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INCLUSIVE EDUCATIONAL GARDEN TOOLKIT

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Work package n°3 - Creation

Result 1: toolkit of the inclusive educational garden

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1. INTRODUCTION AND OVERVIEW

Purpose of the Toolkit: This toolkit aims to guide educators, school administrators, and community members in creating an inclusive and sustainable educational garden that supports learning for all students, regardless of abilities or learning needs.

Benefits of Garden-Based Learning: Garden-based education offers numerous advantages, both academically and personally, for students. It promotes environmental stewardship by encouraging hands-on interaction with nature, which fosters a sense of responsibility toward the environment (Blair, 2009). Moreover, it has been shown to enhance social skills and teamwork, as students collaborate on gardening tasks and solve problems collectively (Passy, 2014). Research also indicates that garden-based education contributes to better physical and mental well-being by providing outdoor activities that reduce stress and improve mood (Davis, 2017). A study conducted in the United States found that students participating in garden-based programs demonstrated increased enthusiasm for learning, particularly in science subjects (Williams & Dixon, 2013). Additionally, garden-based learning can support interdisciplinary education by integrating subjects such as biology, mathematics, and language arts in a practical context (Skinner & Chi, 2018). These diverse benefits make garden-based education an effective tool for fostering a holistic learning environment. Highlight the benefits of garden-based learning, such as promoting environmental stewardship, improving social skills, fostering teamwork, and enhancing physical and mental well-being.

2. STEP-BY-STEP GUIDE TO GARDEN CREATION

2.1 PLANNING AND DESIGN

It is essential to understand that creating a teaching garden must take into account the local needs, possibilities, and culture of the community it serves. The success of an educational garden depends on its relevance to the local context, including the types of plants, cultural practices, and community involvement. According to Montenegro de Wit (2014), locally adapted gardens that incorporate traditional knowledge and community-specific practices are more likely to be successful and sustainable. Considering local context not only fosters a sense of ownership but also ensures the garden is meaningful and accessible to all participants. When planning and designing the garden one has to take into consideration the following aspects:

- **Community Involvement:** Engage all stakeholders—students, teachers, parents, and community members—in the design process. This includes conducting brainstorming sessions, surveys, and workshops to gather ideas and ensure the garden meets everyone's needs and educational goals. Involving stakeholders from the beginning fosters a sense of ownership and commitment to the garden's success (Moore & Cosco, 2010). Moreover, research has shown that collaboration between community members and schools can lead to more effective and sustainable educational gardens that better address local needs (Ozer, 2007).
- **Setting Objectives:** Clearly define measurable objectives for the garden that align with curriculum goals. Objectives should reflect the educational, social, and environmental aims of the garden. For example, objectives could include:

Enhancing Environmental Literacy: Develop students' understanding of ecological principles, such as plant growth cycles, soil health, and sustainability practices. This can be assessed through activities like maintaining garden journals or participating in environmental science lessons integrated with garden tasks (Williams & Dixon, 2013).

Promoting Student Well-Being: Use the garden as a therapeutic space where students can engage in physical activity, reduce stress, and improve their mood (Davis, 2017). Specific objectives may include encouraging students to spend at least 30 minutes per week in the garden, participating in activities like planting or observing nature.

Developing Teamwork and Leadership Skills: Encourage students to take on leadership roles within garden activities, such as leading small groups or managing specific tasks like composting. Objectives could involve students organizing

garden-related events or working in teams to complete gardening projects, which fosters social interaction and collaboration (Passy, 2014).

- **Cultural Awareness and Inclusivity:** Create opportunities for students to learn about different cultures by growing culturally significant plants and sharing traditional gardening practices. This promotes inclusivity and respect for diversity, as well as providing hands-on learning experiences. Plan an annual or biannual event in the garden that is part of local tradition, such as a harvest festival or cultural celebration. This event can engage students, families, and community members, reinforcing the connection between the garden and local culture.
- **Improving Nutrition Awareness:** Teach students about healthy eating by growing fruits and vegetables in the garden. Specific objectives could include involving students in planning, planting, and harvesting edible plants, followed by using them in cooking activities or educational sessions about nutrition.
- **Accessibility and Inclusivity:** Ensure the garden is accessible to all students and community members, especially those with disabilities. This can be achieved through raised garden beds, wide pathways for wheelchair access, and sensory garden elements for students with different sensory needs. The garden should be a welcoming space for everyone, encouraging community participation and ensuring that all members, regardless of ability, can benefit from and contribute to the garden.

