

# Research Skills for Impactful Knowledge Creation and Application: From Academic Publishing to Community Practice



# RESEARCH SKILLS FOR IMPACTFUL KNOWLEDGE CREATION AND APPLICATION: FROM ACADEMIC PUBLISHING TO COMMUNITY PRACTICE

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This resource is developed by the *Camerise Communities project* (2025) of York University under grant DPPF\_2223\_034\_York\_FSL Projects awarded by the [Ontario Ministry of Education](#) (Agreement number: 2025 0296) under the funding for the York University FSL Teacher Recruitment and Retention 2025-2026 (Agreement number: 2025 0296)

Please note that the views expressed in the publication are the views of the Recipient of the award and co-author of the course and do not necessarily reflect those of the Province.



## 1.

## Dominique Scheffel-Dunand and Mrs Sushumna Rao Tadinada

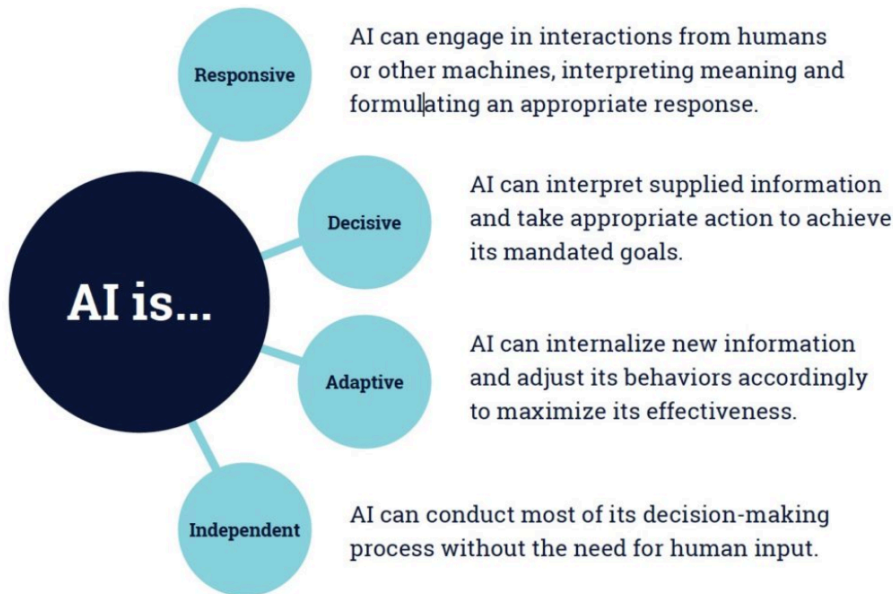
The original definition of artificial intelligence by McCarthy (1956, cited in Russell & Norvig, [2010](#)) is:

*every aspect of learning or any other feature of intelligence can in principle be so precisely described that a machine can be made to simulate it. An attempt will be made to find how to make machines use language, form abstractions and concepts, solve kinds of problems now reserved for humans, and improve themselves.*

Zawacki-Richter et al. ([2019](#)), in a review of the literature on AI in higher education, report that those authors that defined artificial intelligence tended to describe it as:

*intelligent computer systems or intelligent agents with human features, such as the ability to memorise knowledge, to perceive and manipulate their environment in a similar way as humans, and to understand human natural language.*

Klutka et al. ([2018](#)) also defined AI in terms of what it can do in higher education



What AI can do in education Image: Klutka et al. ([2018](#))

## AI adoption trends

The idea of artificial intelligence (AI), where computers doing things that humans would normally do, is not

new. Generative AI, on the other hand, is a type of artificial intelligence system which generate text, graphics, etc. in response to the prompts or signals given to the computers. This has suddenly became popular across the globe in all fields used by all walks of life and academia is not left behind. Generative AI made its debut into academic institutions in the form of ChatGPT and other applications in the second half of the year 2022.

**One million people signed up for ChatGPT in the first five days after its launch in November 2022 (Statista)**

According to a report presented by OpenAI itself, ChatGPT was first made available to the public on November 30, 2022. In just five days, the app gained over a million users. – from <https://businessolution.org/es/chat-gpt-statistics/>

