Effective ways to enhance collaboration in the classroom

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> HEAd'15

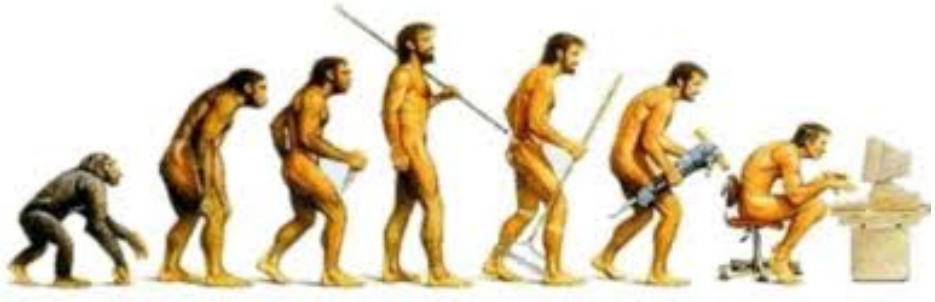
Outline

1. Motivation
2. Integrating ICTs
3. Pen-based technologies. HP project
4. Other collaborative tools
5. Conclusions

1. Motivation

ICTs are evolving very rapidly

1. Motivation



Some TECHNOLOGIES are referred to as *disruptive* and *ubiquitous*

1. Motivation

An old classroom

Are our current classrooms really different?

1. Motivation

Classrooms of the Faculty of Informatics (UPV)

1. Motivation

But, what about paradigms?

Robinson, Ken. (2010). Changing Education Paradigms. RSA Animate.
http://www.ted.com/talks/ken_robinson_changing_education_paradigms

1. Motivation

Johnson, L., Adams Becker, S., Estrada, V., Freeman, A. (2014). NMC Horizon Report: 2014 Higher Education Edition. Austin, Texas: The New Media Consortium

"The paradigm that has worked for over a century is gradually becoming obsolete, and universities must renovate - or in some cases rebuild their foundations - if they want to stay relevant."

*"Education paradigms are shifting to include more online learning, blended and hybrid learning, and **collaborative** models."*

1. Motivation

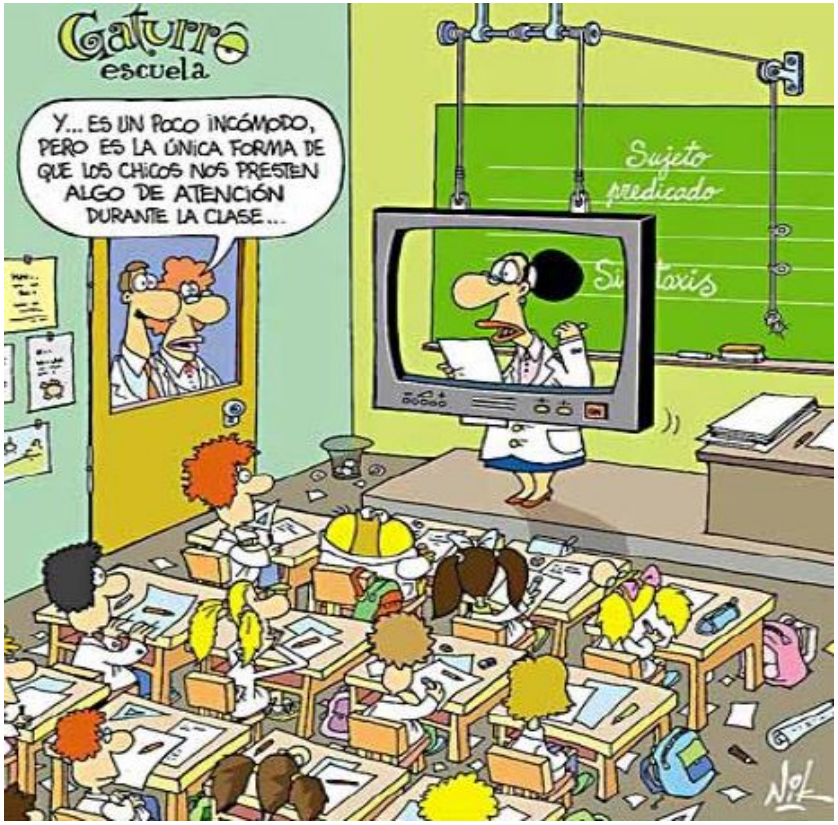
Fundación Telefónica (2011). "Universidad 2020: Papel de las TIC en el nuevo entorno socio-económico". Ariel: pp.47

"A trend toward a participatory and collaborative model has been noted, in which learning takes place as the student performs activities and acquires knowledge through interaction with the environment."

