Where are Girls and Women in Science and Technology?

Promotion of Scientific and Technical Talents at an early Age - New Educational Concepts

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Approaches

- Main channel through the teacher
- Teacher support, education and development projects
- Integrated research results and findings
- Develop support material, new contents and procedures
- Mirror Equal Project - resources

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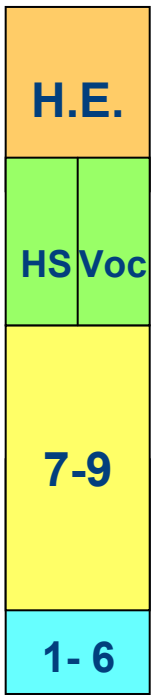
MIRROR Equal –project to tackle gender segregation in education and labour market



The main objective of MIRROR is to increase the proportion of girls participating in technology by

- developing motivational education and learning methods at all levels of education
- offering positive experiences and role models
- targeting girls, teachers, study/career counsellors and parents

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MOTIVATING AND GENDER-SENSITIVE TEACHING METHODS AND MATERIAL

- On-going action research and evaluation
- Gender-sensitive education material and methods
- Functional visits
- Technology competitions
- Training events for teachers

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Interest research

Typically, student interest has been explored by looking at their interests towards

1. the domains of physics or content,
2. the context, where a certain scientific domain is met,
3. the activity, the type of teaching methods
4. …

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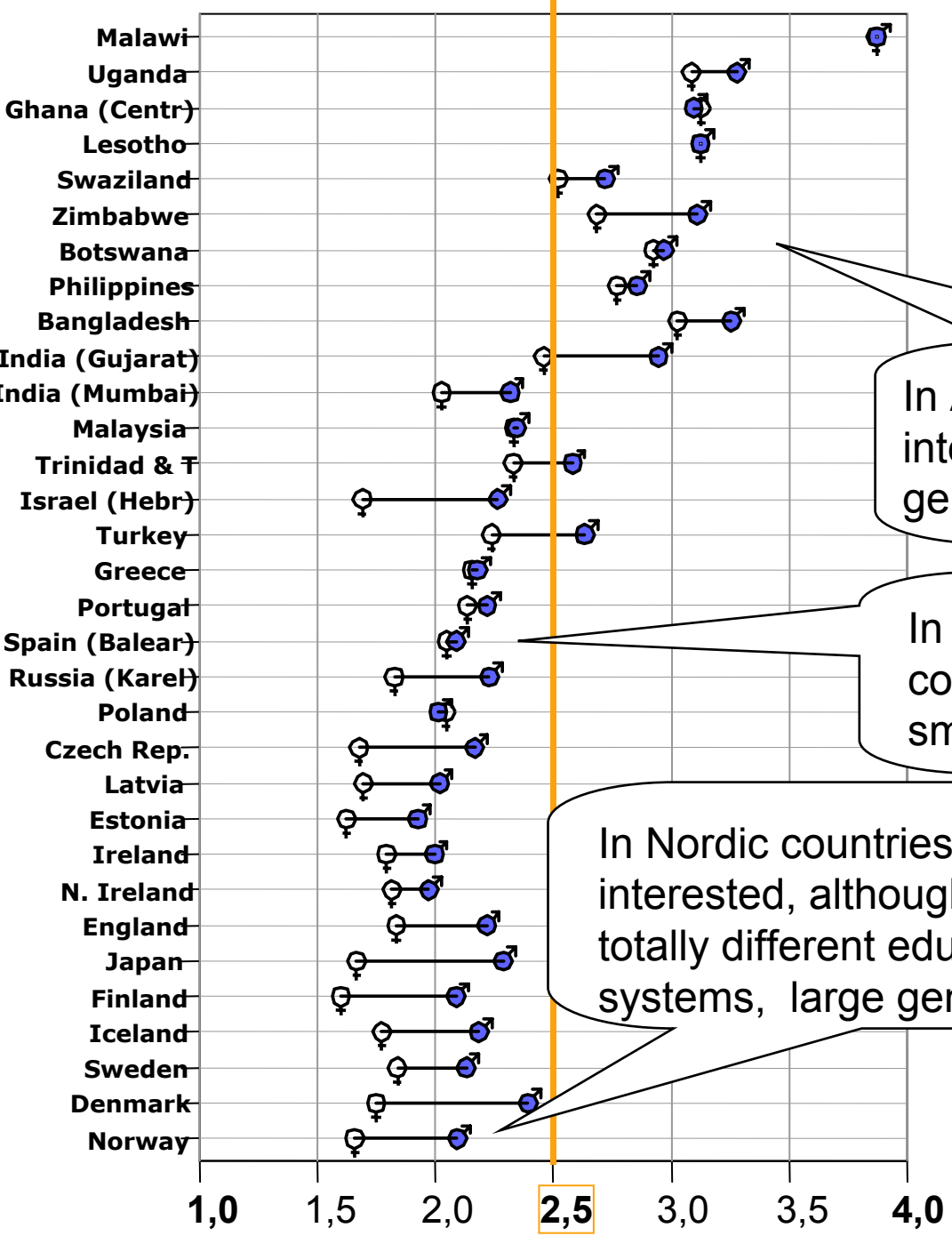
Atoms and molecules



