BENEFIT HANDBOOK

THE BENEFITS OF THE LTHP APPLICATION AND SMART METHODOLOGY IN EDUCATION

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INTRODUCTORY THOUGHTS

The Benefit Handbook document is part of the EET-IO5 output, the Communication Toolbox, and supports the sustainability of the project results and the effectiveness of dissemination.

Through this document, we aim to provide all interested parties (teachers, parents or students) with a useful and informative description of the basic features of the LTHP system and the benefits of its use. The manual contains all the essential information in a concise form that is useful to be aware of before using the application.

The chapter What makes LTHP different - Methodological Introduction introduces the Smart methodology and how it differs from other traditional forms of learning. The advantages of using the system are described, such as the automatic differentiation built into the task system, learning along adaptive individual pathways, the structure of the level-skipping learning materials, the reporting function as a system to facilitate assessment and monitoring of learner activity. In addition, practical information such as the accessibility of the LTHP's teacher and learner interfaces, pre-learning preparations such as registration, logging into user accounts, etc.

The second chapter, Integrating the LTHP as a digital tool in education, describes the role and benefits of the application in education, including questions such as the educational formats in which the LTHP can be used, the educational objectives it can achieve and the didactic functions it can perform.

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I. WHAT MAKES THE LTHP DIFFERENT - METHODOLOGICAL INTRODUCTION

1.1. Methodology used

The LTHP application is based on the innovative Smart Methodology, which allows for automatic differentiated instruction by having the ALA learning algorithm redesign the student's learning path based on the results achieved after each task, ensuring that each student can learn at his/her current level of knowledge and individual pace. As each child is different, the individual pathways followed in the task system are different. The idea of an individual learning pathway is that if a student successfully solves a task, he or she moves up to a more difficult level, while if he or she fails, he or she drops a level, i.e. moves to an easier level for the next question. In a traditional linear problem set, students progress through successive problems in a sequence. However, with the methodology we have developed, students can roam through a system of multiple levels of difficulty (level-jumping learning material) according to their own abilities.

1.2. Automatic differentiation

The idea behind differentiation is that because each child is different, each learning path followed has a unique pattern. In a level-jumping task system, the learner can progress at his/her own learning pace, according to his/her own abilities. Once a task has been successfully solved, the student is given a more difficult question, i.e. moves up one difficulty level. If a problem has been unsuccessfully solved, an easier problem follows, i.e. the student drops a level. By allowing each child to work with tasks of the appropriate difficulty, the experience of failure is reduced, and both faster and slower learners are able to learn effectively thanks to automatic branching.

