijkheid tot ontwikkelen diepteperceptie	Between Groups	,028	1	,028	,059	,810
	Within Groups	12,662	27	,469		
	Total	12,690	28			
05 Mogelijkheid tot	Between Groups	,000	1	,000	,000	1,000

ontwikkelen hand-oog coördinatie	Within Groups	18,000	27	,667		
	Total	18,000	28			
06 Uiterlijk	Between Groups	,028	1	,028	,059	,810
	Within Groups	12,662	27	,469		
	Total	12,690	28			
06 Projectie vn oefening op scherm	Between Groups	4,416	1	4,416	4,291	,048
	Within Groups	27,790	27	1,029		
	Total	32,207	28			
06 Hanteerbaarheid	Between Groups	,948	1	,948	1,145	,294
	Within Groups	22,362	27	,828		
	Total	23,310	28			
06 Mogelijkheid tot ontwikkelen motorische vaardigheden	Between Groups	2,566	1	2,566	8,385	,007
	Within Groups	8,262	27	,306		
	Total	10,828	28			
06 Mogelijkheid tot ontwikkelen diepteperceptie	Between Groups	3,082	1	3,082	2,593	,119
	Within Groups	32,090	27	1,189		
	Total	35,172	28			
06 Mogelijkheid tot ontwikkelen hand-oog coördinatie	Between Groups	,737	1	,737	1,646	,210
	Within Groups	12,090	27	,448		
	Total	12,828	28			

Descriptives general impression

		Descriptives						
		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum
geschikt vr motorische vaardigheden	0	15	4,53	,516	,133	4,25	4,82	4
	1	5	4,60	,548	,245	3,92	5,28	4
	2	9	4,56	,527	,176	4,15	4,96	4
	Total	29	4,55	,506	,094	4,36	4,74	4
oefenen diepteperceptie	0	15	4,00	1,069	,276	3,41	4,59	2
	1	5	4,00	,707	,316	3,12	4,88	3
	2	9	4,00	,707	,236	3,46	4,54	3
	Total	29	4,00	,886	,165	3,66	4,34	2
oefenen oog-handcoördinatie	0	15	4,60	,507	,131	4,32	4,88	4
	1	5	4,80	,447	,200	4,24	5,36	4
	2	9	4,67	,500	,167	4,28	5,05	4
	Total	29	4,66	,484	,090	4,47	4,84	4
samenwerking tss handen	0	15	4,33	,617	,159	3,99	4,68	3
	1	5	4,00	,000	,000	4,00	4,00	4
	2	9	4,44	,527	,176	4,04	4,85	4
	Total	29	4,31	,541	,101	4,10	4,52	3
oefenen handen individueel	0	15	4,47	,640	,165	4,11	4,82	3
	1	5	3,80	,447	,200	3,24	4,36	3
	2	9	4,56	,527	,176	4,15	4,96	4
	Total	29	4,38	,622	,115	4,14	4,62	3
moeilijkheidsgraad oefenen	0	15	3,93	,594	,153	3,60	4,26	3
	1	5	3,80	,447	,200	3,24	4,36	3
	2	9	3,78	,667	,222	3,27	4,29	3
	Total	29	3,86	,581	,108	3,64	4,08	3
duidelijke beschrijving oefeningen	0	15	4,60	,507	,131	4,32	4,88	4
	1	5	4,20	,837	,374	3,16	5,24	3
	2	9	4,56	,726	,242	4,00	5,11	3
	Total	29	4,52	,634	,118	4,28	4,76	3
geschikt voor studenten	0	15	4,53	,743	,192	4,12	4,94	3
	1	5	4,40	,894	,400	3,29	5,51	3
	2	9	4,67	,707	,236	4,12	5,21	3
	Total	29	4,55	,736	,137	4,27	4,83	3
standaard in curriculum	0	15	3,47	1,246	,322	2,78	4,16	1
	1	5	3,00	1,225	,548	1,48	4,52	1
	2	9	4,00	1,000	,333	3,23	4,77	3
	Total	29	3,55	1,183	,220	3,10	4,00	1

waardering gehele protocol	0	15	4,60	,507	,131	4,32	4,88	4
	1	5	4,00	,707	,316	3,12	4,88	3
	2	9	4,78	,441	,147	4,44	5,12	4
	Total	29	4,55	,572	,106	4,33	4,77	3