## AI no longer a futuristic concept – is it a friend or foe?

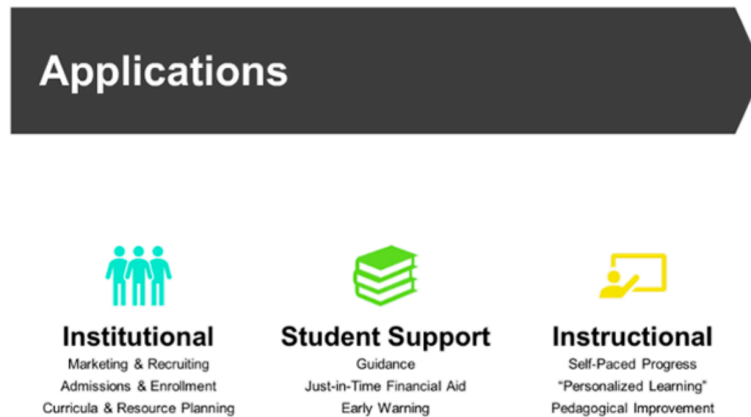
AI is everywhere and used by almost by everyone. In academic world teachers and students are using AI to enhance teaching learning experiences. From personalised learning to automated grading systems AI can do a lot to take teaching learning environments to next level. Apps like Duolingo may play an important role in language learning classroom. Where teachers can provide personalised lessons to make language learning effective for diverse students of the classroom saving teachers time and efforts to build personalised lessons. However usage of AI may enhance teaching experience by saving time, creating accessible learning, fostering creativity, it also poses challenges. Like it may tamper originality and critical thinking capabilities of both teachers and students. To address these kind of concerns many institutions across the globe are introducing guidelines to use AI ethically as it ensures the presence of AI in teaching learning environment but with some ethics.

When this thought comes to mind that AI is a friend or foe? the answer may depend upon how it is used/ integrated in the situation. No doubt that when used responsibly AI can enhance teaching learning experiences. This will help teachers to focus on meaningful interactions, making their students achieve their learning outcomes. It is users responsibility to use it responsibly. Otherwise it may give adverse results. With its pros and cons AI can truly be a friend in shaping future education system.

<https://youtube.com/watch?v=XLpxF9Dsg5U%3Fcontrols%3D0%26modestbranding%3D1%26rel%3D0%26showinfo%3D0%26loop%3D0%26fs%3D0%26hl%3Den%26enablejs-api%3D1%26origin%3Dhttps%253A%252F%252Fcontinue-lms.glendon.yorku.ca%26widgetid%3D1%26foreign%3Dhttps%253A%252F%252Fcontinue-lms.glendon.yorku.ca%252Fmod%252Fbook%252Fview.php%253Fid%253D210%2526chapterid%253D87%26aoriginsup%3D1%26gporigin%3Dhttps%253A%252F%252Fcontinue-lms.glendon.yorku.ca%252Fmod%252Fbook%252Fview.php%253Fid%253D210%2526chapterid%253D85%26vf%3D1>

Is using AI cheating: What are the teachers' reactions? by [AI4Teachers](#) is licensed under [CC BY 4.0](#)

There are different possible areas of application of AI in education. Zeide (2019) makes a very useful distinction between institutional, student support, and instructional applications.



AI applications in education Image: © Zeide, 2019

Before we talk about the applications let's read and watch little about AI.

AI is all about Machine Learning, Natural Language Processing, and Computer Vision enabling brilliant innovations in education. Not to be scared looking at these phrases. To simplify machine learning given below is an excellent video created by [AI4Teachers](#) is licensed under [CC BY 4.0](#)



*One or more interactive elements has been excluded from this version of the text. You can view them online here:*

<https://ecampusontario.pressbooks.pub/airesearchmethodology/?p=5#oembed-1>

What is Machine Learning by [AI4Teachers](#) is licensed under [CC BY 4.0](#)

Currently there are many applications like adaptive learning systems for example, these systems are capable of supporting teachers recommending appropriate teaching strategies based on student performance, automated assessment tools like automated grading mechanisms, feedback providers which may provide students guidance when they are confused in their work or they provide assistance to students in completing assessments by providing respective resources that help them in their assessment questions, virtual tutoring systems which may provide teaching content to students while supporting them with adaptive feedback and hints to solve questions related to the content, also parallelly working on detecting students' difficulties when working with the content or the exercises, speech recognition tools to support language learning etc. making teaching learning environments more robust by reducing the time consumption and providing teachers their valuable time to utilise in bet-

terways to engage students in more meaningful ways. (from [Teaching in a Digital Age: Third Edition – General](#) Copyright © 2022 by Anthony William (Tony) Bates is licensed under a [Creative Commons Attribution-NonCommercial 4.0 International License](#))

Educators can utilise machine translation tools to create multilingual resources, communicate with non-native speakers, and support diverse students in language acquisition.

While these tools are powerful tools, it is essential to review and refine the translations, especially for grammar, bias, cultural nuances and domain-specific terminology, to ensure accuracy and appropriateness.

**Google Translate, Copilot, ChatGPT, and DeepL** are few examples of AI tools used for machine translation and other language-related tasks.

- Have you ever tried <https://translate.google.co.in/Links to an external site.> to translate Webpages or Documents?