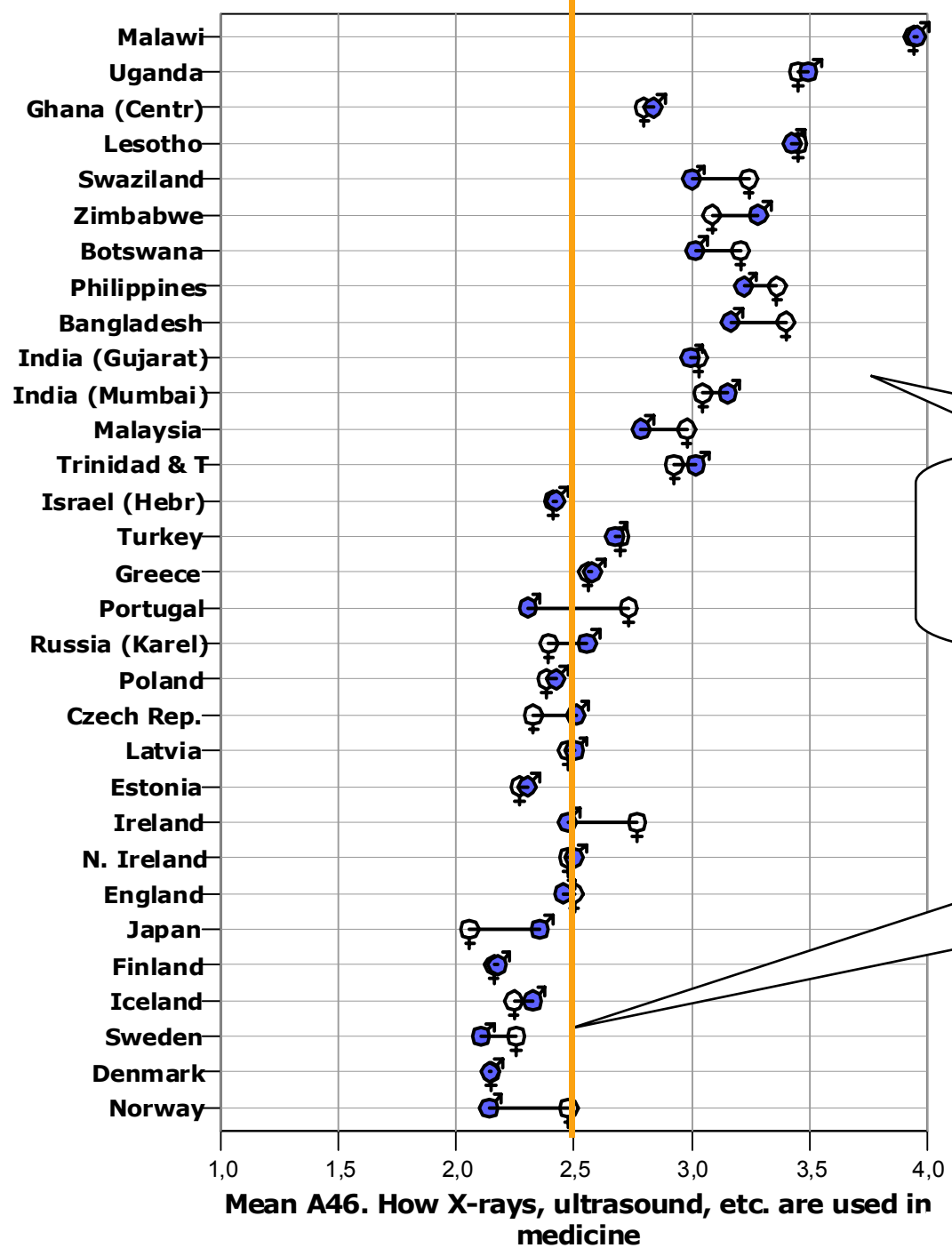
In African countries pupils are interested, typically small gender difference

