

**THE LIFE SKILLS CURRICULUM AT MA TECHNONATURA
IN TERMS OF HARD SKILLS IS BASED ON STEM EDUCATION
WHICH REFERS TO 21ST CENTURY SKILLS**

Armai Arief

Universitas Islam Negeri Syarif Hidayatullah Jakarta
armai.arief@uinjkt.ac.id,

Dede Rosyada

Universitas Islam Negeri Syarif Hidayatullah Jakarta
dede.rosyada@uinjkt.ac.id

Ahmad Sujai

Institut Agama Islam Depok
ahmad.sujai@iaidepok.ac.id

Alip Nuryanto

Institut Agama Islam Depok
alip.nuryanto@iaidepok.ac.id

Muammar Zulfiqri

Institut Agama Islam Depok
rasmuammar@iaidepok.ac.id

ABSTRACT

Madrasah Technonatura is one of the Islamic-based educational institutions that seeks to adopt the historical progress of medieval Islamic civilization, which is the foundation of research at Madrasah Technonatura. The curriculum used in Madrasah TechnoNatura is based on KTSP 2006 content standards coupled with self-developed content standards taken from 21st century skills, which include 4C and 3R. The 4Cs are critical thinking, creativity, collaboration, and communication, while the 3Rs are reading, writing, and arithmetic, with the addition of 1C and 1R, namely Concordance Work and Religion. This research uses descriptive research methods, with researchers carrying out interview activities and using general guidelines about the information needed from key informants who provide informative data according to research needs. The life skills curriculum at MA Technonatura in terms of hard skills is based on STEM education, which refers to 21st century skills with a learning process based on First Global Challenge (FGC), Internet of Things (IoT), IOS Game Development, Smart Ecosystem, Arduino Weather Balloon, and Tissue Culture (Orchid), which is able to foster and develop students' life skills. In the category of soft skills, MA TechnoNatura builds and familiarizes the school culture with the implementation of dhuha prayer, tadarrus, learning Islamic religious lessons in the morning, and praying together.

Keywords: *Life Skills, Curriculum*

INTRODUCTION

Islamic education has a long history of preserving the nation's treasures long before the nomenclature "Indonesia" was born; simply put, Islamic education in Indonesia is older than Indonesia itself. In the mid-twentieth century, madrasahs with room and classroom patterns, or classical traditional madrasahs, began to emerge in Indonesia. The first Islamic school to facilitate oneself and use chairs, tables, and blackboards was Madrasah Adabiyah (*Adabiyah School*) in Padang. Madrasah Adabiyah is the first madrasah in Minangkabau, even in Indonesia, founded by Sheikh Abdullah Ahmad in 1909. This madrasa lived until 1914, then changed to HIS Adabiyah in 1915, which became the first HIS in Minangkabau to incorporate Islamic religious studies into its curriculum. Before that, Islamic education was held in mosques with the consonant word Jami, which has several research roundabouts (halaqah), such as dar, temple, and khazanah, all of which have bibliotechnic or library meanings. Other institutions similar to madrasahs are ribath, khangah, zawiyah, turbah, and duwairah, all of which are models of religious schools in the Middle Ages in the Middle East, namely the 10th–11th centuries. Over time, these institutions changed functions and developed according to the needs of the times, which in the Indonesian context is a madrasah, an Islamic educational institution that arises from the needs of the community, by the community, and for the community. The urgency of the existence of madrasahs arouses the passion and awareness of the Islamic community towards religious education, which is very important.

Under the auspices and authority of the Ministry of Religious Affairs of the Republic of Indonesia, madrasah remains centralized and is not classified in the decentralized education program, although the autonomy of policies at the school level still remains the same. According to the Constitution, local governments are not obliged to facilitate madrasahs. The development and authority over madrasahs remain the responsibility of the Ministry of Religious Affairs and its extension in the regions. However, madrasahs, which have a population of approximately 17% of the total primary and secondary education institutions in Indonesia, still meet the expectations of the community as well as being the main asset of the region in giving birth to its human resources. If the management of the madrasah is weak, then the human resources it will produce will also be weak and uncompetitive.¹

The independence born by vocational skills or work skills is a small part of life skills; in fact, life skills have a broader meaning. Basically, the ability to survive and face reality is an integral part of life skills. A good process of education and continuous coaching is the main step in equipping a person with useful skills to discover and develop the life skills that Allah the Exalted has made human nature. Because man is given the potential to seek sustenance prepared by God through the management of various resources, Life skills are an effort to find and develop these innate skills for the Muslim generation to be competitive and productive, finding useful steps to achieve piety.

The link to education has at least two goals: "developing professional skills to enable advancement in a particular career" and "how to learn". In addition to personal growth, learners are also able to gain credentials and experience that will help them in the workplace.² Programs that provide training in a series of life skills will gradually lead to the

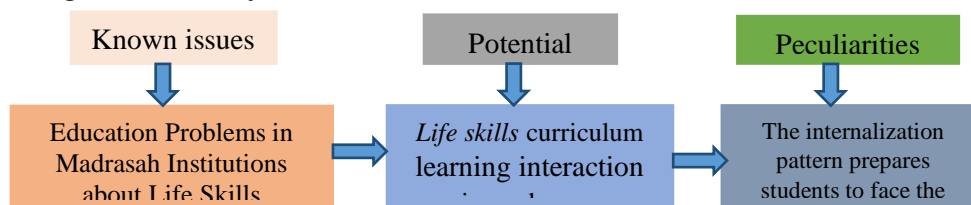
¹ Dede Rosyada, *Madrasah dan Profesionalisme Guru Dalam Arus Dinamika Pendidikan Islam di Era Otonomi Daerah*, (Depok: Kencana, 2017), h. 3.