"It is anticipated, for example, that in the year 2015, 80% of university professors will be using new, ICT-supported didactic models in their classes."

1. Motivation

new, ICT-supported didactic models…



Simply integrating technology does not guarantee improved learning achievement.

2. Integrating ICTs

https://www.jasondavies.com/wordcloud/#

2. Integrating ICTs

Before you start / CONTEXT…

- School
- Subject (s)
- Staff (teaching training)
- Students (learning styles)
- Resources (Hw & Sw)
- …

2. Integrating ICTs

Free Educational Technology for Teachers

1. Free Tools To Create Infographics For Teachers
2. Free Text To Speech Tools For Teachers
3. Free Digital Storytelling Tools For Teachers
4. Free Podcast Tools For Teachers
5. Free Survey, Polls, and Quizzes Tools For Teachers
6. Free Screen Capturing Tools For Teachers
7. Free Social Bookmarking Tools For Teachers
8. Online Bibliography and Citation Tools For Teachers
9. …

http://www.openeducationeuropa.eu/en/blogs/free-technology-teachers-321-free-tools-teachers

2. Integrating ICTs

- *Using Clickers (Classroom / Student / Personal / Audience Response Systems)*
- *Software tools*
  - *Socrative*
    http://www.socrative.com/
  - *Kahoot!* *https://kahoot.it/#/*
  - *SpeakUp* *http://graasp.epfl.ch/*

Is that enough?

2. Integrating ICTs

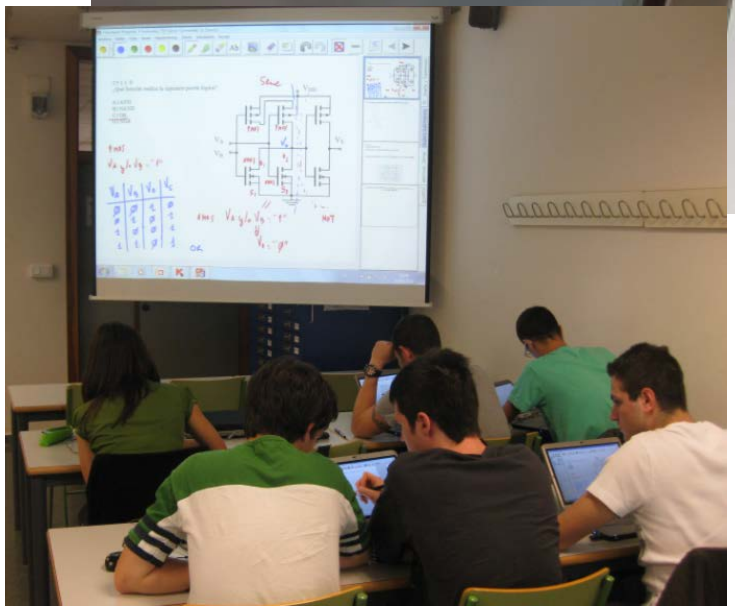
Preparing a project (*instructional design*)

1. Student learning issues (why the project is important)
2. Goals, objectives and outcomes
3. Technology integration (how technology will contribute to resolving the learning issues)
4. Assessment (specific plans for measuring the success of the project in terms of student learning outcomes)

3. *Pen-based* Technology

Digital ink

- Pen and paper
  - Digital format
- Pen is used to introduce information
- Digitizer + OS