In Southern European countries gender difference is small

In Nordic countries pupils are not interested, although there are totally different educational systems, large gender difference

Source: Svein Sjoberg, Oslo

X-ray and ultrasound use in medicine



Small gender difference (Human context)

"Neutral"

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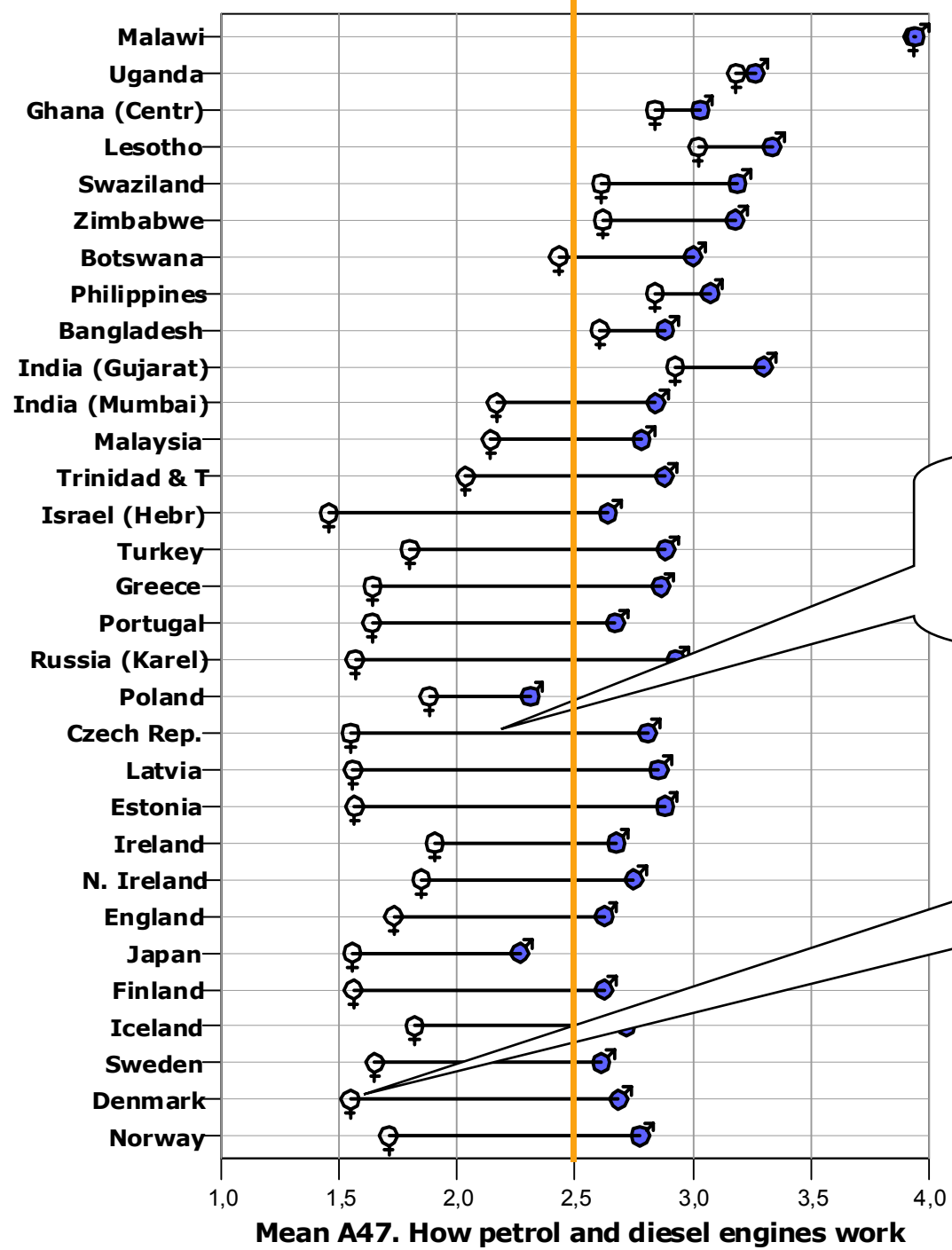
Petrol and diesel engine



