Vocational training for sustainable development and artificial intelligence for the food value chain

Date: 4–8 August 2025 (4 hours per day + homework)
Location: Chitralada Technology Institute or Vocational School, Bangkok

How can AI be used to sustainably support professions in the food value chain – and what challenges does this pose for educational processes?

This draft of an English-language seminar 'BBNE & AI' in Bangkok at the CDTI shows the didactic concept for one week of teaching. It shows how nutrition and artificial intelligence can be combined in educational processes in the spirit of 'sustainability'.

Note: The following concept is based on the assumption of a 5-day seminar. Each day consists of 4 hours of classroom time with lectures, discussions and exercises. It also includes homework for the participants and preparation by the lecturer for the next day. The concept has a modular structure and can alternatively be expanded into a two-week seminar with two hours of classroom time each day. It can also be supplemented with additional activities such as the practical application of AI tools or video inputs from German experts.

Google Classroom

- *Link to Google Classroom; https://tinyurl.com/23duwhjl*
- *please download the PDF schedule with all tasks and links*
- *file: VET-SD-KI-Food Chain - Seminar Schedule.pdf*

All documents are stored in the Google Glass Room. If you click on a document here, you must decide what you want to do. Usually the documents are stored here as master documents, i.e. you can edit the documents. This also applies to Google surveys (questionairs). If you want to complete a survey, you must click on a participant link.

Day 1 – Artificial intelligence and Nutrition

Duration: 4:00 hours + homework

The first day establishes the connection between artificial intelligence and nutrition. It begins with an introduction of the lecturer and the participants, including their interests and areas of expertise. The check-in concludes with a technical test and an overview of the seminar. After discussing the benefits of the seminar, there is an initial introduction to the topic of artificial intelligence with a video and a lecture. Participants then research how artificial intelligence is already being used today. The seminar concludes with a homework assignment in which participants use AI to analyse the benefits and risks of a food value chain.

- Start 09:00
- (1:15/10:15) Check-in
  - Welcome - Topic - Quote (sense of AI)
  - Overview of today
  - Introducing myself (my job and my projects)
  - Task 1a Technic Test (Folder: Day 1 - Task 1 - Technic Test)
    Link to Google Classroom: **NN**
    - i. Signing up for and using Chrome
    - ii. Accessing to Google Drive
    - iii. Moving Google Classroom to 'My Drive'
    - iv. Open the folder Google Classroom
    - v. Open the folder Day 1 - Technic Test
    - vi. Filling out and submitting forms (Task 1a - Technik Test 1a)
    - vii. Questionnaire for Participants **NN**
    - viii. Questionnaire for Lecturer (answers) **NN**
    - ix. Google Presentations cloud-working: copying, renaming, opening and fill in your name and close (Task 1b Technik Test 1b)
    - x. PowerPoint offline working: copying, downloading, renaming, filling in your name, save and close, uploading to GDrive (Task 1b Technik Test 1b)
  - Task 2 - Participants introduce themselves to each other
    - i. Questionnaire for Participants: **NN**
    - ii. Questionnaire for Lecturer (Answers): **NN**
    - iii. Answer in the file: *Day 1 - Task 2 - Check-In Interests Knowledge*
    - iv. Participants introduce themselves using their set cards (Google Forms).
  - Participants receive a short overview of the 5-day course schedule
  - Task 3 - Participants will get and will rate the potential benefits for themselves
    - i. Quick overview of the benefits of the seminar
    - ii. Questionnaire for Participants: **NN**
    - iii. Questionnaire for Lecturer (answers): **NN**
    - iv. Answers the file: *Day 1 - Task 3 - Benefits of the Seminar*
- (0:30/10:45) Task 4 - Quiz: What is AI? (overview of the topic of AI) - Part 1
  - (10 min) Quiz: What do I know about AI?
    - i. Questionnaire for Participants: **NN**
    - ii. Questionnaire for Lecturer (answers): **NN**
    - iii. Answer the file: Day 1 - Task 4 - What do you know about AI?
  - (10 min) Video 1: AI, Machine Learning, Deep Learning and GenAI Explained

