[Eval] Suitable methodology (5 Punkte) Sie haben die folgende Antwort gegeben:

Imagine you work at a university as a researcher. Different colleagues approach you asking for help to choose a suitable evaluation method for their problem. Assign the correct statements to each of the given problems (there might be several statements correct):

"I just built this cool prototype of a mobile application, and I would like to find out how well it is designed, but I don't know how."	passt zu	I recommend the AttrakDiff for that!	•
"I would like to compare the task completion time of the 3 different VR scenarios I analysed in my study."	passt zu	ANOVA might be suitable for your problem!	•
"I conducted 10 t-tests on my sample and it looks like 8 times there was statistical significance, that's cool right?"	passt zu	You could use the SUS for that!	×
"I redesigned my interface design and conducted a study comparing the two designs. How can I tell with my data which one is statistically significant better?"	passt zu	You should definitely think about using the Bonferroni correction!	×

"I just built this cool prototype of a mobile application, and I would like to find out how well it is designed, but I don't know how."	passt zu	You could use the SUS for that!
"I would like to compare the task completion time of the 3 different VR scenarios I analysed in my study."	passt zu	ANOVA might be suitable for your problem!
"I conducted 10 t-tests on my sample and it looks like 8 times there was statistical significance, that's cool right?"	passt zu	You should definitely think about using the Bonferroni correction!
"I redesigned my interface design and conducted a study comparing the two designs. How can I tell with my data which one is statistically significant better?"	passt zu	The student t-test could be helpful!
"I just built this cool prototype of a mobile application, and I would like to find out how well it is designed, but I don't know how."	passt zu	I recommend the AttrakDiff for that!

[Eval] Median (2 Punkte)

Sie haben die folgende Antwort gegeben:

A study shows an experiment in which the reaction time of goalkeepers is measured. They are asked to press a button when a symbol appears on a white screen. Except for a few outliers, the data are all within a range of 400 - 600 milliseconds. In the study, the median was calculated to evaluate the reaction time.

Why was the median chosen in the study? What disadvantages could the median have?

Choose the correct explanations.

The median is relatively unaffected by outliers.

☑ The median is not very stable. ②

☐ The median is resistent to sampling variation. •

☐ The median is very much affected by outliers. •

Die bestmögliche Lösung lautet:

The median is relatively unaffected by outliers.

☑ The median is not very stable.

The median is resistent to sampling variation.

☐ The median is very much affected by outliers.

[Paper] Use Case for Design Personas (2 Punkte) Sie haben die folgende Antwort gegeben:

Which of the following domain has **not** been identified by Salminen et al. as most commonly used in research?

Source: Salminen, Joni & Guan, Kathleen & Jung, Soon-Gyo & Jansen, Jim. (2022). Use Cases for Design Personas: A Systematic Review and New Frontiers. 1-21. 10.1145/3491102.3517589.

- Software development
- O Healthcare
- O Higher education
- O Marketing
- O Robotics
- Dialogue systems
- Videogames
- O Privacy and security
- Recommendation systems
- O Food industry

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- Food industry

[Paper] Use Cases for Design Personas (2) (2 Punkte) Sie haben die folgende Antwort gegeben:

There is a variety of user-centered design techniques, that are used in combination with persona design, forming the overall design process.

Which of the following techniques have been identified by Salminen et. al. as additional user-centered methods that are frequently used in research studies?

Source: Salminen, Joni & Guan, Kathleen & Jung, Soon-Gyo & Jansen, Jim. (2022). Use Cases for Design Personas: A Systematic Review and New Frontiers. 1-21.

10.1145/3491102.3517589.

Scenarios (narrative of user activities) 
Semi-structured interviews 
Multiple Usability tests 
Communicate with stakeholders

- Scenarios (narrative of user activities)
- ☑ Semi-structured interviews
- ☐ Communicate with stakeholders

# [Princ] Robustness (4 Punkte)

Sie haben die folgende Antwort gegeben:

Robustness describes the level of support provided to the user in determining successful achievement and assessment of goal-directed behaviour. Assign the best-suiting sub-category of robustness that are considered in each scenario.