Large gender difference

Girls are not at all interested

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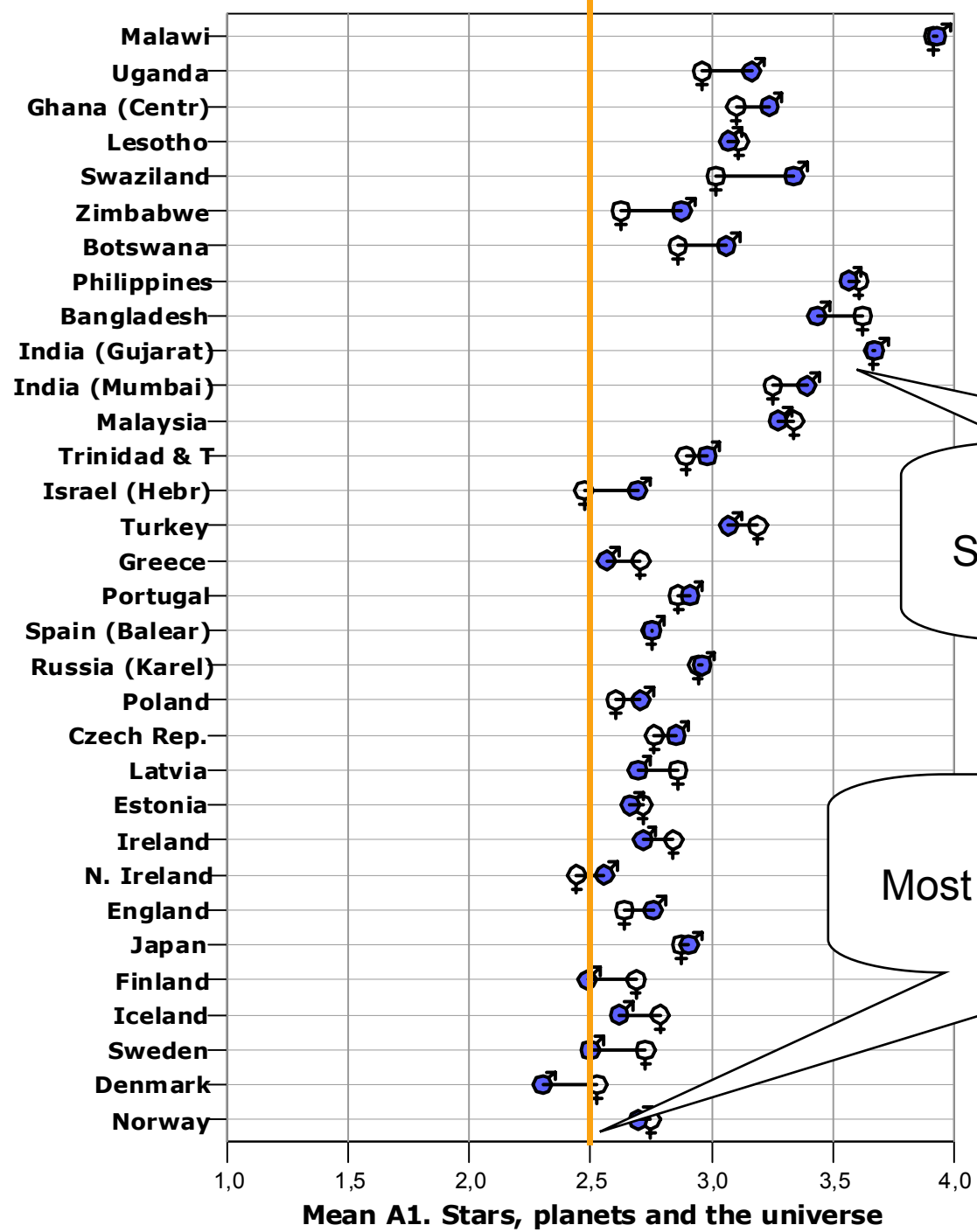
Astronomy



