LEARNING MANAGEMENT OF VISUAL BLOCK PROGRAMMING COURSES IN PRODUCING SUPERIOR HUMAN RESOURCES WITH INDUSTRY 4.0 SKILLS AT EDUCOURSE.ID SOUTH TANGERANG

Anastasia Vivi Iswandari[1], Ila Rosmilawati [2], Dadan Darmawan[3]

[1]Department of Non-Formal Education, Faculty of Teacher Training and Education, Banten-Indonesia
[2] Department of Non-Formal Education, Faculty of Teacher Training and Education, Banten-Indonesia
[3] Department of Non-Formal Education, Faculty of Teacher Training and Education, Banten-Indonesia

email: 2221200031@untirta.ac.id

ABSTRAK

The purpose of this study is to investigate how Educourse.id's visual block programming courses handle learning in order to develop superior human resources (HR) in South Tangerang that are equipped with industry 4.0 competencies. The data was gathered using a descriptive, qualitative methodology that included documentation, interviews, and observation. The findings demonstrated that proficient learning management—which encompasses learning planning, learning implementation, and learning evaluation enhance students' programming abilities as well as their capacity for critical, creative, collaborative, and critical thinking. The study's conclusion highlights the value of STEM-based education in developing skilled labor resources equipped to thrive in the digital age.
Keywords: Educourse.id, Industry 4.0, Learning Management, STEM, Visual Block Programing, 4C Skills

INTRODUCTION

Enhancing national character and human resource quality requires education. A country's ability to advance is influenced by the quality of its people resources, which are what drive economic expansion. Consequently, Article 31 paragraph 1 of the 1945 Constitution states that "Every citizen has the right to education" and guarantees education to all citizens. Law No. 20/2003, which incorporates formal, non-formal, and informal education paths, was created for an organized implementation. These three routes, together known as the Tri Center of Education by Ki Hadjar Dewantara, are crucial for raising the caliber of human resources.

Eleven, Twelve, and Thirteen paragraphs of Article 1 discuss the three educational courses. Primary, secondary, and postsecondary education are all part of the organized and graded system known as formal education. Informal learning takes place in the family. A systematic, tiered non-formal education pathway serves as a substitute for, addition to, or enhancement of formal education. Non-formal education, according to Sudjana (2010: 13), is a methodical, autonomous activity that helps pupils who require extra or supplemental formal education. Non-formal education is defined as: life skills education, early childhood, youth, women's empowerment, literacy, skills and job training, equality, and other education to build students' capacities in Law No. 20/2003 Article 26 paragraph 3.

Technologies like artificial intelligence (AI), the Internet of Things (IoT), robotics, and big data are evolving quickly in the industrial era 4.0 and are displacing a lot of professions. Human resources with the qualifications to compete on a global scale are needed for these transformations. The need for course programs to build specialized skills that are relevant to industry demands is critical. The workforce's transition to the digital industry is a major challenge in Indonesia. However, according to Gallup Research and Amazon Web Services (AWS), just 27% of the local workforce have digital capabilities.According to projections made during seminars regarding the fourth industrial revolution, 35% of occupations may vanish in the next five years and 75% in the next ten. According to BPS

2022 data, the majority of Indonesia's workforce is made up of those with only an elementary school education (39.10%), followed by those with a junior high school education (18.23%), a high school education (18.23%), and a vocational school education (11.95%). In the meantime, just 12.6% have a college degree or a diploma. Graduates of SMK schools account for the majority of the unemployment rate (10.38%), followed by those from primary school and below (3.09%), junior high school (5.61%), high school (8.35%), and universities.

In the wake of the industrial revolution, education must change to meet the demands of the business world. Critical abilities include communication, socializing, critical thinking, and technology use are necessary to succeed in this day and age (Trilling & Fadel, 2009). These skills can be acquired through course work. According to Law Number 20 of 2003 Article 26 paragraph 5, courses are included in non-formal skills education targeted at the community for the development of knowledge, skills, and attitudes needed in various vocations (Desti Ria Monika, 2020).

STEM-based visual block programming courses are offered by PT Maleo Edukasi Teknologi - Educourse.id as a first step in producing top-notch human resources that meet industry demands. This course enables students to interact with computers by developing problem-solving tools or software. In the context of the fourth industrial revolution, this knowledge becomes crucial as we work to enhance critical thinking, creativity, communication, and teamwork—the four essential skills of today's workforce.

To meet the anticipated learning objectives, course learning programs need to be managed in an organized manner. The quality of output, or student production in this example, might be negatively impacted by the use of learning management systems in educational institutions (Rasmi, 2016). Teachers or other educators serve as managers in the field of learning management. In order to implement learning management in an attempt to enhance student learning outcomes, qualified educators or tutors must be available.

There are two primary components to learning: student-directed learning and teacher-led instruction. In order to guide the learning process, lesson planning is crucial, necessitating the development of learning resources by tutors. In order to accomplish learning objectives, learning is implemented through resource gathering and elemental synergy. This is consistent with Hartatik's (2016) assertion that instructors need to be able to gather and organize a variety of resources for the learning process, including those related to students, science, and learning media. In the interim, the evaluation phase is necessary to raise the standard of instruction going forward.

According to the learning objectives created by the tutor, students can enhance their industry 4.0 abilities through learning management at Educourse.id. With the first STEM-based visual block programming or coding course program in Indonesia that has received a STEM certificate directly from America, Educourse.id is a successful non-formal education unit. This research aims to explore the "Learning Management of Visual Block Programming Courses in Creating Superior Human Resources with Industry 4.0 Skills at Educourse.id South Tangerang."

RESEARCH METHODS
Research Methods and Approach

In order to understand a certain topic or issue, the research process is a gradual scientific activity that begins with topic definition, data collecting, and data analysis (Dr. J.R. Raco, 2010: 2). Descriptive research approaches, according to Sujarweni (2014: 32), describe or characterize a situation objectively. According to Harahap (2020: 7), qualitative research produces unbiased and logical conclusions by contextually examining and interpreting symptoms.

Researchers gather and evaluate data using descriptive methods with a qualitative approach in order to gain an objective understanding of specific subjects or symptoms. The learning management system for the Educourse.id visual block programming classes was examined in this study. This study investigates the learning management of visual block programming courses in developing superior human resources with industry 4.0 skills at Educourse.id, South Tangerang, using descriptive methodologies and a qualitative methodology.

