Faculty of Education

Guiding tomorrow

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$P(|t+r|) = Fv$

Fezekisa amaphupha akho

The CRAR³FS² framework for developing teachers' ICT skills for e-Education
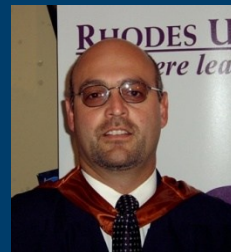
**By André du Plessis
NMMU (SMATE)**

**Walter Sisulu University (WSU)
E-LEARNING EVENT**

"Integrating information and communication technology into learning and teaching"

**East London, South Africa,
3-4 November 2009**

BACKGROUND

- WHO AM I?
  - ❖ I sometimes don't know either!!!
- Lecturer at Nelson Mandela Metropolitan University (NMMU)
- Areas of knowledge and expertise …
  - ❖ Intermediate Phase & Senior Phase Maths Method
  - ❖ Research design & supervision
  - ❖ ICT and school implementation & integration
  - ❖ ICT and Teacher Development
  - ❖ ICT teaching and learning strategies, frameworks & models
  - ❖ Learning as Design
  - ❖ ICT & School Leadership
  - ❖ E-Learning
  - ❖ M-Learning (emerging researcher)
  - ❖ Web Design
- PHD just submitted related to ICT implementation, integration, developing ICT teaching strategies, ICT and the critical outcomes AND ICT & Teacher Development

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INTRODUCTION

- What is E-Learning? Is there a 'one only' answer? Is E-Learning & E-Education synonymous?

- A great deal has been written in the South African *White Paper on e-Education* (DoE, 2003, 2004) in terms of:

  - ❖ the type of learning envisioned,

  - ❖ the kind of Information and Communications Technology (ICT) levels that need to be developed, and

  - ❖ the type of school that is required

    - ➢ BUT … Where is the actual implementation? Policy is one thing … Implementation is the evidence!!!

- HOWEVER: There is a ***paucity of information on how teachers and schools are expected to practically integrate or make use of ICT*** within the South African context (Hodgkinson-Williams, 2005).

- ICT used in many instances to complement traditional teaching & learning practices

- This paper forms part of a larger study related to ICT teacher development of teachers.

  - ❖ Teachers-as-designers of cyberhunts as an e-learning tool AND Learners-as-designers

PROBLEM STATEMENT

- The fact that what happens in the computer room is **not directly linked** to what happens within the classroom.

- Teachers want to be responsible for their own class's computer integration, but they are unsure what to do as they *lack the basic computer and Internet skills*.

- There is a *need to establish the integration* of computers within learning areas and assistance with the implementation of integration.

- There is a need to get *personally involved* with computer integration and to *play an active part* in the establishment and implementation of computer integration at schools.

- In many cases, *one person* is responsible for teaching computer literacy to the whole school.

- The Internet has to be introduced to teachers and learners, but teachers do not have *access* to the Internet, nor do they know *how to introduce* the Internet, or *how to implement* Internet or related strategies in teaching and learning.

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AIMS OF THE STUDY

- To ***develop a strategy to introduce the participating teachers to the Internet*** in an integrative manner.

- To establish from the literature what the ***problems, concerns and barriers*** are that mitigate against the implementation and integration of ICT and to propose how these barriers can be addressed.

- To establish, on a continuous basis, ***how participants experienced the professional training development process used*** to prepare them for cyberhunt implementation in order to address teacher needs during the process with a view ***to make any necessary changes and to assist with future planning and teacher development-training sessions***.

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- How should the teacher development process for ICT integration using cyberhunts as an Internet strategy be managed?

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RELEVANCE OF THE STUDY

- *ALARM BELLS or SIRENS:*
  - ❖ Many teachers feel that *research and teachers' actual practices are too far removed* from one another (Royer, 2002) and …
  - ❖ Researchers and their research *do not take teachers' needs into consideration*

    (Blumenfeld, Fishman, Krajcik, Marx & Soloway, 2000).
  - ❖ Quote from an in-service teacher's remarks about academics:
    - ➢ "There are many of them [academics] out there who have all of the theory and none of the classroom" (Watson, 2001, p. 185)

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CONTEXT OF THE RESEARCH AND DELIMITATION

- Teachers from 6 SMIS disadvantaged schools comprising of 6 disadvantaged schools
  - ❖ Four primary schools and two high schools in the Port Elizabeth Missionvale area) formed the convenience sample used in this study.
  - ❖ Each of these six schools received 20 computers each from the Dell Foundation. From each school approximately six teachers participated.