Small gender difference

Most students are interested

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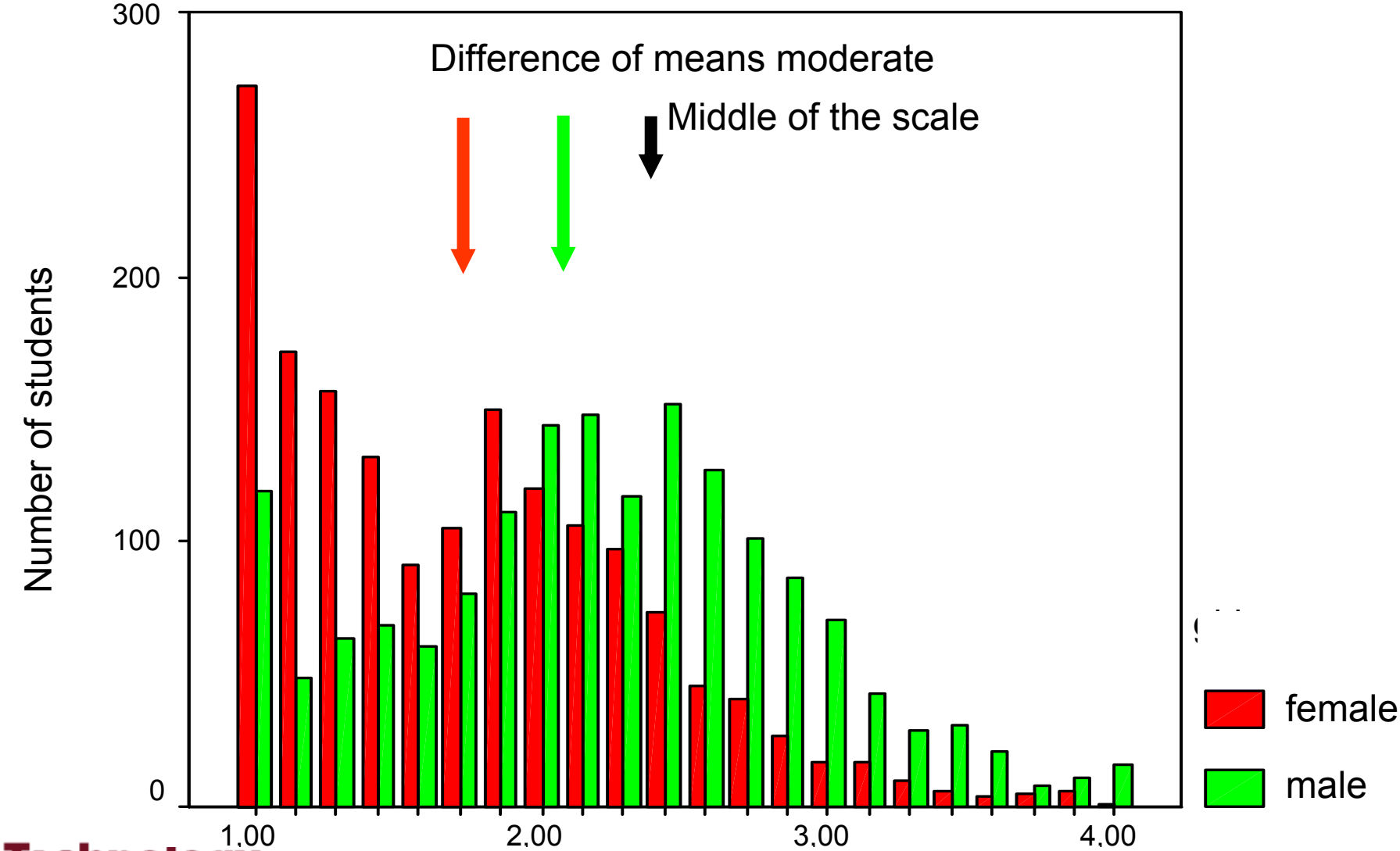
Ideal context (Science)



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Society

- Communication satellites etc.
- Traffic safety (starting, braking, ...)
- How to save energy and avoid misuse?
- Musical instruments and how they produce different sounds
- How to use and keep in shape everyday electrical appliances?
- How electricity has influenced the development of our society?

