

FRAMEWORK PROGRAMME OF EARLY STAGE RESEARCHER TRAINING¹

1. BASIC DATA

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Research programme (RP) leader's name and surname:	Polona Tominc	RP leader's register number at ARIS (SICRIS) :	10504
Title of research programme:	Entrepreneurship for Innovative Society	RP's Register number at ARIS (SICRIS) :	P5-0023
Research organisation (RO) of University of Maribor, where training shall be conducted:	Faculty of Economics and Business	RO Register number at ARIS (SICRIS) :	0585
Research field according to ARIS classification :	5. Social Studies 5.02 Economics	Research field according to EURAXESS classification	Economics

2. DEFINITION OF RESEARCH PROBLEM AND GOALS OF DOCTORAL RESEARCH²

Starting point of research task of the early stage researcher and its position in the research programme, where the mentor is included, work hypothesis, research goals and foreseen result with emphasis on an original contribution to science:

Proposed Topic of the Research Programme

Entrepreneurial Decision-Making Supported by Generative Artificial Intelligence: Trust Calibration, Uncertainty Judgement, and Decision Quality in Business Opportunity Evaluation

Research Problem

The young researcher's programme is positioned in the field of entrepreneurship and integrates selected approaches from behavioral decision-making and digital transformation in order to develop

¹ Term early stage researcher (ESR) is written in male form and used as neutral for women and men.

² Research and study programme of training have to harmonise with contents of the research programme, where the mentor is a member.

an in-depth understanding of how generative artificial intelligence (AI) influences entrepreneurial decisions. The programme builds on the observation that generative AI is rapidly becoming accessible to a broad range of users (including smaller organisations and entrepreneurial teams) and is increasingly used to generate recommendations, structure information, and create decision alternatives. At the same time, this increases the risk of inappropriate reliance on AI (overreliance) or the rejection of useful recommendations (underreliance), which may lead to inferior decisions—particularly in contexts characterised by high uncertainty, time pressure, and limited resources.

Generative AI and advanced analytics represent an important accelerator of firms' digital transformation. In entrepreneurship, AI is applied across a variety of domains—from market and customer analysis to financial scenario development, process optimisation, and support for sales activities. However, empirical findings on AI's effects remain mixed, as outcomes are strongly context-dependent: they vary with the type of decision, the level of uncertainty, data quality, digital competences, organisational culture, and process maturity. A particularly relevant risk occurs when a user attributes excessive authority to AI, overlooks limitations and uncertainty, and consequently makes a lower-quality decision.

In entrepreneurial contexts, this problem is even more pronounced because decisions are often made quickly, with incomplete information, and with significant consequences for the further development of an idea or project. Therefore, the central research question of the programme is the following: when does AI truly improve the quality of entrepreneurial decisions, and when does it—through miscalibrated trust and distorted uncertainty judgement—worsen decision-making?

The key research gap is methodological. Entrepreneurship research is still dominated by survey designs and self-reported measures, which makes it difficult to explain decision-making mechanisms reliably. To genuinely understand the effects of AI, subjective assessments must be complemented with experimental and behavioural measurements, and the way AI is used must be linked to the actual decision outcome. The newly established EPF laboratory infrastructure enables such a shift towards evidence-based entrepreneurship research.

However, a classical laboratory approach in entrepreneurship has an important limitation: access to a large number of entrepreneurs or experienced decision-makers is realistically difficult, response rates are low, and additional ethical and organisational barriers occur. For this reason, the programme is built on a two-part empirical design: (1) an in-depth experimental study with a smaller sample of real-world decision-makers (primarily from SMEs), and (2) a large-scale factorial vignette experiment embedded in a survey, providing statistical power, robustness of results, and the possibility to test moderating effects.

The programme's research core focuses on one key phase of the entrepreneurial process: business opportunity evaluation and the decision about further development (go/no-go). This phase is pivotal, repeatable, and methodologically suitable for experimental simulations.

Research Content

The purpose of the research is to explain how AI-based decision support at a specific moment in the decision process influences business opportunity evaluation, and which factors determine whether such support leads to improved decisions or increases the risk of bias and inappropriate reliance.

The research draws on a combination of entrepreneurship and organisational theories, as well as behavioural decision-making theories. The programme builds on the perspectives of entrepreneurial cognition and bounded rationality, which explain decision-making under uncertainty, the use of heuristics, and vulnerability to biases. Theories of trust in automation and human–AI interaction introduce the central concept of trust appropriateness (trust calibration)—that is, the degree of alignment between the quality of AI support and the user's reliance on it. Organisational perspectives (e.g., dynamic capabilities and absorptive capacity) provide a broader interpretative lens for understanding how individual decision-making patterns translate into organisational AI implementation practices.