Before the user is redirected to a travel website, an airplane moves in a circle, indicating that the page is still loading. Observability

A keyboard command deletes the table you have just created in a word editor. Recoverability

A customized toolbar shows all possible functions a user can perform in an image editor. Task Conformance

A navigation app gives speech feedback about the calculation of the route, the estimated time of arrival and traffic jams on the way to Italy. Responsiveness

# [Modl] Steering Law (3 Punkte)

Sie haben die folgende Antwort gegeben:

Complete the given statement about the Steering Law by filling the gaps with the missing words and selecting the correct equation for MT.

The time to acquire a target through a tunnel 🕢 is a function of the length 🕡 and width 🕡 of the tunnel and depends on the pointing system 🕡 .

#### **Equation:**

Movement Time MT = a + b \* D / W

# Die bestmögliche Lösung lautet:

The time to acquire a target through a tunnel is a function of the length oder width and width oder length of the tunnel and depends on the pointing system.

#### **Equation:**

Movement Time MT = a + b \* D / W

[Proto] Prototype design applied (3 Punkte) Sie haben die folgende Antwort gegeben:

You want to develop a tool to help elderly people monitor and manage their health and daily tasks. To this end, you want to develop a UI that is tailored to this user group. You are still at the very beginning of your considerations and therefore you have little money available in this initial phase.

To test your ideas, you are developing a prototype of the UI.

What should you consider in the process regarding the given circumstances? Mark the correct statements.

- ☐ You could choose a high-fidelity prototype because they are cheap and easy to develop. •
- You could consider doing a "Wizard of Oz" experiment because you are able to test quite complex interactions quickly.
- You could choose a high-fidelity and functional prototype because that is a good way to get feedback about the look and feel of your UI.
- You could choose a throw-away paper prototype because such a prototype is suitable if you need a cheap way of testing your initial ideas.
- You could choose a vertical prototype to test whether the way you have implemented the key feature of your UI works for the targeted user group.
- ☐ You could choose a horizontal prototype to test whether all the functionalities of your UI design are working correctly. ◆

# [Hum] Gestalt laws (1 Punkt) Sie haben die folgende Antwort gegeben:

Which Gestalt law states that elements that are arranged on a line or curve are perceived to be more related than elements not on that line or curve?

- O Law of similarity
- O Law of common fate
- Law of perception
- O Law of pragnanz / simplicity / good shape
- Law of continuity
- O Law of pleasure
- O Las of symmetry
- O Law of closure

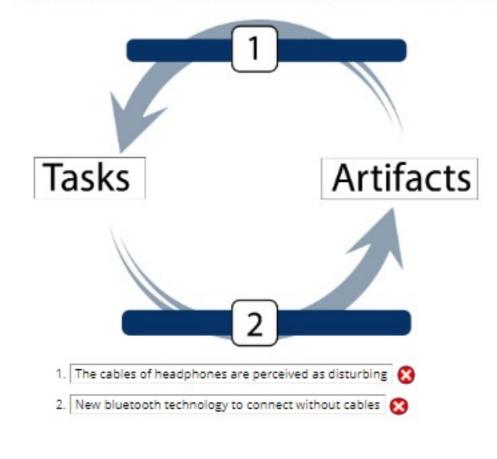
- Law of similarity
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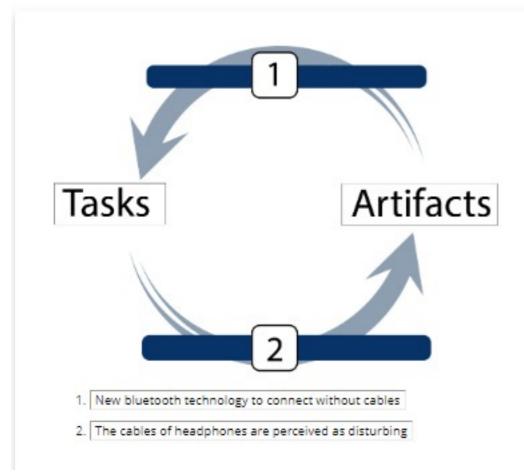
#### [Intro] Task-artifact cycle (2 Punkte)

Sie haben die folgende Antwort gegeben:

The task artifact cycle captures the idea that tasks and artifacts coevolve.

Choose the correct labelling in the chart for the example of the development of wireless headphones.