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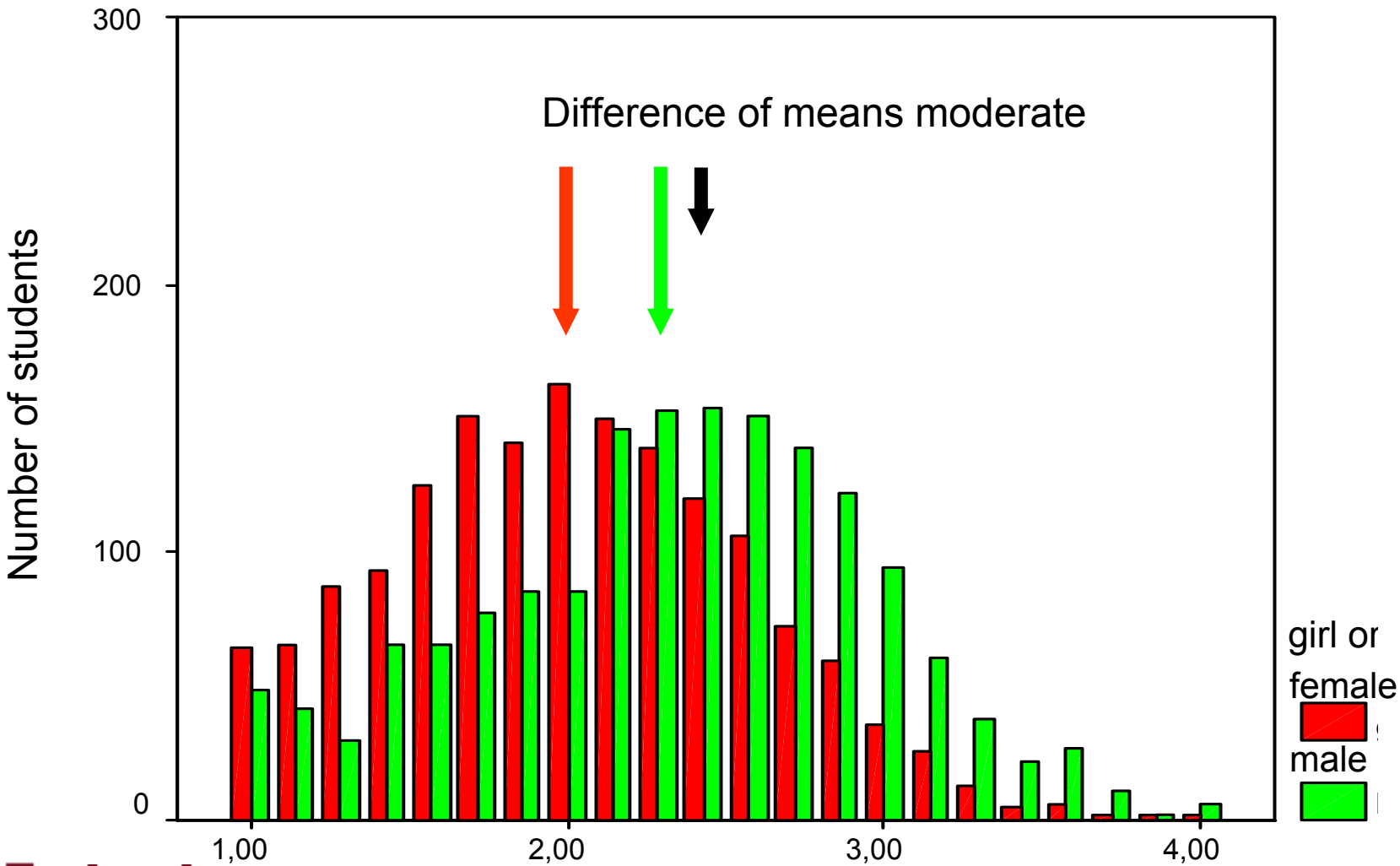
Social context



