



UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA



Agenda

- Context
- The role of our department
- Innovative use of objective assessment
- Examples
- Feedback
- Conclusion



Context

- Objective assessment : There is one correct answer (or set of answers) to a given question
- Technology – ideal tool for this type of assessment
- Different types of technology available for objective assessment:
 - Optical mark reader
 - Computers (CBT)
 - Customised devices (e.g. “clickers”)
 - Mobile devices/technologies



Context

- Objective assessment at the University of Pretoria:
 - Various media are used (pen & paper, optical mark reader, computers)
 - Exam regulations must be adhered to
 - Restricted use of objective assessment for final mark:
 - 50% on a 1st year level
 - 35% on 2nd year level
 - 25% on 3rd year level and higher
 - Used in combination with different types of assessment



Context

- Computer-based objective assessment at the University of Pretoria:
 - 5 testing centres (\pm 900 workstations)
 - Software used:
 - CompAssess
 - clickUP quiz tool (Blackboard)
 - Umfundi
 - 2007: 207 351 tests taken

The strategic focus of our department



- Department for Education Innovation: support service within UP
- Strategic foci
 - education innovation
 - e-education
- Mission
 - leading, facilitating and participating actively in actions aimed at education innovation, focused on the establishment of blended learning environments

The operational role of our department



- Provide training (assessment workshop / JIT)
- Assist lecturers in setting up their tests (Online quizzes & Umfundi)
- Undertake quality assurance to revise questions (based on statistics)
- Work in close co-operation with Information Technology Dept
 - Provide infrastructure
 - Provide technical support
 - Responsible for stability and security

Innovative use of objective assessment



- Innovative use of objective assessment by means of technology
- Not only testing knowledge and recall - test students' ability to **analyse, synthesise** and **evaluate** (Bloom's taxonomy)
- Enhance deep learning
- Unique features of technology make it possible



Innovative use of objective assessment

- Unique features of technology:
 - Include multimedia elements (graphics, video, animation, sound, flash)
 - Questions can be shuffled
 - Options can be shuffled
 - Unique test per student or group can be generated
 - Sequence of questions can be set according to student response
 - Immediate feedback is available to students
 - Lecturers receive scores, student comments & statistical analysis immediately after a test

Examples

- Anatomy
- Physiotherapy
- Radiology
- Production Animal Studies
- Language
- Computer Science

Question Preview

Op die video sien u hoe 'n fisioterapeut 'n sewejarige seun, gediagnoseer met serebraal motoriese disfunksie, behandel. Op grond van u waarneming, watter een van die volgende diagnoses van serebraal motoriese disfunksie is van toepassing op hierdie seun?

On the video, the physiotherapist is treating a seven-year-old boy diagnosed with cerebral motor dysfunction. Based on your observations, which one of the following diagnoses of cerebral motor dysfunction are appropriate for this boy? (1)



- Spastiese triplegie / Spastic triplegia
- Spastiese hemiplegie / Spastic hemiplegia
- Spastiese monoplegie / Spastic monoplegia
- Spastiese diplegie / Spastic diplegia

Question Preview

Click on the sound icon to hear the pronunciation of a certain phrase.
What is the speaker saying?

Kliek op die klanksimbool om die uitspraak van 'n sekere frase te hoor.
Wat sê die spreker?



- Put away the cellphone!
Bêre die selfoon!
- Bring the cellphone!
Bring die selfoon!
- Switch off the cellphone!
Skakel die selfoon af!
- Look for the cellphone!
Soek die selfoon!

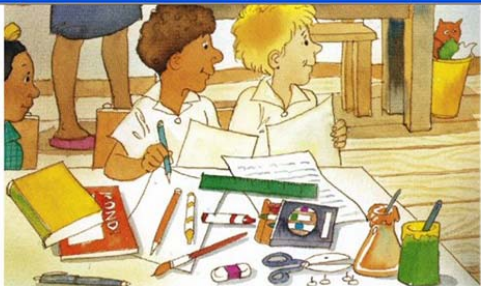
Submit Answer

Close Exam Preview



Which of the following objects DO appear on the learners' table?
Watter van die volgende voorwerpe verskyn WEL op die leerdere se tafel?

- iglu*
- ibhokisi lelantshi*
- irula*
- isiloli-pensele*
- amashoki*
- isibali*
- amaphinimakhanda*



Which of the following objects DO appear on the learners' table?
Watter van die volgende voorwerpe verskyn WEL op die leerders se tafel?

