

Ethics, Public Policy and Technology for Education

Beverly Park Woolf

1University of Massachusetts – Amherst, MA., USA

bev@cs.umass.edu, Ivon

Education and Technology

Education Technology is a double-edged sword; it is probably the most significant education technology since the printing press:

- It has the potential to:
 - make routine monitoring, teaching and diagnosis quick & easy;
 - augment classroom and homework activities;
 - provide personalized care, comfort, teaching, support;
 - communicate, dialogue, debate with teachers and students.
- However, it has potential problems:
 - loss of privacy, bias in prediction;
 - possibly breakdown educational structures.

Technology in Education

Teaching and learning has changed:

- classroom and individual learning involves technology;
- computers are used in the classes and for homework
- teachers and parents are experimenting with technology

Education budgets are moving to hardware/software purchases:

- In US the computer-and software market for education is projected at **\$21 Billion by 2020 (NYT Nov 3, 2017)**

Motivation

- Deployment of school technology and learning analytics takes place in a **moral vacuum**.
- We have few fully-defined **moral groundings** specific to ethics and policy in education.
- What happens when a student is subjected to **biased algorithms**? Algorithms might impact negatively on individuals (in terms of gender, age, race, social status, income, equality).

AGENDA

- · Define Ethics · Policy
- Educational Bio · Ethics
- Educational Ha · software and
Ethics
- Discussion

What is Ethics?

Sarah Rauchas

Dept. of Comp Science U of London

Moral philosophy

Concepts of right and wrong behavior

- metaphysical issues – psychological issues – linguistic issues
- normative ethics — arrive at moral standards that regulate right and wrong conduct
- Assume people are rational and have free choice

An approach for ethical

analysis:

1. Identify all people and organizations affected
(Baase, Sarah Rauchas)
(stakeholders)
2. List all possible actions
3. Consider impact of each action on stakeholders
consequences: risks; benefits; harms; costs.
4. Identify responsibilities of decision; makers &
rights of stakeholders
5. Decide which choices are ethically wrong, ethically
obligatory, acceptable but not required
6. Consider ethical merits of each option, if there are
several.

Professional Ethics

The professional is a specialist; the products of professionals affect many people.

Ethical rules are not universal, but the tools we use should include:

- reason; introspection
- observation of human nature, values and behavior
- an understanding of ethical principles

Ethical behaviors are based on ethical theory and what is possible and what is generally accepted practice.

Professional responsibility includes:

- maintaining a level of competence; learning enough to do a good job
- honoring agreements and contracts made

Do organizations have ethical status? Is it only individuals

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Ethics in Education Technology

(Sara Rauchas, Computer Science, University of London)

“Computers bring new ethical problems”— Maner

“Computers just bring a new slant to old problems”-
Johnson

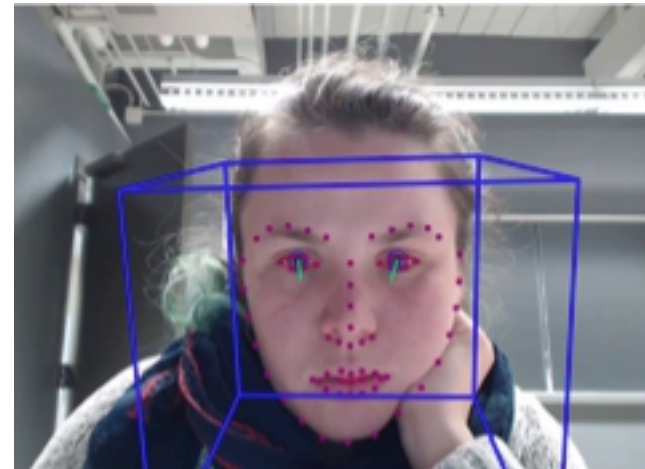
“Social and ethical use of new technology”- Moor

“Applied ethics for computer professionals” - Gotterbarn

Changes in Education

Technology allows educators to cross the line from monitoring students' output to monitoring the student

Researchers use facial recognition to predict students' emotion (confidence, interest) and effort (guessing, solved on first, attempted problems).



Woolf, Arroyo, Betke, Joshi, Alessio, Whitehill, NSF sponsored, 2018

Another Video Study

Video segments where students attempt to solve a problem (a few minutes long).