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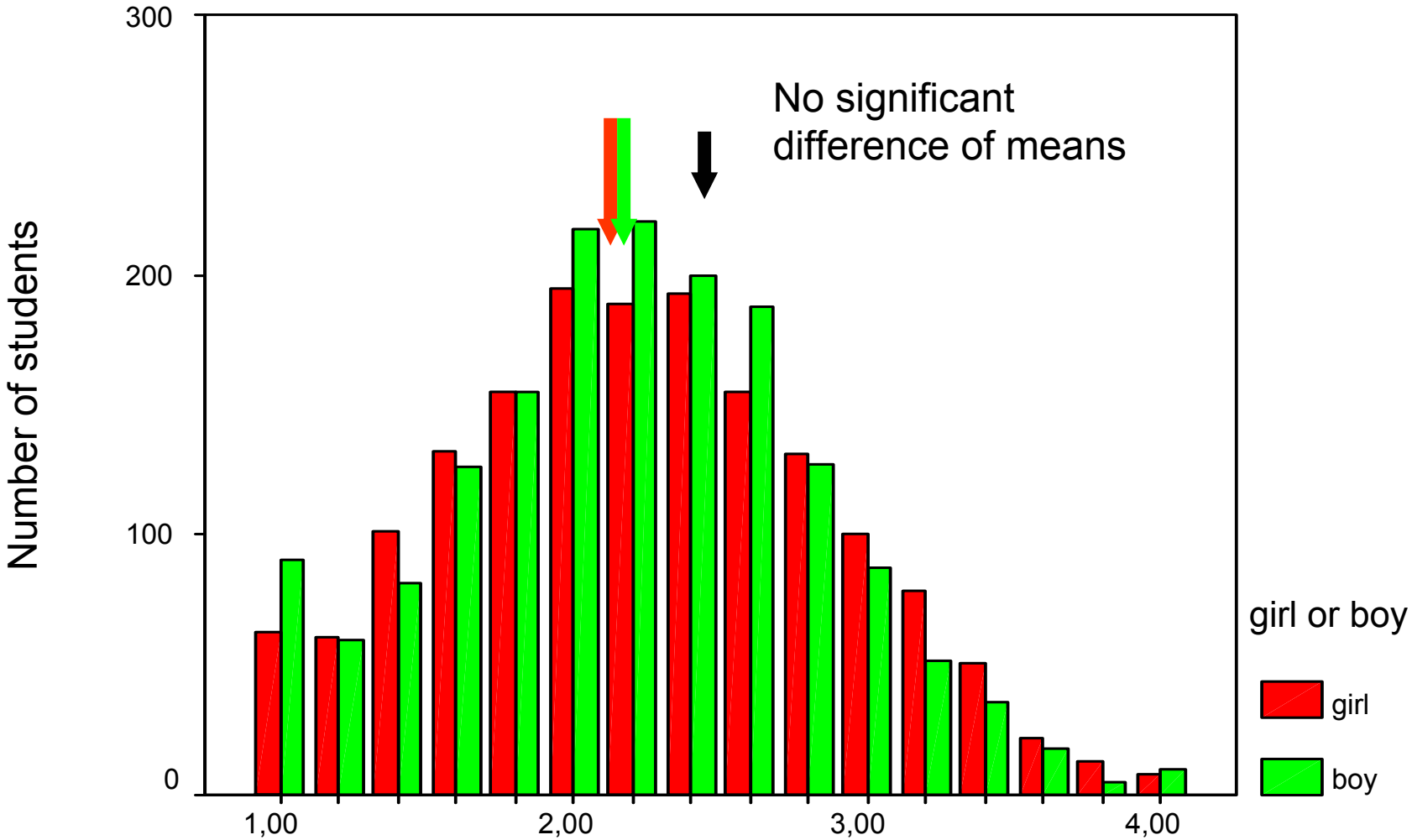
Human context

- Muscular strain and forces in sports
- Hearth, blood pressure and circulation, control of body temperature
- Effects of solarium and sunlight on skin
- Electrical shock / electrical muscular phenomena
- Effect of ionising radiation on human body

Human context



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It works Competition

- Technology Education in Primary School
- Grades 1-6
- Integration and Innovation in Technology
- Future Moving Toy
- Joint effort: teams and teacher