Place and Time of Research

This study was carried out at Educourse.id, a non-formal education organization that offers STEM-based visual block programming and coding courses. At Jl. Letnan Soetopo, Ruko Golden

Madrid 2 Blok F No.19, BSD City, Kec. Serpong, South Tangerang City, Banten 15310, you may find Educourse.id. In May 2024, this research was carried out.

Method of Gathering Data

In order to get data for study, data collecting procedures are a crucial stage (Sugiyono, 2019: 296). The following methods are used in this study to gather data: a) Observation through monitoring the learning management system of the visual block programming courses at Educourse.id Infrastructure and facilities are included in South Tangerang, along with educational activities like media, interactions, and methodologies. b) Conduct interviews with a number of Educourse.id teachers and staff members. c) Documentation: gathering information on STEM implementation via images, videos, and pertinent Educourse.id papers.

Method of Data Analysis

The methodical process of organizing data from observations, interviews, and documentation is known as data analysis. Three avenues of qualitative data analysis were distinguished by Miles and Huberman: data reduction, data presentation, and conclusion drafting and verification. a) Information about Educourse.id's contribution to the development of excellent human resources will be gathered, analyzed, and categorized. This information will come from observations, interviews, and documentation. b) Data Presentation: Descriptive text, pictures, and tables are used to display data. c) Drawing conclusions and confirming the information.

RESULTS AND DISCUSSION

Result

The management of visual block programming learning at Educourse is broken down into three stages: planning, implementation, and evaluation, based on the findings of the interview. The description is as follows.

A. Visual Block Programming Course Learning's Planning at Educourse.id to Create Better HR with Industry 4.0 Skills

1. Analyzing Learner Needs

At Educourse.id, learning planning begins with a needs analysis of the traits and passions of the learners. This procedure is crucial to ensuring that the learning activities created are inclusive, effective, and capable of inspiring students to achieve better learning outcomes. By conducting this requirements analysis, learning outcomes can be improved by making the learning process more efficient, inclusive, and motivating.

a. Holland's RIASEC, a child psychological assessment tool

Prospective students can use the psychological test offered by Educourse.id to map their needs and interests. The six components of Holland's RIASEC theory—realistic, investigative, artistic, social, enterprising, and conventional—are referenced in this test. Parents are allowed to accompany their children for the one-hour test. When deciding whether courses are suitable for children, parents, and teachers, the test results serve as a valuable tool. For instance, students in programming classes typically exhibit a significant preference for the conventional, artistic, and investigative components. The assessment's outcomes can influence a learner's decision to enroll in a robotic programming or language course.

b. Block Programming with Visuals Trial Class

Prospective students and their parents attended the hour-long trial class following the psychological test. Students can get a firsthand look at the instructional strategies and resources during the trial session, including using the Scratch platform to create games or animations. Depending on the class selected, trial sessions may be conducted online or offline. Teachers can get to know prospective students through trial sessions and adapt their teaching strategies to match their skill levels. Trial classes assist teachers in identifying the individual interests of their students, such as whether they are more interested in making games or cartoons.

c. Classification

Following the trial session, students are placed in classes based on their comprehension and growth levels. Among the class groupings at Educourse.id are:

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1) Customized Visual Scratch Block Coding: Three age-based levels—Junior One (5-7 years), Junior Two (8-9 years), and Upper Junior One (10 years and above)—are offered for this online and offline course. Starter (3 months), Beginner (3 months), Intermediate (3 months), and Advance (6–9) are the stages that each grade passes through. Additionally, Educourse.id is creating the Master Level, an advanced level.

2) Visual Scratch School Block Programming: There are two kinds of classes available to partner schools: Extracurricular and Intracurricular. Extracurricular classes take place after school hours, while intracurricular classes are part of the curriculum and are considered subjects. There are numerous levels in both kinds of classes: Starter, Beginner, Intermediate, and Advance.

2. Learning Intentions

The goal of Educourse.id is to deliver STEM-based learning to increase skills important to industry 4.0, and their learning objectives are in line with this vision and mission. The American STEM curriculum, which places a strong emphasis on the development of 21st century abilities including critical thinking, creativity, teamwork, and problem solving, is referenced in this aim. The improvement of 4C (communication, creativity and innovation, collaboration, critical thinking and problem solving) and coding abilities is one of Educourse.id's learning goals. Additionally, the purpose of the intended learning is to develop children's creativity and logic in the creation of digital works.

3. Instructional Resources

Educourse.id offers a range of instructional resources to enhance the study of visual block programming. Among these teaching aids are:

a. Devices: Computers, tablets, or laptops that are utilized by teachers and students. The primary tool that enables students to use coding projects, access programming applications, and take part in interactive class discussions is this gadget.

b. The semester learning plan, or RPS, is a planning document that arranges the time allotment, learning flow, and assessment schedule. The RPS was used to construct the syllabus, which is broken down into multiple instructional periods and difficulty levels. One meeting's worth of learning is divided into two JPs, or lesson hours, with each JP lasting thirty minutes. This results in a weekly total of sixty minutes for one meeting. There are three sections to the assessment: a quiz (30%), a project (40%), and free design (30%).

c. Coding Project: Practical assignments include games and animations created in accordance with the syllabus. Students get a preview of what they will be producing with these projects. The RPS contains references to coding projects, as do other online resources like YouTube and Google.