² Rachel Spronken-Smith, Nell Buissink-Smith, Carol Bond and Gabrielle Grigg: *Graduates' Orientations to Higher Education and their Retrospective Experiences of Teaching and Learning Teaching*

reduction of risky behaviors in various areas.³ Therefore, Islamic education must continue to strive to produce an education system that is applicable in developing the life skills of students as a generation of Muslims, not just a normative system so that the glory of the golden age of Islam in the Middle Ages can be again achieved and surpassed by future generations of Muslims, at least in the smallest scope in madrassas or schools that breathe Islam.

It was found that some madrasas apply management and curriculum, especially in organizational and administrative aspects. This management advancement began with a shift in leadership style from paternalistic-authoritarian to partnership diplomacy. This situation is characterized by the division of duties, functions, and power, where absolute power is no longer centralized in the hands of one person. The management of work units according to the instructions can already be applied to several madrasas. The division of work tasks as a whole can improve the quality of good management, further having an impact on improving the quality of education, which is manifested in improving the ability of students, both in terms of achievement and in terms of skills and life skills.⁴

The implementation of education management theory is difficult because of several factors that hinder its implementation. Objective conditions and normative conditions of management contradict each other. Applying management science without taking into account the actual conditions is *reckless*, and allowing reality without bringing about changes in management is also a less effective action. Therefore, implementation must be effective and efficient to guarantee standardization and objectivity. The complexity of education is also a problem, ranging from the problem of curriculum program development to the integration of *link and match*, facilities, and educator professionalism.⁵ In the current era of information technology, there are still graduates who are confused about finding jobs or entrepreneurship, while on the other hand, the need for employment for people who have skills and integrity is also very urgent compared to the community's need for a good da'i with a global perspective. There are also many educational institutions whose production has not been able to meet these needs. In addition, graduates of Islamic educational institutions lack confidence in the world of work, especially in the industrial and office worlds. So they seem to be marginalized by graduates of state educational institutions. The line of thought of the study can be described as follows:



& Learning Inquiry: The ISSOTL Journal , hal 63 Vol. 3, No.2 (2015), Stable URL: <https://www.jstor.org/stable/10.2979/teachlearninqu.3.2.55>

³ Susan Pick, Martha Givaudan and Ype H. Poortinga, *Sexuality and Life Skills Education: a Multistrategy intervention in Mexico* (Article in American Psychologist, April 2013). h. 232

⁴ Zamakhsyari Dhofier, *Tradisi pesantren*, (Jakarta: LPEES, 2011), Cet. VII, Ed. 8, h. 80

⁵ Fathurrahman dkk, *Education in the 21th Century...*h. 267.

So that it can be explained the problems that exist in madrasah educational institutions about the challenges of institutional readiness to produce outputs that have life skills, and it will be interesting to study more deeply because this uniqueness is carried out in madrasah learning or boarding school, which is unique because it is oriented to the pattern of internalization of *life skills* in preparing students to face the Industri 4.0 Era.

METHODS

The study uses a descriptive research method that allows answering detailed and complete educational questions covering a limited number of research topics, depending on the type of case studied. During this implementation, researchers engage in free, guided interviews. Researchers, in carrying out interview activities, also provide general guidelines on what is needed in key information that provides informative data in accordance with the study of Islamic education and life skills in Madrasah Techno Natura, namely:

1. Riza Wahono *Principal* Madrasah Techno Natura;
2. Tras Rustamaji Head of Madrasah Aliyah Techno Natura and main mentor of *Arduino, Robotics and Computing*;
3. Mentors (the name of the teacher used) Madrasah Techno Natura;
4. The students of Madrasah Aliyah TechnoNatura.
5. H. Maralih, S.Ag.M.Pd. Madrasah Superintendent)

For documentation literature, researchers import data from institutional profile documents, history, student data, employment data, facilities and infrastructure, organizational processes, management, education and learning, strategic plans, and other program plans, as well as access to other Internet sources investigated in order to obtain data relevant to the topic, as well as studies and publicly available photos on Madrasah Aliyah Techno Natura material.

RESULTS

Curriculum 21st century skil Madrasah Technonatura

Madrasah Technonatura is one of the Islam-based educational institutions that seeks to adopt the progress of the medieval history of Islamic civilization, which is the foundation of research in Madrasah Technonatura. The curriculum used in Madrasah TechnoNatura is based on KTSP 2006 content standards, which are supplemented with self-developed content standards taken from 21st century skills, which include 4C and 3R. The 4Cs in question are critical thinking, creativity, collaboration, and communication, while the 3Rs are reading, writing, and arithmetic, with the addition of 1C and 1R, namely Concordance Work and Religion. The curriculum used is a manifestation of the vision and mission carried by the Tachnonatura madrasah, which has a vision: "To be a leading education institution that is capable of reengineering education systematically, is self-sustaining, is a center of excellence in human development with international connection and reputation, and is capable of deploying the highest standard of continuous quality system in education, with the mission: "Fostering all kids to develop their potentials and prepare their role as Caliph of this world, Creative and confidence Academic Excellence "Life Motivation in Equilibrium: Provide and Adapt Human and Nature Interaction" Madrasah Technonatura is under the auspices of the CREATE Foundation (Center for Research on Education, Art, Technology, and Entrepreneurship), which was founded in 2004 by engineers from IPTN (the archipelago aircraft industry), driven by Dr. Ing Ilham A. Habibie.