METHODOLOGY AND METHODS

- Ontological position:
  - ❖ The greater research project was conducted within the ***post-positivist*** paradigm underpinned by a ***critical realist*** position
    - ➤ A reality do exist, BUT we can only apprehend it to a certain extent as our *knowledge of reality is fallible and open to correction*
- Epistemological position:
  - ❖ ***Socio-cultural perspective***, including situated learning within communities of practice recognising the cognitive, social and situated learning dimension of teacher learning
- Methodological position:
  - ❖ ***Interpretive case study approach*** (qualitative and quantitative data gathering method)

- What is a cyberhunt?
  - A cyberhunt is an **online activity**
  - Learners use the Internet as a tool to find **answers to questions based upon a certain theme or topic**
  - **Hyperlinks** are provided on which the user have to click so that the hyperlink to which the hyperlink points, can open and be displayed on the computer screen
    - Resources can be text based, graphical, digital media, etc.
  - **Questions composed** should be on **different cognitive levels**
  - Example of a the online learning tool for learning how to design CYBERHUNTS

- First and second order barriers have to be identified and addressed

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❖ Teachers and/or learners can be the **_designers_** of cyberhunts

❖ Why should learners become designers?

➤ The only ***people who significantly benefit from the design process during the design of educational software through the use of design tools are the designers themselves***, **not the learners** (Jonassen, Myers & McKillop, 1996).

➤ Design emphasis ***process and product***

➤ ***Reflection is a key element*** during the learning as design process

➤ Learning as design is underpinned by ***constructivist principles***

➤ ***Possible to achieve the Critical Outcomes*** of the National Curriculum Statement

➤ ***Knowledge creation*** a possibility

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- Training model,
- Award-bearing model,
- Deficit model,
- Cascade model,
- Standards-based model,
- Coaching/mentoring model,
- *Community of practice model* (This study) & cognitive apprenticeship
- Action research model and the
- Transformative model (some elements) as the focus is the transformation of current practices
- PROBLEM …. & CHALLENGE
  - Dana and Yendol-Hoppey (2008, p. ix) The problem is that teachers see teacher development as ***"torture"*** and ***not as "treasure"***