- iglu*
- ibhokisi lelantshi*
- irula*
- isiloli-pensele*
- amashoki*
- isibali*
- amaphinimakhanda*

Module Code: JKL251 Student Number: Exam Preview Question ID: 18305

Current Question: 3

Total Answered: 0

Total Questions: 50

Time remaining: 00:58:41

Scrutinize the following pictures and then instruct the children NOT to do what they are doing in these pictures by choosing the correct commands from the list below. Write the number of the correct negative command underneath each picture.

Bestudeer die onderstaande prentjies en beveel dan die kinders om NIE te doen wat hulle in hierdie prentjies doen nie deur die korrekte bevel uit die lys hieronder te kies. Skryf die nommer van die korrekte negatiewe bevel onderaan elke prentjie.



1. Ungakhalii
2. Ningadlali
3. Ungalindi
4. Ningahleki!
5. Ungagijimi!
6. Ningaphendulii

Module Code: DIM781

Student Number: Exam Preview

Question ID: 21074

Current Question: 13

Total Answered: 7

Total Questions: 18



Click on the area of pathology. [1]





Question summary

Question: Click on the code segment that represents an example of a simple type.

Klik op die kode segment wat 'n voorbeeld van 'n eenvoudige tipe voorstel.

using System;

```
public struct Mountain {  
    private string name;  
    private int height;  
    private string range;  
    private int rank;  
}
```

```
public Mountain(string name, int height, string range, int rank) {  
    this.name = name;  
    this.height = height;  
    this.range = range;  
    this.rank = rank;  
}
```

```
public string Name {  
    get { return name;}  
}
```

```
public int Rank {  
    get { return rank;}  
}
```

```
public int RankDifference(Mountain other) {  
    return this.Rank - other.Rank;  
}
```

```
public override string ToString() {  
    return "[" + rank + "]" + name + ": " + range + " (" + height + "m)";  
}
```

```
}
```

```
public class MountainsInfo {
```

```
    public void Go() {  
        Mountain[] mountainArray = new Mountain[4];  
        mountainArray[0] = new Mountain("Saser Kangri I", 7672, "Saser Karakoram", 35);  
        mountainArray[1] = new Mountain("Druk Maphok", 7504, "Himalayas Karakoram", 34);  
    }  
}
```

Question Preview

The video shows a procedure which is performed on a blood vessel of a patient.

Click on: (1) one of the procedures performed (2) one of the vessels involved and (3) one of the entrance arteries used (3x1=3)

Procedure / Procedure:

Ballonangioplastie / Balloon angioplasty

Sentrale veneuse kateter / Central venous catheter

Aortogram / Aortogram

Bloedvat betrokke / Blood vessel involved:

Ramus circumflexus van a. coronaria sinistra / Circumflex branch of the left coronary artery

Anterior interventrikulêre tak van a. coronaria sinistra / Anterior interventricular branch of the left coronary artery

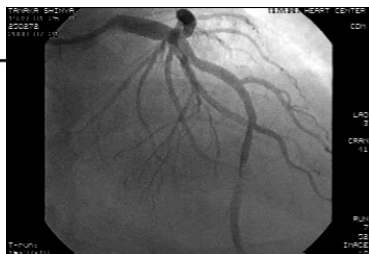
Vena cava superior / Superior vena cava

Toegangsarterie gebruik / Entrance artery used:

A. Iliaca communis / Common iliac artery

A. Femoralis / Femoral artery

V. Subclavia / Subclavian vein



Question summary

Question: The video shows a procedure which is performed on a blood vessel of a patient.

Click on: (1) one of the procedures performed (2) one of the vessels involved and (3) one of the entrance arteries used (3x1=3)

Prosedure / Procedure:

1 Ballonangioplastie / Balloon angioplasty

Sentrale veneuse kateter / Central venous catheter

Aortogram / Aortogram

Bloedvat betrokke / Blood vessel involved:

Ramus circumflexus van a. coronaria sinistra / Circumflex branch of the left coronary artery

2 Anterior interventrikulêre tak van a. coronaria sinistra / Anterior interventricular branch of the left coronary artery

Vena cava superior / Superior vena cava

Toegangsarterie gebruik / Entrance artery used:

A. iliaca communis / Common iliac artery

3 A. Femoralis / Femoral artery

V. Subclavia / Subclavian vein

Question Preview

Read the description of the findings at postpartum examination of a dairy cow which follows.

3rd lactation, 38 days postpartum, healthy with normal production level.