The rationale of the TechnoNatura madrasah, as conveyed by Ilham Habibie, is: "The vision and dream of building a developed country supported by quality youth and

utilizing Indonesia's demographic bonus." The initiative process begins by imagining what set of competencies future generations need to master, then takes into account the reality of the extent to which the dreams and missions of current generations correlate with future trends. Previously, they were given an overview of technological developments that occur in the world, especially disruptive technological developments, which are the creation of the fourth industrial revolution and have a direct impact on their lives now and in the future. At the same time, understand the context of global problems that will occur due to the rapid development of disruptive technology. The education roadmap towards achieving R2045 is built by outlining several educational change initiatives in various aspects, ranging from the substance of learning to learning approaches and the role of teachers. Education needs to make a paradigm shift, introduce and adopt the latest technological developments from industry 4.0 in the curriculum, and apply a good STEAM approach to the curriculum, syllabus, selection of relevant projects, STEAM lesson plans, and meaningful assessments.

The most important factor that continues to be noted is the happiness of students with learning. The voice of student satisfaction through learning is taken at the end of each project session, in each type of project, to find out the extent of happiness, passion, and correlation with retention of learning and acquired performance. TechnoNatura has been implementing STEAM learning using project-based learning with Project 4.0 technology since 2004, and the dominant results are character building such as creativity, critical thinking, independence, and initiative, student spirit, and teamwork ability, in addition to happiness and encouraging results from students. Portfolios that have attracted attention at national and international events

This was also conveyed in an interview with the principal of MA TechnoNatura, Arie Nurul Hatta, on September 13, 2020. About the learning foundation or lesson plan of Madrasah TechnoNatura, based on the presentation, information can be obtained that the life skills curriculum at MA Technonatura in terms of hard skills is based on STEAM education, which refers to 21st century skills with a learning process based on the First Global Challenge (FGC), Internet of Things (IoT), IOS Game Development, Smart Ecosystem, Arduino Weather Balloon, and Tissue Culture (Orchid) that is able to grow and develop the life skills of students. While in the soft skills category, MA TechnoNatura builds and familiarizes school culture with the implementation of dhuha prayers, tadarrus, learning Islamic lessons in the morning, and congregational prayers.

The educational process at Madrasah TechnoNatura is project-based education (project-based learning). Simply put, this project-based learning is a student-centered learning innovation, and the teacher's position is only as a facilitator and motivator, where all students are given the opportunity to learn to construct their educational process. PBL is a learning model that involves a project in a series of lessons. There are five projects that are always repeated in the Technonatura madrasah every month, namely⁶:

- a. Engineering Project: a project that invites students to design a technological object/product
- b. Science Project: a project that invites students to research natural phenomena around them
- c. Social Project: a project that invites students to observe social symptoms that occur around them and actively prepare students to engage in the existing social environment.

⁶Trianto Ibnu Badar Al-Tabany, *Designing Innovative, Progressive and Contextual Learning Models: Concepts, Foundations, and Implementation in the 2013 curriculum (Integrative thematic curriculum)*, (Jakarta: Kencana, 2014), p. 42.

- d. Entrepreneurship Project: a project that invites students to design an entrepreneur with an emphasis on developing taste between Product, Price, Promotion and Place one project will take one week, thus in one month will create 4 weeks with different projects as above.
- e. If there is a week in one month, the fifth week will be filled by a week with the theme of the Art or Sport Event project.

The combination of Islamic education reflected in madrasah education units and life skills education in the face of the fourth industrial revolution is a very interesting discussion because there are still few madrasahs that carry out educational innovations in involvement on the international stage, especially in the fields of robotics and cyber, which can be the main provision of competence for students to have life skills who are qualified without abandoning the spiritual competence that characterizes madrasahs.

Based on an interview with the Principal of TechnoNatura, A Riza Wahono, Msc, Ph.D., information was obtained that the curriculum used in Madrasah TechnoNatura is a curriculum based on KTSP 2006 content standards coupled with self-developed content standards taken from 21st Century Skills, which include 4C and 3R.

He further explained that, for planning life skills education, it is a process of determining decisions related to the goals to be achieved, carried out through the selection of learning resources to be empowered and also the selection of appropriate learning methods. "As well as establishing learning programs anywhere, anytime, and with anyone so that the learning resources we use are not only from textbooks but also from nature, parents, and the surrounding community.

The curriculum used in Madrasah TechnoNatura combines 21st century skills with the 4 C+, namely critical thinking, creativity, collaboration, communication, and concordance.

- a. *Critical thinking*: Critical thinking empowers students to find truth in statements, especially when it comes to separating facts from opinions.
- b. *Collaborative*. Is a form of discussion between students and teachers, students with students in providing responses and ideas to summarize the results of student thoughts.
- c. *Communicative*: Communication skills are the ability to share ideas about the reading experience. Students will have the opportunity to communicate their readings through both verbal and non-verbal communication.
- d. *Creative*, Creativity is the ability to develop, create, and create to generate new ideas and ways of solving problems and find opportunities in making new things.
- e. *Concordance Workplan*, is a work plan determined by the provisions of *Herman's Quadran Brain table*. This is one of the advantages of the 4C+ curriculum at Madrasah TechnoNatura.



Source: <https://www.learnupon.com/blog/whole-brain-thinking/>

Gambar.1. Whole brain Thinking

The curriculum application of 21st Century Skills character building experience at Madrasah TechnoNatura comes out of the comfort zone to "dig deeper" to find new resources in students. By adopting the example of Prophet Muhammad as a role model of Islamic character and building 12 monthly themes that focus on character such as honesty, constancy, smart thinking, trust, communicating well, God awareness, positive example, positive thinking, fairness, planning ahead, good news bearer, leadership, and fact-based decisions,

Madrasah techno Natura invests in 21st century resources such as e-learning, a cloud-based school management system, a mini Fablab with its 3D printer, CNC models, kit holders, and the latest industrial tariff software, STEAMlab facilities with various types of robots, IoT devices, actuator sensors, and processors, a network engineering lab for biotechnology learning, greenhouses, rare Indonesian orchid collections, a range of ICT, and other equipment to support student learning.⁷

Madrasah TechnoNatura is an experimental school established in 2004 under the auspices of the CREATE Foundation (Research Center for Education, Art, Technology, and Entrepreneurship). The presence of Madrasah TechnoNatura is an expression of a form of education that is in accordance with its era. Existing conventional schools are considered not optimal for responding to the challenges of the 21st century, especially with the rapid development of technology, namely information technology.