3. *Pen-based* Technology

Tablet PC

Graphics tablet

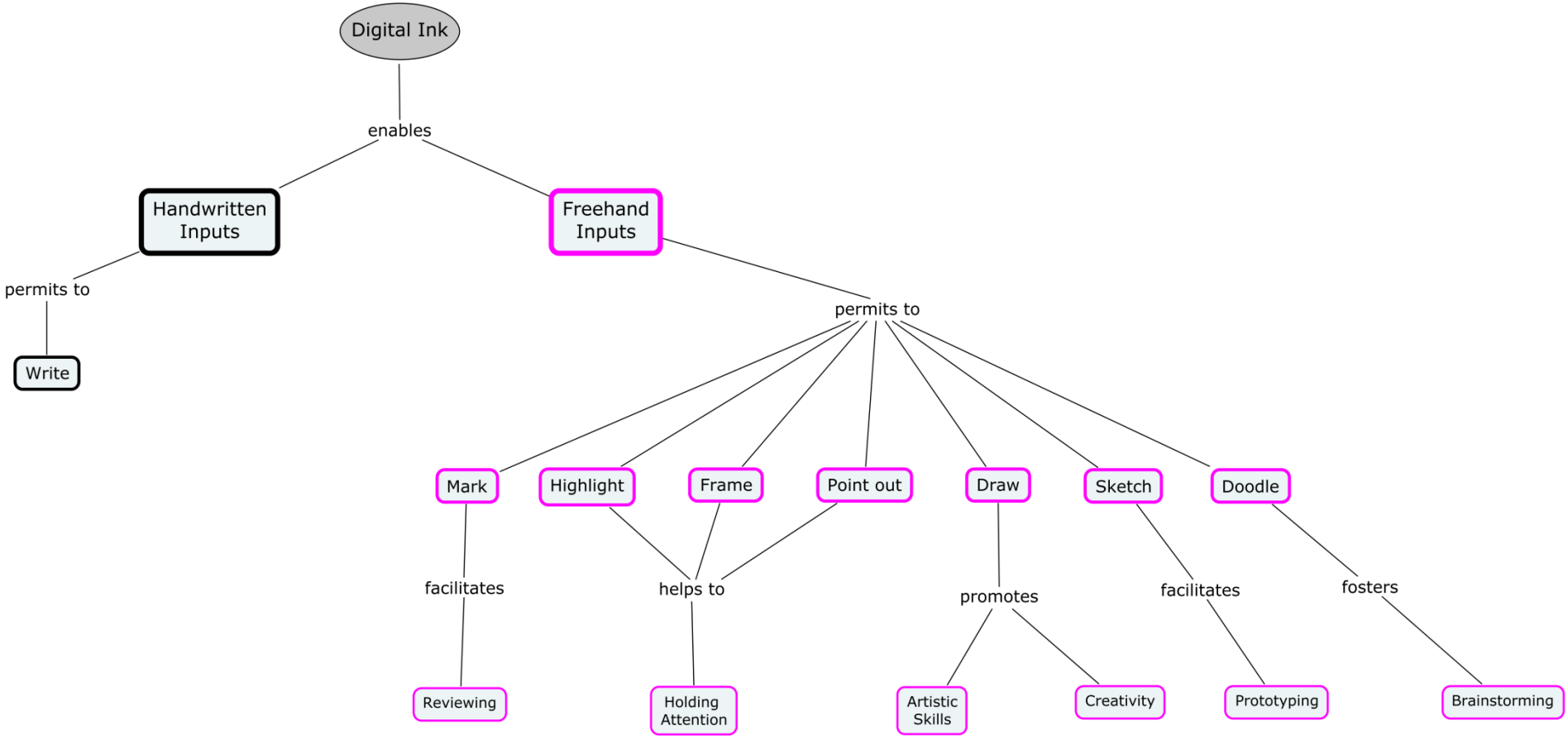
Interactive whiteboard

Phablet

Tablet

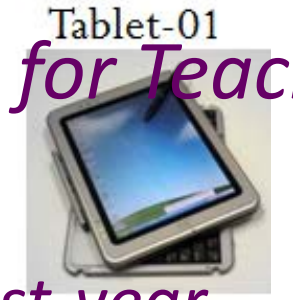
Convertible Tablet

3. *Pen-based* Technology



3. HP project

- *2008 Hewlett-Packard Technology for Teaching Grant Initiative*
  - *"Improving effective learning in a first-year Computer Engineering course by using mobile Tablet PC technology"*
  - 20+1 Tablet PCs HP Compaq 2710p