Source: https://*scratch* .mit.edu/users/anst_vivi/*projects*/

Figure 1. Animation and Game-shaped Coding Projects

d. Modules: Developed for each material and project, these modules incorporate STEM and include instructions on how to develop a coding project as well as programming ideas. Additionally, multiple-choice tests are typically included in this subject.
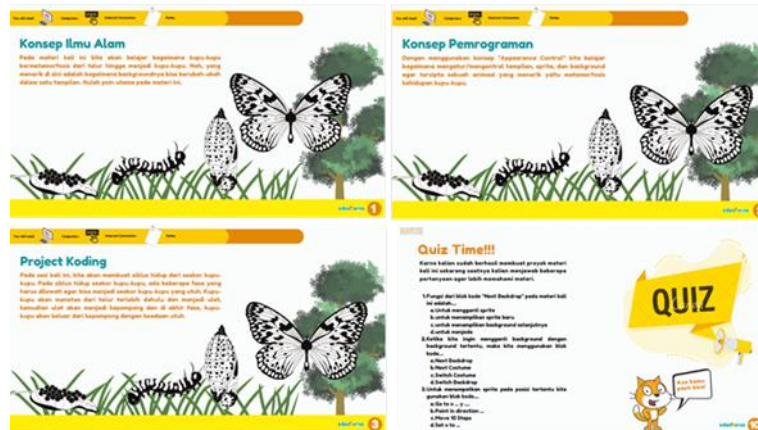

Figure 2. Visual Block Programming Module with a STEM Focus

e. Tutorials, coding project demonstrations, and programming idea explanations are all done through learning videos. Through the use of instructional films, students can learn both orally and visually at their own pace.
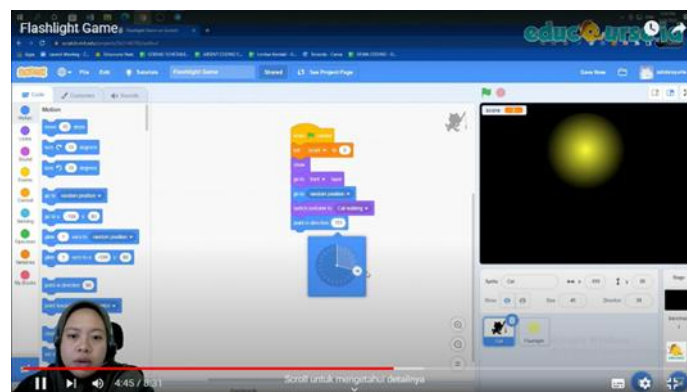

Figure 3. Learning Video

f. Learning Management System (LMS): Online tool for organizing, allocating, and tracking educational resources. With an LMS, students can access resources, turn in homework, and take tests. Because learners can access resources whenever and wherever they choose, learning can be flexible thanks to LMS.
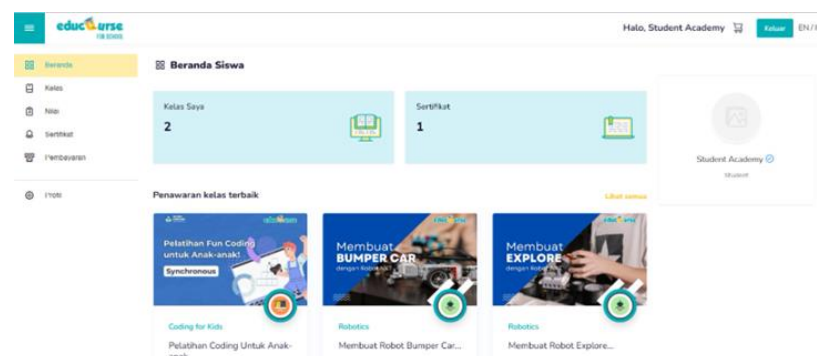
Figure 4. LMS View

4. **Choose a Learning Approach**
   a. STEM-Based Learning Method

   For its visual block programming course, Educourse.id uses the STEM (Science, Technology, Engineering, and Math) approach. This strategy was selected because it is thought to address the issue of Indonesian education's lack of application and close the knowledge gap between academia and business. Through real-world projects, the STEM approach encourages students to think critically and creatively, allowing for more practical and transdisciplinary learning. Despite having many advantages, there are still obstacles to be addressed, such as educators' lack of knowledge about STEM and the scarcity of available technology. Some of these challenges are addressed by Educourse.id, which offers educators training and lends gadgets like Chromebooks to underprivileged schools and pupils.

   b. Selection of Scratch Learning Media

   The Scratch platform was selected by Educourse.id as the visual block programming learning medium. Children can easily use Scratch because of its visually appealing and dynamic interface. With the help of this platform, kids can learn programming concepts more easily because they can see the concepts rather than just reading scripts. While not always having an internet connection is a problem, Scratch offers offline apps. Children can gain a clear and targeted understanding of the fundamentals of programming algorithms with the aid of Scratch. Python and HTML are two script-based programming languages that Educourse.id offers lessons for students who wish to study advanced programming.
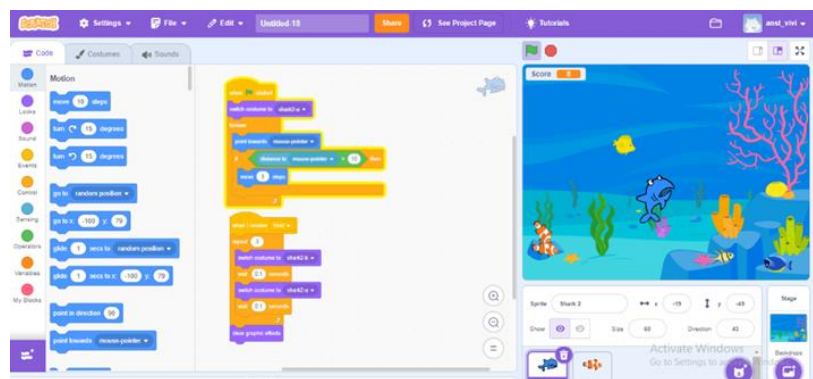

Figure 5. View of Coding Project Creation

B. **Visual Block Programming Course Learning's Implementation at Educourse.id to Create Better HR with Industry 4.0 Skills**
   1. **Using Educational Techniques**

   Using a variety of techniques, instructors may keep students motivated while improving the learning experience and making it more applicable to the workplace. 4.0 Competencies.
   1) Learning through projects
      a. Every meeting include working on a coding project, like an animation or game.
      b. Students gain knowledge on how to combine various coding blocks and hone their critical thinking, problem-solving, and time management abilities.
   2) Conduct an experiment
      a. Students get the chance to alter the project by fusing together various code blocks.
      b. Through trial and error, this approach fosters understanding and creativity.
   3) Tutorial

    a. The instructor walks students through the process of organizing code blocks, explaining how each code works, and demonstrating the project's advancement.

    b. Instructional films, modules, and in-person classroom training are all possible formats for tutorials.

4) Gamification, or game-based learning

    a. Tasks include developing interactive games with points, awards, stages, and competitive components.

    b. Quizzing is done using platforms like Kahoot or Quizizz, which raises student participation.