# [Intro] Terms and Concepts (2 Punkte) Sie haben die folgende Antwort gegeben:

V V	Usefulness 🕢 Generalisability 🕢	ng terms are a	ttributes of <b>u</b>	ısability?	
Die b	estmögliche Lösung	lautet:			
	Learnability Usefulness Generalisability Satisfaction				

# [Princ] Flexibility (2) (3 Punkte)

Sie haben die folgende Antwort gegeben:



Flexibility in user interfaces allows for more than just a linear path when navigating through a system. Therefore, multiple ways to exchange information exist.

# Which of the following statements are correct?

- ☑ Multithreading describes the ability of a system to support user interaction for several tasks at a time 
  ☑
- ☐ To keep task migratability, all given tasks must be passed to the user and not the system
- A system needs to allow equivalent values of input and output, that can be substituted for each other 🕢
- Adaptability describes the ability of the user to adjust the form of input and output
- ☐ By collecting user data on interaction and behavior, the system better adapts to user's preferences
- ☐ Two types of Multithreading in UX design are asynchronous multimodality and interleaving multimodality 🕢

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- ☐ Two types of Multithreading in UX design are asynchronous multimodality and interleaving multimodality

# [Tech] Taxonomy by Buxton (1 Punkt)

Sie haben die folgende Antwort gegeben:

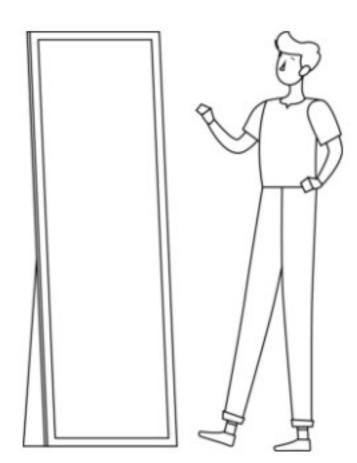
# Which of the following criteria has **not** been defined by Bill Buxton to assess input devices?

- O Is the input continuous or discrete?
- O What is the agent of control?
- O What is being sensed?
- O What is the number of dimensions being sensed?
- How much time does the sensing last?

- Is the input continuous or discrete?
- O What is the agent of control?
- O What is being sensed?
- O What is the number of dimensions being sensed?
- How much time does the sensing last?

### [Princ] Flexibility (1 Punkt)

Sie haben die folgende Antwort gegeben:



To explore the impact of ubiquitous artifacts on a person's fitness tracking routine, a smart mirror visualizes a wide range of tracking parameters for physiological data gathered by an EmpaticaE4 wristband. A recognized challenge in HCI is how to present such data to the user optimally.

There are two types of dialogue initiatives which allow for interaction with the system: user preemptive and system preemptive.

The following examples give dialogue scenarios. Assign each of the two categories to the corresponding scenario.

Every morning a daily overview is presented that comprises essential vital data.

Passt zu user preemptive 
To configure the main page, a setting dialogue can be opened via touch 
Passt zu system preemptive

## Die bestmögliche Lösung lautet:

Every morning a daily overview is presented that comprises essential vital data.

Passt zu system preemptive

To configure the main page, a setting dialogue can be opened via touch passt zu user preemptive

# [Intro] Utility, Usability & Likeability (2 Punkte) Sie haben die folgende Antwort gegeben:

C	Choose the correct statement(s).
	Utility describes if a product can be used to reach a certain goal or to perform a certain task.  Usability relates to how well a product supports the user to reach a certain goal or perform a certain task.  Usability relates to how easy it is for the user to reach a certain goal or perform a certain task in a specific amount of time.  Usability relates to how well a product supports the user to reach a certain goal or to perform a certain task.
Die b	estmögliche Lösung lautet:

# [Modl] GOMS Definition (1 Punkt)

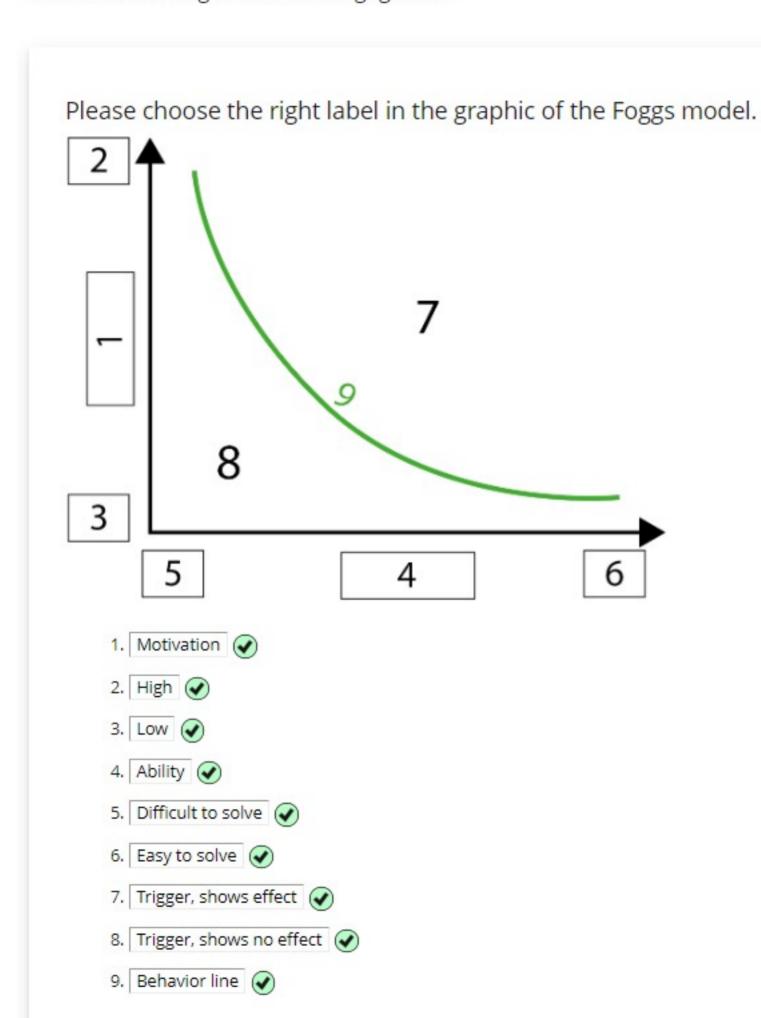
## Sie haben die folgende Antwort gegeben:

#### What does **GOMS** stand for?

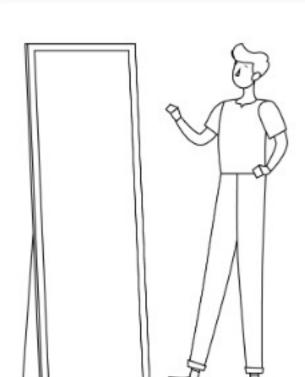
- Goals, operation, methods and selection rules
- Goals, objects, models and selection rules
- O Goals, operation, methods and state rules
- O Goals, operation, models and state rules

- Goals, operation, methods and selection rules
- Goals, objects, models and selection rules
- O Goals, operation, methods and state rules
- O Goals, operation, models and state rules

# [Guest talk] Foggs model (4.5 Punkte) Sie haben die folgende Antwort gegeben:



[Princ] Mirror, Mirror on the Wall (2 Punkte) Sie haben die folgende Antwort gegeben:



To explore the impact of uniquitous artifacts on a person's fitness tracking routine, a smart mirror visualizes a wide range of tracking parameters for physiological data gathered by an EmpaticaE4 wristband. A recognized challenge in HCI is how to optimally present such data to the user.

To think about the target population of this system, personas are created. Choose the right statements in the context of interaction design for this use case.

☑ A persona is used to role-play through an interface design 🕢

☑ A persona must represent a real person

☐ A persona represents a particular type of user ເ

☐ A persona is limited to the average person ✔

Die bestmögliche Lösung lautet:

☑ A persona is used to role-play through an interface design

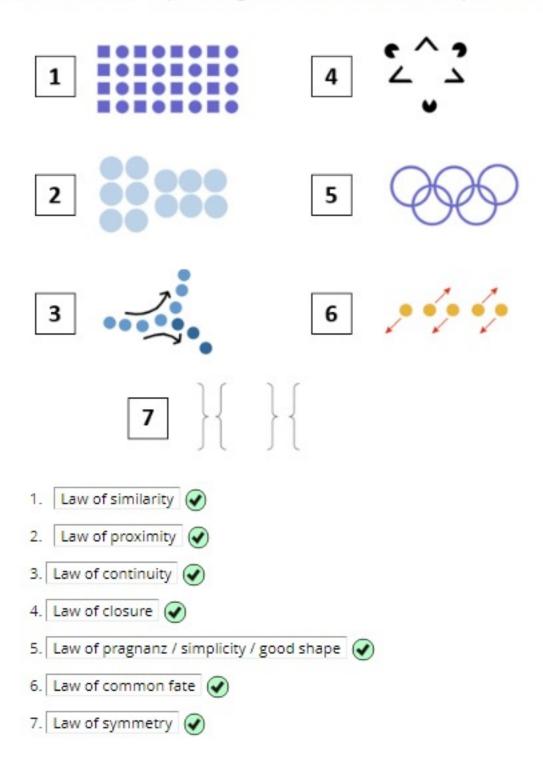
☐ A persona must represent a real person

A persona represents a particular type of user

 $\ \square$  A persona is limited to the average person

[Hum] Gestalt Laws (assign) (7 Punkte) Sie haben die folgende Antwort gegeben:

To display the data on the mirror, Gestalt laws can be applied to increase usability. Choose the corresponding **Gestalt law** for each picture (1-7).



[Modl] Buying a train ticket (2 Punkte)

Sie haben die folgende Antwort gegeben:

☑ The GOMS model could have been used to get an early understanding of the interaction.

☑ There is an increased risk of forgetting your credit card. ②

☐ This interaction is a good example for the use of the KLM model. •

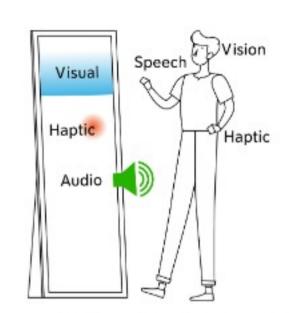
Imagine it is Sunday, and you want to visit the old town of Bamberg. You decide to take the train and therefore, need to buy a ticket at a ticket machine at Nuremberg main station. You approach the machine, and the following interaction takes place: 1 You type in the desired destination. 2 You choose a suitable connection. 3 You check and verify the details. 4 You insert your credit card and enter the PIN. 5 You collect your train ticket. 6 You collect your credit card. Which of the following statement(s) is/are correct? ☐ The outer goal is satisfied after collecting the credit card. ◆

[Modl] GOMS Model - Strength & Weakness (2) (2 Punkte)	
Sie haben die folgende Antwort gegeben:	
Mark the correct statement(s) about the <b>strengths and weaknesses of the GOMS mode</b> ☐ Easy to model novel interactions ② ☐ Good treatment of learning effects ② ☐ Good to identify bottlenecks ② ☐ High costs regarding time and money investment ②	·1.
Die bestmögliche Lösung lautet:	
<ul> <li>□ Easy to model novel interactions</li> <li>☑ Good treatment of learning effects</li> <li>☑ Good to identify bottlenecks</li> <li>□ High costs regarding time and money investment</li> </ul>	

# [Anyl] Ethnography (2 Punkte) Sie haben die folgende Antwort gegeben: Select the correct statements about **ethnographic observation in HCI**. Potential users (typical users) are observed over a period of time (critical times are included, for example shift changes). One goal of ethnographic observation is to get information about the usability of the UI. (X) Ethnographic observation in HCI is robust to the Hawthorne Effect. One risk of ethnographic observation in HCI is that observations are often misinterpreted due to a lack of insight. Die bestmögliche Lösung lautet: Potential users (typical users) are observed over a period of time (critical times are included, for example shift changes). One goal of ethnographic observation is to get information about the usability of the UI. Ethnographic observation in HCI is robust to the Hawthorne Effect. One risk of ethnographic observation in HCI is that observations are often misinterpreted due to a lack of insight.