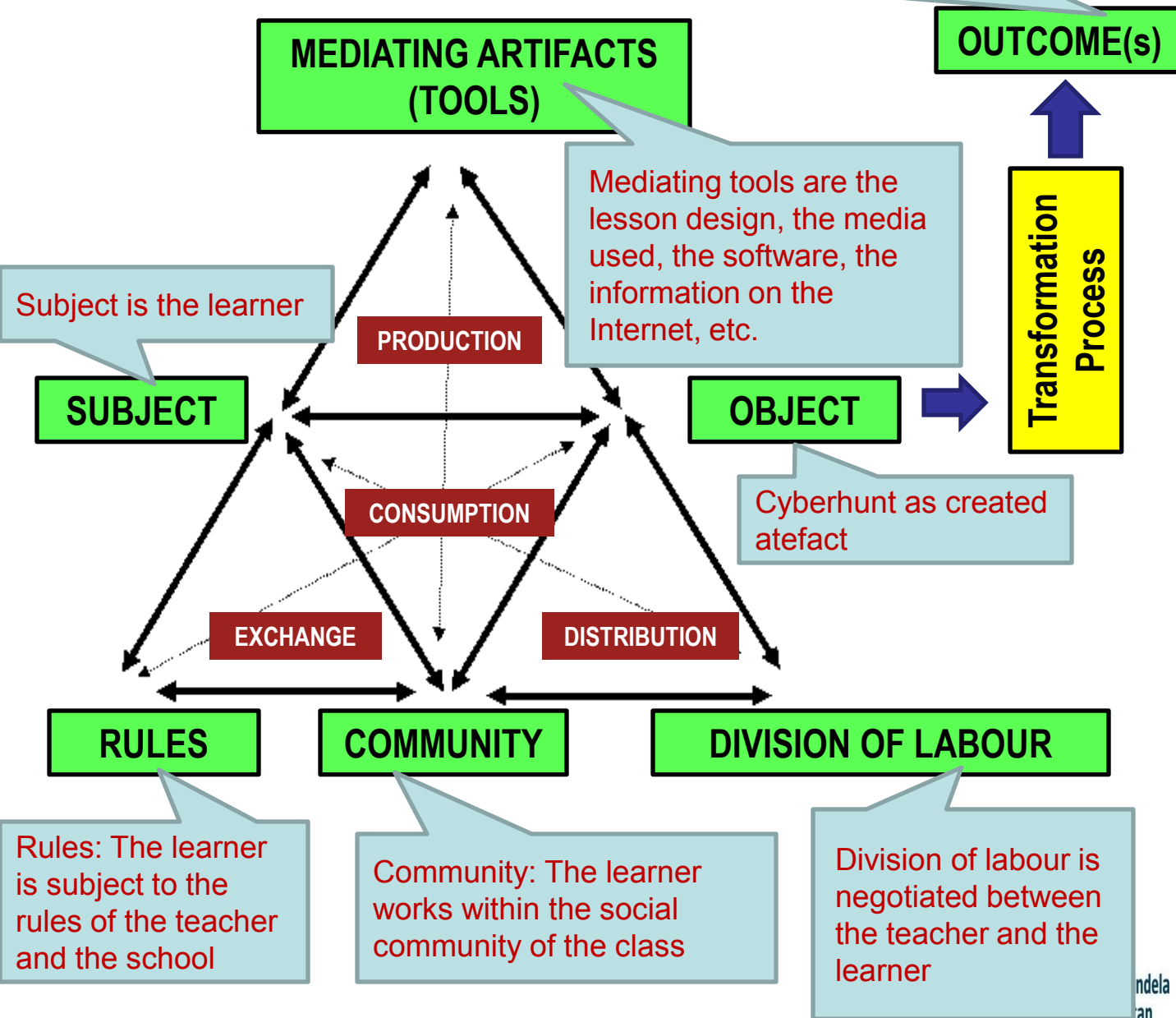Nelson Mandela Metropolitan University
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Enablers for Teacher Development during this research & intervention project

- This study has been informed by a ***community of practice model*** embedded by cognitive apprenticeship

- It is acknowledged that teachers' ***prior beliefs and knowledge related to classroom practice*** influence their interpretation of new pedagogical ideas (and new practices.

- Teachers also ***learn a great deal from their social interaction(s) in discourse communities when they share*** experiences from the classroom contexts in which they experiment with new or alternative practices

- Social interaction as a learning tool through language NB: …

  ❖ ***knowledge creation model*** of Nonaka and Takeuchi (1995) was seen as a useful model for learning

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ACTIVITY THEORY TRIANGLE

Mediated (higher) functioning are interactions between the subject (individual) and object (task) mediated by tools, at the vertex of the triangle

Object the lesson outcomes (or higher order thinking skills, motivation and interest, greater interaction or collaboration, etc.) that the learner needs to achieve.

MEDIATING ARTIFACTS (TOOLS)

OUTCOME(s)

Mediating tools are the lesson design, the media used, the software, the information on the Internet, etc.

Transformation Process

Subject is the learner

PRODUCTION

SUBJECT

OBJECT

CONSUMPTION

Cyberhunt as created atefact

EXCHANGE

DISTRIBUTION

RULES

COMMUNITY

DIVISION OF LABOUR

Rules: The learner is subject to the rules of the teacher and the school

Community: The learner works within the social community of the class

Division of labour is negotiated between the teacher and the learner

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Unmediated (elementary) functioning occurs along the base of the triangle

- Acronym C R A R^3 F S^2 holds the key for teacher development and classroom implementation.
- Figure of C R A R^3 F S^2 follows …

CRAR³FS²

Care Relate Assess Reflect Read Re-Plan Feedback Share Support

ON A CONTINUOUS BASIS DURING THE PHASES & STAGES BY THE PROJECT FACILITATOR & BY THE PARTICIPANTS

RELAXED ATMOSPHERE   CONTAIN ANXIETY ONGOING SUPPORT
CLASS VISITATIONS   PACE   MODEL / COACH / MENTOR

CRAR³FS²

Care   Relate   Assess   Reflect   Read   Re-plan   Feedback   Share   Support

ON A CONTINUOUS BASIS DURING THE PHASES & STAGES BY THE PROJECT FACILITATOR

Care: Show that you care

Relate: Build relationships throughout

Assess: Identify the positive and negative aspects that have occurred during

Reflect: Journal writing provides a window for the learners and the teacher on the learning process (useful for sharing)

Read: Reading the journals empower the teacher to plan with a view to address mentioned issues for the next session

Re-Plan: Plan by taking the needs into consideration

Feedback: Empower learners by providing the learners with feedback on their progress and their needs.