3. HP project

1. In some first-year Computer Eng. courses it has been noticed (learning issues):
   - pupils' lack of motivation
   - low class attendance rates
   - high course drop-out rates
   - low participation and student interaction
   - eventually, poor students' academic performance

3. HP project

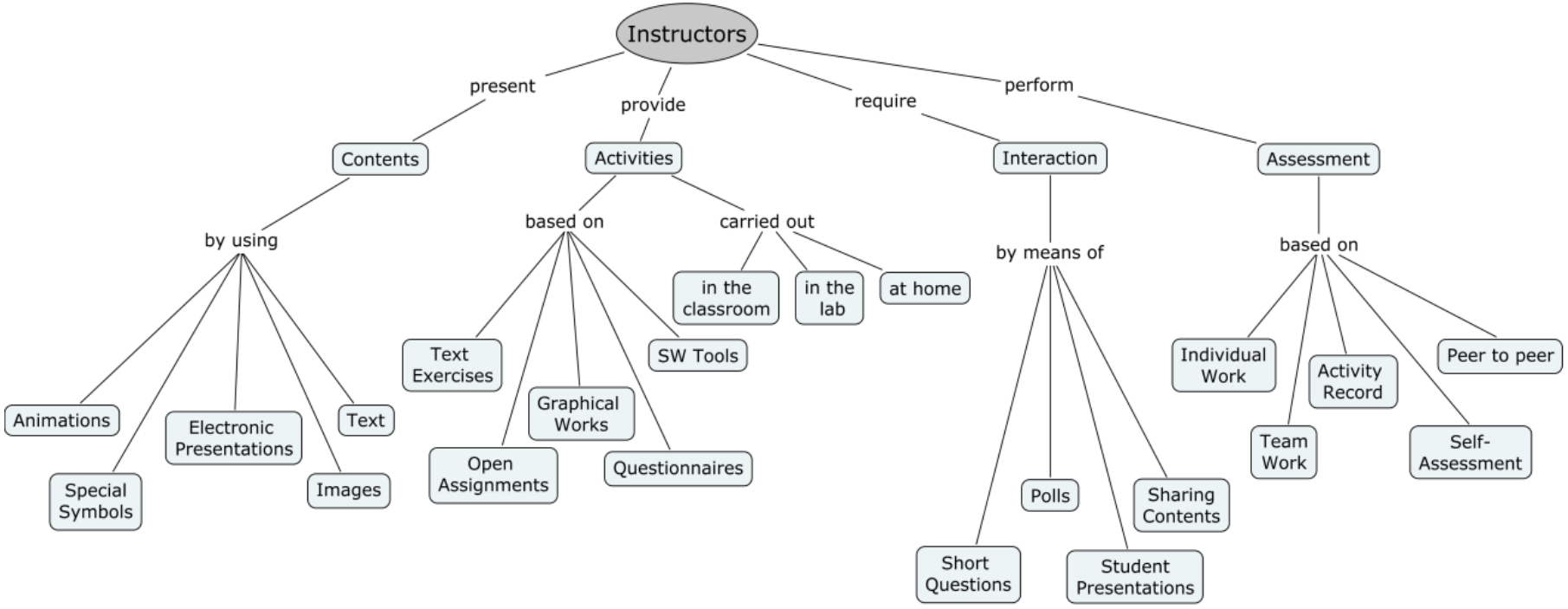
2) To develop a Tablet PC-based learning environment aiming at:

- Increasing class attendance and reducing drop-out rates
- Fostering student participation and enhancing peer collaboration
- Including formative assessment strategies that give students timely feedback
- Improving learning achievements and academic performance