# [Tech] Mirror Technology (6 Punkte)

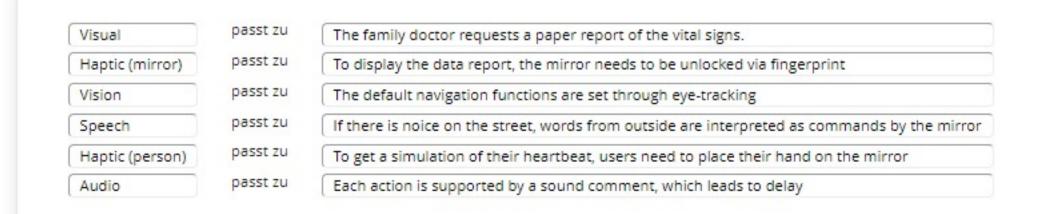
Sie haben die folgende Antwort gegeben:



To explore the impact of uniquitous artifacts on a person's fitness tracking routine, a smart mirror visualizes a wide range of tracking parameters for physiological data gathered by an EmpaticaE4 wristband. A recognized challenge in HCI is how to optimally present such data to the user.

Assign the input and output modalities, that fit best to the given usability related limitations

Visual	passt zu	The default navigation functions are set through eye-tracking
Haptic (mirror)	passt zu	To display the data report, the mirror needs to be unlocked via fingerprint
Vision	passt zu	The family doctor requests a paper report of the vital signs.
Speech	passt zu	Each action is supported by a sound comment, which leads to delay
Haptic (person)	passt zu	To get a simulation of their heartbeat, users need to place their hand on the mirror
Audio	passt zu	If there is noice on the street, words from outside are interpreted as commands by the mirror

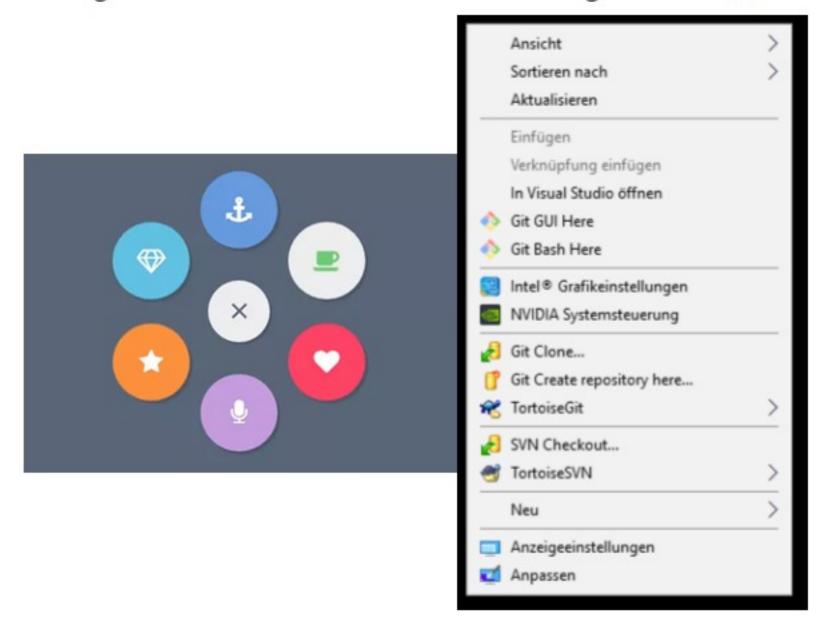


# [Modl] Pop up menus (2 Punkte)

Sie haben die folgende Antwort gegeben:

Look at the following circular and linear pop-up menus. On right-clicking the mouse, the circular pop-up menu opens at the central cross while the linear menu opens at the top element "Ansicht". So the mouse cursor is either on the cross (circular menu) or at "Ansicht" (linear menu).

Having Fitts' Law in mind which of the following statement(s) is/are correct?



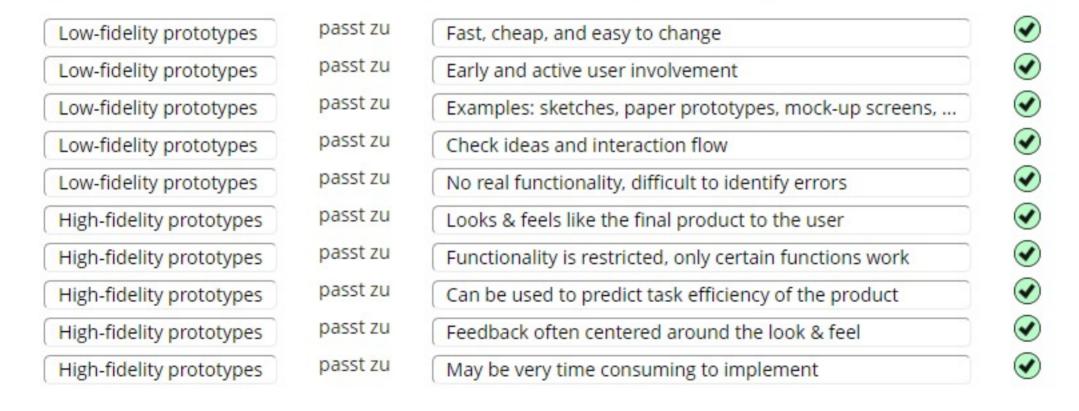
- The circular pop up menu benefits in terms of target distance.
- ☐ All elements in the linear menu can be accessed equally well. •
- ☐ The linear pop up menu would improve accessibility of the upper items if on right clicking the mouse cursor was already at the level of the center. •
- At each element of the circular pop up menu another circular menu could open and increase the access speed.