Share: Create opportunities to share experiences with one another during development sessions

Support: Support & classroom visits by the project facilitator(s) and from peers at school Establish internal school based support group
Create staff development sessions
Arrange support sessions where participants from participating schools can share experiences and support one another

PHASE 1

Introduction and Pre-Assessment stage:
Introduction to the project and the Internet as well as computer skills self-assessment

PHASE 3

Assessment stage:
This phase provide another chance for the project leader and participants to assess their basic computer literacy skills

Further data collection stage:
Provide participants with an opportunity to voice their experiences during the project

Tool stage
The rational for choosing email as a tool, is that it presents participants with an opportunity to communicate with one another to share information or anyone else

GATHER DATA CONTINUOUSLY TO ASSIST WITH THE DEVELOPMENT PROCESS AND THE PLANNING OF ON-SITE SUPPORT

Journals
Reflection Sheets
Interviews
Observation
Questionnaires

Decide upon your PHASES & what each entails

PHASE 2

Design copy stage:
Initial first design following instructions of facilitator (facilitator explains & participants copy him)

Tool stage:
Obtaining additional tool skills from other software or applications

Design in group stage:
Participants design cyberhunt in group context

Presentation stage:
Participants test one another's cyberhunts

APPROACHABLE   PATIENCE   LISTEN   PEER-FACILITATORS
PEOPLE SKILLS   FEEDBACK   CLEAR EXPLANATIONS

COMMUNITY   COOPERATE & COMPROMISE   ASSISTANCE
CONSIDER GROUPING: HOW?   CO-PLANNING

HOME LANGUAGE   MOTIVATE   ONGOING TRAINING ONGOING SUPPORT
KEEP DIFFERENT LEVELS OF PARTICIPANTS IN MIND
DEVELOP COMPETENCE   TRAINING HANDS-ON & PRACTICAL   MANUAL

- Graphical presentation to follow …

C R A R³ F S²
Care Relate Assess Reflect Read Re-Plan Feedback Share Support
ON A CONTINUOUS BASIS DURING THE PHASES & STAGES BY THE PROJECT FACILITATOR & BY THE PARTICIPANTS

RELAXED ATMOSPHERE   CONTAIN ANXIETY ONGOING SUPPORT
CLASS VISITATIONS   PACE   MODEL / COACH / MENTOR

Left margin (vertical): APPROACHABLE PEOPLE SKILLS PATIENCE FEEDBACK LISTEN PEER-FACILITATORS CLEAR EXPLANATIONS
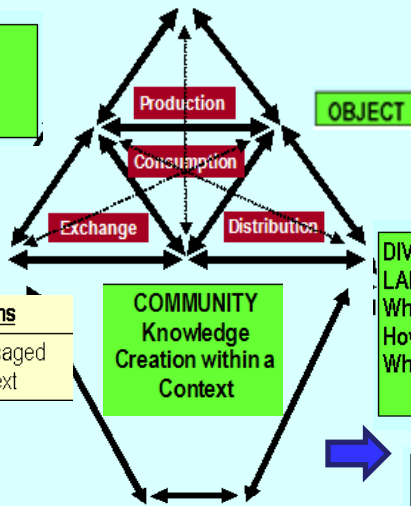
Right margin (vertical): COMMUNITY COOPERATE & COMPROMISE ASSISTANCE CONSIDER GROUPING: HOW? CO-PLANNING

Contradictions

Traditional context	Envisaged context

DECIDE ON TOOLS PHASE
What Tools are needed?
What Tools do we have?
What Tools have to be purchased?
What Tools have to be developed?