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2.2 IMPLEMENTATION

Teacher Training: Provide inclusive garden teaching opportunities for teachers who will be involved in this project. This includes professional development opportunities that cover horticulture basics, outdoor classroom management, and inclusive teaching methods that cater to diverse learners. Additionally, support the creation of teaching instruments and resources that will ease the process for teachers, such as lesson plans, activity guides, and instructional videos. These resources will help ensure that teachers feel confident and prepared to facilitate garden-based learning for all students.

Community Engagement: Foster partnerships with local gardening experts, community organizations, and volunteers who can support the garden's implementation and maintenance. Engage parents and community members through workshops, volunteer opportunities, and garden events.

2.3 MAINTENANCE AND SUSTAINABILITY

Student Involvement: Involve students in the ongoing care of the garden by assigning them roles such as watering, weeding, composting, and monitoring plant health. Incorporate garden activities into the traditional teaching curriculum where possible. For instance, use the seeding process during multiplication lessons to teach practical math skills, or have students monitor plant health and bug prevention as part of biology classes. Similarly, the composting process can be used to teach students about mixing quantities, ratios, and the science of decomposition. Rotate leadership roles to ensure shared responsibility and promote ownership.. Rotate leadership roles to ensure shared responsibility and promote ownership.

Seasonal Planting Schedules: Develop a planting calendar that aligns with local seasons and growing conditions. Place this calendar in a visible area where everyone can easily see it, such as a bulletin board or the school entrance. Ensure the calendar is full of visual cues, such as icons representing planting, watering, and harvesting activities. Additionally, create materials to announce upcoming activities and events, ensuring everyone is prepared and excited. Establish a reward system for classes that actively participate in activities outlined in the calendar, such as earning badges or certificates for their contributions. Integrate garden tasks into the school routine with weekly gardening sessions and seasonal activities like planting and harvesting.

3. INCLUSIVE AND ACCESSIBLE DESIGN PRINCIPLES

Universal Design Features: Incorporate features such as wide paths, raised beds, sensory gardens, and adaptive gardening tools to ensure accessibility for all students and community members. Wide paths allow wheelchair users and individuals with mobility challenges to navigate the garden independently (Pivik, McComas & Laflamme, 2002). Raised beds are beneficial not only for accessibility but also for reducing physical strain, making gardening more manageable for students and community members of all ages (Relf, 1992). Sensory gardens that include fragrant plants, textured surfaces, and brightly colored flowers provide an engaging experience for all learners, particularly those with sensory processing challenges. Adaptive gardening tools, such as ergonomic trowels and long-handled tools, allow individuals with limited grip strength or mobility issues to participate comfortably in gardening activities.

Accommodating Diverse Learners: Create multisensory experiences, including visual cues, textured surfaces, and fragrant plants, to cater to different sensory needs. Modify garden activities for different physical, cognitive, or sensory abilities, such as providing seated gardening options or large-print signage.

Flexible Activities: Design garden tasks that can be adjusted based on students' needs and abilities, allowing everyone to participate meaningfully. For example, younger students or those with limited mobility could participate in activities like planting seeds in small pots, while older students or those with more advanced skills could take on tasks such as building garden structures or organizing composting stations. Activities like watering plants can also be rotated among students to ensure everyone has a chance to contribute. Additionally, tasks can be simplified or expanded in complexity depending on the abilities of the students. For example, while some students might be involved in basic weeding, others could engage in monitoring plant growth, recording data, and drawing conclusions about the health of the garden. Creating flexible activities helps ensure that every student, regardless of skill level, can engage with the garden in a meaningful and enjoyable way.

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4. PRACTICAL RESOURCES AND TOOLS

4.1 GARDEN PLANS AND TEMPLATES

Include ready-made garden layout plans that can be adapted to different school environments, along with templates for planning sessions, activity schedules, and lesson integration. These garden plans should consider the specific space availability, local climate, and the diverse needs of students. For example, a smaller garden layout might include vertical gardening options or container gardens for schools with limited ground space, while larger layouts could feature separate zones for different activities, such as sensory areas, vegetable plots, and flower beds. Templates for planning sessions can be used to engage stakeholders by providing structured steps for designing the garden, from brainstorming ideas to choosing plants and layout. According to Henderson and Tilbury (2004), effective environmental education practices are those that are participatory and adapted to the unique context of each school. Additionally, including visual aids such as colorful diagrams and sketches in the templates helps ensure accessibility and engagement for all participants (Relf, 1992).