One way ANOVA general impression all groups

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
geschikt vr motorische vaardigheden	Between Groups	,017	2	,008	,031	,97
	Within Groups	7,156	26	,275		
	Total	7,172	28			
oefenen diepteperceptie	Between Groups	,000	2	,000	,000	1,00
	Within Groups	22,000	26	,846		
	Total	22,000	28			
oefenen oog-handcoördinatie	Between Groups	,152	2	,076	,308	,73
	Within Groups	6,400	26	,246		
	Total	6,552	28			
samenwerking tss handen	Between Groups	,651	2	,326	1,121	,34
	Within Groups	7,556	26	,291		
	Total	8,207	28			
oefenen handen individueel	Between Groups	2,072	2	1,036	3,076	,06
	Within Groups	8,756	26	,337		
	Total	10,828	28			
moeilijkheidsgraad oefenen	Between Groups	,159	2	,080	,223	,80
	Within Groups	9,289	26	,357		
	Total	9,448	28			
duidelijke beschrijving oefeningen	Between Groups	,619	2	,310	,758	,47
	Within Groups	10,622	26	,409		
	Total	11,241	28			
geschikt voor studenten	Between Groups	,239	2	,120	,208	,81
	Within Groups	14,933	26	,574		
	Total	15,172	28			
standaard in curriculum	Between Groups	3,439	2	1,720	1,251	,30
	Within Groups	35,733	26	,1,374		
	Total	39,172	28			
waardering gehele protocol	Between Groups	2,017	2	1,008	3,664	,04
	Within Groups	7,156	26	,275		
	Total	9,172	28			

One way ANOVA general impression groups 1 and 2

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
geschikt vr motorische vaardigheden	Between Groups	,017	1	,017	,061	,80
	Within Groups	4,933	18	,274		
	Total	4,950	19			
oefenen diepteperceptie	Between Groups	,000	1	,000	,000	1,00
	Within Groups	18,000	18	1,000		
	Total	18,000	19			
oefenen oog-handcoördinatie	Between Groups	,150	1	,150	,614	,44
	Within Groups	4,400	18	,244		
	Total	4,550	19			
samenwerking tss handen	Between Groups	,417	1	,417	1,406	,25
	Within Groups	5,333	18	,296		
	Total	5,750	19			
oefenen handen individueel	Between Groups	1,667	1	1,667	4,592	,04
	Within Groups	6,533	18	,363		
	Total	8,200	19			
moeilijkheidsgraad oefenen	Between Groups	,067	1	,067	,209	,65
	Within Groups	5,733	18	,319		
	Total	5,800	19			
duidelijke beschrijving oefeningen	Between Groups	,600	1	,600	1,687	,21
	Within Groups	6,400	18	,356		
	Total	7,000	19			
geschikt voor studenten	Between Groups	,067	1	,067	,110	,74
	Within Groups	10,933	18	,607		
	Total	11,000	19			
standaard in curriculum	Between Groups	,817	1	,817	,530	,47
	Within Groups	27,733	18	1,541		
	Total	28,550	19			
waardering gehele protocol	Between Groups	1,350	1	1,350	4,339	,05
	Within Groups	5,600	18	,311		
	Total	6,950	19			

One way ANOVA general impression groups 1 and 3

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
geschikt vr motorische vaardigheden	Between Groups	,003	1	,003	,010	,92
	Within Groups	5,956	22	,271		

	Total	5,958	23			
oefenen diepteperceptie	Between Groups	,000	1	,000	,000	1,00
	Within Groups	20,000	22	,909		
	Total	20,000	23			
oefenen oog-handcoördinatie	Between Groups	,025	1	,025	,098	,75
	Within Groups	5,600	22	,255		
	Total	5,625	23			
samenwerking tss handen	Between Groups	,069	1	,069	,202	,65
	Within Groups	7,556	22	,343		
	Total	7,625	23			
oefenen handen individueel	Between Groups	,044	1	,044	,123	,72
	Within Groups	7,956	22	,362		
	Total	8,000	23			
moeilijkheidsgraad oefenen	Between Groups	,136	1	,136	,353	,55
	Within Groups	8,489	22	,386		
	Total	8,625	23			
duidelijke beschrijving oefeningen	Between Groups	,011	1	,011	,031	,86
	Within Groups	7,822	22	,356		
	Total	7,833	23			
geschikt voor studenten	Between Groups	,100	1	,100	,188	,66
	Within Groups	11,733	22	,533		
	Total	11,833	23			
standaard in curriculum	Between Groups	1,600	1	1,600	1,184	,28
	Within Groups	29,733	22	1,352		
	Total	31,333	23			
waardering gehele protocol	Between Groups	,178	1	,178	,759	,39
	Within Groups	5,156	22	,234		
	Total	5,333	23			