Less Lectures and More Activity

3. HP project

3) Tablet PC integration



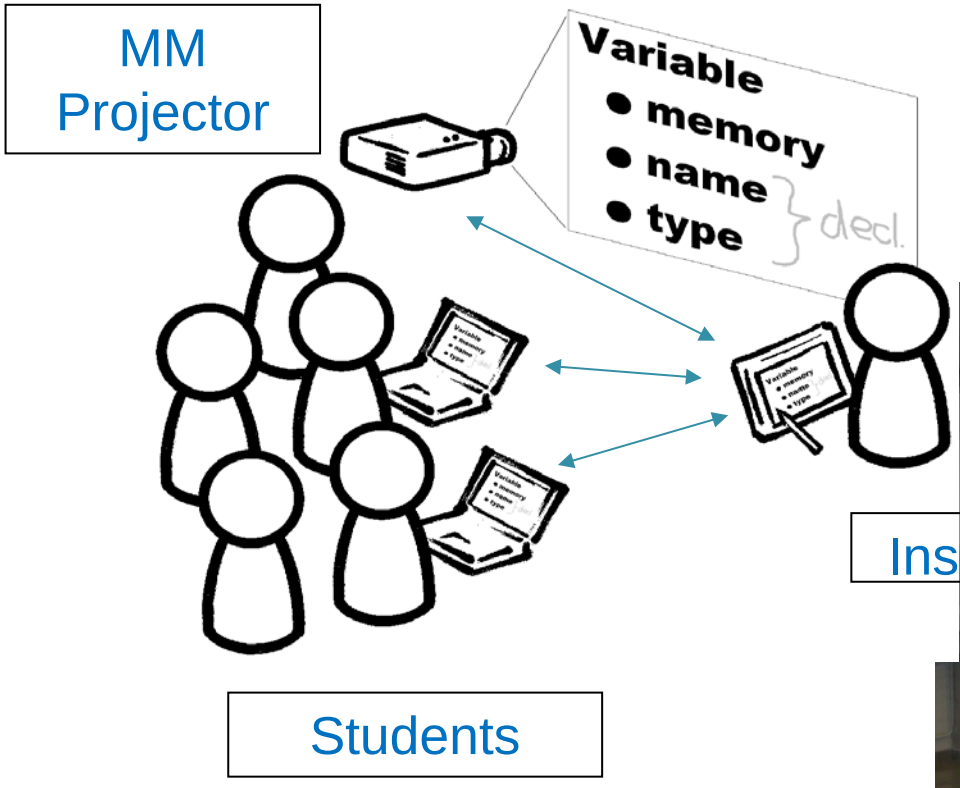
3. HP project

Classroom Presenter: a Tablet PC-based classroom interaction system allowing instructors:

- to share slides with students
- to annotate slides using digital ink
- to receive contributions from students
- to use quick polling (multiple choice, T/F)

Combined with the use of our Sakai-based LMS: resources, assignments, quizzes…

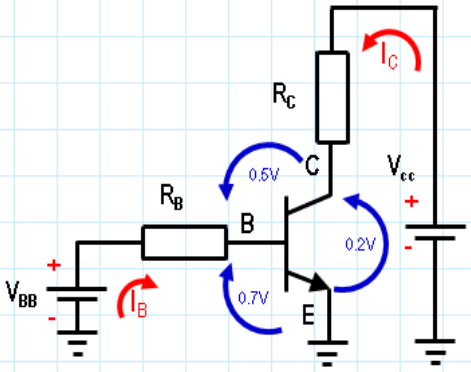
3. HP project


MM Projector
Variable
memory
name
type
decl.
Students


Instructor

3. HP project

1.7 BJT. Regions of operation. Saturation



The switch is fully ON

- Saturation occurs because the output circuit (V_{CC} and R_C) limits I_C to a maximum value.

While ACTIVE: $I_C = \beta I_B$

If $I_B \uparrow \exists I_{B_{min_{SAT}}} / I_B > I_{B_{min_{SAT}}} \rightarrow I_C < \beta I_B$ AND $V_{CE} \simeq 0{,}2V$

I_C has got a maximum $\longrightarrow$ SATURATION

3. HP project

Classroom Presenter 3 (Version 3.1.1826): Instructor; Disconnected

Archivo Editar Vista Insert Herramientas Decks Estudiante Ayuda

8.4 El circuito de la figura utiliza un transistor cuya ganancia de corriente es $\beta = 50$. Sabiendo que $V_{BE(ON)} = 0.6V$, $R_1 = 80K\Omega$, $R_2 = 10K\Omega$, $V_{CESAT} = 0.2V$ y que la tensión de alimentación es $Vcc = 5V$, se pide:

DATOS:

$\beta = 50$

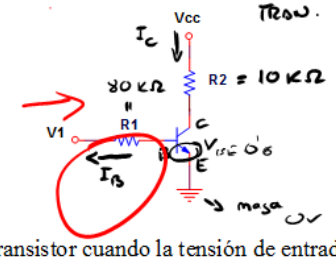
$V_{BE\,ON} = 0'6\,V$

$R_1 = 80K\Omega$

$R_2 = 10K\Omega$

$V_{CESAT} = 0'2V$

$V_{CC} = 5V$



TRAN. N-P-N

¿ BE ?

$V_E = 0V$.

Sup. AD

[A] (0.5p) Calcule el punto de trabajo del transistor cuando la tensión de entrada sea V1 = 1V.

$I_B = \frac{(1 - 0'6)V}{80K\Omega} = \frac{0'4}{80} = 0'005\,mA$ esto no es congruente con (I_B ←) el sentido dibujado

Sup A.D.

$I_C = \beta . I_B \rightarrow I_C = 50 . 0'005 = 0'25\,mA$

$V_{CC} = R_2 * I_C + V_{CE} \rightarrow$

$V_{CE} > 0'2\,v$ ✓

$5 = 10 * 0'25 + V_{CE}$

$5 - 2'5 = V_{CE}$ $V_{CE} = 2'5\,v$ 0,45

Respuesta:	$V_{CEQ} = 2'5$	$I_{CQ} = 0'25$

✓

27mar09

3. HP project

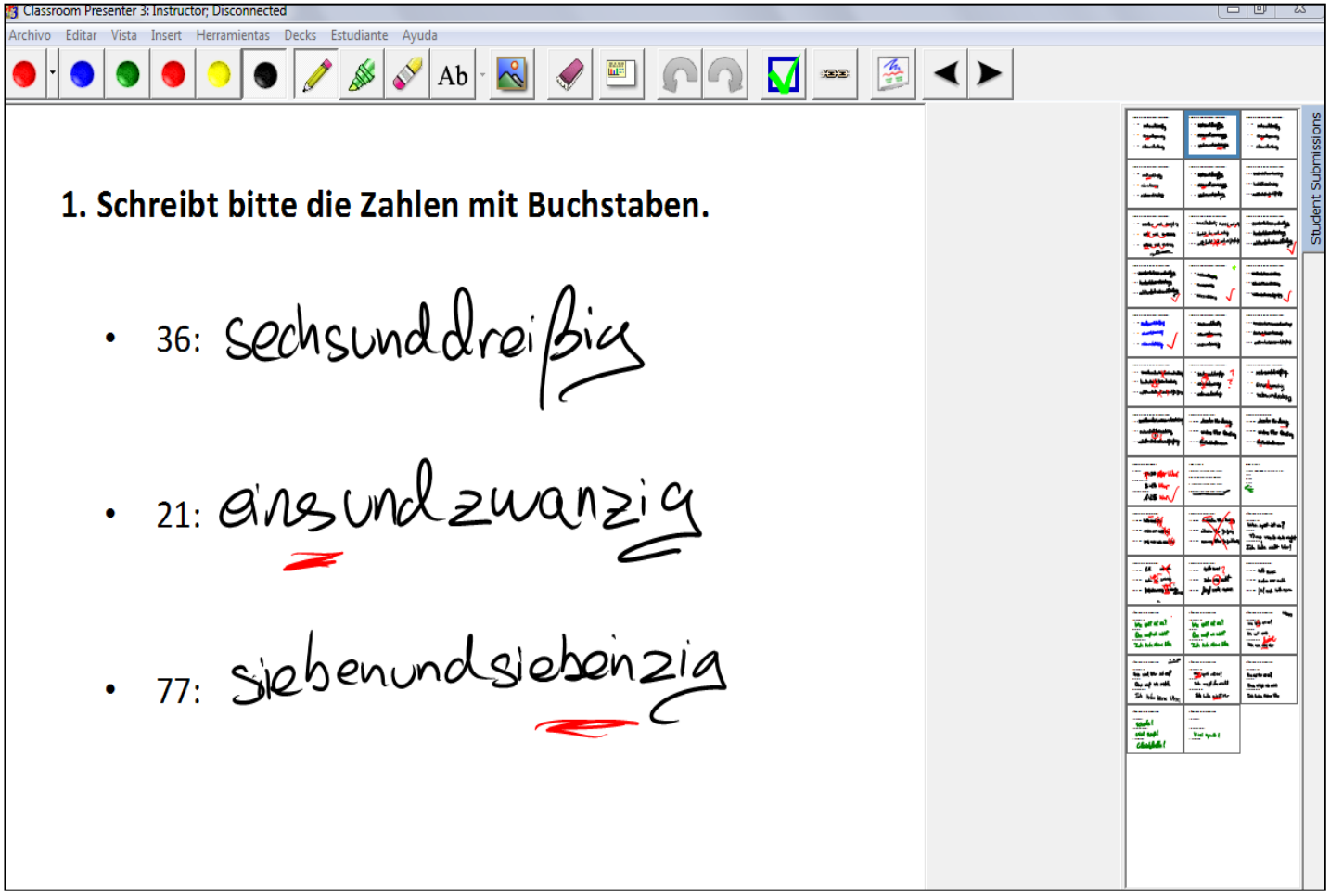
Ejercicio nº. 2