5) Distinguishing

    a. Instruction is customized to meet each student's unique needs and skill level.

    b. Assignments and projects are made to vary in difficulty so that every student can study at their own speed.

6) Dependent on Competency Learning

    a. Evaluation predicated on mastery of particular abilities and information, like the application of loops or variables.

    b. This approach guarantees that students can practically apply concepts.

2. The Visual Block Programming Process Activities for Learning at Educourse.id

The graphic block programming learning approach at Educourse.id The three primary phases of BSD South Tangerang are assessment and follow-up, instructional, and pre-instructional.

1) Pre Intructional Activities

    a. Classroom Setup: Teachers set up the physical and digital learning spaces, including the internet and technological gadgets.

    b. Introduction and Motivation: Teachers welcome pupils, go over prior knowledge, and give a quick overview of the subject matter and assignment that needs to be learned. The objectives of this exercise are to break the ice and spark learners' enthusiasm and curiosity.

2) Intructional Activities

    a. Material Delivery: To guarantee comprehension, learning materials are presented in a variety of ways. One such example would be the incorporation of STEM topic explanations and modules into programming materials.

    b. Practice: Through debate and question-and-answer sessions, students actively participate in developing coding projects. To aid with comprehension, educators provide step-by-step instructions, describe the purpose of each code block, and provide project previews.

    c. Assistance and Guidance: During instructional activities, educators offer assistance and guidance to students who are having trouble.

    d. Troubleshooting (Debugging): Teachers assist students in finding and fixing defects in their programs, encouraging them to use critical thinking to problem-solving.

Figure 6. Activities For Teaching and Learning

3) Evaluation and follow-up activities
   a. Evaluation: To gauge students' knowledge and proficiency, formative evaluation is carried out using questions and answers, quizzes, and observation.
   b. Follow-up: Teachers use communication groups to send parents learning result reports, and they use the Educourse LMS to provide them individualized feedback.

3. Educourse.id's Visual Block Programming Learning Integrates STEM

Every meeting on Educourse.id incorporates STEM (Science, Technology, Engineering, and Math) ideas through visual block programming learning:

a. Science: In order to comprehend the transformation of a butterfly from egg to adult, students study pertinent science principles, such as those found in the "butterfly life cycle" project.
b. Technology: Coding projects are created using computers, tablets, laptops, keyboards, and mouse. They also learn about software, digital tools, and troubleshooting techniques for technical problems.
c. Engineering: By creating code blocks and creating digital projects, students put engineering principles into practice. For instance, in the "traffic light" project, students learn how to generate and combine sprites for games and animation as well as how to use paint tools to construct a backdrop of a highway.
d. Mathematical application: This includes learning about cartesian coordinates, geometric transformations, and measuring distance and angle, as well as placing sprite coordinate points using the x and y axes. For instance, they comprehended the idea of angles in the "analog clock" project by seeing how the hour and minute hands intersected.

C. Visual Block Programming Course Learning's Evaluation at Educourse.id to Create Better HR with Industry 4.0 Skills

1. Decide on The Format and Timing of The Formative and Summative Evaluation
   a. Formative Evaluation

   Formative evaluation are multiple-choice exams designed to gauge students' comprehension of the STEM and programming subjects covered that day. Following every lesson, tests are administered via the Educourse.id LMS or websites like Kahoot and Quizizz. Following the test, teachers go over the questions with the students to give helpful criticism and confirm understanding.

   b. Summative Evaluation

   At the conclusion of the learning period, this assessment attempts to gauge the attainment of student competencies.
   1) One type of summative assessment is the final exam, which consists of multiple-choice questions combining the content from each meeting to assess conceptual understanding and recall.
   2) The final project is the second method of summative evaluation. Evaluates students' proficiency in using programming concepts to create digital creations, such as games or animations. The project's presentation is a significant component of the evaluation, and there is no set subject for evaluating the project's inventiveness and ingenuity.

   A final project and multiple-choice exams are used for evaluation at the end of the semester in both extracurricular and intracurricular classes at the school. Regarding the regular classes, during the level up with the final project, an evaluation is conducted once every three months.

2. Evaluation Result Report

The report card includes grades and scores based on collaboration, critical thinking, communication, creativity, and programming abilities, among other characteristics. includes

comments and feedback based on the indications. contains a brief synopsis that parents and students can read to recognize their hard work. Parents, students, and the school are the interested parties who will get this evaluation report. The distribution of report cards is explained as follows:

a. Regular Class: Three months in advance (ascend)
b. School Extracurricular and Intracurricular Classes: At the conclusion of each semester, in accordance with the timetable of each school.

Discussion

A. Visual Block Programming Course Learning's Planning at Educourse.id to Create Better HR with Industry 4.0 Skills

The methodical process of lesson planning is what teachers do to decide what to teach, how to teach it, and how to assess the learning outcomes of their pupils. It is crucial because it guarantees the effectiveness and efficiency of the learning process. Lesson planning is a process that involves preparing resources, media, approaches, and methodologies in addition to evaluation within a specific time frame in order to meet predefined objectives, according to Gemnafle et al. (2021:37).

While Matin interprets learning planning as an attempt to distribute learning resources in an efficient, equitable, and logical manner in Entoh Tihani (2022: 16). In order to organize visual block programming learning, Educourse.id has done a number of tasks, including assessing student needs, traits, and interests; creating learning objectives; creating instructional materials; and figuring out learning tactics.

In order to create learning activities that complement children's preferences and tendencies and enhance the inclusive and motivating nature of the learning process, educators must first analyze the needs, characteristics, and interests of their students. Only then can they plan lessons that will maximize learning outcomes. This is consistent with a study by Dewi (2020: 257), which states that in order to meet the primary learning goals, a teacher must be aware of the beginning skills and characteristics of each student during the learning planning process.

According to an interview with the Psychology Education Consultant at Educourse.id, the website offers psychological assessments to potential students. Holland's RIASEC theory, which evaluates six primary characteristics—realistic, investigative, artistic, social, enterprising, and conventional—is referenced in the psychological exam that was utilized. Teachers can map students' preferences for different activities with the aid of each of these features. Based on Meiriyanti's (2015) description in Dewi (2020: 257), educators need to be aware of four primary attributes of students, which include:

1) Fundamental skills like cognitive or intellectual capacities.
2) Religious beliefs, socioeconomic standing, and cultural heritage in the area, etc.
3) Disparities in personality, including beliefs, emotions, and interests.
4) Dreams, insight, courage, perseverance, etc.