The leadership role at TechnoNatura is to foster STEAM-related interest, generate STEAM project-based learning for TechnoNatura Madrasah students, and nurture students to become inventors, innovators, thinkers, and creatives who possess the soft skills needed by 21st-century global professionals and are ready to make the best of a highly developed future.

Life skills are practical skills used as a guide for students to live in the present and future while solving various life problems. includes knowledge and attitudes that are physically and mentally appropriate, as well as career skills related to the moral development of students so that they can meet the demands and challenges of life. In general, life skills education aims to develop the character and emotional and spiritual potential of learners in the hope of developing and positioning their roles now and in the future.⁸

The concept of life skills is one of the analytical approaches to developing life skills or work-based education programs. Life skills have a broader meaning than employability skills and vocational skills, both of which are part of the life skills program. Unesco explained that life skills education is an important vehicle to equip young people to negotiate and mediate challenges and risks in their lives and to enable productive participation in society. Life skills education is an important tool that enables young people to effectively negotiate, mediate, and participate in society about life's challenges and risks. The concept of life skills is one of the axes of analysis in the process of developing educational programs that emphasize life skills or work skills.⁹ Life skills have a broader meaning than vocational skills. What is meant by "life skills" here is not only having special skills but having complementary basic skills such as reading, writing, arithmetic, problem solving and building, group resource management, using technology, and so on.

⁷ <https://www.technonatura.sch.id/>

⁸ Jamal Ma'ruf Asmani, *Kiat Melahirkan Madrasah Unggulan* (Jogjakarta: Diva Press, 2013), h. 132.

⁹ UNICEF, *Global evaluation of life skills Education Programmes*, (United Nations Children's Fund: New York, 2012), h. 7.

Implementation of 21st Century Skills Curriculum Management in Madrasah TechnoNatura

In analyzing the implementation of education in line with this study, an analysis will be carried out on life skills education in the natural Techno Madrasah, the weaknesses of the model, obstacles in its implementation, and the results achieved. Before a specific analysis of the concept of life skills needs to be carried out, it first needs to be related to the basic concept, namely the vision, mission, and objectives of education in Madrasah Techno natura.

Madrasah TechnoNatura has a vision: "To be a leading education institution that is capable of reengineering education systematically, is self-sustaining, is a center of excellence in human development with international connections and reputation, and is capable of deploying the highest standard of continuous quality systems in education." (To be a leading educational institution capable of systematically re-engineering education independently, a center of excellence in human development with international connections and reputation, able to apply the highest standards of sustainable quality systems in education.) And Mission: "Fostering all kids to develop their potential and prepare their role as Caliphs of this world through creativity and confidence, academic excellence "Life Motivation in Equilibrium: Provide and Adapt Human and Nature Interaction" (Fostering all children to develop their potential and prepare for their role as caliphs of this world through creative and confident academic excellence and motivation to live in balance by providing and adjusting human and natural interaction.)

The vision is simple and focused formulation, describing realistic and actionable certainty. The most important good or bad formulation of a vision is that the vision can be captured in meaning by the entire extended family of educational institutions, including even the lowest staff or implementers. This is in the opinion of Bound et. al. quoted by Danim (2007) that the formulation of the vision must be *"Simple and compelling, certainly challenging, practicable, and realistic"*.¹⁰

Furthermore, the mission of Madrasah TechnoNatura is "to foster all children to develop their potential and prepare for their role as creative and confident world caliphs, possessing academic excellence and life motivation in a balance of giving and adapting human interaction with nature." The mentioned mission underlines the purpose of Madrasah TechnoNatura, which is to prepare qualified learners. These learners are expected to have a strong understanding of religion, faith, and taqwa as a result of their strong vision of religion. They are also expected to have a broad scientific or technological understanding as a consequence of a vision of excellence in achievement. In addition, students are also expected to have independence in life, in accordance with the vision of being skilled in life. To achieve this mission in order to compete in the global era, several efforts need to be made, such as improving the quality of highly dedicated education personnel, developing an optimal curriculum, maximizing facilities, providing a professional service system, and exploring and managing financial resources optimally and proportionally. Madrasah TechnoNatura uses a curriculum based on KTSP 2006 content standards that is also equipped with self-developed content standards taken from 21st century skills covering 4C and 3R.¹¹

Madrasah TechnoNatura has invested in 21st century resources such as e-learning, a cloud-based school management system, a mini-fablab with its 3D printer, CNC models,

¹⁰ Danim, *Visi Baru Sekolah Dari Unit Birokrasi Ke Lembaga Akademik*, (Jakarta: Bumi Aksara, 2007), h. 73.

¹¹Interview with *Principal TechnoNatura*, A Riza Wahono, Msc, Ph.D. January 25, 2020.

kit holders, and the latest industrial tariff software; STEAMlab facilities with various types of robots, IoT devices, actuator sensors, and processors; a network engineering lab for biotechnology learning; greenhouses; rare Indonesian orchid collections; and a wide range of ICT and other equipment to support student learning.

Based on the results of an interview with Principal TechnoNatura, A Riza Wahono, Msc, Ph.D., about planning and implementing a life skills curriculum in Madrasah TechnoNatura, he explained that "the curriculum used in Madrasah TechnoNatura is a curriculum based on KTSP 2006 content standards coupled with self-developed content standards taken from the 21st Century Skills, which includes 4C and 3R."