- Completar el siguiente código para mostrar por pantalla los datos que están en el Diccionario

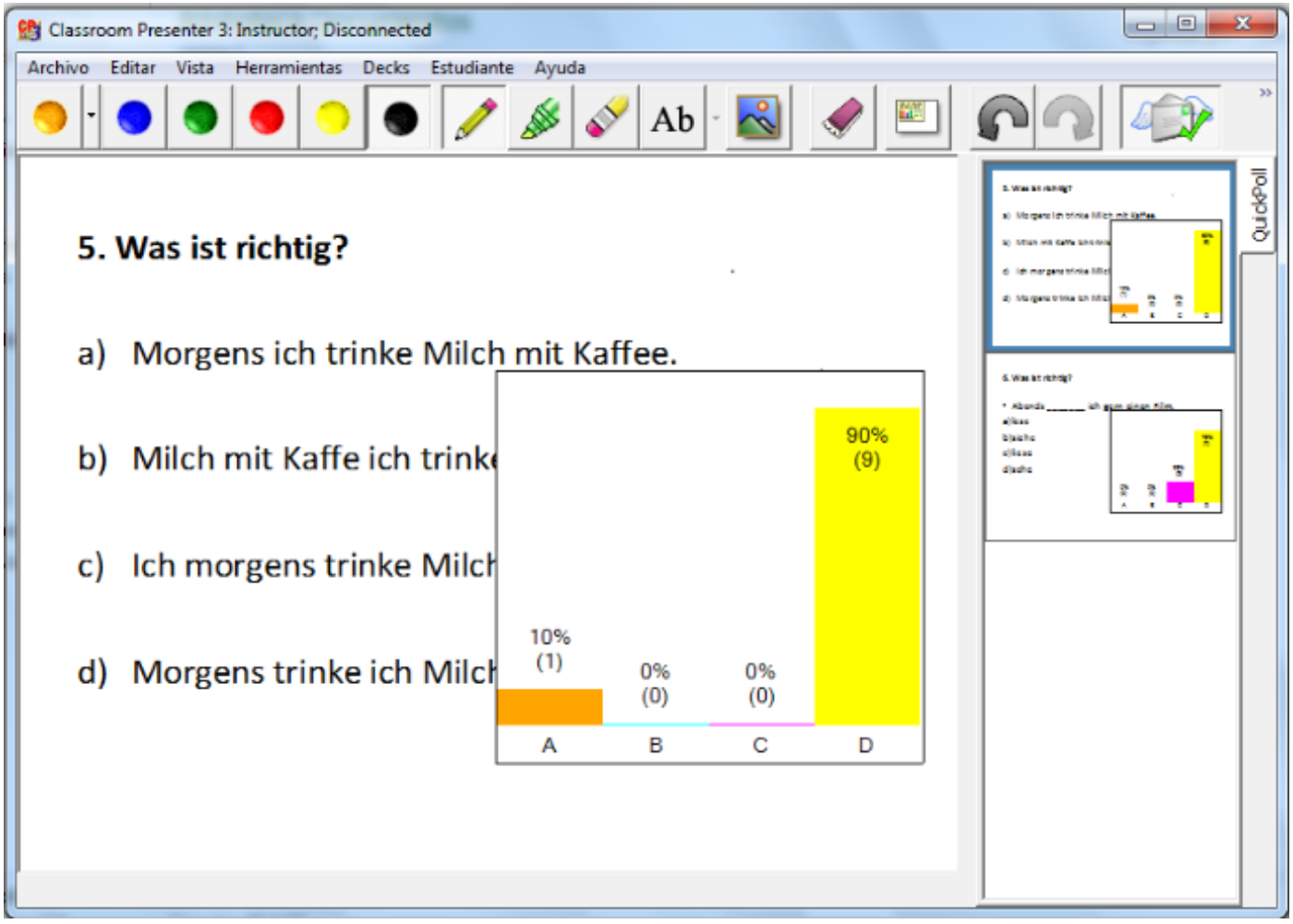
```
import librerias.estructurasDeDatos.modelos.Diccionario;
import librerias.estructurasDeDatos.YYY.XXXDiccionario;
import java.util.*;
public class Ejercicio2 {
    public static void main (String args[]) {
        Diccionario<Integer,Integer> d=new XXXDiccionario<Integer,Integer>();
        Random r = new Random();
        for (int i=0; i<100; i++)
            Integer ant=d.insertar(r.nextInt(50),i);
        for (int i=0; i<50; i++){
            Integer res=0;
            res= d.recuperar(i);
            if (i==res) System.out.println(i+" "+res);
        } catch (Exception e) {System.out.println("Elemento No Encontrado");
    }
}
```

