

Choose Science, Art or Alchemy as a Modern Learning Design Metaphor: From the Perspective of Heutagogy

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ABSTRACT

Learning and learning science, art and alchemy need to be adapted to the needs of learners. Student-centered learning requires a heutagogy approach to be a learning approach that is in accordance with the characteristics of the humanities, exact sciences and vocational fields. Students in various fields of science need the opportunity to: 1) choose content, (2) develop their own learning resources, and (3) take advantage of the content developed together in learning. Science, art and alchemy are learning design metaphors that prepare features of a learning environment. The ability to choose, develop and utilize learning resources independently shows the success of learning designs and the heutagogy approach is a necessity in life-based learning.

Keywords: science, art, alchemy, heutagogy

1. INTRODUCTION

Learning cannot be separated from educational technology. Now, perhaps more than at any time in the last four decades, the influence of technology on teaching and learning is challenging and changing traditional design practices and models [1]. Different parts of the world are showing significant changes in the way people communicate, how they complete financial and business transactions and how they access and transmit information. Accompanying this change has been the massive increase in learning available online, offered not only by new online institutions but also through schools, colleges or universities [2], [3]. Now more learners are choosing to study online to take advantage of studying anytime, anywhere [4], and more teachers have provided for the needs of learners [5], [6]. So that teachers need knowledge on how to design learning and learning. Teachers need to have knowledge and skills in design practice because of the needs of contemporary, “thirsty” learners to have an online learning experience. Although many educational designers have experience using established design theories and models, the quality of new learning that is developed should still vary.

Strengthening the concept of heutagogy is carried out by examining various literacies about the abilities and obligations of learners (students) to decide their own path of life. A comprehensive study of developing a learning environment is the main way to develop a Learning Management System in a life-based learning curriculum. Heutagogy, or as defined by the term ‘self-study’ [7]. The

essence of heutagogy is that in some learning situations, the focus should be on what and how the learner wants to learn, not what is being taught. This is a very different approach from the more formal and traditional way of ‘teaching’ people. In heutagogy, the educational process changes from being a process where people (academics) pour information into learners, to places where learners choose what to learn and even how they can learn it. This represents a change from teacher-centered learning to learner-centered learning. In the heutagogy approach, people who ‘learn’ more take the role of facilitator or guide on how the necessary learning occurs, and if formal assessment of learning is required,

Conceptual analysis is needed to develop a learning approach carried out by educators. Educators in developing learning must ask: (1) how learning will be carried out [8]; and (2) how teachers should guide students in their own learning [9]. Certainty in learning and learning is that the desired learning is in the level of ability and maturity of the learner. Learners have the feeling of being unreasonably challenged, no matter how much they want to learn about anything. One of the inherent beneficiaries of the heutagogy approach that learners will gain is that their learning abilities are significantly improved through the use of the heutagogy learning approach. This is the challenge of learning something that, conventionally, might be thought to be beyond their capabilities, may actually develop and expand the learner’s abilities. This is of particular relevance given the emphasis on lifelong and limitless learning.

2. SELECTION OF TRANSFORMATION TO PERSONAL LEARNING

Does it need to be asked that universities need to be transformed? The answer refers to the 2000s utterance known as the year 2K. Whatever will change, but there is something that remains, namely change itself. Like the law jokes in the 90s where article 1 states that a lecturer is never wrong and article 2 states that if a lecturer makes a mistake intentionally or not, then the rules are returned to Article 1. The direction of the question that we actually know the answer to but needs to be emphasized to be sure of ourselves we alone. Transformation is not a taboo culture, nor is it a condition of giving up after being declared defeated by technological changes. This is because we are still puppet spectators with the play “Industrial Revolution”. If we were the masterminds of it all, we would never be surprised. Because the change is actually in the hands of the puppeteer. When is romantic, when is it dramatic, when is war, when it changes, it’s actually in our hands (the mastermind)?

Automation on campus is the hope of many audiences. One of the effects of automation has infected libraries in various well-known universities in the world. The library, which is the heart of a university, really needs automation in its services [10]. Aspects of library automation include information technology infrastructure, in-house activities, information services and their use, workforce development, to budget. Although it leaves a problem, namely the identification process, anticipates damage to non-digital books and predicts suggestions on services.