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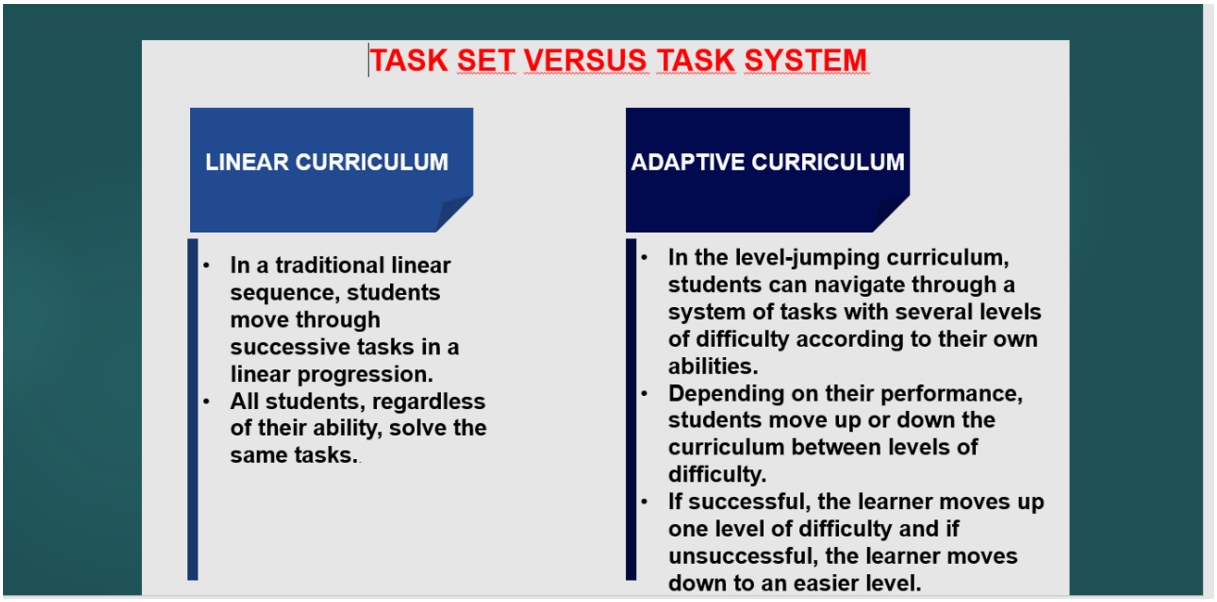
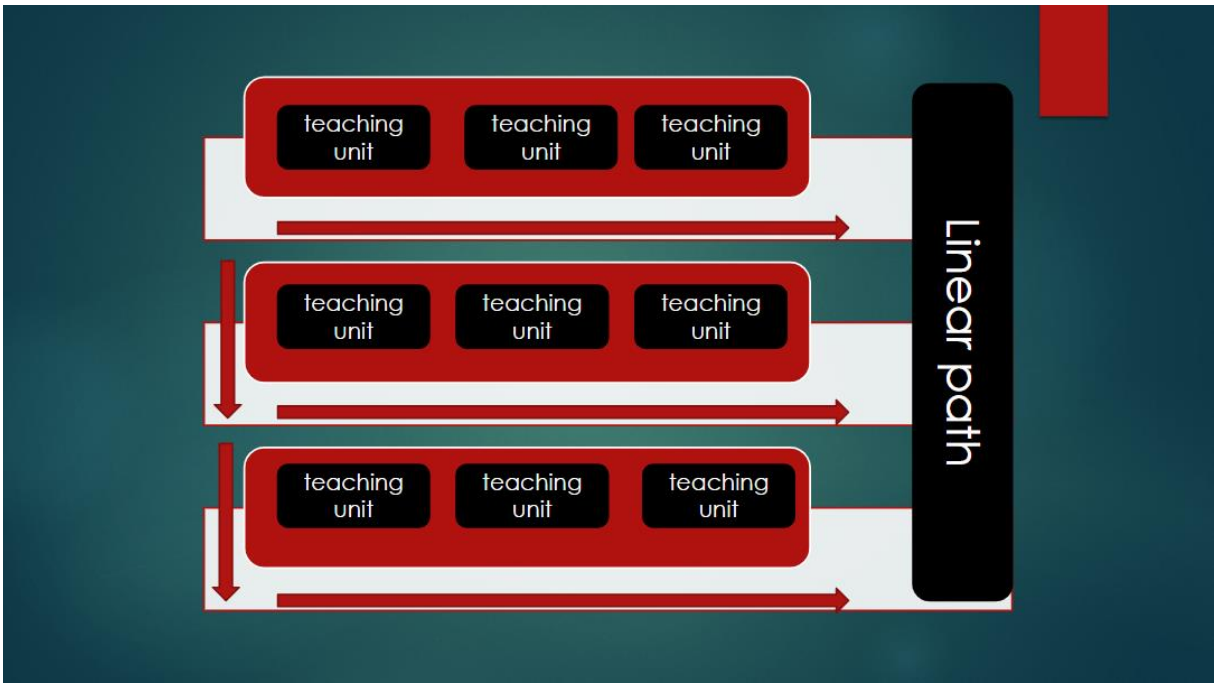
1.3. The logic of linear and synoptic content

