IL142-15 Effective Decision-Making

24/25

Department
Institute for Advanced Teaching and Learning
Level
Undergraduate Level 3
Module leader
Miryana Grigorova
Credit value
15
Module duration
10 weeks
Assessment
Multiple
Study location
University of Warwick main campus, Coventry

Description

Introductory description

Would you like to enhance your decision-making skills? Have you wondered what makes a decision defensible? Or which areas of our brain are activated when we make decisions? Are you curious about the connections between decision-making and Shakespeare's plays? Would you like to learn about decision-making under uncertainty?
If you have answered positively to some of these questions, then join us on this engaging module.

This interdisciplinary module aims to equip students with the necessary knowledge and skills to make effective decisions in various contexts. Drawing on concepts, theories, and approaches from multiple disciplines such as probability and statistics, design engineering, psychology and economics, risk management, sociology and social work, chemistry and neuroscience, environmental science, translation and language studies, theatre and drama, the module will explore different decision-making models and strategies. The module provides space for teamwork and learning from one's peers. It is suitable for students from all faculties: the Faculty of Arts, the Faculty of Social Sciences, and the Faculty of Science, Engineering, and Medicine.
It will give you an opportunity to enhance your critical thinking and your ability to make effective informed decisions, to broaden you vision and understanding, and to develop key problem-solving skills, which will benefit you through your life and career.

Module aims

Introduce learners to up-to-date processes, methodologies, and applications for informed, responsible, effective decision making in various settings.

Provide learners with a skill-set to become well-informed, effective, and confident decision-makers, enabling them to assess and compare alternative scenarios and strategies: from what time to go to bed to how to make the world a better place.

Empower learners to deal with real-world complex problems in increasingly uncertain environments.

Outline syllabus

This is an indicative module outline only to give an indication of the sort of topics that may be covered. Actual sessions held may differ.

This is an indicative list. Actual weeks and sessions might differ.

Each week is structured in the following manner:
-a regular two-hour workshop/seminar session per week that the students must attend;
and
-a one-hour lecture a week which the students can attend in person or watch remotely via lecture capture.

The module explores decision-making from multiple angles.
Each week of the module builds upon the previous weeks, gradually broadening and deepening the learners' understanding of the complexities and intricacies of decision-making processes, and providing them with a range of tools, methodologies, and perspectives which they can integrate in their decisions in various contexts.
The module includes quantitative and qualitative insights.
Examples and explanations relating to the students' existing knowledge and interests will make the quantitative concepts accessible to students from any of the three Faculties of the University. This approach will help the students understand and relate to the studied material.

Week 1: Introduction to Decision Making & Fundamental Tools
(Contributors Yudhi Ariadi and Miryana Grigorova)

Overview of the module and of decision making.
Introduction to Pros-Cons Analysis.
Introduction to strengths, weaknesses, opportunities, and threats analysis (SWOT analysis), a strategic analytic tool applicable to projects, organisations, and individuals.

Activities:
Simple decision scenarios using Pros-Cons Analysis.
SWOT Analysis of a case study.

Week 2: Analytical Tools for Decision Making
(Yudhi Ariadi and Miryana Grigorova)

Week 2 expands on analytical tools for decision-making, introducing Decision Trees and Cost-Benefit Analysis as tools aiding in decision-making.

Activities:
Developing a Decision Tree for a given problem.
Applying Cost-Benefit Analysis to a project.

Week 3: Enhancing Product and Process Quality.
Creative Approaches to Decision Making
(Contributor: Yudhi Ariadi)

Session 1: Enhancing Product and Process Quality.

Introduction to Quality-Cost-Delivery (QCD).
Introduction to Fishbone Diagram.

Session 2: Creative Approaches to Decision Making
Introduction to Design Thinking.
Introduction to the Theory of Inventive Problem Solving (TRIZ).

These creative approaches provide learners with supplementary methods for decision-making and problem-solving.

Activities:
Analysing a process using QCD metrics;
Identifying root causes of a problem using Fishbone Diagram;
Prototyping a solution using Design Thinking principles;
Solving a problem using TRIZ methodology.