One way ANOVA general impression groups 2 and 3

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
geschikt vr motorische vaardigheden	Between Groups	,006	1	,006	,022	,88
	Within Groups	3,422	12	,285		
	Total	3,429	13			
oefenen diepteperceptie	Between Groups	,000	1	,000	,000	1,00
	Within Groups	6,000	12	,500		
	Total	6,000	13			
oefenen oog-handcoördinatie	Between Groups	,057	1	,057	,245	,63
	Within Groups	2,800	12	,233		

	Total	2,857	13			
samenwerking tss handen	Between Groups	,635	1	,635	3,429	,08
	Within Groups	2,222	12	,185		
	Total	2,857	13			
oefenen handen individueel	Between Groups	1,835	1	1,835	7,286	,01
	Within Groups	3,022	12	,252		
	Total	4,857	13			
moeilijkheidsgraad oefenen	Between Groups	,002	1	,002	,004	,94
	Within Groups	4,356	12	,363		
	Total	4,357	13			
duidelijke beschrijving oefeningen	Between Groups	,406	1	,406	,694	,42
	Within Groups	7,022	12	,585		
	Total	7,429	13			
geschikt voor studenten	Between Groups	,229	1	,229	,381	,54
	Within Groups	7,200	12	,600		
	Total	7,429	13			
standaard in curriculum	Between Groups	3,214	1	3,214	2,755	,12
	Within Groups	14,000	12	1,167		
	Total	17,214	13			
waardering gehele protocol	Between Groups	1,944	1	1,944	6,562	,02
	Within Groups	3,556	12	,296		
	Total	5,500	13			

One way ANOVA general impression between males and females

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
geschikt vr motorische vaardigheden	Between Groups	,072	1	,072	,275	,604
	Within Groups	7,100	27	,263		
	Total	7,172	28			
oefenen diepteperceptie	Between Groups	,138	1	,138	,171	,683
	Within Groups	21,862	27	,810		
	Total	22,000	28			
oefenen oog-handcoördinatie	Between Groups	,461	1	,461	2,045	,164
	Within Groups	6,090	27	,226		
	Total	6,552	28			
samenwerking tss handen	Between Groups	,378	1	,378	1,305	,263
	Within Groups	7,829	27	,290		
	Total	8,207	28			
oefenen handen individueel	Between Groups	,066	1	,066	,165	,688
	Within Groups	10,762	27	,399		
	Total	10,828	28			
moeilijkheidsgraad oefenen	Between Groups	,591	1	,591	1,802	,191
	Within Groups	8,857	27	,328		
	Total	9,448	28			
duidelijke beschrijving oefeningen	Between Groups	,008	1	,008	,019	,890
	Within Groups	11,233	27	,416		
	Total	11,241	28			
geschikt voor studenten	Between Groups	,011	1	,011	,019	,892
	Within Groups	15,162	27	,562		
	Total	15,172	28			
standaard in curriculum	Between Groups	1,482	1	1,482	1,062	,312
	Within Groups	37,690	27	1,396		
	Total	39,172	28			
waardering gehele protocol	Between Groups	,072	1	,072	,215	,647
	Within Groups	9,100	27	,337		
	Total	9,172	28			

One way ANOVA general impression between faculties

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
geschikt vr motorische vaardigheden	Between Groups	,072	1	,072	,275	,604
	Within Groups	7,100	27	,263		
	Total	7,172	28			
oefenen diepteperceptie	Between Groups	2,210	1	2,210	3,014	,094
	Within Groups	19,790	27	,733		
	Total	22,000	28			
oefenen oog-handcoördinatie	Between Groups	,095	1	,095	,395	,535
	Within Groups	6,457	27	,239		
	Total	6,552	28			
samenwerking tss handen	Between Groups	,016	1	,016	,054	,818
	Within Groups	8,190	27	,303		
	Total	8,207	28			
oefenen handen individueel	Between Groups	,237	1	,237	,605	,444
	Within Groups	10,590	27	,392		
	Total	10,828	28			
moeilijkheidsgraad oefenen	Between Groups	,158	1	,158	,459	,504
	Within Groups	9,290	27	,344		
	Total	9,448	28			
duidelijke beschrijving oefeningen	Between Groups	,213	1	,213	,521	,477
	Within Groups	11,029	27	,408		
	Total	11,241	28			
geschikt voor studenten	Between Groups	,411	1	,411	,751	,394
	Within Groups	14,762	27	,547		
	Total	15,172	28			
standaard in curriculum	Between Groups	,011	1	,011	,007	,933
	Within Groups	39,162	27	,1,450		
	Total	39,172	28			
waardering gehele protocol	Between Groups	1,025	1	1,025	3,396	,076
	Within Groups	8,148	27	,302		
	Total	9,172	28			

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