According to Dewi's research (2020: 257), there are a few different methods to get data regarding a student's characteristics: a) observation b) interview c) questionnaire d) The preliminary exam. Following the psychological assessment, trial classes are conducted based on the findings of interviews with educators and Educourse.id staff members. A trial class is an essential part of Educourse.id's learning planning process since it guarantees that students will enter the course highly motivated and prepared and that the curriculum is properly tailored to their requirements and interests.

Students will be placed in classes based on the grouping in Educourse.id after completing the trial session, specifically: Based on age (regular class only), namely:

1) Junior One is a class for kids five to seven years old.
2) Junio Two, a program for kids in grades 8 through 9.
3) Upper Junior One, a program for kids ten years old and up.

There are multiple levels of visual block programming at Educourse.id for each class level, beginning with Junior One, Junior Two, and Upper Junior One classes. These levels are as follows:

1) Beginner Level, which lasts for three months

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2) Beginner Level, three months long
3) Intermediate Level, a three-month duration
4) Advanced Level: six to nine months long.

The sole distinction between extracurricular and intracurricular lessons at Educourse.id partner schools is visual block programming level, not age.

In order to maximize the effectiveness and efficiency of the learning process by matching each learner's level of growth and knowledge with the appropriate learning environment. Nasihin and Sururi (in the UPI AP Lecturer Team, 2009: 210-211) stress this point, and Zakia's research (2017: 202) reiterates it as well: there are two purposes that serve as the foundation for assigning students to groups:

1) The purpose of integration, which is to put students in groups according to their shared characteristics. This resemblance extends to factors like age and gender.
2) The purpose of difference, which is to classify students according to individual differences in their personalities, aptitudes, interests, and skills.

Of course, learning objectives are developed as part of learning planning. Learning objectives give teachers and students a clear idea of what has to be accomplished during the learning process. According to Zubaidah (2016) in a research by Oktapiani et al. (2020:100), schools are faced with the issue of figuring out how to help students succeed in the workplace and in life by teaching them how to think creatively, solve problems adaptably, collaborate, and be innovative. This is because of the industrial era 4.0. Then, according to Mulyani (2019:454), education in the twenty-first century needs to be focused on the scientific and quantitative sciences along with the social and humanities.

According to the results of many informant interviews, Educourse.id's vision and goal, which center on offering STEM-based learning to enhance skills pertinent to industry 4.0, are in line with the learning objectives of visual block programming. Educourse.id created programming education with the goal of improving kids' everyday reasoning skills and boosting their creativity—particularly in the realm of digital art.

According to Suparno, in the research of Umiarti et al. (2014:161), a teacher is expected to prepare the lesson plan, the teaching aids (parktikum) to be used, the questions and instructions to encourage students to actively learn, the student's situation, the understanding of their strengths and weaknesses, and the student's prior knowledge, all of which will be uncovered in the learning tool.

According to the interview's findings, the instructional resources available for learning visual block programming take the following forms: 1) Device, 2) Learning Management System (LMS); 3) Coding project; 4) Module; 5) Learning Video; and 6) RPS/Semester Learning and Assessment Plan (SLAP). According to Anggraeni et al.'s research (2015:2), there are four processes in developing learning tools that are based on the 4-D model (also known as the Thiagarajan, Semmel & Semmel model).

1) Define. Umiarti et al. (2014:163) state that the initial purpose of these actions was to identify and describe the development conditions. This phase is frequently referred to as a needs analysis in other frameworks. Undoubtedly, every product needs a unique analysis. With laptops, PCs, and tablets serving as the primary means of accessing visual block programming software, Educourse.id examines the requirements for studying visual block programming. Additionally, a strong internet connection—such as wifi—is needed to use this software.
2) Design. The researcher created a prototype or product design during the design phase. This step of the teaching material production process involves creating textbooks or modules based on the curriculum and material analysis results' content structure (Umiarti et al., 2014:164). Educourse.id creates an RPS / Semester Learning and Assessment Plan (SLAP) at this point. The interview results from this RPS/SLAP will be used to construct a syllabus that is broken down into multiple teachings and structured according to the degree of visual block programming in Educourse.id.
3) Develop. According to Umiarti et al. (2014:164), there are two components to the development stage: developmental testing and expert appraisal. A method to confirm or

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evaluate a product design's viability is expert appraisal. Experts in various domains conducted an appraisal for this task. At this point, the educator will send the prepared teaching materials—such as projects, modules, and learning videos—to the curriculum division for assessment based on the interview findings. On the other hand, developmental testing involves testing the product design on the real target. Currently, teachers will employ these instructional resources to help students learn. Teachers should be aware of what the pupils are saying about the resources they are using for instruction.

4) Dissemination. The instructional materials will now be distributed. Instructional resources on the Learning Management System (LMS) will be distributed by Educourse.id. The intention is to provide flexible, anytime, anywhere access to educational resources for both parents and kids.

Educourse also creates learning techniques for learning planning. This is consistent with Ananda (2019:8), who was cited by Sagala as saying that learning planning is a discipline. This indicates that it is a field of study that consistently considers the findings of studies and theories regarding learning strategies and how they are applied. According to Warni in Sanjani (2021:35), teachers' use of various learning styles has a significant impact on students' academic performance. A strategy centered on STEM methods and the utilization of the Scratch platform was created by Educourse.id.

Sanjani (2021:33) states that when developing a learning strategy, the students, the materials, and the learning objectives must all be taken into account. This aligns with Educourse.id, which takes into account each of these factors. By taking into account the learning objectives, which include enhancing 4C (Communication, Creativity and Innovation, Collaboration, Critical Thinking and Problem Solving) skills and coding skills pertinent to industry 4.0, Educourse.id selected a STEM (Science, Technology, Engineering, Math) method. These abilities can help close the knowledge gap between academia and business. With an emphasis on project-based learning that incorporates practice and the creation of actual projects, STEM approaches are thought to be able to increase the application and relevance of learning. Morrison emphasizes this further in Mu'minah et al. (2019:1496), where she lists some advantages of STEM education, such as fostering students' ability to solve problems, be inventors and problem solvers, think independently and logically, be technologically literate, connect STEM education to the workplace, and connect STEM education to culture and history.