Week 4: Defensible Decisions. Decision Making in the Brain.

In week 4, we will broaden our understanding of the factors which may have an impact on our decisions, and
of the impact our decisions may have.

Session 1: Defensible decisions (Guest Speaker: Andrew Gambrill)

The guest speaker will provide insights from social science and social work on the topic.
What makes a decision “defensible”?
What is a decision process from the social sciences perspective?
Do we need to record the rationale behind our decisions? Why?

Session 2: Decision Making in the Brain (Guest Speaker: Dr Bora Karasulu)

Overview of the biochemical processes that control and regulate the decision-making process in mammals, addressing some questions like:

- What brain chemicals, e.g., dopamine, governs decisions about actions?
- Can we identify the regions of neural activity in the brain when a decision is being made?
- How can we study decision making in the lab using state-of-the-art neuroscience tools?

Week 5: Advanced Analytical Tools. Global challenges.

In week 5, we will further enhance our problem-solving skills, by taking a closer look at decision-making under uncertainty and decision-making for global challenges.

Session 1: Tools from data analysis, probability, statistics, and economics (Miryana Grigorova)

The session will include some illustrative examples of uncertainty in decision making from psychology, behavioural economics, risk management. We will then focus on some useful theories and techniques from probability, statistics, and decision theory in economics (Expected utility theory, regret theory, prospect theory,…), as well as on some techniques from data analysis.

Session 2: Decision-Making for Sustainable Development (Guest Speaker: Dr Simoni Da Ros)

This session will explore the multifaceted concepts of sustainability and how the use of environmental metrics can guide decision-making for contributing to the achievement of sustainable development goals. The session will also present an introduction to life cycle assessment, providing learners with the skills and knowledge to apply the methodology in everyday life cycle decisions.

Further reading (or pre-session reading): The following resource introduces life cycle assessment and illustrates its application in the comparison of takeaway containers:

Royal Society of Chemistry: Life Cycle Assessment https://www.rsc.org/globalassets/22-new-perspectives/sustainability/progressive-plastics/explainers/progressive-plastics-explainer-8---life-cycle-assessment.pdf

In week 5, the students may choose one or both of the following optional activities:

Activity A. Group work: Modelling situations involving uncertainty appearing in your areas of interest.

Activity B. Computer session on Data Visualization (based on various data sets).

Week 6: Shakespeare and Decision Making
Guest speaker: Oliver Turner

In week 6, we will further broaden our understanding of the factors which may have an impact on our decisions, and of the impact our decisions may have, now by bringing in some insights from drama and the theatre.

This session gives the students insights into connections between decision making and drama.

How does Shakespeare articulate and explore indecision, difficult choices and the best courses of action?

Exploration of key moments/quotations in Shakespeare plays, and how they might link to contemporary notions of decision making.

Week 7: Divergent Thinking in Decision Making.
Decision making and translation studies.

In week 7, learners will be further encouraged to consider alternative perspectives when making decisions.

Session 1. Divergent thinking in Decision making (Yudhi Ariadi)

Introduction to Six Thinking Hats

Activity: Group discussion using Six Thinking Hats.

Session 2. Translation as decision-making and making decisions about translation in society (David Orrego-Carmona and Caroline Summers, Guest speakers from the department of Translation studies).

The session delves into the multifaceted realm of decision-making and agency within the translation process. In an increasingly interconnected world, translation has become an integral part of everyday life, whether or not users are consciously aware of it.

The session revisits key works in translation studies that conceptualise producing translations as a decision-making process and contrasts this with the probabilistic approaches embedded in automated machine translation processes. In the current landscape, the session scrutinises automated decision-making in neural machine translation (NMT) and large language models (LLMS) shedding light on the evolving role of technology in shaping translation choices.

Considering human-machine cooperation, the session will explore the connection between decision-making and authorship. This is particularly pertinent within the human-computer interaction framework, prompting an assessment of the evolving dynamics of creativity and control in translation. Finally, the discussion will emphasise individual decision-making related to users of translation in society and navigate the complex interplay between human agency and technological advancement.