To ensure feasibility and research strength at the doctoral level, the programme intentionally does not treat AI as support across the entire entrepreneurial process. Instead, it analyses AI assistance within a clearly delimited phase—business opportunity evaluation. This phase represents a critical turning point in entrepreneurship (resource allocation, investment of time and money, strategic direction) and is suitable for realistic simulations and repeatable experimental scenarios.

The research focuses on the (potential) entrepreneur or decision-maker as the agent of decision-making. Key micro-mechanisms shaping decision outcomes in AI-supported contexts will be examined:

- how participants process AI information (attention to recommendations, explanations, and uncertainty displays),
- how they evaluate the quality of AI recommendations and develop (appropriate) trust,
- how AI influences perceived uncertainty, decision speed, and confidence,
- how overreliance or underreliance patterns emerge and under which conditions.

In both empirical studies, participants will evaluate business opportunities (go/no-go). AI is introduced as decision support at the moment of judgement, and AI recommendations will be compared: (a) with or without explanations, and (b) with or without explicit uncertainty presentation.

The programme will also account—within a limited scope—for broader contextual and individual factors (digital competences, experience, tolerance for uncertainty), but exclusively as moderating variables explaining heterogeneity in AI effects. This keeps the research core sufficiently focused for a doctoral project while maintaining relevance for practice.

Methodology

The research will be conducted using a combination of experimental and quantitative approaches, designed as a methodologically coherent whole. The empirical core consists of a laboratory-based study investigating entrepreneurial decision-making with AI support in a specific moment of opportunity evaluation under controlled conditions. Since collecting a large entrepreneurial sample is not realistically feasible, the research will be complemented by a large-scale factorial vignette experiment that retains experimental logic (randomised manipulations) and provides higher statistical power.

Contextual Analysis of Secondary Data

In the initial phase, a contextual analysis of Global Entrepreneurship Monitor (GEM) secondary data will be conducted as an international framework for understanding early-stage entrepreneurial processes and the conditions under which business opportunities emerge and are evaluated. The analysis will focus on comparing Slovenia with selected comparable countries and will be based on key early-stage entrepreneurship indicators (e.g., perceived opportunities, perceived capabilities, fear of failure, entrepreneurial intentions, and early-stage entrepreneurial activity—TEA). The purpose of this analysis is not to establish an additional empirical pillar, but to provide a solid contextual foundation for selecting the opportunity evaluation (go/no-go) phase as the central decision moment in the doctoral research. The GEM results will be used for: (1) positioning the research problem in a broader national and international context, (2) informing the design of realistic opportunity evaluation scenarios, and (3) interpreting empirical findings from both studies. Where data availability permits, special attention will also be paid to indicators linked to digitalisation and the role of AI in entrepreneurship.

Study 1: In-Depth Micro-Experiment with Real-World Decision-Makers (Primarily SMEs)

Population and rationale. The subjects of the experiment are real-world decision-makers with experience in evaluating business opportunities (founders/entrepreneurs, owners, project managers, or functional managers involved in go/no-go decisions). The sample will be purposively selected and recruited through realistic channels: partner companies of the faculty, existing professional networks,

and direct contacts (N = 10–20). The aim is not statistical representativeness, but a deeper understanding of decision mechanisms in realistic entrepreneurial contexts.

Experimental task and AI role. The experiment will be based on short, realistically designed business opportunity evaluation scenarios in which participants decide whether to proceed with further development (go/no-go) and, if relevant, choose among alternatives. AI acts as decision support at the moment of judgement and provides a structured recommendation, while the following characteristics of AI support will be systematically manipulated:

- whether the AI provides a clear explanation of key arguments,
- whether the AI explicitly presents uncertainty (data limitations, risks, and alternative scenarios).

This design positions AI as “pure” decision support, directly aligned with the research questions on trust and uncertainty and suitable for experimental testing.

Testing procedure and organisation. Testing will use a within-subject design: each participant will solve 4–6 opportunity evaluation scenarios, with AI-support conditions systematically alternating across scenarios (explanation: yes/no; uncertainty: yes/no). This increases the informational value of the data even with a small number of participants.