Educourse.id employs Scratch, a visual block programming platform, to make sure STEM learning is relevant and involves hands-on practice to build 4C abilities. This is an explanation of how studying visual block programming on the Scratch platform may be applied to enhance 4C skills.

a) Critical Thinking and Problem Solving : Students learn how to solve difficulties by applying critical thinking skills. They gain the ability to think logically while comprehending and making difficult decisions, as well as when figuring out how various systems interact. Problem analysis, solution design, and debugging are all part of learning visual block programming using Scratch, which develops analytical and critical thinking abilities.

b) Creativity and Innovation: Students are urged to generate, put into practice, share, and show others new ideas. They are also taught to be receptive to fresh viewpoints. They can use Scratch to make inventive and imaginative games, animations, and interactive stories.

c) Communication: Using a variety of media, students learn how to read, write, communicate, and listen. They get knowledge on how to effectively manage and develop oral, written, and multimedia communication in a variety of formats. They are frequently required to present their work during Scratch learning, which tests their ability to communicate and accurately explain concepts.

d) Collaboration: Students gain the ability to work in groups, exercise leadership, adjust to new roles and responsibilities, and collaborate well with others. Working in teams to complete Scratch coding projects teaches students how to share tasks, cooperate, and accomplish shared objectives.

Scratch was selected because it is an aesthetically pleasing, intuitive, and useful tool for teaching children the fundamentals of programming. This assertion is consistent with what

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Sutikno said in Chaerunnisa et al. (2021:1578–1579), according to which the Scratch software is a simulation tool used to build and analyze content that is presented as animation to illustrate a lesson's fundamental idea. Furthermore, as noted by Iskandar & Raditya in Nisa et al. (2022), students can construct programs more easily with the help of puzzles on scratch since they don't have to struggle with writing syntax in programming languages as a whole.

B. Visual Block Programming Course Learning's Implementation at Educourse.id to Create Better HR with Industry 4.0 Skills

The learning plan's implementation step is known as "learning implementation." According to Syahril (2016: 27), the execution phase, also known as the actuating stage, refers to carrying out the planning function's intended actions. The RPS / SLAP, curriculum, and learning objectives are taken into consideration when implementing visual block programming learning. This is also mentioned in Permendikbud No. 22 of 2016 regarding the Process Standards for Primary and Secondary Education, which states that the lesson plan's introductory, main, and closing activities constitute the implementation of learning.

Learning implementation, according to Wijayatika et al. (2022), is the process of carrying out learning activities utilizing a variety of tools and techniques to support the accomplishment of preset objectives. According to the interview findings, visual block programming instructors at Educourse.id employ a range of teaching strategies in accordance with that assertion. This flexible approach is modified based on the needs of the students and the class. Nasution's research (2017: 10) highlights that a quality learning process can result in high-quality learning outcomes for students. However, a quality learning process requires an educator to be able to employ learning strategies that are appropriate for the needs of the class.

The interview findings demonstrate how project-based learning is applied in this visual block programming learning method since students consistently produce projects throughout each meeting. The project may take the shape of a game or animation. The instructor said that students will develop their critical thinking, problem-solving, and time management skills by working on projects that require the development of different code blocks. Furthermore, the instructor mentioned that while working on assignments, students have the chance to consult with acquaintances who have more experience. According to Moursund, who was quoting Farihatun et al. (2019: 640), project-based learning offers the following benefits.

1) 1)Enhanced problem-solving skills: Project-based learning has the potential to enhance problem-solving skills, encourage student participation, and enable them to effectively tackle intricate difficulties.
2) More cooperation; project-based learning places a strong emphasis on teamwork in tasks that call for students to hone and practice their communication skills.
3) Improved resource management abilities: Properly executed project-based learning gives students experience and knowledge in planning projects and allocating time and other resources, such equipment, to finish assignments.

Teachers provide students the chance to alter coding projects by modifying specific code blocks in order to promote independent application of programming ideas. By providing this chance, teachers use the experimental method of instruction. By using this approach, students can develop their critical thinking skills. According to Hamdani et al. (2019: 143), this is accomplished through teaching methods that actively engage students in the process of learning, aiding them in developing their own body of knowledge through experimental activities like problem-solving, direct experimentation, and drawing conclusions from the findings of the experiment.

Teachers use the tutorial method when teaching content or finishing coding projects. Teachers assist students with organizing code blocks in a step-by-step manner and go over each code block's purpose one at a time. One by one, the teacher will also have power over the students. The goal is to gradually increase the learners' pace so they can follow the instructions with ease until the project is finished. According to Said et al.'s research (2021: 50), which outlines the benefits of using the tutorial method—namely, that students would receive tailored

International Conference on Learning Community (ICLC)
2076

ICLC 2024
INTERNATIONAL CONFERENCE
ON LEARNING COMMUNITY
UNTIRTA-INDONESIA

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learning services and learn in accordance with their particular abilities—this application is deemed appropriate.

Using game-based learning, or gamification, teacher may also create competitive, dynamic, and interesting learning experiences. Teachers assess students' courage to communicate the content and projects they would be working on based on the answers from the interviews. Teachers also administer tests using a variety of websites, including Kahoot and Quiz. In Oktavia (2022:2), Vigotsky claims that learning games provide an excellent environment for cognitive development. particularly with Generation Z, who like engaging in non-boring forms of play and learning.

To tailor instruction to the needs and skills of specific students, the differentiation approach is also used. Tomlinson's classification of student learning needs is based on three factors, according to Purwowidodo et al. (2023:22): (1) student readiness; (2) student interest; and (3) student learning profile. Teachers of visual block programming at Educourse.id use the differentiation method based on the students' age and level. This approach adheres to the principles of education that recognize the unique qualities of every child, as stated by Ki Hajar Dewantara, the first Minister of Education in Indonesia, as cited in Purwowidodo et al. (2023: 20).