5

3. HP project


Classroom Presenter 3: Instructor; Disconnected
Archivo Editar Vista Insert Herramientas Decks Estudiante Ayuda
Ab
Student Submissions
1. Schreibt bitte die Zahlen mit Buchstaben.
• 36: sechsunddreißig
• 21: einundzwanzig
• 77: siebenundsiebenzig

3. HP project


Classroom Presenter 3: Instructor; Disconnected
Archivo Editar Vista Herramientas Decks Estudiante Ayuda
5. Was ist richtig?
a) Morgens ich trinke Milch mit Kaffee.
b) Milch mit Kaffe ich trinke
c) Ich morgens trinke Milch
d) Morgens trinke ich Milch
10% (1)
0% (0)
0% (0)
90% (9)
A
B
C
D
QuickPoll

3. HP project

4) **Assessment** (qualitative and quantitative)

- Attendance and dropout rates have notably improved.
- The pass and presented rates in the Tablet group nearly double those for the other groups.
- Technology has favored important changes both in the instructional model and the student activity inside the classroom.
- Students have valued the experience as very positive although some identify the Tablet PC as something that "invited" to distraction.

4. Other collaborative tools

- *Google Drive*
- Microsoft *OneNote* (digital notebook)
- *Scribblar*, *Dabbleboard* (web-based interactive whiteboards)
- *Vyew* (meeting room for real-time & anytime visual collaboration)
- *Cmap Tools* (concept maps)
- Word cloud tools

4. Other collaborative tools

- *ClassFlow* https://www.youtube.com/watch?v=DSvdZNlVmVg
  - Instant Interactivity
  - Device Agnostic
  - Real-Time Feedback
  - Limitless Responses
  - Collaborative Learning
  - Differentiate Instruction
- …

5. Conclusions

- Our students love ICTs!
- Effective ICT integration should focus on instructional design. Teacher training is a must.
- Research in the classroom (Boyer, “Scholarship of Teaching and Learning”, 1990).
- Collaboration between High School and University teachers is essential (Schooling vs Ed.)
- Don’t give up…, but

Felder, Richard, "We Never Said It Would Be Easy.“
Chem. Engr. Education, 29(1), 32-33 (Winter 1995)


Gracias

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