-
  -
    - i. *Link: https://youtu.be/qYNweeDHiyU*
  - ○ (5 min) Questions of the participants
- ● (0:15/11:00) Break (10:45-11:00)
- ● (0:30/11:30) What is AI? (overview of the topic of AI) - Part 2
  - ○ (20 min) Presentation
    - i. Is KI an old idea?
    - ii. Can we Define Intelligence?
    - iii. What is "Training of Neural Networks"?
    - iv. Weak or Strong? (How does Chat GPT see itself?)
    - v. What are the differences between types of AI
    - vi. And at least a Paradox
  - ○ (10 min) Questions?
- ● (1:00/12:30) Task 5: Where is AI already being used?
  - ○ look for examples in the following areas:
    - i. Education
    - ii. Nutrition (whole value chain)
    - iii. Sustainability
  - ○ Make a description:
    - i. Questionnaire for Participants: **NN**
    - ii. Questionnaire for Lecturer (answers): **NN**
    - iii. Answer the file: Day 1 - Task 5 - Where is AI already been used today?
  - ○ Presentation of the Info-Cards (2 minutes per team)
    - i. Link to folder: Day 1 - AI and Nutrition (click on file name)
- ● (0:30/13:00) Homework Task 6: Using AI in the Food Value Chain
  - ○ 1st To Do: Group Building if you want (here in the classroom)
    - i. Questionnaire for Participants: **NN**
    - ii. Choose one of the dimensions: ecological, social, economical, political or health
    - iii. Summarise the benefits and risks of this dimension for the food in question
      - ● Pork
      - ● Chicken
      - ● Beef
      - ● Milk
      - ● Rice
      - ● Vegetables
    - *iv.* Use a KI if necessary
    - v. Copy your complete text into a Word document
    - vi. Upload it to Co-Pilot to create a presentation
    - vii. Save the präsentation: "Day 1 - Task 6 - Your Name/s"
    - viii. At least: Upload your präsentation up to the folder "Day 1 - Nutrition and KI"
    - ix. Questionnaire for Lecturer (answers): **NN**
    - x. Answer the file: Day 1 - Task 6 - Using AI in the Food Value Chain
- ● End 13:00
- ● Tasks after the face-to-face seminar
  - ○ Students: Homework (see above, approx. 1-2 hours)
  - ○ Lecturer: Preparation for the next day (approx. 2-3 hours)

Day 2 – Nutrition and Sustainability

Duration: 4:15 hours + homework
On day 2, the topic of sustainability will be explored in depth using nutrition-related professions as examples. The status quo in Thailand will be examined and compared with the German system. The complexity of sustainability will be illustrated using the example of training to become a specialist in system catering. Sustainability will then be explored for various professions and economic sectors through group work.

- Start 09:00
- (0:15/09:15) Check-in
  - Brief reflection on the 1st day
  - Participants: Questions about the 1st day
  - Presentation of today's schedule
- (0:45/10:00) Results of the homework assignment
  - Results of the homework assignment – presentation by the groups
  - Questionnaire for Participants: **NN**
  - Questionnaire for Lecturer (answers): **NN**
  - Answer the file: Day 1 - Task 6 - Using AI in the Food Value Chain
  - Link to classroom: **NN**
  - Discussion of the results
- (0:20/10:20) Lecture: Nutrition and ecological sustainability in Germany
- (0:25/10:45) Lecture to prepare *Task 7 - Thailand's Way of SD in Nutrition*
  - Make notices - which problem in Germany could be interesting für Thailand
  - At the end: build a group (3-4 ps.)
- (0:15/11:30) Break (11:15)
- (0:45/11:45) Task 7 – Thailand's way for a sustainable nutrition
  - Making set cards - relevant topics for Thailand's nutrition
  - decide about a food stuff - build a group
  - Questionnaire for Participants: **NN**
  - File: *Day 2 - Task 7 - Thailand's Way of SD in Nutrition*
  - Use a AI of your choice - fill out the Google Form and send it
- (0:45/12:30) Task 7 - Presentations by the participants
  - Lecturer - answers by each participant: **NN**
  - Lecturer - all answers: **NN**
- (0:30/13:00) Task 8 - Homework: How can AI be used in the following food value chains?
  - Please form groups of 4 to 5 people (we have 6 value chains)
    i. The first 4 to 5 starts with the Chicken-Value Chain
    ii. The second 4 to 5 starts with the Pork-Value Chain
    iii. The third 4 to 5 starts with the Beef-Value Chain
    iv. The fourth 4 to 5 starts with the Milk-Value Chain
    v. The fifth 4 to 5 starts with the Rice-Value Chain
    vi. The sixth Vegetable-Value Chain (organic, saisonal, regional)
  - Open the Miro Board and start recording the value chain. Link: **NN**
  - All participants can work simultaneously.
  - Your task is to identify the advantages and risks in a food value chain.
- End 13:00