Competency-based learning is also implemented in visual block programming instruction. Using the competency method, educators concentrate instruction by emphasizing the acquisition of certain, targeted skills and information. For instance, learning programming or coding abilities is a component of visual block programming. According to data from the National Statistics Agency (BPS) in 2003, 82.1 million workers in Indonesia were considered unskilled laborers, as stated by Rahdiyanta. Most of the people in this group attended public schools. There are 20.4 million skill workers above them, and there are just 4.8 million expert workers, making up the lowest tier. Competency-based education prepares students for a changing world.

Implementing learning is a process of verbal and nonverbal communication between learners and facilitators, according to Saputri (2020:103). There are various phases to the communication process. The learning stage is separated into three phases, according to Sagala in Ilhaq et al. (2022: 795). These phases are the pre-instructional stage, the instructional stage, and the assessment and follow-up stage. According to Ilhaq et al.'s research (2022: 795), pre-instructional activities include a variety of tasks like confirming student attendance, posing queries, and going over prior material to serve as a foundation for today's lesson.

Pre-instructional activities in visual block programming learning, based on the interview results, aim to prepare students and provide a basic understanding before entering the core of learning. These activities include setting up the device, asking students how they are, inquiring about prior material, praying, recording students' attendance, and posing lighter questions about the material being covered today. The foundation of learning lies in the instructional level (Ilhaq et al., 2022: 796). Providing information, practicing creating coding projects, offering help, and resolving issues (debugging) in programming are all part of the instructional stage of learning visual block programming.

Moreover, the stages of assessment and follow-up. This stage's goal, according to Ilhaq et al. (2022: 796), is to assess how successful the instructional stage was. Parents receive learning reports from Educourse.id's visual block programming trainers, and students receive feedback in addition to tests covering the day's lessons.

Learning implementation, according to Anisa et al. (2022), is an operational version of learning planning, meaning that the two cannot be separated from the original planning of learning. Whereas Educourse.id's visual block programming learning curriculum has been planned using a STEM methodology. Thus, in its application, STEM (Science, Technology, Engineering, and Math) ideas are combined with the learning of visual block programming at Educourse.id.

STEM (science, technology, engineering, and math) is an interdisciplinary approach to learning, according to Reeve in Sartika (2019: 91). As per Widya (Sapatri et al., 2022: 256), incorporating STEM education into the classroom offers distinct advantages, such as enhancing critical and creative thinking, logical thinking, innovation and productivity, and relevance to real-

ICLC 2024
INTERNATIONAL CONFERENCE
ON LEARNING COMMUNITY
UNTIRTA-INDONESIA

world scenarios. This demonstrates how learning that incorporates STEM subjects may foster the development of the 4C skills—critical thinking and problem solving, creativity and innovation, communication, and collaboration—which are the learning objectives of visual block programming at Educourse.id.

This is how visual block programming instruction incorporates STEM:

1) Science: science enables us to acquire abilities in cooperation, research, critical thinking, and experimentation as well as an interest in and comprehension of the living, material, and physical world (Davidi et al., 2021:12). According to the findings of the interviews, students who participate in visual block programming learning acquire pertinent social science and natural scientific concepts through their coding assignments. In the "butterfly life cycle" project, for instance, students learn about the transformation of butterflies from eggs to adults.

2) Technology: encompasses a broad spectrum of disciplines that apply information, abilities, and computational thinking to enhance human potential and assist in satiating needs and desires (Davidi et al., 2021:12). In this domain, students' capacity to apply STEM through technology is improved. In visual block programming instruction, students individually develop code projects using laptops, tablets, PCs, keyboards, and mice. Along with learning how to tackle technical issues, they also study software and digital tools utilized in programming.

3) Engineering: the aptitude and expertise to plan, develop, and assemble practical machinery, equipment, and procedures to address practical issues (Davidi et al., 2021:12). Here, students studying visual block programming put engineering concepts into reality through the creation and development of digital products like games and animations. Using paint tools, the example project "traffic light" creates a background of a highway.

4) Mathematics: the aptitude for resolving issues with angles and numbers. Based on the findings of the interviews, math principles are utilized in the placement of sprite coordinate points using the x and y axes, as well as in the comprehension of cartesian coordinates, geometric transformations, and angle measurements. Visual block programming is taught using the Scratch platform. For instance, through the interaction of the clock hands, students learn about angle construction in the "analog clock" project.

C. Visual Block Programming Course Learning's Evaluation at Educourse.id to Create Better HR with Industry 4.0 Skills

One task that needs to be completed for learning management is learning evaluation. Idrus(2019:922) defines learning evaluation as the process of assessing or measuring learning and learning activities in order to ascertain the worth of learning that has been done. Citing Fitrianti (2018: 90), the National Education System Article 58, paragraph 1 of Indonesian Law No. 20 of 2003 states that educators evaluate student learning outcomes "to monitor the process, progress, and improvement of student learning outcomes on an ongoing basis."

The learning evaluation of visual block programming includes both formative and summative assessments based on the findings of interviews conducted at Educourse.id. Formative evaluation, as defined by Waseso (2014:13), is the process of determining if the implementation process is proceeding as planned and whether there are indications of progress toward program goals. The goal of formative evaluation on Educourse.id is to track students' progress toward learning as they go through the curriculum. In keeping with the assertion made by Gaspersz et al. (2023: 4), formative evaluation is done to see whether there is still content that students find confusing, difficult to understand, or what issues they encounter so that necessary adjustments may be made.

Weekly quizzes are used in Educourse.id's formative assessment process, which follows each learning session. Sujana in Fetrianto (2017:399) defines formative assessment as the process of conducting tests within the teaching and learning process, particularly towards the conclusion of the endeavor. The quiz questions include STEM and visual block programming principles and are arranged according to the subject covered in each meeting. Following the quiz, the teacher goes over the questions with the students to give them helpful criticism, clarify the right answers,

ICLC 2024
INTERNATIONAL CONFERENCE
ON LEARNING COMMUNITY
UNTIRTA-INDONESIA

and help them comprehend the material better. The benefits of using quizzing in the teaching and learning process include improving learning outcomes, stimulating student initiative, and raising interest, according to Slameto in Wardani (2016: 5).

Based on the findings of interviews conducted at Educourse.id, educators claim that, depending on their inventiveness, quizzes can be disseminated via the LMS Educourse.id or other platforms like Quizizz and Kahoot. Quizizz, Kahoot, and other applications can help students get over their learning boredom (Fadly et al., 2022: 1030). With the help of this formative assessment, which guarantees real-time monitoring of students' learning progress and fosters a flexible and dynamic learning environment, students will receive the help they need to succeed and be able to apply their knowledge in practical settings.