The test procedure will follow these steps:

1. informed consent and a short entry questionnaire (basic demographics, decision experience, AI experience),
2. instructions and an example task (to ensure standardised understanding),
3. scenario solving: for each scenario, the participant reviews the opportunity description, receives the AI recommendation (in the assigned variant), and makes a decision,
4. after each scenario, a short set of questions (go/no-go, uncertainty rating, confidence, reliance on AI, perceived trust),
5. a short retrospective explanation (“what was decisive” and “how AI influenced the decision”),
6. completion, debriefing, and acknowledgement.

To ensure experimental control, AI recommendations will be prepared and standardised in advance (participants will not use a “live” ChatGPT system in real time), enabling comparability and preventing results from changing due to stochastic variability in AI outputs. Scenarios and the “correctness/appropriateness” of decisions will be validated in advance via expert judgement (e.g., 3–5 practitioners or mentors), enabling a more objective measurement of decision quality.

Measures and data capture. The study will measure: (1) decision outcome (go/no-go; alternative selection), (2) decision quality (against a pre-validated benchmark), (3) decision time, (4) decision confidence, (5) perceived trust in AI and reliance on AI, (6) perceived uncertainty and risks, and (7) short process explanations (retrospective). Where feasible and meaningful given the scope, laboratory equipment for attention and cognitive load tracking (e.g., eye-tracking and basic biometrics) will be used to link AI elements (recommendation/explanation/uncertainty) with information processing patterns.

The experiment will be designed to be time-efficient (25–35 minutes per participant), organisationally flexible (individual appointments), and free from the need to disclose sensitive business information.

Study 2: Large-Scale Factorial Vignette Experiment Embedded in a Survey

Purpose and role within the research design. The second empirical component provides statistical power and enables robustness testing of AI-support effects. Instead of a conventional survey on

attitudes toward AI, a factorial vignette experiment will be used, maintaining experimental logic: participants make decisions in short scenarios while AI-support attributes are randomised.

Vignette study design. Each participant will complete multiple short decision-making scenarios of business opportunity evaluation (2–4 vignettes per person). In each vignette, AI will provide a recommendation, while the same key dimensions as in Study 1 will be varied (explanation of recommendation; uncertainty presentation). This ensures methodological alignment between the studies and enables integration of results.

The vignette experiment will be administered via an online survey tool that supports randomisation and controlled scenario assignment. Participants will receive a sequence of vignettes, and the system will randomly assign which AI recommendation variant they receive (with/without explanation; with/without uncertainty). After each vignette, participants will answer the same key questions as in Study 1 (decision, uncertainty, confidence, AI reliance), without the longer qualitative component to ensure feasibility of large-scale data collection.

Sample and feasibility. The large sample ($N > 200$) will primarily consist of students (graduate and undergraduate programmes), as recruitment is feasible, response rates are high, and data collection is time-efficient. The programme explicitly acknowledges that students are not substitutes for entrepreneurs, but enable testing of fundamental mechanisms of AI trust and uncertainty judgement in a broader population of future decision-makers. Where possible, a smaller supplementary sub-sample of entrepreneurs or practitioners will be added to strengthen external validity, though it will not be a prerequisite for feasibility.

Measured variables. In addition to decisions and confidence, the study will measure: (1) perceived usefulness of AI, (2) perceived trust, (3) tolerance for uncertainty, (4) digital literacy, (5) decision-making experience, and (6) baseline risk profiles. This enables moderation testing (e.g., who is more prone to overreliance) and the development of segmented recommendations.

Integration of the Two Empirical Components

Both studies form a coherent research design based on the principle of combining depth and breadth. They use the same decision task (opportunity evaluation) but differ in population and purpose: Study 1 enables mechanism explanation in real-world practice, while Study 2 tests robustness on a large sample and enables moderation analyses. Together, they allow triangulation of evidence and the development of an AI decision-support model that is scientifically grounded and practically applicable.

Data Analysis

Data analysis will rely on advanced statistical approaches tailored to each study's design. For Study 1, repeated-decision within-person analysis will be applied to compare the effects of AI-support characteristics even with a small sample. Retrospective explanations will be analysed using thematic analysis to interpret quantitative findings and identify typical patterns of overreliance and underreliance.

For Study 2, regression and mixed-effects models (multiple vignettes per participant) will be applied to estimate main effects (explanation, uncertainty) and interactions with individual characteristics. Where appropriate, mediation and moderation models will be included, as the objective is to explain how AI shapes decisions through trust and perceived uncertainty. Special attention will be given to ethics and data protection, including informed consent, anonymisation, data minimisation, compliance with GDPR, and adherence to internal regulations of the University of Maribor.