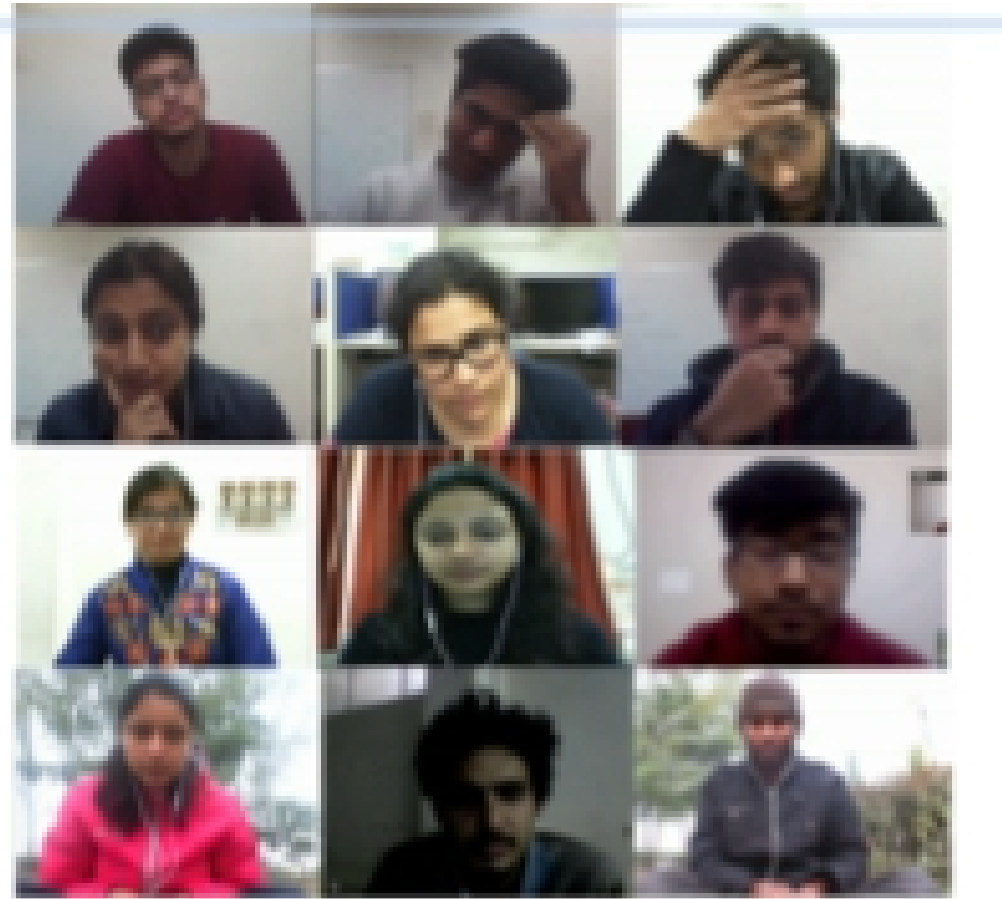


Fig. 1: Examples of frames from our engagement database. Top to bottom rows show engagement intensity level: (0 (low) - 3 (high)).

Ethics in Classroom Facial Monitoring

A Chinese school has installed facial recognition technology to monitor how attentive students are in class.



Smart Eye in China

- Surveillance equipment to be rolled out in China.
- Some students are already changing their behavior due to the increased monitoring.
- "Previously, when I had classes that I didn't like much, I would maybe take naps on the desk, or flick through other textbooks," "But I don't dare be distracted after the cameras were installed. It's like a pair of eyes are watching me."

Legal Challenges against Police

Specific Complaints against Facial Recognition

People are tracked at a peaceful anti-arms protest /while out shopping;

It is dangerously authoritarian technology, unregulated and violates privacy;

It has *wrongly identified* more than 2,200 people as possible criminals;

Indiscriminately scanning makes privacy rights meaningless;

It shows a disregard for democratic scrutiny, a rejection of the public's fundamental rights to privacy and free expression;

Why should we worry about

this? Monitoring students (and individuals) extends to:

- keystrokes
- physical surveillance
- e-mail, voicemail, files, Internet access

What is appropriate, what is ethically acceptable?

Two legal challenges have been launched against police forces in south Wales and London over their use of automated facial recognition technology on the grounds the surveillance is unregulated and violates privacy.

The claims are backed by the human rights organisations Liberty and Big Brother Watch following

Public Policy in EU (GDPR)

Data must be:

fairly and lawfully processed; processed for limited purposes;
adequate, relevant and not excessive; accurate;
not kept longer than necessary; processed in accordance with the

Data subject's rights;

secure; not transferred to countries without adequate protection.

Data may only be processed by registered data controllers

Personal data includes facts and opinions about an individual

Every person shall have the right of access to all information

Ethics Research at AIED 2018

London

- AI can change conversations during informal learning (Mike Sharples, The Open University)

“It was not until the end of the Spring 2016 term that we told the students that one of their teaching assistants secretly was an AI agent” (Eicher, Polepeddi & Goel, 2017).