No vulvar discharge.

On rectal examination, cervix 4cm, left horn 4cm, right horn 5cm, tone moderate, horns feel slightly thick-walled, left ovary 20mm corpus luteum, right ovary 15mm follicle.

Vaginal exam reveals normal vagina and cervix, and a small amount (± 10 ml) of a viscous opaque pale yellowish discharge.

Herd background: Year-round calving herd, bred exclusively by AI, following a voluntary waiting period of 50 days.

Choose the **CORRECT** diagnosis from the options below. (2 marks)

- Mild metritis
- Pyometra
- Severe endometritis
- Mild endometritis
- Subclinical endometritis

Submit Answer

Close Exam Preview

Question Preview

The correct diagnosis is **mild endometritis**.

3rd lactation, 38 days postpartum, healthy with normal production level.

3rd lactation, 38 days postpartum, healthy with normal production level.

No vulvar discharge. On rectal examination, cervix 4cm, left horn 4cm, right horn 5cm, tone moderate, horns feel slightly thick-walled, left ovary 20mm corpus luteum, right ovary 15mm follicle.

Vaginal exam reveals normal vagina and cervix, and a small amount (± 10 ml) of a viscous opaque pale yellowish discharge.

Herd background: Year-round calving herd, bred exclusively by AI, following a voluntary waiting period of 50 days.

What would the preferred treatment for this cow be? (1 mark)

- Prostaglandin
- GnRH
- Intrauterine therapy with oxytetracycline
- Intrauterine therapy with Urea Glycerosaline
- Systemic treatment with penicillin

Submit Answer

Close Exam Preview

Question Preview

The correct diagnosis is **mild endometritis**.

The best therapy is **Prostaglandin**.

3rd lactation, 38 days postpartum, healthy with normal production level.

3rd lactation, 38 days postpartum, healthy with normal production level.

No vulvar discharge.

On rectal examination, cervix 4cm, left horn 4cm, right horn 5cm, tone moderate, horns feel slightly thick-walled, left ovary 20mm corpus luteum, right ovary 15mm follicle.

Vaginal exam reveals normal vagina and cervix, and a small amount (± 10 ml) of a viscous opaque pale yellowish discharge.

Herd background: Year-round calving herd, bred exclusively by AI, following a voluntary waiting period of 50 days.

If this drug were given, when would you expect this cow to show signs of heat? (1 mark)

- No heat for next 30 or more days
- Heat in 18-24 days
- Heat in 7-14 days
- Heat in 3-5 days
- Heat within 2 days

Submit Answer

Close Exam Preview

Question Preview

The correct diagnosis is **mild endometritis**.

The best therapy is **Prostaglandin**.

The cow will probably show heat **within 3-5 days**.

3rd lactation, 38 days postpartum, healthy with normal production level.

No vulvar discharge.

On rectal examination, cervix 4cm, left horn 4cm, right horn 5cm, tone moderate, horns feel slightly thick-walled, left ovary 20mm corpus luteum, right ovary 15mm follicle.

Vaginal exam reveals normal vagina and cervix, and a small amount (± 10 ml) of a viscous opaque pale yellowish discharge.

Herd background: Year-round calving herd, bred exclusively by AI, following a voluntary waiting period of 50 days.

What is the correct course of action when this cow is seen to be on heat?

(1 mark)

- Do not inseminate
- Inseminate with cheap semen at the appropriate time
- Inseminate with cheap semen at the appropriate time only if bull string is clear
- Treat with intrauterine penicillin
- Systemic treatment with penicillin

Submit Answer

Close Exam Preview

Question Preview

The correct diagnosis is **mild endometritis**.

The best therapy is **Prostaglandin**.

The cow will probably show heat **within 3-5 days**.

The cow should **not be inseminated**.

At your next herd visit 4 weeks later, you wish to confirm that the cow has fully recovered from the endometritis for the purposes of use as an embryo donor.