Sometimes these technological advancements may give errata, for example in a classroom if a system is predicting students behaviour and recommending learning path, it's teachers responsibility to evaluate the machines prediction and decision and act accordingly. Machines may not be always correct. **Do you agree?**

*For example if a student is using a language learning app and by mistake gave few wrong answers or may be tired that day aand gave wrong answers and the app may start giving simpler questions assuming students need easier questions as their level of understanding is low, this makes the learning journey not only boring but may demotivate student to go further. Here the machine could not account external factors.*

2.

## PRACTICAL TOOLS FOR RESEARCH TASKS

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- Idea generation, crafting research questions and hypothesis generation and validation
- Literature Review with AI
- Automating Writing Process of Research with AI
- Collaborative, evidence-driven hypothesis evaluation
- Crafting Research Topic with AI
- AI tools to help in checking Algorithm biases and Plagiarism and require human judgment and critical thinking to assess results provided by AI



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<https://ecampusontario.pressbooks.pub/airesearchmethodology/?p=25>

3.

## AI EXPERIENCES AND BEST PRACTICES - DISCUSSION TOPIC

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AI experiences and best practices – Discussion Forum Text to use in LMS

Choose **one AI tool** (or a feature of a tool) that you've used or would like to explore for a **specific research task** (e.g., literature review, hypothesis generation, plagiarism checking, data analysis) and post your experiences.

In your post, please include the following:

1. **Describe the tool** and its main purpose.
2. **Please explain how you used (or would use) it** in your research workflow.
3. **Analyse its strengths and weaknesses** in terms of accuracy, usability, and time-saving. (your perspectives)
4. **Discuss what human judgment is still needed** to ensure high-quality, ethical research output.
5. **Propose one best practice or tip** for others to use this tool effectively.

4.

# ETHICAL CONSIDERATIONS IN AI-DRIVEN RESEARCH - VIDEO

Dominique Scheffel-Dunand and Mrs Sushumna Rao Tadinada

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**Video will be updated soon...**

Video Transcript: *Ethical Considerations in AI-Driven Research*

In this session, we'll dive into **Ethical Considerations in AI-Driven Research**—a topic that's essential as AI becomes a core part of the research process.

AI offers us incredible power to analyze data, generate insights, and automate workflows.

But with that power comes **responsibility**.

As researchers, we're not just using technology; we're shaping the way knowledge is created and applied.

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**[Slide: "Why Ethics Matters"]**

Ethics in AI isn't just a buzzword. It's about trust, fairness, and accountability.

If we misuse AI—intentionally or unintentionally—we risk:

- Reinforcing biases in datasets
- Misinterpreting or overstating AI-generated results
- Violating privacy
- Eroding public trust in science

Responsible AI is not optional; it's the **foundation of credible research**.

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**[Slide: "Key Ethical Challenges"]**

Let's break this down into four major areas:

### 1. **Bias and Fairness**

- AI models learn from data, and data often reflects human biases.
- Example: An AI trained on historical hiring data may inherit gender or racial biases.
- Solution: Proactively audit datasets and apply fairness checks.

### 2. **Transparency and Explainability**

- Black-box AI models can produce results we don't fully understand.
- In research, this limits reproducibility and accountability.
- We need models that are **interpretable**, or at least documented thoroughly.

### 3. **Privacy and Data Protection**

- Sensitive data—health, financial, or personal—must be handled carefully.
- Regulations like **GDPR** and **HIPAA** exist for a reason.
- Always anonymize data and use secure platforms.

### 4. **Authorship and Integrity**

- Should AI-generated text or images count as your own work?
- The answer is no—AI is a tool, not an author.
- Always disclose AI's role in your research outputs.

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#### [Slide: “Best Practices”]

To conduct ethical AI-driven research, adopt these habits:

- **Audit Your Models:** Regularly test for bias and validate accuracy.
- **Document Everything:** Keep detailed notes on model design, data sources, and parameters.
- **Seek Peer Review:** Get ethical and methodological feedback from colleagues.
- **Stay Informed:** AI ethics is evolving—read guidelines from organizations like IEEE, UNESCO, and AI Now.

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#### [Slide: “A Mindset Shift”]

Think of AI as a **partner**, not a decision-maker.

Your role as a researcher is to ensure:

- Transparency: Others can replicate your work.
- Fairness: AI tools don't amplify inequality.
- Trust: Research integrity is never compromised.

Ethics is not a checklist; it's a **mindset**.

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As we integrate AI into every stage of research, let's remember:

It's not enough to ask, "What can AI do?"

We must also ask, "What **should** AI do?"

This ethical lens will ensure your work contributes responsibly to science, society, and the future.

Thank you, and in our next session, we'll explore practical frameworks to evaluate AI tools ethically before deploying them in your projects.

5.

## BIAS, ACADEMIC INTEGRITY, AND PRIVACY IN AI-DRIVEN LANGUAGE RESEARCH - DISCUSSION TOPIC

Dominique Scheffel-Dunand and Mrs Sushumna Rao Tadinada

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AI tools are powerful, but they also raise important ethical questions. For this discussion, reflect on how **bias, privacy, and academic integrity** come into play when using AI in research.