Week 8-9: Integrative Workshops

In these weeks, students will be divided into groups, and each group will be given a complex interdisciplinary problem to study, or will devise/propose a complex problem to study. They will need to use a combination of the methodologies, tools, theories, approaches, and perspectives encountered in the module to understand the problem and to propose a solution.

Week 10: Presentations and Reflection

Session 1:

Group presentations: Students present their work, discussing which methods they used and why ,and reflecting on which methods and approaches they did not use, and why.

Session 2:

Course reflection: Discussing the applicability of various methods and potential integrations.

Feedback and closure.

Learning outcomes

By the end of the module, students should be able to:

- Select and apply appropriate methodologies, theories, and approaches, while questioning their assumptions and developing awareness of their limitations.
- Identify, analyse, and evaluate relevant information taking into account limited and/or uncertain data to make informed decisions.
- Design suitable approaches to generate solutions of complex problems in a dynamic context.

- Assess and compare alternative scenarios and strategies.
- Interpret outcomes, reflecting on past decisions to improve/optimise future decisions.
- Interact, collaborate and communicate on decision making processes within a group context.

Indicative reading list

This is an indicative non-exhaustive list.

1. De Bono, E. Six thinking hats. Penguin life, 2000. (Available via Warwick library) https://www.vlebooks.com/Product/Index/1251760?page=0&startBookmarkId=-1
2. Goebes, L. Better understanding of decision making under risk: An interdisciplinary approach (2016), PhD thesis, University of Karlsruhe
3. Kahneman, D. Thinking, Fast and Slow. Penguin, 2011. https://go.exlibris.link/9NpvjbNc
4. Kahneman, D., and A. Tversky. (1979) Prospect theory: An analysis of decision under risk. Econometrica 47(2), 263–291
5. Klöpffer, W., and B. Grahl. Life Cycle Assessment – A guide to best practice, Wiley, 2014. (Available via Warwick library https://go.exlibris.link/F4YDqkHj)
6. Newman, D., Sather, T., and B. Woolgar. Pros and Cons: A Debaters Handbook, Edition19th , 2013. (Available via Warwick library) https://www.taylorfrancis.com/books/mono/10.4324/9781315886039/pros-cons-ben-woolgar-debbie-newman-trevor-sather
7. Quiggin, J. (1982) A theory of anticipated utility. Journal of Economic Behavior & Organization 3(4), 323–343
8. The SWOT Analysis: A key tool for developing your business strategy (Management & Marketing Book 21), 2015.
9. Womack, J.P., and D.T. Jones. Lean Thinking. Banish Waste and Create Wealth in Your Corporation. New York, NY: Free Press. (Available via Warwick library) https://ebookcentral.proquest.com/lib/warw/detail.action?docID=5737175

Research element

Research aspects are embedded in the module in a mostly student-centred and student-led way. These include: brainstorming and topic/problem selection; searching, reviewing, and summarizing relevant sources of information depending on the problem and on the students' disciplinary background ; drawing conclusions; communicating conclusions in writing and orally. We will provide opportunities for students to choose their preferred research methods and/or presentation styles.

The students will also have the opportunity to engage and interact with researchers from various disciplines.

Interdisciplinary

The interdisciplinary and transdisciplinary components of this decision-making module work together to ensure broad understanding of decision-making and to foster collaboration.

Interdisciplinarity: students will integrate knowledge, approaches, and ways of thinking from

different disciplines. By bringing together perspectives from various disciplines, the module ensures a rich approach to decision-making.

Transdisciplinarity: the module goes beyond the boundaries of individual disciplines to create connections and collaborations. The module involves students and academics from numerous departments, who will bring their perspectives, expertise, and experience to the decision-making process. By fostering collaboration and integrating different viewpoints, transdisciplinary approaches have the potential for leading to more inclusive, effective, and sustainable decision-making outcomes.