4.2 PLANTING GUIDES AND SEASONAL CALENDARS

Provide detailed guides for selecting native, low-maintenance plants that are culturally relevant. Offer planting schedules and calendars that align with local climate conditions. Include information about planting and harvesting timelines for different types of plants to ensure that activities are well-coordinated throughout the school year. For example, provide guidelines for when to plant seasonal vegetables like tomatoes, carrots, and spinach, and when to harvest them. Incorporate visual cues such as color-coded schedules to make it easy for students of all ages and abilities to understand planting and care timelines. According to Blair (2009), visual aids in gardening activities enhance student engagement and help them better understand seasonal changes and plant care requirements. Additionally, providing reminders for key tasks like fertilizing, watering, and pest control helps ensure the garden thrives and can be a valuable part of the learning experience (Williams & Dixon, 2013).

4.3 ADAPTIVE GARDENING TOOLS AND MATERIALS

Suggest adaptive gardening tools, such as ergonomic trowels, long-handled tools, and tools with enlarged grips to cater to the diverse physical needs of all participants. These tools are especially beneficial for individuals with limited grip strength or reduced mobility, allowing them to garden comfortably. For instance, ergonomic trowels with non-slip handles reduce strain on the hands, making gardening more accessible (Relf, 1992). Additionally, long-handled tools can assist individuals who have difficulty bending or kneeling by allowing them to reach the soil without discomfort. Recommend materials like large-seed varieties for easier handling, which are particularly useful for younger children and individuals with fine motor challenges. Furthermore, using lightweight, portable seating options can provide rest opportunities for those who need it during gardening activities, enhancing participation and inclusivity. According to Thompson (2005), the availability of adaptive tools significantly increases the inclusivity and engagement of all individuals in gardening activities.

4.4 INCLUSIVE TEACHING RESOURCES

Develop activity sheets, lesson plans, and instructional guides that cater to diverse learning styles and abilities. For instance, create multisensory lessons that engage different senses—such as touching different textures, smelling various herbs, or listening to nature sounds—so that students with different sensory preferences can participate fully. Use differentiated learning paths that offer multiple entry points for students at different skill levels; for example, providing parallel tasks that accommodate both individual work and group collaboration. Incorporate visual and symbolic supports, such as picture cues, visual schedules, and step-by-step guides, to make instructions clear and accessible to all students (Skinner & Chi, 2018). Additionally, developing resources that align garden activities with core curriculum subjects—such as using gardening to teach concepts in math, science, or art—helps make learning more relatable and hands-on (Blair, 2009). These resources should be tailored to ensure that students of all abilities can engage meaningfully in the educational garden. Resources should include multisensory lessons, differentiated learning paths, and visual and symbolic supports like picture cues and visual schedules.

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5. TRAINING AND PROFESSIONAL DEVELOPMENT MODULES

5.1 EDUCATOR AND STAFF TRAINING GUIDES

Offer training modules that cover garden basics, inclusive education practices, and outdoor classroom management. Emphasize adapting lessons and tools for diverse learners, ensuring all educators feel prepared and confident in using the garden as a learning environment. For instance, training could include practical workshops on horticulture skills, such as planting and composting, as well as sessions on how to adapt these activities to accommodate students with special needs. Providing hands-on experiences through training can help teachers better understand the challenges students might face and develop effective strategies to support them (Moore & Cosco, 2010). Additionally, training should include the use of adaptive tools and assistive technologies that can facilitate participation for students with physical limitations (Pivik, McComas & Laflamme, 2002). Creating peer learning opportunities, where experienced educators mentor new staff members, can also foster a collaborative and supportive teaching community.

5.2 COMMUNITY ENGAGEMENT AND PARTNERSHIPS

Provide guidance on building connections with the community. Include tips for involving local experts (e.g., horticulturists), parents, and community volunteers in garden activities. For example, hosting workshops led by local gardening experts can provide valuable learning experiences for both students and staff. Involving parents through dedicated garden workdays can also foster stronger community ties and increase participation (Ozer, 2007). Encourage collaboration with community organizations such as local farmers' markets or environmental groups to expand the garden's resources and activities. Offer strategies for securing funding or in-kind donations from local businesses and organizations, which can include contributions like seeds, gardening tools, or even sponsorship for garden events. Research has shown that community engagement not only increases the success of educational gardens but also promotes social cohesion and a sense of shared responsibility among participants (Henderson & Tilbury, 2004).