What?
How?
Why?
MEDIATING ARTIFACTS (TOOLS)

Contradictions

Traditional context	Envisaged context

PLANNING PHASE FOR INTENDED OUTCOMES
What are the Intended Outcomes?
How to reach Intended Outcomes?
How to assess if Intended Outcomes have been reached?

OBJECT

Transformation Process

OUTCOME(s)
What?
How?
Report?

ASESSMENT & REPORT PHASE OF OUTCOMES OF TRAINING
Have the Intended Outcomes been Achieved?
How was the Intended Outcomes achieved?

ASESSMENT & REPORT PHASE OF IMPLEMENTATION OF OUTCOMES OF TRAINING
Are the Intended Outcomes visible in the School?
Are the Intended Outcomes visible in the classroom?

SUBJECT
School, Teachers and/or Learners

Production
Consumption
Exchange
Distribution

RULES
What?
Why?
How?

Contradictions

Traditional context	Envisaged context

COMMUNITY
Knowledge Creation within a Context

DIVISION OF LABOUR
What?
How?
Why?

Contradictions

Traditional context	Envisaged context

Conditions for Learning
Internal diversity   Redundancy
Decentralized control
Organized randomness
Neighbour interactions

MOTIVATORS
Who?
How?
Why?

MOTIVATOR PHASE FOR COMMUNITY
How can the Participants be motivated?
How can the Community be motivated?

Contradictions

Traditional context	Envisaged context

RELAXED ATMOSPHERE	CLASS VISITATIONS	CO-PLANNING
PACE	MODEL/COACH/MENTOR	TRAINING: ONGOING
CONTAIN ANXIETY	COMMUNITY	ASSISTANCE
ONGOING SUPPORT	COOPERATE & COMPROMISE	CONSIDER GROUPING: HOW?
DEVELOP COMPETENCE	LISTEN	APPROACHABLE
PEER-FACILITATORS	PATIENCE	CLEAR EXPLANATIONS
HANDS-ON & PRACTICAL	MOTIVATE	FEEDBACK
KEEP DIFFERENT LEVELS OF PARTICIPANTS IN MIND	HOME LANGUAGE	PEOPLE SKILLS

CONCLUSION

- Education Department and its officials should take note of the barriers and the *C R A R^3 F S^2 framework* provided within this paper

- WHY?

  ❖ **To assist with the development of teachers, in order to achieve the type of learning and the necessary aspects that are required pertaining to teacher development as envisioned in the South African *White Paper on e-Education*.**

- **'One-shot sessions' are not the answer**, *but* …

  ❖ *ongoing teacher development and ongoing supports* seems to be the key.

END

- SharePoint Designer as E-Learning tool for school principals
  - ❖ Current project: SOS for school principals http://nmmumod.nmmu.ac.za/sites/sosproject/default.aspx
- Thanks for attending
- Any questions or remarks?

- **OUTCOMES AND OBJECT**
  - ❖ Determine what is the object of the teacher development sessions and what are the intended outcomes and assessment strategies
  - ❖ Design instruments; for example reflection sheets, questionnaires (open-ended, closed, or a combination of open-ended and closed questionnaires) and/or checklists to ascertain whether the development sessions planned were achieved
  - ❖ Sessions should not be once-off, but should be ongoing.
  - ❖ Teacher development sessions should include follow up in-context school visits in order to determine what has been learned and implemented within the school context.
  - ❖ Classroom observations will help to determine the needs of the participants, and to inform further support strategies.

- ❖ Teacher development should be tailored according to the specific needs of individuals.
- ❖ Data collection is vital before the teacher development commences
  - ➢ It renders a picture of the participants
- ❖ Classes or training groups should be kept at manageable sizes
- ❖ Enables improved classroom support.
- ▪ COMMUNITY
- ❖ Create collaborative communities of practice
- ❖ Identify and utilise capable peers as co-facilitators and as co-support
- ❖ Training in real life contexts
- ❖ Value input from participants

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- **MOTIVATORS**
  - ❖ ARCS
  - ❖ Cultural responsive

- **DIVISION OF LABOUR**
  - ❖ Who does what?
  - ❖ Who is responsible for what?
  - ❖ What are possible contradictions?

- **RULES**
  - ❖ Rules must be very clear
  - ❖ WHY?
    - ➢ Rules may results in the manifestation of contradictions in terms of traditional beliefs and approaches associated with non-constructivist teaching and learning approaches.

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