The life skills curriculum that is a reference for the learning process at Madrasah TechnoNatura is the concept of a life skills curriculum, which contains content of learning, strategies of learning, and school culture based on KTSP 2006 content standards coupled with self-developed content standards taken from 21st Century Skills, which include 4C+3R. Madrasah TechnoNatura realizes and knows that there is a division of life skills into generic and specific life skills, but in its implementation, learning in extracurricular and intracurricular activities and evaluation has not been integrative. In addition, the Life Skills application is still limited to learning skills identical to vocational skills.

Skills programs are intended to equip students to be able to work or create jobs independently and not depend on others, including the government. With these skills, it is hoped that graduates of Madrasah Technonatura will be able to solve life's problems, including finding or creating jobs for those who do not continue their education. Educational institutions that equip students with skills are very positive for their own future, along with the mentality of the Indonesian nation. This refers to the educational experience of other nations with more emphasis on vocational or professional skills education than academic education. For the skills program for Madrasah Teknologi students, it should apply to all because it is a school under the auspices of the Ministry of Religious Affairs in the form of a madrasah.

The implementation of skill learning in Madrasah TechnoNatura students takes place effectively in one type of skill, followed by all students who are at the level themselves and are guided by instructors, laboratories, or technicians. The learning is direct, where students are introduced to the material and directly practice it in skills workshops, but there are also indirect lessons because instructors or mentors act as learning facilitators. Based on observations, learning like this can give birth to student creativity through curiosity and a desire to try.

In addition to the importance of quality control in education for life skills, there are several aspects that need to be considered, namely: raw input, instrumental input, environment, educational process, and feedback. Raw input is related to students who have specific skills, while tool input includes educational objectives, curriculum, educational facilities and media, administrative and supervision systems, educators, and guidance and counseling. The environment includes ecological factors of society and family, while the educational process involves the interaction between raw input and tool input, with output in the form of graduates who are ready to participate in community life. Feedback is the result of educational outputs that provide information for the evaluation of raw input conditions, tool inputs, and the environment for educational progress.

The field of work is often divided into jobs that emphasize more manual skills and jobs that emphasize thinking skills. However, there is an important general skill set, namely productive attitudes and behaviors, which means being someone who is productive in

whatever vocational field or job is studied. In addition, special life skills education can be divided into academic skills and vocational skills.

Here is the need for a skills program that is integrated with each subject in the integrated curriculum unit in the sense that it is implicit in the learning steps. The obstacle faced is changing the paradigm of the mindset and pattern of action of teachers. It takes a long time, and not all teachers are creative. The solution is socialization when making syllabuses and lesson plans.

Life skills education is integrated in its implementation by habituation and is more dominant in the training aspect. The obstacles faced are the lack of funds and the fact that the culture in schools is limited by time, so that graduates are considered less skilled in their field of work. The solution is to increase the allocation of practice time with a mastery learning approach and funds by asking for community help and collaborating with the business world. To achieve this, it is necessary to apply widespread educational principles, not only focused on academic or vocational fields but also providing an understanding of "Learning How to Learn." This includes not only learning theory but also applying it to solving problems in everyday life, so that students are able to compete in the global era. Education in the global era is education that is able to integrate five pillars of education, namely "learning to know," "learning to do," "learning to be," and "learning to live together," plus one additional pillar, namely "learning to believe." These principles are in line with the objectives of national education based on the philosophy of Pancasila.

Life skills, which consist of personal skills, social skills, academic skills, and vocational skills, are considered appropriate, but the components are not in accordance with the realm of personality as per the Islamic view. In Islam, the realm of the heart, or qolb, is where the human person has a very dominant role. Because such a heart (spiritual) is not yet contained in the four aspects of life skills, in addition to the need for integrative steps in the educational component, Then life skills also need to be aligned with learning to believe.

Life skills Learning Planning at Madrasah TechnoNatura

From the results of life skills education planning research in TechnoNatura Madrasah, researchers found several things, namely how to plan life skills curriculum in TechnoNatura Madrasah, when planning was carried out, what are the elements involved in design, how to plan life skills education in TechnoNatura Madrasah and what steps are taken in planning life skills education in TechnoNatura Madrasah TechnoNatura.

a. Life skills curriculum planning at Madrasah TechnoNatura

Life skills education curriculum planning in Madrasah TechnoNatura is a decision-making process about the goals to be achieved, resources that must be accounted for and methods chosen appropriately to carry out life skills education in Madrasah TechnoNatura. As stated by the principal of Madrasah TechnoNatura, namely:

*"For life skills planning, it is a decision-making process that depends on the goals we want to achieve, the selection of learning resources, and the selection of the right learning method."*¹²

Madrasah TechnoNatura aims to ensure that its graduates have mastery of basic skills, have life skills, and build strong character in order to live independently in society and face the challenges of life in the future. Therefore, everything that is taught and imparted to students is not only limited to the applicable curriculum but also changed or developed

¹² Wawancara dengan *Principal TechnoNatura*, A Riza Wahono, Msc, Ph.D. Tgl. 25 Januari 2020.

in order to achieve the educational goals of life planning skills in Madrasah TechnoNatura in an effective and efficient way.

In terms of learning resources, Madrasah TechnoNatura not only relies on manuals as the main source but also increases the utilization of natural learning resources, which are often referred to as "learning from nature." In addition, parents are used as an important learning resource and involve the surrounding community as a valuable learning resource. This was revealed in an interview with the school's staff, who stated:

*"Our program is learning anywhere, anytime, with anyone, so the learning resources we use not only come from textbooks but also from nature, parents, and the surrounding community."*¹³

While the method applied in the cultivation of *LifeI skills* education in Madrasah TechnoNatura is *Project Based Learning* (PBL) in all *contentI of learning*. Students conduct exploration, assessment, interpretation, synthesis, and information to produce various forms of student-centered learning results to conduct an in-depth investigation of a topic. Students constructively deepen learning with a research-based approach to weighty, hard, and relevant problems and questions. In order for this method to satisfy students' curiosity and after the student's curiosity is satisfactorily answered, students will be able to choose the next step in order to develop their creativity and life skills.