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6. MONITORING, EVALUATION, AND CONTINUOUS IMPROVEMENT

6.1 MONITORING TOOLS

Provide templates for tracking garden growth, student participation, and lesson integration. Monitoring tools should include specific metrics for tracking various aspects of the garden project. For example, use growth charts to record plant health and progress over time, with students documenting height, leaf count, and any signs of pests or disease. Include participation logs where teachers can note the frequency of student involvement in garden activities, helping identify which students may need additional encouragement to engage. Observational forms can be used to track the development of soft skills, such as teamwork and leadership, during garden activities. According to Henderson and Tilbury (2004), systematic monitoring enhances the effectiveness of sustainability initiatives by ensuring that goals are being met and necessary adjustments are made promptly. Additionally, digital monitoring tools such as photo documentation and time-lapse videos can make the monitoring process more interactive and engaging for students, enhancing their involvement and understanding of growth patterns (Moore & Cosco, 2010). Include checklists and observation forms for teachers to document progress and identify areas for improvement.

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6.2 EVALUATION FRAMEWORKS

Offer frameworks for assessing the garden's impact on student learning and well-being. Consider both qualitative data and quantitative data to provide a comprehensive evaluation.

Qualitative Data Examples:

- Student reflections through journals or diaries documenting their experiences in the garden.
- Teacher feedback collected via interviews or focus groups, providing insights into student engagement and changes in behavior.
- Observational notes detailing student interactions, teamwork, and skill development during garden activities.
- Testimonials from parents or community members on how the garden has influenced students' learning or well-being.

Quantitative Data Examples:

- Attendance records that track participation rates in garden activities.
- Skill development assessments, such as pre- and post-tests on knowledge about plants, gardening practices, or environmental topics.
- Number of vegetables harvested or compost produced, providing concrete data on productivity and student involvement.
- Surveys with scaled questions to evaluate changes in students' attitudes toward environmental stewardship, teamwork, and nutrition awareness.

6.3 FEEDBACK LOOPS FOR IMPROVEMENT

Suggest methods for collecting feedback from all stakeholders, including students, teachers, and parents, to refine the garden program. Examples include surveys, focus groups, and regular review meetings. Additionally, use suggestion boxes placed in visible areas of the school to encourage ongoing feedback. Create student-led feedback sessions where students can discuss their experiences and suggest improvements. Teachers can also maintain reflective journals that capture their observations of student engagement and challenges faced during garden activities, which can provide valuable insights for improving the program. Organize annual community events where feedback from parents and community members can be gathered to make adjustments and celebrate successes together.

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7. ADDITIONAL SUPPORT AND RESOURCES

7.1 CASE STUDIES AND BEST PRACTICES

Showcase successful examples of inclusive educational gardens, highlighting key takeaways and lessons learned. Include stories from schools of various sizes and demographics. Where possible, organize visits to such places to provide hands-on experiences for those involved in the project. These visits can help educators, students, and community members see practical examples of how inclusive gardens operate and learn best practices that can be implemented in their own garden projects.

7.2 RESOURCE DIRECTORY

Curate a list of useful contacts, including local garden centers, educational organizations, funding sources, and accessible tool suppliers.

This part will also be useful in promoting inclusion and participation, not just in securing funding and planning. By connecting with local organizations and suppliers, community members will better understand the garden's higher purpose and see how it serves as a valuable, inclusive learning space for all.

7.3 DIGITAL AND PRINTABLE RESOURCES

Ensure all resources are available in both digital and printable formats for easy access. Consider developing an online platform with video tutorials, discussion forums, downloadable resources, and interactive activities to make learning more engaging.

Additionally, create printable guides, posters, and activity sheets that can be used in the garden. The online platform could also include a section for frequently asked questions (FAQs) to support teachers and community members, and a repository for user-submitted ideas and successful practices from other schools. Providing webinars and live Q&A sessions can further enhance support, ensuring that all educators and community members feel well-equipped to participate in the garden project.

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