# Milestone 3: Research Methodology

### Determine whether the research aim, hypothesis and questions previously proposed need to be revised.

The research aim remains appropriate, maintaining its focus on exploring the effectiveness of Augmented Reality (AR) technology in enhancing cooking skills and boosting confidence in the kitchen, particularly for beginners. However, the hypothesis has been revised to reflect the current technical constraints. Specifically, the project will not include real-time guidance features—such as visually demonstrating how to cut an onion through a user interface in the AR display—due to limitations in AR functionality without the use of a dedicated VR headset.

### Propose a pipeline/plan for your research and prepare an illustration. Some sort of experimentation is needed for evaluation purposes. Use your early literature review as inspiration for candidate pipelines in your chosen subject area.

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| Phase 01: Initial Research and Setup | Phase 02: Data Acquisition | Phase 03: Experimentation | Phase 04: Evaluation | Phase 05: Improvements |
| 1.1 – Topic selection  1.2 – Literature Review  1.3 – System Setup | 2.3 – Requirement Mapping  2.1 – User Research  2.2 – Task Analysis | 3.3 – Focus Definition  3.2 – Feature Review  3.1 – Prototype design | 4.3 – Identify Gaps  4.2 – User Feedback  4.1 – Usability Testing | 5.1 – Improvement Research  5.2 – Prototype Update  5.3 – Final Review |

Phase 01: Initial Research and Setup

*Lays the groundwork for the project by identifying the topic, reviewing existing literature, and preparing development tools.*

* 1.1 Topic Selection – Select the core research topic focused on AR’s role in enhancing beginner cooking skills.
* 1.2 Literature Review – Review existing studies and technologies that apply AR in education and culinary training.
* 1.3 System Setup – Set up development tools and frameworks required for building the AR prototype

Phase 02: Data Acquisition

*Gathers user needs and analyses cooking activities to define relevant features for the AR prototype.*

* 2.1 User Research – Gather insights from students who do not have substantial experience in cooking activities to identify common challenges and learning needs.
* 2.2 Task Analysis – Analyse basic cooking tasks to determine which are best supported by AR instructions.
* 2.3 Requirement Mapping – Translate findings into technical and user experience requirements for the AR prototype.

Phase 03: Experimentation

*Involves developing, reviewing, and refining the initial prototype based on feasibility and research directions.*

* 3.1 Prototype Design – build an initial AR interface to support basic cooking guidance trough overlays and prompts.
* 3.2 Feature Review – Compare with similar AR tools and identify realistic features to implement withing limitations.
* 3.3 Focus Definition – Define the research scope, excluding complex real-time features not feasible without VR gear.

Phase 04: Evaluation

*Tests the prototype with users and gathers feedback to measure effectiveness and identify areas for improvement.*

* 4.1 Usability Testing – Observe users interacting with the prototype to assess ease of use and learning impact.
* 4.2 User Feedback – Collect feedback to understand strengths, weaknesses, and areas for enhancement.
* 4.3 Identify Gaps – Document limitations in design, functionality, and technology use that affect learning effectiveness.

Phase 05: Improvements

*Focus on refining the prototype and preparing it for final review based on user feedback and research findings.*

* 5.1 Improvement Research – Investigate feasible ways to address identified limitations using available tools.
* 5.2 Prototype Update – Integrate feedback-based changes to improve the AR cooking assistant experience.
* 5.3 Final Review – Conduct a final evaluation and summarize limitations, strengths, and future enhancement opportunities.