The characteristics of learning in *Project Based Learning*, among others:

1. *Centrality*; In *project-based learning*, the project becomes central to learning.
2. *Driving question*; *Project-based learning* is focused on questions or problems that lead students to find solutions with appropriate concepts or principles of science.
3. *ConstructiveI Investigation*; In *project-based learning*, students build their knowledge by conducting independent investigations (teachers as facilitators).
4. *Autonomy*; *Project-based learning* demands *student centered*, students as *problem solvers* of the problems discussed.
5. *Realism*; Student activities are focused on work similar to actual situations. This activity integrates the task and produces a professional attitude.

b. Time for Planning *Life skills* Learning at Madrasah TechnoNatura

Time planning for Life skills learning at Madrasah TechnoNatura is usually carried out in June and December (at the end of each semester). In the sense that programming is carried out every 6 months, precisely in June and December. This activity is also a work meeting (Raker) to remember the activities of the previous semester, to assess which activities did not go well and needed to be changed or which activities went well and needed to be maintained and even developed. In addition, this raker is the beginning of planning life skills education about what will be implemented in the following year, as well as to discuss the schedule for registration and admission of new students which usually opens in July, or: *"For Life skills education planning here we usually do it at the time of Raker, which is in July or at the end of each semester"*.

c. Elements involved in planning *Life skills* learning in Madrasah TechnoNatura.

In the design of life skills education in Madrasah TechnoNatura is not only based on the thoughts of someone, namely the founder or chairman of the foundation, but also involves many elements such as the principal, parents represented by the school committees, teachers, school management, foundations and school counselors. As the principal said, and precisely: *" The elements involved in this planning are the principal, parents, teachers, school administration, foundations and school consultants"*.

¹³ Wawancara dengan *Principal TechnoNatura*, A Riza Wahono, Msc, Ph.D. Tgl. 25 Januari 2020.

All are free to express their opinions and ideas and are ready to make changes and development in a better direction for the progress of Madrasah TechnoNatura and also for the better education of children.

d. Preparation of *Life skills* Learning Planning at Madrasah TechnoNatura

In the preparation of life skills education plans in Madrasah TechnoNatura is carried out in an open space, namely the school yard and is usually carried out in conjunction with work meetings. The preparation of this plan pays attention to the things below, namely:

1) The main goal of Madrasah TechnoNatura is to create competent individuals who possess characteristics such as "*Intellectual Curiosity, Creative Imagination, Art of Discovery and Invention, and Noble Attitude.*" In the case of *Intellectual Curiosity*, the goal is to develop students' curiosity by training them in questioning skills and facing challenges that can develop their personal abilities. Meanwhile, in *Creative Imagination*, the goal is to form students who have high imagination skills and dare to express ideas that can develop their personal abilities. *Art of Discovery and Invention* aims to create students who enjoy discovering new things in every lesson, even while learning simple things, which can help develop their academic skills. Lastly, *Noble Attitude* aims to form students of strong character, who hone their social skills and spiritual aspects. In the learning process, the barrier between teachers and students is deliberately removed to support the achievement of this goal.

2) Madrasah TechnoNatura emphasizes a unique and different learning approach from formal schools in general, especially through the application of *Project-Based Learning* (PBL) methods. This method aims to improve students' ability to solve project problems, acquire new knowledge and skills, make students more active in solving complex project problems with tangible results, develop students' skills in managing materials or tools to complete tasks or projects, and improve student collaboration especially in projects involving groups.

Madrasah TechnoNatura accepts with an open mind various opinions, ideas, and ideas coming from teachers, parents, school management, principals, and related foundations. *Life skills* include a person's ability to face life and life problems with a reasonable attitude, without pressure, and proactively in finding creative solutions to overcome these problems. In general, there are two types of life skills, namely general life skills (GLS) and specific life skills (SLS). In life skills learning at Madrasah TechnoNatura, the application of project-based learning is proven to improve students' life skills.

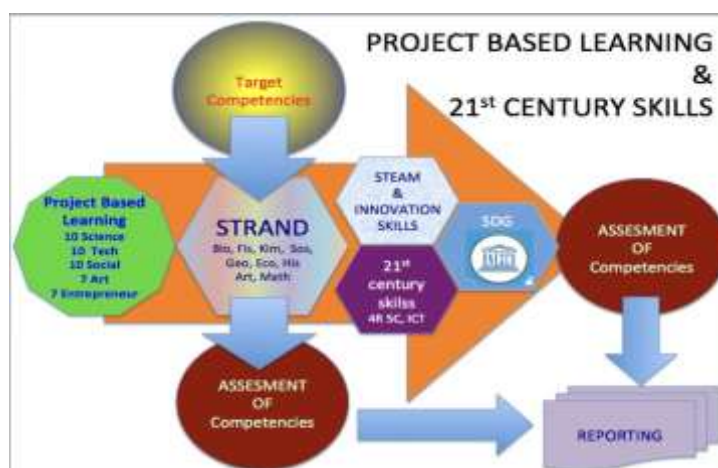
This project-based learning encourages students to develop collaboration and reflection skills. Through this project-based learning, students can improve their social skills, reduce absenteeism, and reduce discipline problems in the classroom. Students also become more confident in communicating in groups and between groups about the products they produce. This learning not only focuses on developing individual skills, but also skills to live in society, nation, and state.