International

There are international aspects within this module: the students will gain understanding of decision making within a global context and for global challenges. Through engaging with case studies, guest lectures and lecturers, and interactive discussions, students will gain insights into the complexities of decision making in a diverse cultural context.

Subject specific skills

Critical thinking: by incorporating various disciplines, students are exposed to multiple perspectives when approaching complex decision-making situations; this diverse range of viewpoints encourages critical thinking by challenging learners to analyse and evaluate information from different angles, to weigh various options, to consider multiple solutions, while being aware of their limitations and their implications.

Appreciation of the value of adopting interdisciplinary approaches for understanding global challenges and topics within one's disciplines.

Cross-disciplinary knowledge, understanding of the basic concepts and principles of multiple disciplines in their relation to decision-making.

Reflective thinking via reflection on one’s own decision making processes.

Analysis of information from multiple sources, modelling.

Negotiation and Communication.

Transferable skills

Identifying transdisciplinary issues: recognising problems or topics that lie at the intersection of two or more disciplinary fields.

Critical thinking: critically analysing information, appreciation of different perspectives, and evaluation of the pros and cons of different options.

Problem-solving skills: the module allows to build problem-solving skills by introducing tools, methods, approaches, ways of thinking, and perspectives from various disciplines, which are progressively integrated and connected into a comprehensive understanding of decision-making. The practical applications allow the learners to approach and tackle complex problems in various

situations.

Recognising the importance of effective collaboration and team effort with peers from different disciplines

Communication.

Adaptability through exposure to different disciplines, perspectives, and approaches to decision-making, adapting to new information, ideas, and ways of thinking.

Time management through setting priorities, allocating time effectively, and meeting deadlines.

Self-reflection.

Study

Teaching split

Provider	Weighting
School of Engineering	20%
Statistics	20%
Academic Development Centre	12%
Centre for Lifelong Learning	12%
Chemistry	12%
School of Modern Languages and Cultures	12%
WMG	12%

Study time

Type	Required
Lectures	10 sessions of 1 hour (7%)
Seminars	10 sessions of 2 hours (13%)
Private study	75 hours (50%)
Assessment	45 hours (30%)
Total	150 hours

Private study description

Private study hours for this decision-making module are dedicated hours for students to independently review and consolidate their learning.
These include also preliminary reading and preparation for the guest lectures where and when needed,
and self-directed study.

Costs

No further costs have been identified for this module.

Assessment

You do not need to pass all assessment components to pass the module.

Assessment group A

	Weighting	Study time	Eligible for self-certification
Individual written reflection	60%	30 hours	Yes (extension)

An individual written reflection comprising of:
-short individual reflection on your learning and individual progress in each week;

- reflection on the group project;
- reflection on how specific insights from one’s own discipline can be used to enhance one or more aspects of the group work.
  The three elements have to be addressed in this written piece of work.

Viva presentation	40%	15 hours	No

A viva presentation, where each student of the group presents part of the group work.
As an example, for a group of 5 students, each student will have 5 minutes of presentation time. The overall duration of the presentation of the group will be 25 minutes, followed by questions (approx. 15 minutes).
The individual mark for the presentation will be based on your 5 minutes' presentation and your answers to questions.
The collective (group) component of the mark for the presentation will be based on the way the different individual contributions fit together in creating a consistent and meaningful whole.
The split in the final mark for the presentation will be 50% individual component and 50% group component.

Assessment group R

	Weighting	Study time	Eligible for self-certification
Individual written reflection	60%		Yes (extension)

An individual written reflection comprising of:
-short individual reflection on your learning and individual progress in each week;

- reflection on the group project;
- reflection on how specific insights from one’s own discipline can be used to enhance one or

	Weighting	Study time	Eligible for self-certification

more aspects of the group work.
The three elements have to be addressed in this written piece of work.

Individual Presentation	40%	No

Individual Presentation followed by questions.
The duration of your presentation should be approximately 5 minutes.

Feedback on assessment

Written feedback.

Verbal feedback.

Self-reflection.

Availability

There is currently no information about the courses for which this module is core or optional.