- Tasks after the face-to-face seminar
    - Students: Homework (see above, approx. 1-2 hours)
    - Lecturer: Preparation for the next day (approx. 2-3 hours)

Day 3 – Large Language Models and Nutrition

Duration: 4 hours + homework
On day 3, the topics of AI and sustainability in the food industry will be linked with the help of large language models. We watch various videos that explain what an LLM is and what a 'neural network' is. Then, a video explains how to write an effective prompt. We test our knowledge with a quiz. After that, we get an overview of the different LLMs. What are the advantages and disadvantages of the models? What are they best used for? Finally, we work with the different LLMs and compare the LLM's answers to selected questions.Participants will use artificial intelligence to explore various topics related to the food value chain and the way we eat. They will learn that AI and LLM cannot be trusted blindly.

- Start 09:00
- (0:15/09:15) Check-in
    - Lecturer: Brief reflection on the 2nd day
    - Participants: Questions about the 2nd day
    - Presentation of today's schedule
- (0:45/10:00) Task 8 -Homework results
    - Group presentations Link:**NN**
    - Discussion of the results
- (0:45/10:45) LLM, neural network and promoting
    - (0:15) Explaining the core of a LLM
        i. Video 2: LLM Explained in 5 Minutes
        ii. Link: *https://youtu.be/67_aMPDk2zw?si=JRv8T9clg3wdCm98*
        iii. Questions
    - (0:15) What is a Neural Network
        i. Video 3: What is a Neural Network? (00:11)
        ii. Link: *https://youtu.be/ER2lt2mIagI?si=48RqDYEHLQ6tx0eH*
        iii. Questions
    - (0: 15) Explaining how you write a 'prompt'
        i. Video 4: Simple guide so effektiv prompting
        ii. Link: *https://youtu.be/988IvqkHCGY?si=p0awVKXNybFVy2zn*
        iii. Questions
- (0:15/11:00) Task 9 - Quiz - What did you remember?
    - Link to the quiz (participants): **NN**
    - Link to the answers (lecturer): **NN**
- (0:15/11:15) Break - 11:00-11:15
- (0:30/11:45) Comparing different LLM
    - (0:15) Comparison of different LLM (1)
        i. Video 5: The Best LLM Is.... (A breakdown for every category) (00:12)
        ii. Link: *https://youtu.be/0K66T6J1pVc?si=FG5FjJuzpFlJ0-0x*
        iii. Questions
    - (0:15) Comparing different LLM (2)

Klima- und energieeffiziente Caterer und Zentralküchen
keecz

BilRessNetzwerk
Bildung für Ressourcenschonung und Ressourceneffizienz

- i. Video 6: LLM Overview of 5 LLMs (00: 10 min)
- ii. Link: *https://www.youtube.com/watch?v=kogy04oZMuA*
- iii. Questions
- (0:15/12:00) Task 10 Quiz - What did you remember?
  - ○ Link to the quiz (participants): **NN**
  - ○ Link to the answers (lecturer): **NN**
- (0:45/12:45) Working session - Task 11:
  Testing different LLM's - Is there only one truth – or many?
  - ○ Your Task: Day 3 - Task 11 - Testing different LLM's
    - i. Say "Hello" to your neighbor and build a group (2 persons)
    - ii. Open questionnaire for participants: **NN**
    - iii. Choose one of the topics ("First come, first served)
    - iv. Fill in the line for your team
    - v. Open the following document (Google Forms)
    - vi. *Day 3 - Task 11b - Testing different LLM's*
    - vii. Link:**NN**
    - viii. Fill in the document according the description of the task
  - ○ Questionnaire for Lecturer (answers): **NN**
  - ○ Questionnaire for lecturer (questions): **NN**
- (0:15/13:00) Task 12 - Homework: My model XY told me ….
  - ○ Make a presentation with max. 5 slides about the results of Task 11b (your answers):
    - i. Link for participants (all answer): **NN**
    - ii. Scroll to your answer
  - ○ Go to classroom - use the following link for down and upload:
    - i. Link for all participants **NN**
    - ii. Read the instruction:
      Day 3 - Task 12- Read me - Instruction for Homework
  - ○ Choose on of the following documents
    - i. PowerPoint (offline):
      Day 3 - Task 12a - Testing the LLM - Group Name
      To do: download - rename - fill in and edit - upload
    - ii. Google Presentation (cloud working):
      Day 3 - Task 12b - Testing the LLM - Group Name
      To do: copy - rename - fill in and edit – close
  - ○ If you want, ask Co-Pilot to make your presentations
    - i. Copy your answer of Task 11b and write a good prompt
      Upload the presentation: Day 3 - LLM and Nutrition
      Link for all participants: **NN**