Life skills can be explained as follows: (1) the ability to know oneself, including awareness as a creature of God, awareness of self-existence, and awareness of one's potential; (2) thinking skills, including the ability to find information, process information, make decisions, and solve problems; (3) social skills, including the ability to communicate orally and in writing, as well as the ability to cooperate; (4) academic skills, including the ability to identify variables, connect variables, formulate hypotheses, and carry out research; (5) vocational skills, also known as vocational skills. In choosing a learning experience, it

is necessary to consider what life skills will be developed for each basic competency. Therefore, a life skills analysis is required for each basic competency.

Themes applied in life skills should have significant meaning for students, both for the present and the future. Life skills learning is delivered thematically by raising the problems of everyday life. Through problem solving in everyday life, students are trained to deal with real life. With this ability to think rationally, it is expected that students can face life's challenges with a reasonable attitude without feeling pressured.

Enthusiasm in learning also increases when students have passion and enthusiasm for what they learn. This often makes them more involved in the subject and broadens their interest in the subject. Awareness of self-existence refers to awareness of self-existence. With awareness of self-ability, students will know their strengths and weaknesses, strengths and weaknesses. Learners' enthusiasm also tends to retain what they learn, rather than just forgetting it after they finish taking the test. Therefore, the selection of learning materials should be able to provide alternative work for students.



Source: <https://www.technonatura.sch.id/>

Picture 2 *Project Based Learning & 21st Century Skills*

Project-based learning has several advantages, namely helping students become more independent, self-regulated, and responsible for their learning process through projects. Students are motivated when they engage in learning by doing simple research. Students learn how to manipulate their environment to become more active, which will ultimately improve their learning outcomes. Product assessment in this learning is carried out based on the process of making products and the quality of these products. Product development involves three stages of assessment, namely product design, selection of appropriate materials, tools, and techniques, and ensuring the resulting product conforms to the criteria set. Some examples of products produced by students in project-based learning at Madrasah TechnoNatura include the Internet of Things (IoT), the Arduino Weather Balloon project, and orchid tissue culture. Project-based learning in this context can stimulate, improve, and improve students' thinking skills, social skills, academic skills, and vocational skills in Madrasah TechnoNatura.



Source: <https://www.technonatura.sch.id/>

Picture 3 Project Monthly Cycle

Project-based learning allows students to pursue learning that matches their interests and talents and offers a diverse menu from hands-on teaching to fun learning so that students can develop a wide range of skills and competencies from mastery of academic subjects to learning creatively and collaboratively. solve problems to learn how to apply knowledge to real-world situations.¹⁴

Life skills development is one of the alternative solutions for the advancement of education in Indonesia, which has an impact on education rankings at the international level, including aspects of education, economy, and civilization in general. Although the achievements achieved by Madrasah TechnoNatura have not significantly raised Indonesia's education ranking globally, at least it has changed the negative perception of some parties who underestimate the quality of Islamic education and consider Islamic educational institutions as lagging institutions in terms of quality. It is hoped that the experience of Madrasah TechnoNatura can be an inspiration for other educational institutions to focus more on developing the life skills of students.

The contribution of Madrasah TechnoNatura to Indonesia includes several things, including:

1. *Firsfirst Global Challenge (FGC)* : The FGC project is a learning process that involves making robots as a learning tool. Through this project, students learn not only about robots, but also gain a broader understanding.
2. *Internet of Things (IoT)*: Skills in IoT are one of the important components in the era of Industry 4.0. Through education at Madrasah TechnoNatura, students are equipped with IoT skills that are very relevant to compete in this 21st century.
3. *iOS Game Development*: Through game creation, students can hone their creativity, programming logic, and teamwork. In this project, they used Xcode and Swift programming language for iOS app development.¹⁵

With the development and implementation of the *21st Century Life skills* curriculum students at Madrasah TechnoNatura have the confidence to take part in high-level, National and International competitions carrying the name of Indonesia, some of the results are listed below:

1. *Nominated at ICAD, Indonesian contemporary Art and Design*
2. *Competing in Google science Fair*
3. *Nominator of Young Indonesian Inventor Award*
4. *competing Sci-Fi Hackathon*
5. *Winning Robotic Imagine Competition 2008*
6. *Winning Indonesia ICT Award, INA ICTA Robotic Competition 2008*

¹⁴ <https://www.technonatura.sch.id/>

¹⁵ <https://www.technonatura.sch.id/courses>

7. *Nominated Indonesia ICT Award, INAICTA, Student Project Eco Bot, 2010*
8. *Special Mention winner, Indonesia ICT Award, INAICTA, Student e learning Project 2012*
9. *Special Mention winner, University project, Indonesia ICT Award, INAICTA, 2013*
10. *Silver medal in Innovation Engineering, Al Lahori Award, First Global Challenge, Washington DC, 2017*
11. *Bronze medal Walt Disney awards on Imagination, and creativity, First Global Challenge, Mexico, 2018*
12. *Judge Award, FIRST Technical Challenge, Sydney, Australia, 2018*
13. *Rookie Inspiration Award, FIRST Robotic Competition, Sydney, Australia, 2019*
14. *Rookie All Stars awards FIRST Robotic Competition, Sydney, Australia, 2019*
15. *FIRST Robotic Competition, World Championship, Detroit USA 201*
16. *Safety Award FIRST Global Challenge, Dubai UAE, 2019*
17. *Think Award Nominee, FIRST Technical Challenge, Sydney, Australia, 2019*
18. *Imagery Award FIRST Robotic Competition, Turkey, Istanbul 2022*
19. *XPRIZE, Innovator Award, New Technology Experience: Carbon Countermeasures. FGC, GENEVA, SWITZERLAND, 2022*

CONCLUSION

From the results of the research that has been described, the author concludes as follows: *he Life* skills curriculum at MA Technonatura in terms of *hard skills* is based on STEM education which refers to the *21st Century Skills* with a learning process based on *the First Global Challenge* (FGC), *Internet Of Thing* (IoT), *IOS Game Development*, *Smart Ecosystem*, *Arduino Weather Balloon* and *Tissue Culture* (Orchid) that is able to grow, and develop the *life skills* of students. Meanwhile, in the *soft skills* category, MA TechnoNatura builds and familiarizes school culture with the implementation of *dhuha* prayers, *tadarrus*, learning Islamic lessons in the morning and congregational prayers can answer the challenges of the industrial era 4.0.