The logic of linear and synoptic content



Direction of progress in the linear task system



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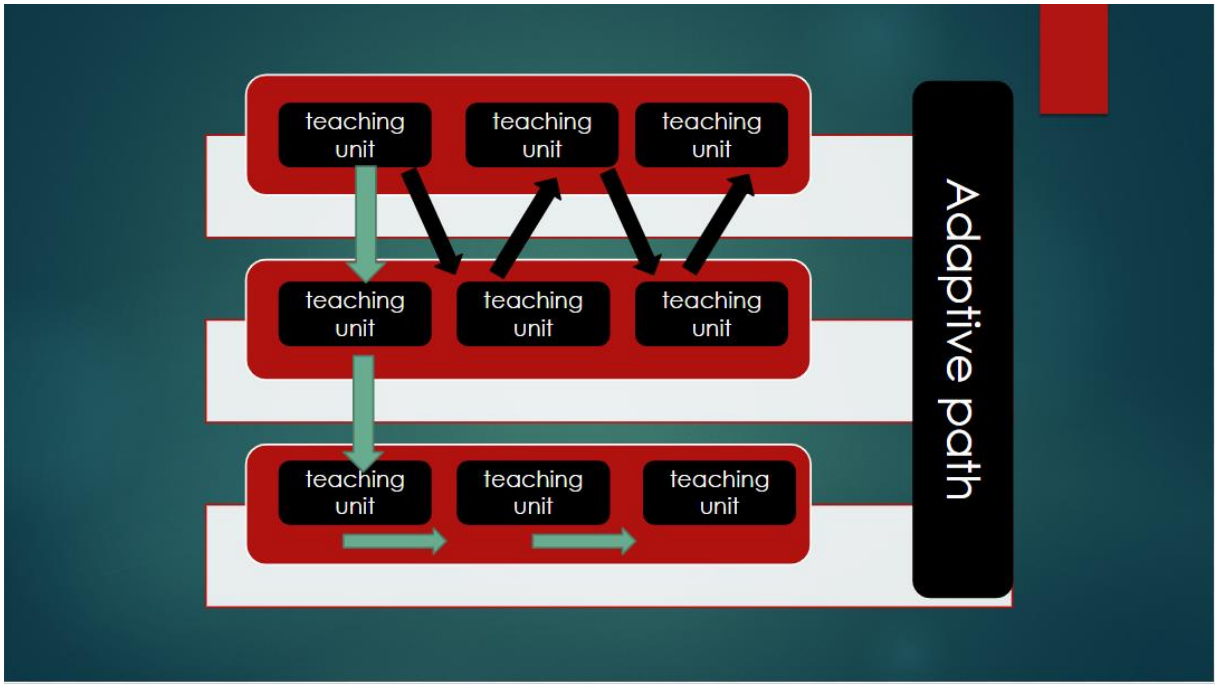
The direction of progress in the level-jumping task system



1.4. Supporting the learning process: supporting tasks and explanations

The Superunit (Supercell) task block is designed to help students who are stuck in the learning process. The SU unit consists of a basic task, a support task and an explanation. The help task tries to guide the student to the solution if he/she has failed to solve it. Questions that the teacher would ask the student in class are used to guide the student to the solution and to assess where the stuck point might have occurred. If the problem is unsuccessful, the child is given an explanation and the correct solution procedure so that he or she can solve the problem independently in the future. To make learning fun and effective, audiovisual explanations can be used alongside textual explanations.

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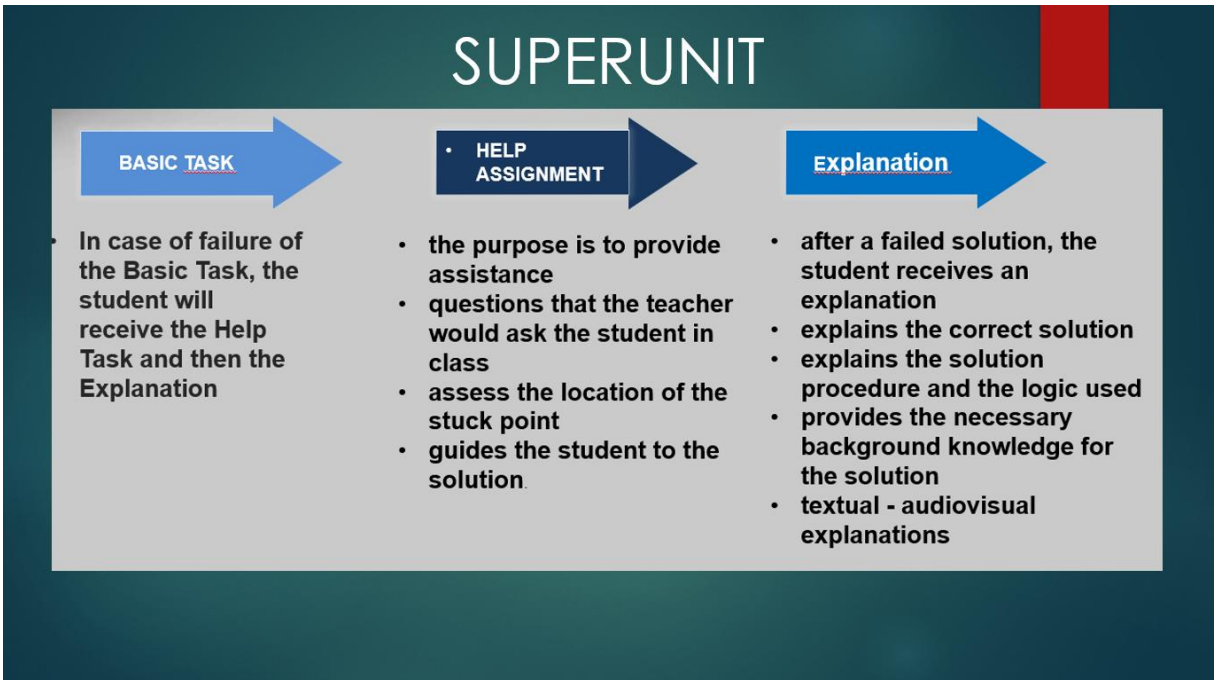
Structure of the SUPERUNIT task unit