[A 2025 study \(Addressing Speaker Gender Bias In Large Scale Speech Translation Systems\)](#) revealed persistent masculine bias in speech translation systems: even with clear audio input, translations defaulted to masculine forms. Researchers corrected this using LLM-based post-editing and fine-tuning with gender-balanced data, improving accuracy in English→Spanish and English→Italian translations. This case highlights **bias, academic integrity, and privacy** concerns in AI-driven research and language technology. Read this case and post your reply based on the instructions given by the facilitators.

### Discussion Instructions:

- Read the [study](#) summary carefully.
  - Reflect on **bias, academic integrity, and privacy** in AI research.
  - Choose **ONE** of the following prompts to respond to in **≤500 words**:
1. 1. From a linguistic theory perspective (syntax, morphology, sociolinguistics, pragmatics), what deeper issues do you see in “gender bias” here? How do grammatical gender systems complicate fairness in machine translation?
  2. If you were designing this study, what linguistic variables (e.g., morphosyntactic features, sociolinguistic variation, dialectal differences) would you include to uncover hidden biases?
  3. Many low-resource or endangered languages lack representation in training data. How might this lead to linguistic inequities? Propose one data collection strategy to ensure more inclusive and equitable treatment of these languages in AI systems.
  4. How could these findings influence linguistic fieldwork, corpus building, or computational linguistics research in your area?

6.

# FINAL PROJECT AND CRITICAL REVIEW

Dominique Scheffel-Dunand and Mrs Sushumna Rao Tadinada

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Submit a **research topic proposal** in your field of language and linguistics, **supported by AI tools** (e.g., literature discovery, translation, corpus analysis, writing assistance).

The project must include:

## 1. Research Topic & Rationale

- Clear, focused research question.
- Justification of the topic's significance in language and linguistics research.

## 2. AI Tools Integration

- Explanation of at least **one AI tool or feature** used in shaping the topic, methods, or literature review.
- Critical reflection on **how AI shaped their thinking** or design choices.

## 3. Critical Review

- Identify and analyse **at least one ethical, methodological, or linguistic bias issue** encountered while using AI tools.
- Discuss **strategies to ensure academic integrity** (citation, originality, avoiding plagiarism).

## 4. Proposed Methodology

- Clear outline of research approach, data collection, and expected outcomes.

## 5. Annotated Bibliography or Corpus Snapshot

- List of key sources (manual and AI-suggested) with **brief annotations** on their relevance.
  - **Please do share the prompts used wherever they were used**
- 

## Deliverable Format

Upload a .PDF document or Presentation in PDF format. ( Make sure you add a public link to your videos, if you presented in videos)

- **Report:** 1500–2000 words (or multimedia presentation).
- **Optional Video Pitch:** 5-min summary (optional, for peer review engagement).
- Include **screenshots or brief logs** showing AI tools used (to make the process transparent).

7.

# ETHICAL CHALLENGES AND CONSIDERATIONS OF USING AI IN EDUCATION

Dominique Scheffel-Dunand and Mrs Sushumna Rao Tadinada

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Though there is immense potential benefits in using AI in education, there are also equal challenges and many concerns to address. The first and foremost that we hear is bias in AI algorithms, which may give results that are not inclusive and show disparity in results due to inadequate or erata in data provided.

Another most important concern is data privacy. Most of the times these applications require lot of personal data to provide effective results which may be a breach/invasion into teacher / students privacy. Very clear data privacy policies regarding data collection, storage and its usage must be clearly stated while using any tools to safeguard the privacy of teachers and students data.

Depending on AI tools with certain precautions may give some good results but over dependency may tamper teacher-student interactions lowering the critical and creative thinking role of teachers. This may also be a major concern that need to be taken care of. while using AI technology in education.

Eventually AI literacy is important for both teachers and students. They must be trained to use AI tools responsibly in ethical ways to maximize the benefits and minimize the risks.

Addressing such challenges may definitely help teachers and students to enhance their teaching learning experiences.

## Ethical Challenges and Considerations of Using AI in Education

### York guidelines on Ethics for Faculty, Staff, and Students

Please refer to [the page from York University](#) Page on AI usage. You can read guidelines like AI for Faculty; [AI for Students](#); AI for Graduate Studies; Ethics. (<https://www.yorku.ca/teachingandlearning/gen-ai/>) along with more details on

- General Limitations and Risks of Generative AI
- GenAI and York Values
- Intellectual Property, Copyright, and Data Security

## York University's guidelines on using AI technology for academic work

1. Please refer to the page from York University [style guide](https://researchguides.library.yorku.ca/c.php?g=679413&p=5316500). (<https://researchguides.library.yorku.ca/c.php?g=679413&p=5316500>)

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