- Tasks after the face-to-face seminar
  - Students: Homework (see above, approx. 1-2 hours)
  - Lecturer: Preparation for the next day (approx. 2-3 hours)

Day 4 – VET-SD and Artificial Intelligence

Duration: 4 hours + homework

On day 4, participants learn what a RAG (Retrieval Augmented Generation) is, how it is created and how it can be used for vocational training for sustainability. The aim is to show that vocational training can be supported by AI in a very subject-specific way and that a RAG can be created that does not hallucinate.

- Start 09:00
- (0:15/09:15) Check-in
  - Lecturer: Brief reflection on the 3rd day
  - Participants: Questions about the 3rd day
  - Presentation of today's schedule
- (1:00/10:15) Results of the homework assignment - Day 3 - Task 12
  - Lecturer: Go to classroom: **NN**
  - Open the presentations of each group (one after another)
  - Participants: present your results
- (0:30/10:45): Lecture: VET-SD GE - Vocational educational training for sustainable development in Germany
  - Lecture: The German training system
    i. Training regulations and framework curricula
    ii. The German standard occupational profile 'Environmental protection and sustainability'
- (0:15/11:00) Break (10:30-10:45)
- (0:45/11:30) Working Session Task 13: AI Translating and Summarizing
  - Background: AI programs will do more and more of our work for us.
  - And this will happen in just a few years or perhaps even next year.
  - In this task, we use Ki for translation and summarization.
  - 25 min. working with AI
  - Open the following folder at Google Classroom:
    i. Folder: Day 4 – VET-SD and AI
    ii. Link for all participants: **NN**
    iii. Count 1-2-3 – the first group download Day 4–Task 13–SDG 2 The next 1-2-3 download the file Day 4–Task 10–SDG3 etc.
  - Open one of yours AI
    i. Write a prompt for translating the document
    ii. Upload the document
    iii. Ask for translation in your own Thai language
    iv. Ask für a Summary in bullet points
    v. Go to the questionnaire: **NN**
    vi. Fill out the questionnaire and send it off
  - 20 min presentation
- (1:30/12:45) Working Session Task 14 – Ping-Pong VET-SD

