BEST PRACTICES FOR CREATING AND USING THE MODEL IN EACH STEAMCITY PROTOCOL

Co-funded by the European Union

Model the city to help students understand its issues and contextualize their learning

Citizen engagement, governance and data

Protocol	Field implementation with model	Educational facilitation
Urban Detective Challenge	Test crisis management solutions on a model to illustrate your ideas. Use the city in the model as a support for crisis situations and propose solutions that take into account the spatial dimension.	Experience crisis management in a controlled environment. Understand the spatial impact of emergency decisions. Develop systems thinking.
Data vs. Context	Use the city model to prepare the data hunt in the city by identifying the locations potentially containing the most data.	Secures field trips through methodical preparation. Provides structured debriefing support. Materializes the invisible geography of urban data.
FactBusters - Deciphering the truth from the lies	Map areas of trust/distrust based on the quality of information. Visualize the spread of rumors in the area. Compare information sources with local reality.	Materializes the geography of information. Understands the spatial spread of rumors. Develops critical territorial thinking.
Bot Buddy Adventure	Validate the relevance of the chatbot's recommendations on a physical route. Test different user profiles (PMR, tourists) on the model. Identify potential physical points of interest connected to the chatbot.	Transforms abstract digital experience into concrete usability testing. Develops empathy for urban navigation challenges.
The AI Odyssey	Plan the route using the model by first identifying the areas to be explored. Practice sensor recognition on the model before the outing. Create positionable sensor/station miniatures, then use them to locate the observed urban sensors.	Secures field trips through methodical preparation. Provides structured debriefing support. Materializes the invisible geography of urban data.

Environment, well-being and public health

Protocol	Field implementation with model	Educational facilitation
Decibel Detectives	Create a classroom model with variable acoustic materials. Use controlled sound sources and modular spaces. Identify optimal acoustic configurations.	Understands the direct influence of the physical environment on learning. Allows experimentation with configurations not possible in a real classroom
Birdsongs AI Explorer	Identify promising observation areas based on the model's vegetation. Place speakers emitting songs; the autonomous agent detects birds. Compare field results with the model's predictions.	Develops the scientific hypothesis and experimental validation. Creates a controlled acoustic environment. Visualizes the urbanization/biodiversity relationship.
The Guardians of the Flowers	Use sensitive mapping to identify priority observation areas. Create modular green spaces, use 3D printed pollinators. Report field observations with physical elements.	Structures naturalist observation. Visualizes the urban ecosystem. Understands the impact of development on pollination.
Light vs. Zzz	Identify areas of tension and noise in the neighborhoods where students move around and live. Reflect on the expected results using flags. Take measurements and visualize them on the model.	Understands the impact of urban lighting on sleep. Visualizes nighttime environmental inequalities. Contextualizes in the students' experiences
Indoor CO2 measurement	Test sensor positions on the building model. Simulate the impact of openings on air circulation. Identify optimal architectural configurations, verify the physical structure.	Allows experimentation with configurations not possible in a real classroom. Understands environmental health issues
Trees vs. Cars	Train the AI with the physical elements of the model for the algorithm. Test the recognition with a supervised learning model on the traffic elements. Validate the object recognition performance in physical conditions.	Makes tangible how AI works and its limitations. Understands AI applied to mobility. Programs classification systems.

Environment, well-being and public health

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Outdoor air quality	Select sites based on vegetation, industries, and schools. Use colored stickers to identify anticipated air quality levels. Compare predictions with field measurements.	Visualize the geography of pollution. Understand environmental inequalities. Develop territorial ecological awareness.
Optimized waste sorting	Test the collection with different types of positionable waste elements. Program the robot as an autonomous collection agent according to AI training. Validate the recognition performance in physical conditions.	Understand AI applied to urban management. Experiment with service robotics. Test technological limits.
Urban greening and AI	Test locations with modular urban spaces for green walls. Use light, humidity, and temperature sensors. Identify optimal locations based on constraints.	Experiment with urban agriculture. Understand the adaptation of plants to the urban environment. Develop greening solutions.
SoundSquad	Identify areas for experimentation based on perceptions. Use different acoustic materials. Visually transfer the results of the sensory mapping onto the model.	Materializes sound geography. Develops acoustic sensitivity. Understands the impact of urban design on ambiance.
Whisper Walls - Exploring the Sound of Silence	Personalize by creating individual "houses" and locating rooms. Test materials using different colors for building materials. Optimize insulation combinations according to student situations.	Contextualizes the physical experience in the students' living environment. Experiments with concrete sound insulation
Ecological impact of mobility regulations	Test scenarios with modular restriction zones, sustainable mobility infrastructure. Roobopoli compatibility, use autonomous vehicles with regulation. Observe flows and environmental quality.	Understands mobility/ecology tradeoffs. Experiences autonomous mobility under controlled conditions. Ecological behavior program

Energy efficiency

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Shine Smart, Shine Bright	Observe residential and commercial lighting according to the model. Test configurations with programmable lighting and brightness sensors. Optimize the balance between safety, economy, and comfort.	Experiment with smart urban lighting. Understand security and energy saving issues. Develop adaptive lighting solutions.
From insulated walls to cool cities	Test insulation using buildings with varying materials and thermal sensors. Use color codes for heat circulation. Identify efficient architectural configurations.	Experiment with energy efficiency. Understand thermal transfer in architecture. Test urban insulation solutions.
Energies in perspective	Simulate the mix with physical energy sources (panels, wind turbines), LED circuits. Test the impact of removing an energy source. Visualize the circulation of energy in the city.	Visualizes the complexity and vulnerability of energy systems. Understands territorial interdependencies. Develops ecological awareness
Negawatt scenario and energy sobriety	Conduct the energy audit using a school model with visible consumption figures. Test the modifications using modifiable equipment and observe the impacts. Identify concrete levers for action.	Realizes the challenges of energy sobriety. Understands the impact of choices on consumption. Develops applicable solutions
Energy mix simulator	Reconfigure modular energy infrastructure. Test the impact of configurations on the network and the environment. Seek a balance between performance and sustainability.	Understands the technical and political challenges of the energy transition. Experiences complex energy trade-offs

Sustainable mobility, transport and regulation

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Road signs of tomorrow	Test the signaling with programmable modular panels on the circuit. Validate the effectiveness with autonomous vehicles recognizing the signs. Integrate the signs created to regulate mobility.	Tests the effectiveness of smart signaling. Understands human-machine interaction in mobility. Programs autonomous behaviors.
Connected Objects Safari	Design objects with a city connected to programmable smart objects. Create Roobopoli-compatible interactions and domino effects between objects. Validate the usefulness of objects in an urban context.	Understand the urban Internet of Things. Program complex interactions. Visualize the smart city of the future.
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Artificial intelligence and new technologies

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Bio-inspired learning processes	Use a model like Roobopoli with removable obstacles to test algorithms and adaptability. Reproduce the behavior of the AI model in real life, verify performance under physical conditions. Compare human intuition and machine logic.	Compares human and machine learning at the learner level. Visualizes trial-and-error processes. Makes how AI works tangible.
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