Work Plan

The work plan is organised into phases enabling gradual progression from instrument development to empirical validation and dissemination.

The first year will focus on developing the conceptual framework, precise operationalisation of constructs, and scenario development for both studies. A pilot phase will be conducted to test vignette clarity, the adequacy of AI-support manipulations, and the feasibility of the experimental protocol.

Ethical documentation will also be prepared. The first year will include the contextual GEM secondary data analysis for Slovenia and selected comparable countries to support international positioning of early-stage entrepreneurial processes and scenario development for opportunity evaluation.

The second year will constitute the empirical core. Study 1 will be conducted with real-world decision-makers (N = 10–20), with an emphasis on process-based explanation and the identification of trust patterns in AI. In parallel, Study 2 will be implemented as a large-scale vignette experiment to generate sufficient data for robust testing of effects.

The third year will focus on advanced analyses, integration of findings, preparation of scientific publications, and completion of the doctoral dissertation. In the final phase, results will also be translated into applied guidelines for entrepreneurial practice (including SMEs) regarding responsible and effective AI use in business opportunity evaluation.

Expected Results and Contributions

The research will contribute to the development and empirical validation of a model of AI-supported entrepreneurial decision-making focused on a specific, experimentally manageable moment in opportunity evaluation. The key scientific contribution will be an explanation of how AI-support characteristics (recommendation explanations and uncertainty presentation) influence decision quality and trust calibration, and for which user profiles the risk of overreliance is particularly pronounced. The methodological value will lie in standardised scenarios and protocols enabling replicable research on entrepreneurial decision-making in interaction with AI.

At the applied level, findings will be translated into concrete recommendations for entrepreneurial practice (including SMEs): how to design AI decision support to structure information effectively, communicate uncertainty clearly, and reduce risks of uncritical following. Special emphasis will be placed on decision practices that can be implemented without high costs (e.g., verification standards, alternative displays, warnings, and decision “checkpoints”). Results will also be relevant for support institutions and policymakers by enabling more targeted interventions to increase AI absorptive capacity.

Institutionally, the programme will contribute to effective utilisation of the EPF UM laboratory infrastructure and to developing research competences in experimental design, advanced analytics, and responsible data use. The findings will also be transferable into teaching, supporting the development of modern case materials, laboratory exercises, and course content related to AI in entrepreneurship.

3. STUDY PROGRAMME

Foreseen study programme, to which early stage researcher shall be enrolled in academic year 2026/2027:

3rd level study program »Economics and Business Sciences«, University of Maribor, Faculty of Economics and Business

4. DESCRIPTION OF WORK AND TASKS

Implements projects of scientific and research work.

Participates in the design of research programs.
The cooperates professionally with clients of research assignments.
Prepares research reports and studies.
Monitors and coordinates research work in accordance with funding agreements.
Take care of safe and healthy work.
Organizes and instructs employees and students on the use of personal protective equipment and other safety measures.
Performs other related tasks as directed by the supervised employee.
Participates in working and standing commissions of UM bodies and members or other members.
Replaces co-workers and supervisor in his absence (by proxy).
Participates in annual and other stock-taking.
Performs other related work on behalf of superiors.

5. REQUESTED LEVEL OF EDUCATION

VII / 2. tariff group

6. REQUESTED FIELD OF EDUCATION

Economics, social sciences, engineering

7. KLASIUS SRV

Seventh level: Second cycle of higher and similar education / Second cycle of higher and similar education

8. KLASIUS P

0488 – Inter-disciplinary programmes and qualifications involving business, administration and law
0788 - Inter-disciplinary programmes and qualifications involving engineering, manufacturing and construction

9. REQUESTED KNOWLEDGE

Computer skills: MS Windows, Word, Excel, Internet, e-mail, e-business, statistical analysis tools in business sciences

10. REQUESTED SPECIAL REQUIREMENTS

/

11. REQUESTED LANGUAGES

Knowledge of at least one global foreign language

12. REQUESTED WORK EXPERIENCE

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13. FORESEEN POSTDOCTORAL TRAINING

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Mentor's signature:



Research programme leader's signature:

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Name and surname of Dean or
authorised person³:

Prof. dr. Polona Tominc

Signature of dean or authorised person:

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³ The training program is signed by the dean of the member where the ESR's employment and training will take place.