Besides rectal palpation and vaginal examination, which of the following procedures is best to rule out this possibility? (2 marks)

- Ultrasound examination
- Culture of a sample collected by uterine flush
- Cytological examination of a sample collected by uterine flush
- Uterine biopsy
- Treat on the assumption that subclinical endometritis may be present

Submit Answer

Close Exam Preview

Feedback from lecturers (8 respondents)



- **Why do you use CBT?**

- “To test large groups”
- “To save marking time”
- “An effective method to test basic knowledge”
- “It is an alternative form of assessment”
- “To motivate students to study continuously”
- “To assist lecturers to identify students with problems early in the module”
- “As an indication to students on how they succeed to keep up with work”

Feedback from lecturers



- **Do you see CBT as a tool to assess on higher cognitive levels?**
 - Lecturers are ambivalent
- Yes:
 - “By using scenarios, visually material and sound identification”
 - “Not difficult to do, depends on ingenuity of lecturer in development of questions”
 - “It is difficult for basic knowledge, but easier when students have to apply their knowledge”

Feedback from lecturers



- **Do you think CBT is used successfully to enhance deep learning in your module?**
 - Lecturers strive for this, but struggle
 - “Students study less for small class tests and rely on word recognition when taking a CBT”

Feedback from lecturers



- **What do your students think of CBT?**

- “They like it because they think it is easier but most underestimate the challenge and are not prepared and only memorise”
- “They appreciate the immediate feedback”
- “Valuable tool to give indication how they succeed to keep up with workload”
- “Sometimes easier, they sometimes misinterpret the questions, frustration with system errors”
- “Apart from complaints about the load times and slow system, overall the response is positive”
- “Generally positive, but understandably irritated when the system is unable to handle the volume of traffic”

Feedback from lecturers



- **Which question types do you perceive to be the most appropriate to test on higher cognitive levels?**
 - Lecturers indicate all question types
 - “It depends on the way the question has been set”

Feedback from lecturers



- **Is CBT adequate to determine the students' level of knowledge?**
 - “I use it as one form of assessment which supports / supplements others e.g. essay writing and portfolios”
 - “Depends on the expertise of the lecturer and the subject content”

Feedback from lecturers



- **Do you think that the immediate feedback in CBT helps the student to understand the work better?**
 - Yes, but not all students make use of that option
 - Yes, provided the system does not hang
 - Yes, I think it is a very effective way for students to learn from their mistakes

Feedback from lecturers



- **Do you use the statistical analysis report?**
 - Only 50% of the respondents use this report
 - “I have tried to establish items and replace poor ones”
 - “To determine which questions should be adapted to improve them, or even discard it because it is of no value”
 - “To determine which sections of the work the students find difficult to study or understand”
 - “To determine the understanding of the class towards knowledge areas”

Summary of lecturers' feedback



- Lecturers use computer-based objective assessment for **formative assessment** and as an **early warning system**
- Some lecturers see CBT as a tool to assess students on **higher cognitive levels**
- Learning enhancement potential is still **under-utilised**
- Objective assessment **alone** is not adequate to determine the students' level of knowledge

Feedback from students

Preparing for CBT is same as for written tests

	Medical & Dentistry students (N = 282)	Veterinary Nursing students (N = 45)
Agree	10%	53%
Neutral	7%	7%
Disagree	83%	40%
Motivation	<ul style="list-style-type: none">• Study to recognise• Written tests require insight	<ul style="list-style-type: none">• Computer literacy is required• Study differently due to different media used

Feedback from students

This type of assessment enhanced my learning experience		
	Medical & Dentistry students (N = 282)	Veterinary Nursing students (N = 45)
Agree	52%	73%
Neutral	33%	23%
Disagree	15%	4%
Motivation	<ul style="list-style-type: none">• Forced regular learning• Use of multimedia was useful	<ul style="list-style-type: none">• Enhanced computer skills• Practical knowledge was tested• Use of multimedia was useful• Found it stressful

Feedback from students

To receive immediate feedback for the short questions helped me to understand the work better		
	Medical & Dentistry students (N = 282)	Veterinary Nursing students (N = 45)
Agree	89%	67%
Neutral	6%	24%
Disagree	5%	9%

Feedback from students

What type of assessment do you prefer?		
	Medical & Dentistry students (N = 282)	Veterinary Nursing students (N = 45)
CBT (MCQ's)	134	15
CBT (Free format questions)	n/a	5
Written tests	91	18
Oral tests	1	1
Assignments	3	13
OSCE	28	8
Practical tests	Dissection = practical	19

Summary of students' feedback



- Students from different subject areas disagree on the way to prepare for CBT
- Students agree that their learning experience is enhanced by this way of assessment
- Students value the immediate feedback

Conclusion



- Technology based objective assessment can be used to assess on different cognitive levels, but is not yet used to its full potential
- Lecturers need to rethink their assessment model if they wish to include innovative objective assessment
- More training with regard to setting questions on higher cognitive levels is required



Thank you!