- ○ 1. Presentation - 11:30-11:45
- ○ 2. Your work phase 11:45-12:15
- ○ 3. Your presentation 12:15-12:45
- ○ We have to build 7 groups
- ○ Say hello to your neighbours - now you are a team (2-3 persons)
    - i. Open the schedule (PDF) from your download
    - ii. or download from Google Classroom: **NN**
- ○ If I present a slide, the first 3 participants count 1-2-3 – they are (the first) group
- ○ Group 1 starts with file Day 4 - Task 14a – Emissions of your tourists
- ○ Group 1 opens the questionnaire with the same name
- ○ Group xy opens another questionnaire
    - i. Task 14a - Emissions of your tourists - **NN**
    - ii. Task 14b - Average emissions for a school meal - **NN**
    - iii. Task 14c - Too much meat and milk products - **NN**
    - iv. Task 14d - Reduce beef without being vegetarian - **NN**
    - v. Task 14e – Overweight and obese are rising - **NN**
    - vi. Task 14f - Use efficient freezer - **NN**
    - vii. Task 14g - Hunger in Germany and Thailand - **NN**
- ○ Link for lecturer to the folder: **NN**
- ○ When I have finished explaining, fill in the questionnaire and click on "Send"
- ● (0:15/13:00) Task 15 - Homework:
    - ○ Make a presentation with max. 5 slides
    - ○ About the results of your(s) Task 14 a – g
    - ○ Use the link for all participants:**NN**
    - ○ You have now three options:
        - i. Option 1 – Co-Pilot
            - ● Copy your answers from your Google Sheet **NN**
              Select your tabLink: **NN**
            - ● Use it as a prompt for Co-Pilot
            - ● Ask Co-Pilot to make a presentation
        - ii. Option 2 – Make your own presentation
            - ● Choose on of the following documents
            - ● Google Presentation (cloud working, click on the file name): **NN**
              To do: copy - rename - fill in and edit - close
            - ● PowerPoint (offline, click on the file name): **NN**
              To do: download - rename - fill in and edit - upload
    - ○ **For all 3 options, you should use an AI of your choice to develop a strategy to overcome one problem**
- ● Tasks after the face-to-face seminar
    - ○ Students: Homework (see above, approx. 1-2 hours)
    - ○ Lecturer: Preparation for the next day (approx. 2-3 hours)

Day 5 – Your Personal RAG-Advisor

Duration: 4 hours

On the fifth day, we will explore a special form of artificial intelligence: RAG Retrieval Augmented Generation. This concept uses an LLM in conjunction with a database. This database can contain any material. For our theme 'nutrition,' we will use scientific studies related to our topic. Today, we will learn what a RAG is, how it differs from fine-tuning and prompt engineering, and how it differs from a chatbot. This will be followed by step-by-step instructions for creating a simple RAG with Chat GPT. In task 16, we will use this RAG to see how good the answers are..

- Start 09:00
- (0:15/09:15) Check-in
    - Lecturer: Brief reflection on the 4th day
    - Participants: Questions about the 4th day
    - Presentation of today's schedule
- (1:00/10:15) Results of the homework - Day 4 - Task 15
    - Results of the homework assignment – presentation by the groups
    - Go to the folder Day 4 - VET-SD and AI (google classroom)
    - Link for all participants: **NN**
    - Open the files of the participants (Google Slides or PowerPoint)
    - Presentation and discussion of the results
- (0:35/10:50) Videos: What is a RAG and what is Fine-Tuning?
    - Video 7: RAG Explained (15 min.)
    - Link: *https://www.youtube.com/watch?v=HREbdmOSQ18*
    - Questions?
    - Video 8: RAG vs Fine-Tuning vs Prompt Engineering (8 min)
    - Link: *https://youtu.be/zYGDpG-pTho?si=INegN5IR7q5wRrjN*
    - Questions?
- (0:15/11:05) Break
- (0:55/12:00) Lecture: Your personal RAG? (Lecture with additional informations)
    - The simple version: Creation in the form of a project in Chat GPT
    - Optional (if we have time): The complex version: Database, chunks, embedding, retrieval, evaluation, testing of the RAG, API connection, front-back end, feedback, logging, roll-out, training, support
- (00:45) Task 16 - Testing the KEECZ RAG
    - Open your schedule
    - We divide the work into six groups - parallel to my lecture
    - Count 1-2-3-4-(5) - You are one group
    - Group a-f opens the file with the corresponding letter a-f
        i. Task 16 - Slide 16a - Avoiding poor nutrition in the canteen Link: **NN**
        ii. Task 16 - Slide 16b - Promoting more organic meals Link: **NN**
        iii. Task 16 - Slide 16c - Reducing bakery waste Link: **NN**
        iv. Task 16 - Slide 16d - Reduce electricity consumption Link: **NN**
        v. Task 16 - Slide 16e - Reduce food waste in supermarkets Link: **NN**
        vi. Task 16 - Slide 16f - Packaging – disposable or reusable? Link: **NN**

- ○ After I have presented all six topics, you have 20 minutes to complete the questionnaire.
- ○ Use the RAG "BBnE" with the following link: *Chat GPT - The BBnE-RAG*
- ○ Present your result to the group
    - i. Link to folder for lecturer: *https://tinyurl.com/2dcerzjw*
    - ii. Link for lecturer - all answers: *https://tinyurl.com/27njazm4*