



WIMS: let computers do the repetitive part of teaching

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<http://cosmo.astro.umk.pl/~boud/wims120629.pdf>

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Abstract

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- motivations for WIMS
- what WIMS is: software package and/or www service
- WIMS demonstration
- usage in TCfA teaching since Nov 2005
- qualitative recommendations

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exam objectivity



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- written exam:
 - ◆ too easy or too hard?
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 - ◆ difficult to prevent cheating
- computer-aided: in principle, objective



exercise (tutorial) sessions



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- different questions to all students:
 - ◆ risk of varying difficulty level: unfair
 - ◆ increased risk that lecturer miscalculates answer: unfair
 - ◆ boring and time-consuming for the lecturer



homework: standard textbook



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- book contains answers: question no longer a useful test after checking the answer



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- book contains answers: question no longer a useful test after checking the answer
- book does not contain answers: no feedback on answer
- timescale for correcting errors in questions is few years

What is WIMS?

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- WIMS = *WWW Interactive Mathematics Server* (1999)

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- \Rightarrow each student sees a different realisation

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■ ⇒ in exam mode:

- ◆ identical set of models can be used in exam mode, but with reduced number of questions and increased strictness



Public Question Test (Xiao 2004)



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software



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- can use FLOSS backends such as OCTAVE and MAXIMA

software

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 - “If you are a teacher, . . . try to click here”.

- <http://cosmo.astro.umk.pl/wims>

- ◆ Students' area

- ◆ Teachers' area



usage in TCfA teaching



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 - ◆ research skills difficult to judge

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 - ◆ non-scoring access from anywhere/anytime during semester
 - ◆ teacher guidance in using shell commands

- since northern winter 2005/2006: *cosmology monograph course*
 - ◆ number of students $\sim 2-4$ /year
 - ◆ main aim of course = intro to research
 - ◆ research skills difficult to judge
 - ◆ WIMS: very minimal calculational tests (max 4.0)



usage in TCfA teaching



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- since northern summer 2011: $SR+GR$

usage in TCfA teaching

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 - ◆ number of students 4.5 /year

usage in TCfA teaching

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 - correct answer *not* given after entering wrong answer;
 - *result*: min–max time with score 5.0 = 45–220 mins



usage in TCfA teaching



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- primarily face-to-face **intranet** mode,



usage in TCfA teaching



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Could/should you try WIMS?



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- as guest at e.g. <http://wims.auto.u-psud.fr/wims>



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Could/should you try WIMS?



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- own server



Could/should you try WIMS?



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- own server

- ◆ pro: your responsibility as sysadmin



Could/should you try WIMS?



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■ own server

- ◆ pro: your responsibility as sysadmin
- ◆ con: your responsibility as sysadmin

learning curve, software quality

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■ teacher:

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learning curve, software quality



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learning curve, software quality

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present vs long term



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- ∃ a large body of GPL'd exercises, mostly at gymnasium/lyceum/early university level,



present vs long term



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- different teachers/student levels/institutes will want different mixes of questions, but a basic “common” set of peer-reviewed astro exercises could be developed if \exists sufficient interest
- GPL'd exercises cannot be removed from the global Commons

Conclusion

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- WIMS = extremely powerful software package for maths/physics/astro-type exercises/exams
- requires some time investment by teacher + sysadmin
- qualitative assessment of 7 yrs' experience on tiny scale at TCfA is positive for faculty + students
- most likely faculty for trying this: young faculty
 - ◆ willing to invest time now to save time over long term
 - ◆ more comfortable with FLOSS software and sysadmin
- better experiment at TCfA level before suggesting to WFAiS or UCI
- students: pressure your lecturers if you want WIMS exercises/exams!

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 - ◆ willing to invest time now to save time over long term
 - ◆ more comfortable with FLOSS software and sysadmin
- better experiment at TCfA level before suggesting to WFAiIS or UCI
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Conclusion

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- <http://cosmo.astro.umk.pl/~boud/wims120629.pdf>