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II. INTEGRATING THE DIGITAL CURRICULUM INTO EDUCATION

2.1. Necessary technical preparations

To use the LTHP system, all users - teachers, parents, students - need to register. The application is available at the following links:

- The Teacher Interface: https://learnthenplay.classyedu.eu

- The link to the Student web application: https://learnthenplay.classyedu.eu/app ,

- The Pupil Android app: https://play.google.com/store/apps/details?id=com.learnthenplay.classy

To learn with the LTHP app, students need to log in to the interface, it is essential that each student logs in with their own ID as this is the only way to track student activity and performance. Logging in only takes a few minutes, it is worth printing out all usernames and passwords and making them available to students in case they lose their details. For classroom use, it is important that if multiple students are logging in from the school IP address, it is advisable not to log in at the same time, but to log in a maximum of 8-10 users per minute.

2.2 Why LTHP? - Benefits of the LTHP application in education

2.2.1 Flexible and easy to customise: modify the content available in the system

The digital application is an easy-to-use and transparent platform that turns the learning and teaching process into an enjoyable and efficient activity for both teacher and student. The system's database currently contains content for several subjects. Existing educational content can be freely used and, if necessary, flexibly adapted to local needs and current educational objectives. In addition to the content available, creative, state-of-the-art teaching materials can be developed easily using more than 10 different game engines, text and audiovisual content. One of the system's main strengths is that it is highly flexible, allowing for the development of curricula and grouping according to local needs. It is up to the teacher to decide how to divide a given topic into themes, sub-themes and levels, and how many successful or unsuccessful solutions to a given task are defined as criteria for changing levels.

2.2.2 Differentiation - identifying learning gaps

The statistics available in the system allow the teacher to monitor the individual performance of students, the path followed, the tasks solved, the results achieved and the difficulties encountered. The identification of learning delays can help the teacher to provide individual or group support to students when needed. This helps the teacher in the task of differentiation: differentiation adapted to the needs of the students, flexible grouping, personalised task planning can be easily and quickly implemented. The differentiation is based on flexible group formation, with the possibility to create new groups based on different criteria and to easily modify existing groups. The main objectives of the project are to reduce school disadvantages, differentiate children and reduce drop-outs.

2.2.3 Reporting data: simple and quick evaluation and traceability

At the same time, reporting data can also support teacher evaluation work by providing a percentage of student performance, thus helping to reduce teacher overload. The system's reporting data makes objective numerical indicators and results available. The application automatically tracks and stores data on the activity performed on the interface, the time students spend online, time spent learning, distance travelled, percentage achieved, scores, progress rate, etc. This system feature, the percentage of results achieved instead of manual evaluation of tests and assignments, makes the task of teachers much easier. The system also offers the possibility to play the exercises in test mode, which, unlike the practitioner, allows the student to continue to work on both good and bad solutions.

2.2.4. Gamification: using the framework game as a motivational tool and improving the learning experience

As a positive motivator, frame games make the learning process more interesting and thus more effective, increase learner engagement and improve performance. The framework game can be freely assigned to any of the pathways, but the content can also be used without it.

The framework game takes place in a castle, the learner can choose a character/role-play and then has to rescue a prisoner locked in a tower. The framework game adapts well to the Smart Methodology, both of which involve reaching the highest level in the task solution. During the learning process, the player has to get to the tower, climb the levels of the castle to free the prisoner. The concept is that successful completion is rewarded with points, and a certain amount of points can be redeemed for a treasure box with a hidden reward. Thanks to the system

of levelling up, collecting points and earning rewards, the student receives immediate positive feedback after each task, which reinforces the feeling of success and motivation.

2.2.5. Wide-ranging competence development

The digital tool and methodology focuses on the development of key competences: reading comprehension, mathematics, science, digital literacy, learning to learn, problem-solving, reasoning, analytical thinking, deduction, synthesis, observation, attention, memory, organisation, etc.