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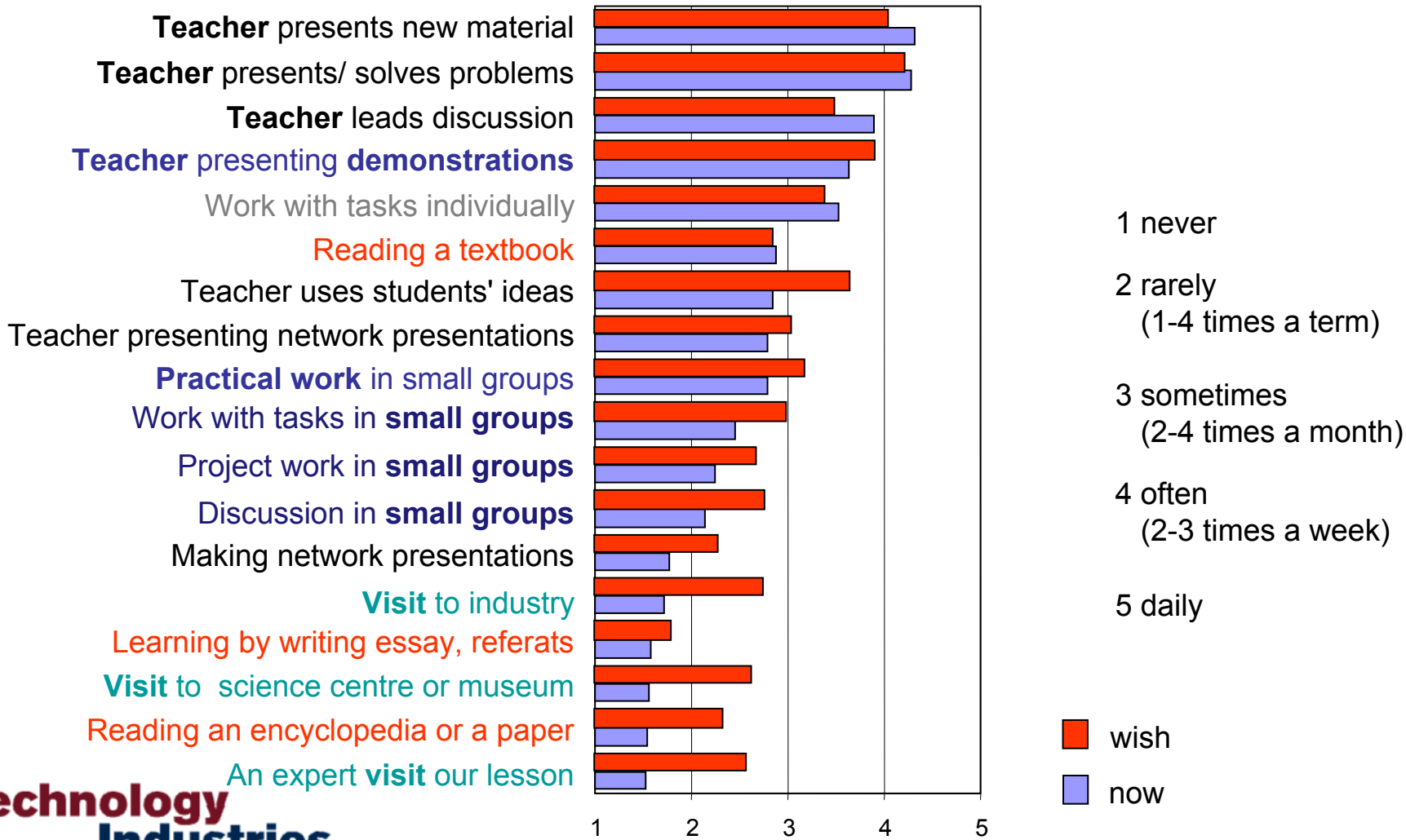
Tulevaisuuden liikkuva lelu
Muistakaa, että lelun pitää LIIKKUA!
Päiväkirja on A ja O.
?
Mainos on tärkeä juttu.
Teknologia teollisuus


Kato, miten upee mainos ja MIKÄ päiväkirja!
Ope! Kiva, kun me osallistuttiin tähän skabaan!

Teaching Methods
Upper secondary students' ($n_{Student}$ = 2661)



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Learning Materials

- Story telling approach
  - research verifies better learning results
- Learning by doing is important to combine
  - Problem solving through electrical tasks
  - Electrical tool kit and Adventure story
- Physics and Chemistry via net - Astel
  - Two visitors from outer space - Gender neutral
  - research verifies better learning of girls
  - www.openet.fi/astel
- Motivation: mathematics and physics in work

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Thank You

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Some Remaining Questions

- Research mostly targeted towards older students
- Teacher education not easy to change
- Customer wishes varying and not easily integrated
- Training and education needs are huge and on-going
- eLearning support

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