Summative evaluation is also carried out via Educourse.id. At the conclusion of the learning period, such as the semester or during level up, summative evaluations are carried out at Educourse.id. In schools, the evaluation is conducted at the conclusion of each semester in accordance with the academic calendar; in regular classes, it is conducted once every three months. This is consistent with the assertion made by Ramayulis and Samsul in Fitriani (2018: 96), according to which summative evaluation is an assessment of students' learning outcomes conducted on the last day of classes, one semester, or after the school year to decide which students move on to the next level of education.

Summative evaluation, according to Fetrianto (2017: 398), is an assessment meant to gauge long-term outcomes. As such, the behavioral components that are evaluated must comprise cognitive (knowledge), psychomotor (skills), and emotional (attitudes and values). Summative evaluation in visual block programming learning is known to be accomplished through several test formats based on researcher interviews. According to Fitriani (2018: 97), there are two types of tests used in evaluation: subjective and objective exams. Multiple choice tests, sentence completion, true/false choices, and matching are a few types of objective assessments. As a summative assessment, Educourse.id uses multiple-choice questions as an objective test form for the visual block programming course at partner schools. To assess recall and comprehension of programming and STEM topics, exam questions are generated based on the content covered in each meeting. Assessing student learning outcomes in terms of the cognitive domain, or thinking process, is a common practice that involves the use of test methodologies (Fitriani, 2018: 98).

Furthermore, Educourse.id uses summative assessment in the form of final project practice for both regular and partner school classes. The benefits of project assessment, according to Kunandar, who cited Maulina et al. (2015: 104), are that students have more freedom to express themselves, have many opportunities to be creative, learn to be more independent and responsible, free up teachers to teach subject matter, can boost students' creativity, and foster a sense of responsibility among both teachers and students for the tasks given.

The ultimate project in visual block programming instruction is to evaluate students' proficiency in applying programming ideas to digital products like games or animations. The project's originality and presentation will be taken into consideration when determining the students' level of creativity. It is an unthemed assignment. According to Rahman et al. (2019:78), project assessment takes into account the originality of the work, where the student's project must be the product of their own effort, while also accounting for the teacher's assistance or advice.

All evaluation outcomes must be communicated to various interested parties, including parents/guardians, superiors, the government, and students themselves as public accountability, according to a book titled "Evaluation of Learning Outcomes" by Rapii (2017: 62). Evaluation reports are a tool for schools, parents, and communities to communicate and work together, which is advantageous for the advancement of kids' learning and school growth, according to Haryanto (2020:137). Educourse.id is also in charge of this. For normal classes, report cards are sent to parents and students directly or online; for extracurricular and intracurricular classes, they are sent through the schools.

According to Haryanto (2020), the evaluation report should include information about the learning outcomes of the students, based on predefined criteria, and should be linked to tests that aid in the students' development. Additionally, comments and feedback will be added to the report

International Conference on Learning Community (ICLC)

2079

ICLC 2024
INTERNATIONAL CONFERENCE
ON LEARNING COMMUNITY
UNTIRTA-INDONESIA

card and categorized into predefined indications. In addition, parents and students will receive a brief summary to read as a thank you for their hard work in finishing the course material.

CONCLUSIONS

Several conclusions about the learning management of visual block programming courses in creating exceptional human resources with industry 4.0 skills at Educourse.id South Tangerang can be reached based on the results and conversations that have been held. These are the findings.

A. Learning Planning

The methodical process of lesson planning entails assessing the needs, traits, and interests of the students. Educourse.id carried out a psychological evaluation utilizing Holland's RIASEC theory, trial classes, and class divisions to create learning activities that align with kids' interests and enhance inclusivity and motivation in the learning process. In order to accomplish the learning objectives of visual block programming—namely, enhancing 4C skills—Communication, Creativity and Innovation, Collaboration, Critical Thinking, and Problem Solving—relevant to industry 4.0, the curriculum is designed to be STEM-based. Devices, RPS/SLAP, coding projects, modules, instructional films, and Learning Management System (LMS) are among the prepared teaching resources. The Scratch platform and STEM methodology are used in the learning plan.

B. Learning Implementation

Educourse.id uses a visual block programming learning environment that adheres to the prescribed syllabus and RPS/SLAP. The teaching strategies used change depending on the students' and the class's needs. Utilizing techniques including project-based learning, experiments, tutorials, game-based learning (gamification), differentiation, and competency-based learning, the goal is to motivate students to apply programming principles on their own. The three stages of the learning implementation are the pre-instructional, instructional, and follow-up evaluation stages. There are unique advantages to incorporating STEM into visual block programming education. These advantages include enhanced 4C (critical thinking and problem solving), creative and innovative, collaborative, and communication abilities.

C. Learning Evaluation

Formative and summative assessments are used in Educourse.id to assess the learning of visual block programming. Weekly quizzes are used in Educourse.id's formative assessment process to gauge students' learning progress following each lesson. Summative evaluation in Educourse.id is conducted at the conclusion of the learning period, e.g., at the end of the semester or upon reaching a higher level through multiple choice tests and final projects. It evaluates cognitive (knowledge), psychomotor (skills), and affective (attitudes and values) aspects in order to assess long-term results. Five indications or categories make up Educourse.id's assessment of visual block programming learning: communication, creativity & invention, cooperation, critical thinking & problem solving, and programming abilities.

So, the goal of the learning management system for the visual block programming courses at Educourse.id is to provide excellent human resources with competencies that meet the demands of industry 4.0. By expanding this study, more research can be carried out in light of the findings and debate. More in-depth studies on particular abilities acquired by visual block programming classes can be carried out by future scholars. For instance, studies that concentrate on problem solving, cooperation, or the development of computational thinking abilities. Further investigation into the efficacy of virtual learning in courses on visual block programming is another avenue for research. An examination of the learning platform, participant-teacher interactions, and participant engagement levels are possible components of this study. Researchers might also look into other cutting-edge teaching strategies in programming classes and how they affect students' abilities to succeed in the industry 4.0. Research on gamification, project-based learning, etc., for instance.

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