2.2.6. Types of tasks used: playful tasks

The application uses a number (percentage) scoring system, which is objective and facilitates grading and ranking. The disadvantage of this is that the numerical feedback is poorer. The interface is not suitable for the assessment of tasks that are not numerically meaningful and require analytical assessment, as it cannot interpret the answers given in the explanatory part, as other digital applications can. As a consequence, it is not possible to use open questions, as in this case the student is able to express the answer in his/her own words, independently. We need to think in terms of a closed question system, where the correct answer has to be chosen from a set of predefined answer options. Accordingly, it is not suitable for formulating independent answers, text composition tasks or for formulating an independent opinion on text comprehension. In total, more than 10 game engines are available on the interface, allowing for playful and varied learning activities.

2.2.7. Combining the new generation method with traditional methods

The new generation of digital teaching aids does not mean that traditional teaching tools should be abandoned, but that the LTHP can be combined with classical methods: teacher presentation, explanation, demonstration, assessment, etc. The application can also be combined with traditional teaching aids, e.g. in the form of paper texts, maps, supplementary materials, etc.

2.2.8 Control function: parental supervision application

Parental control is the ability of the parent to link the free use of the Internet to the homework done in the learning application, with the positive result that the student also tries to finish the learning as soon as possible. This can encourage an exchange of experiences between parent and teacher on the child's learning and abilities, as well as contribute to increasing the effectiveness of cooperation between parent and school.

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2.3. What forms of education can the LTHP be used in?

- Classroom teaching: in the context of classroom work, in the form of individual or cooperative tasks

- home learning: e.g. in the form of homework

- online teaching: students solve the assigned task in the online classroom, if necessary with the teacher's guidance

- blended learning: students learn through a combination of traditional and online learning in the classroom. Traditional learning materials and digital learning materials can complement each other, e.g. the textbook can be used to learn new material and the app can be used to provide students with tasks to work through it.

2.4. What are the educational objectives of the LTHP's linear and leapfrog methodology?

The application is suitable for the following educational purposes:

- introduction of new knowledge - linear content is recommended in this area

- capture knowledge, practice, application of knowledge (problem solving): for practice, the use of level jump content is recommended, as it allows for the effective repetition of larger content, even covering several topics. Level jumpers are an excellent way of practising content that is used to prepare for examinations, for example. It is possible to choose the practice playback mode, which means that the system does not allow the student to progress in the material until the correct solution is indicated.

- reinforcement of knowledge, repetition (systematisation, summary) - level jumpers are recommended

Both the app and the ready-made learning materials are excellent for reviewing what has already been learnt. It can be used at the beginning of a lesson, at the start of a new topic, to mobilise and recall what has already been learnt, but can also be used in a summary lesson.

- Checking knowledge: for knowledge assessment and level measurement

Linear content is suitable for this purpose, as in this case all students have to solve the same series of problems.

- assessment (testing): suitable for diagnostic (prior knowledge assessment), formative (feedback to shape the learning process), summative (end-of-term, final exams). Linear content is also appropriate for assessment.

2.5 Didactical functions fulfilled in the LTHP

In order to ensure the effectiveness of the teaching, the following didactic functions are implemented in the application and in the content produced:

- differentiation

Learning activities adapted to individual abilities are the basis of the system. The digital learning toolkit uses a differentiated, adaptive methodology that supports individual learning paths, the operational logic of which has been described in detail above.

- positive and negative reinforcement

The application provides immediate feedback to students in the form of system messages on the success/failure of the task, the scores achieved and the movement between levels of difficulty.

- instant feedback

The system provides students with continuous information in the form of system messages on progress along the pathway, the percentage of performance achieved, while also providing children with the opportunity for self-monitoring.

- motivation

The learning experience is enhanced by playful task solving, making learning more interesting for students. Learning according to individual knowledge and abilities increases the sense of achievement and reduces performance anxiety. Framework play also has a positive impact on learning.

- activation

Activation, as a means of attracting attention and concentration. Students enjoy learning in an app, the use of tablets and smartphones alone has already attracted their interest compared to traditional methods

- gradualism

The content takes into account prior knowledge and, in the case of level-jumping tasks, progresses from simpler to more complex tasks.

- systematicity

The logical structure and optimum distribution of the material. The frequency of use of the application should be determined according to the educational objective, e.g. several times a week for practice and several times a week for assessment.

- visual clarity

Realistic tasks based on practical application of knowledge. Illustrations and audiovisual explanations provide a wide and colourful range of visualisation possibilities.

- scientific and comprehensible: there are many opportunities to balance scientific and comprehensible aspects and to make the material accessible