# Sie haben die folgende Antwort gegeben: Which of the following are recognized kinds of prototypes: ✓ Interactive sketches Conceptual models ( ☐ Beta versions • ✓ Low-fidelity paper prototypes Die bestmögliche Lösung lautet: Interactive sketches Conceptual models ☐ Beta versions ☑ Low-fidelity paper prototypes

[Prot] Kinds of prototypes (2 Punkte)

[Proto] High- and low-fidelity prototypes (5 Punkte) Sie haben die folgende Antwort gegeben:

# Assign the statements to either high- or low-fidelity prototypes.



[Eval] Study scenarios (4 Punkte)

Sie haben die folgende Antwort gegeben:

Imagine you have developed two different virtual handball scenarios and are testing them on 100 handball players. Both scenarios show a move that is about reacting as fast as possible to the environment. You want to test which of the two scenarios is better suited for a performance analysis of handball players. You test all 100 handball players in both scenarios and investigate both objective and subjective measures. For the objective measure you measure the reaction time during the move and for the subjective measure, the user experience with a questionnaire after the move. This gives you the reaction time and the user experience for each scenario as the basis for comparing the two scenarios.

Please answer the following questions.

What is/are the independent variable(s)?

The two different handball scenarios 
What is/are the dependent variable(s)?

The reaction time and the results of the UX questionnaire 
Which experimental design was used?

Within-subject design 
What was the null hypothesis of this study?

There is no significant difference between the two scenarios

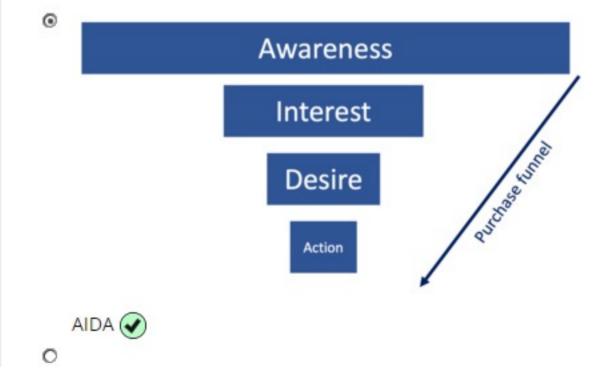
# [Anyl] Focus groups (2 Punkte) Sie haben die folgende Antwort gegeben: Select the correct statement(s) about how to create a focus group.

☑ The sampling of participants is usually not representative 
 ☑ Focus groups gather quantitative information 
 ☑ You should only include participants who have a similar view or opinion 
 ☑ You should prepare material that makes the discussion more tangible

- ☐ Focus groups gather quantitative information
- ☐ You should only include participants who have a similar view or opinion
- You should prepare material that makes the discussion more tangible

[Guest talk] Conversion Rate Optimization (1 Punkt) Sie haben die folgende Antwort gegeben:

The AIDA model, tracing the customer journey through Awareness, Interest, Desire and Action, is a well-known model to plan Conversion Rate Optimization. Which of the diagrams describes the model **best**.