The implementation of *the Life Skills* curriculum at Madrasah Aliyah TechnoNatura is carried out through *Strategic Of Learning*, *Content Of Learning* and *School Culture* with 5 (five) projects repeated every month: 1) Engineering Project; 2) Science Projects; 3) Social Projects; 4) Entrepreneurship Project and 5) *Art Project* or *Sport Event* if in one month there is a fifth week. Meanwhile, in responding to the challenges of the FGC held every year, students at levels 10 and 11 are focused on becoming the Indonesian R2045 Team to take part in the event, while students at level 12 continue to carry out the project-based learning process at school. This implementation results in:

1. Robotics learning in FGC trains students to master hard skills namely *3D Design*, *Engineering*, *Electricity*, *Mathematic* and master *soft skills* namely creative, critical thinking, collaborating and communicative.
2. Tissue culture learning encourages students to master hard skills, namely having the ability to separate / isolate parts of plants such as cells, tissues or organs (leaves, roots, stems, shoots and so on) and master *soft skills*, namely communicative, critical thinking, personal patience and good behavior.
3. IoT learning encourages students to master *hard* skills, namely having technical or mechanical abilities, data analysis skills and mastering computer *software* as well as mastering *soft skills*, namely communication, collaboration, problem solving, personal patience and timekeeping.

4. *Arduino Weather Balloon* encourages students to master *hard skills*, namely programming, engineering and mechanical language skills and master *soft skills*, namely communication, collaboration, adaptation, problem solving.
5. Art and sport event learning encourages students to master hard skills namely technical skills and master soft skills namely imagination, communication skills, emotional intelligence and ethics.
6. The habituation of Tadarrus, dhuha prayer and learning religious knowledge encourages students to master the hard skills of proficient religious sciences including the Qur'an, Hadith, Fiqh, Tariqh and da'wah and *Moral soft skills*, tawadhu, realizing their weaknesses as humans and understanding the greatness of Allah and realizing how much they need Allah SWT.

Supporting factors in the implementation of *Life skills* education at MA TechnoNatura are adequate mentor competence, students who have high enthusiasm, the role and support of parents as supporters of school activities such as participating in FGC activities that take place in Europe, the strategic location of the TechnoNatura Madrasah and funding sources derived from sponsors, APBD and the Ministry of Religion of the Republic of Indonesia. While the inhibiting factor in the implementation of *Life skills* education at MA TechnoNatura is the curriculum required by government policies that are binding with accreditation, the national education system, government support, social / cultural, business / industrial support can answer the challenges of the industrial era 4.0.

REFERENCES

- Abuddin Nata. (2012). *Manajemen Pendidikan: Mengatasi Kelemahan Pendidikan Islam di Indonesia* (Cet. V). Jakarta: Kencana Prnada Media Group.
- Anwar. (tanpa tahun). *Pendidikan Kecakapan Hidup*. (h. 29).
- Danim. (2007). *Visi Baru Sekolah Dari Unit Birokrasi Ke Lembaga Akademik*. Jakarta: Bumi Aksara.
- Dede Rosyada. (2017). *Madrasah dan Profesionalisme Guru Dalam Arus Dinamika Pendidikan Islam di Era Otonomi Daerah*. Depok: Kencana.
- Hidayanto. (2002). Belajar Keterampilan Berbasis Keterampilan Belajar. *Jurnal Pendidikan dan Kebudayaan*, 037, 562-574.
- Jamal Ma'ruf Asmani. (2013). *Kiat Melahirkan Madrasah Unggulan*. Jogjakarta: Diva Press.
- Jensen, Eric. (2013). *Pembelajaran Berbasis Otak* (Edisi Kedua). Jakarta: PT Indeks Permata Puri Media.
- Kementerian Agama RI. (2005). *Pedoman Integrasi Kecakapan Hidup (Life Skills) dalam Pembelajaran*. Jakarta: Direktorat Jenderal Kelembagaan Agama Islam.
- Rachel Spronken-Smith, Nell Buissink-Smith, Carol Bond, & Gabrielle Grigg. (2015). Graduates' Orientations to Higher Education and their Retrospective Experiences of Teaching and Learning. *Teaching & Learning Inquiry: The ISSOTL Journal*, 3(2), 55-62. [URL yang tidak valid dihapus]
- Susan Pick, Martha Givaudan, & Ype H. Poortinga. (2013). Sexuality and Life Skills Education: a Multistrategy intervention in Mexico. *American Psychologist*, 68(4), 232. <https://doi.org/10.1037/a0032222>
- UNICEF. (2012). *Global evaluation of life skills Education Programmes*. New York: United Nations Children's Fund.

Zainal Arifin. (tanpa tahun). Konsep dan Model Pengembangan Kurikulum. (h. 249).

Zamakhsyari Dhofier. (2011). Tradisi pesantren (Cet. VII, Ed. 8). Jakarta: LPEES.

<https://www.learnupon.com/blog/whole-brain-thinking/>

<https://www.technonatura.sch.id/>

<https://www.technonatura.sch.id/courses>