FutureLearn platform based on the Conversation Theory of Gordon Pask. It supports pervasive conversations amongst learners. Courses now have conversations of up to half a million contributions, and a single learning item attracting up to 65,000 learner comments and replies.

Change Models of Student & Learning

- **Course recommendations** (Alessandra Silveira, UC Berkeley)
 - Build Diversity, Equity and Inclusion into Higher Education course recommendations
- **Bias in Student Models** (Nigel Bosch, University of Illinois)

Trust Education Algorithms

- **Stakeholders can not understand algorithms** (Iris Howley, Williams College)
 - Using an assessment and learning system with BKT built on a Hidden Markov Model to predict student skill mastery.
 - Output ☾ “mastered” or “unmastered.”
 - Parameters ☾ existing mastery, slipping (i.e., forgetting), learning,
 - Students and instructors do not understand it.
- **Teachers trusted the output** without a

Personal Data

- Personal Data Protection (Tesla European Union Project)
- TeSLA is using biometrics data (facial and vocal recognition) from students to ensure the real identity of the student in e-assessment. One of the challenge is to put in place ethical systems that respects privacy of students
- Following the new requirement of the GDPR:
 - What kind and what amount of personal data can be processed?
 - Who controls the processing of data?

Big Data Questions

- Who owns and is able to access data (about student competencies, skills, emotions, persistence)?
- How should data be analyzed, interpreted and shared?
- Is the data the property of service providers (who collect and manage it), school managers who “analyze it” or teachers who generate it?

More Education Questions

- Can students opt-out of data-driven assessments? (not clear)
- Can students challenge the content of online profiles? (not likely)
- Should school data be portable? Can it be sold to commercial companies?
- What safeguards should be put in place to mitigate harm?

Current State of Education Data

- Laws protecting students were written before the internet existed.
- Student data now is:
 - collected by third-party service providers,
 - made accessible in the cloud,
 - used for long-term student monitoring and making crucial school decision by opaque code.
- We need new mandates for data collection and reporting in the school.

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Hardware and Software for Schools

- Large market (NYT)
 - In USA **\$21 billion** market in sales by 2020;
 - Multi-million dollar district contracts
 - Big industry players: Apple, HP, Lego Pearson, Microsoft, Discovery Education
- Ethical Issues
 - Industry is courting public-school decision-makers
 - Superintendents are flown to conferences, travel

Ethical Issues

- Industry is courting public-school decision-makers;
- Superintendents are flown to conferences, travel
 - paid \$2,000 to attend conferences
 - To encourage large contracts;
- Large conferences charge \$25,000 annually for corporate sponsorship

Pay-to-Play

- Tech initiatives at school board meetings;
- Baltimore \$205 million dollar contract to Daly Computers to supply HP devices;
- Batteries fell out, keyboard tiles became detached; HP discontinued the line of computers

In Summary

- Many ethical issues have also been relevant to other technologies;
- Perfection is not a goal nor an option
- We need:
 - ethical guidelines
 - public policies
 - to study failures to reduce their occurrence

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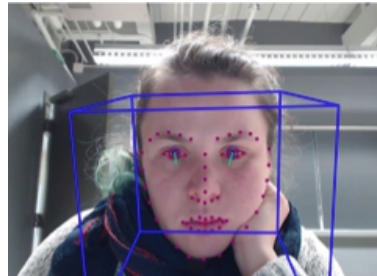
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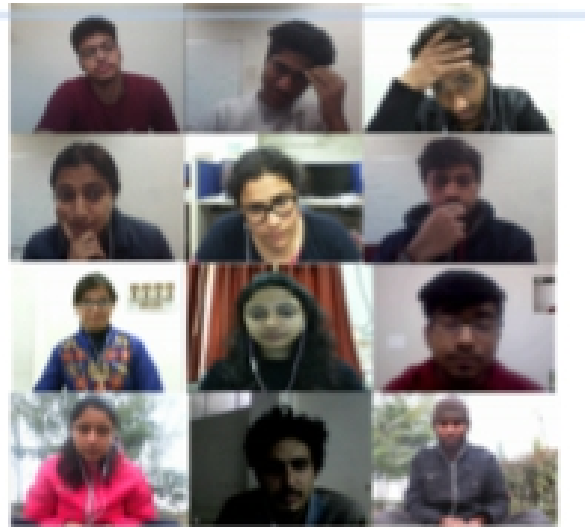


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