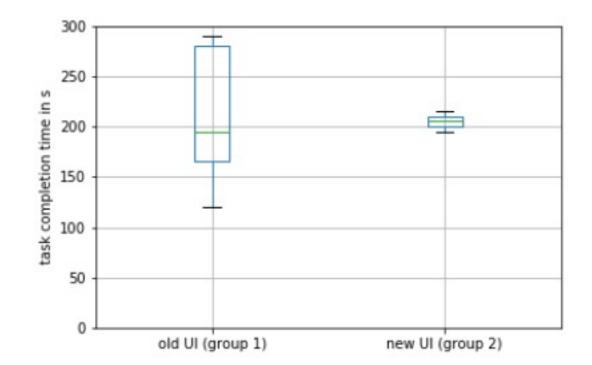
#### [Eval] Boxplots applied (2) (3 Punkte)

Sie haben die folgende Antwort gegeben:

Imagine you are the boss of a small company and, of course, you want your employees to work as efficiently as possible. Therefore, you conducted a study in which all employees were asked to try a new UI for a frequently used program. Half of them performed some specified tasks with the old UI (group 1) and the other half with the new UI (group 2). The respective task completion time was measured.

## Below is a boxplot of the results.

Mark the correct conclusions you can draw from the results shown.



✓ You have used a between-group design for your study. 
✓

☐ You have used a within-group design for your study. •

☑ You chose to use the new design (group 2) from now on because the median of the task completion time may be longer but the variance is much smaller. 🕢

☐ You chose to stay with the old design (group 1) because the median of the task completion time is smaller, which means that all of your employees work faster with the old design. 🕢

☑ The green line in the boxplot shows the average task completion time.

- ☑ You have used a between-group design for your study.
- ☐ You have used a within-group design for your study.
- You chose to use the new design (group 2) from now on because the median of the task completion time may be longer but the variance is much smaller.
- ☐ You chose to stay with the old design (group 1) because the median of the task completion time is smaller, which means that all of your employees work faster with the old design.
- ☐ The green line in the boxplot shows the average task completion time.
- ☑ The green line of the boxplot shows the median of the data.

# [Princ] 8 Golden Rules (2) (2 Punkte) Sie haben die folgende Antwort gegeben:

Choose the correct	ct statement(s) describing the 8 Golden R	Rules of Shneiderman.	
<ul><li>☑ Closure: sequences o</li><li>☑ Locus of control: user</li></ul>	e speed for experienced users by providing shortcuts on or of (non-instantaneous) actions should have a beginning, more should feel to be in control of the system, but system should ally all actions should be reversible, e.g by providing UND	hould initiate actions 🕢	
Die bestmögliche Lösu	ng lautet:		
☑ Closure: sequences o	e speed for experienced users by providing shortcuts on of (non-instantaneous) actions should have a beginning, make a should feel to be in control of the system, but system sh	middle, and end	

☐ Error handling: basically all actions should be reversible, e.g by providing UNDO functions and allowing undo of groups of actions

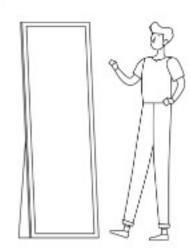
# [Anyl] Task analysis (3 Punkte) Sie haben die folgende Antwort gegeben:

<b>✓</b> Use	d to analyze work processes and interactions 🕢		
✓ Ana	lysis of all actions performed by the user to acco	mplish a task 🕢	
☐ Ana	lysis of the mental processes of the user while pe	erforming a task 🕢	
✓ Task	ks are split into smaller sub-tasks 🕢		
	granularity and level of detail should be suitable	for the analyzed task 🕢	
☐ The	more granularity and level of detail can be achie	ved, the better 🕢	

## Die bestmögliche Lösung lautet:

☑ Used to analyze work processes and interactions
 ☑ Analysis of all actions performed by the user to accomplish a task
 ☐ Analysis of the mental processes of the user while performing a task
 ☑ Tasks are split into smaller sub-tasks
 ☑ The granularity and level of detail should be suitable for the analyzed task
 ☐ The more granularity and level of detail can be achieved, the better

#### [Princ] 8 Golden Rules: Mirror, Mirror on the wall (8 Punkte) Sie haben die folgende Antwort gegeben:



To explore the impact of ubiquitous artifacts on a person's fitness tracking routine, a smart mirror visualizes a wide range of tracking parameters for physiological data gathered by an EmpaticaE4 wristband. A recognized challenge in HCl is how to present such data to the user optimally.

To design the main page, you as a designer need to follow the Eight Golden Rules of Interface Design.

Assign the text and visual features that best describe the given Golden Rule of Interface Design.