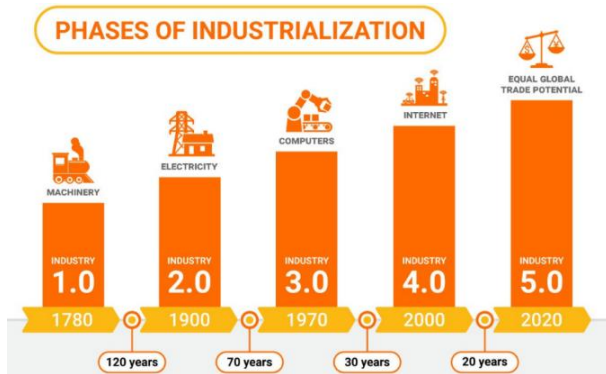


Figure 1 Development Phase of the Source Industry [12]

Automation in learning is no less interesting. How is learning that occurs “outside the campus”, that is, there is a massive effort in doing it continuous improvement as a key requirement for manufacturing companies requiring flexible organization, lifelong learning for its employees, and information processing systems and adaptive learning abilities [11]. Changes in these conditions cannot be denied since the existence of Learning in Intelligent Manufacturing Systems, the availability of abundant literature, and with many contributions from open learning, various surveys of

machine learning techniques that are able to realize systems with intelligent behavior. Symbolic, sub-symbolic approaches and their applications to creation are treated the same, along with blended learning solutions that try to integrate the benefits of personalization. This is what is meant by future trends (Figure 1).

The triumph of personal learning in the 5.0 industrial revolution has perpetuated the need for change. The Advanced Learning Factory (aLF) framework provides the processes necessary to define and run training instruments that meet the demands of the industry [14]. Each training incorporates basic modules which allow efficient individual training. The effectiveness of this approach is proven by statistical means. It is proposed that prior knowledge, experience, and motivation drive successful learning apart from a number of other learning concepts.

Furthermore, in the development of aLF learning, it was found that direct interaction helps an impressive learning process. The aLF learning framework seems to support every new trend including in the era of the industrial revolution 4.0. Therefore, further work is needed to develop new modules that support the development of aLF to tackle the industrial 5.0 era. The industrial world is very responsive to change by adopting personal learning.

3. HEUTAGOGY IN THE SCOPE OF STUDENT LEARNING PERSONALLY

The concept of learning and learning is not a short process, but the roots of psychology in the field of education are the “main engine” of educational technology in Indonesia. Real life, as studied by educational psychology, the individual is the owner of his life. Adjustments to life ownership are very dependent on individual learners, so the heutagogy approach has an important role. Heutagogy is a science that is friendly to individual empowerment. The heutagogy approach is not a new approach to learning. Various records suggest that the heutagogy approach was even recorded on napkins in a restaurant in 2000[7], [15]–[17].

The heutagogy approach is actually not the best idea to be implemented specifically at the Universitas Negeri Malang (UM) or in general at other universities but based on various discussions conducted by lecturers in various parts of the world, there is general dissatisfaction with the way education has been implemented so far. The heutagogy approach is intended to cultivate the ability of learners to expand the boundaries of knowledge, attitudes and skills. Maybe some assumptions about the existence of the most appropriate approach, model, learning strategy for now, may be true, but if someone says that there is one approach, model, learning strategy that is the most appropriate and correct is an “absolute” value, of

course it will be difficult to agree. In general, who does not recognize pedagogical scholarship? However, what was not agreed upon was merely teacher-oriented pedagogy. Learning requires development towards a more aspirational direction.

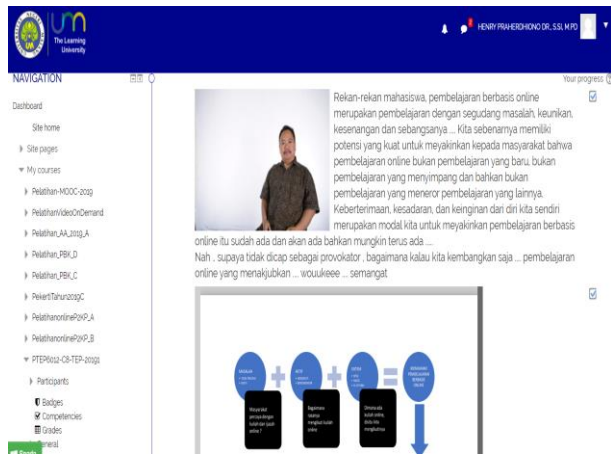


Figure 2 SIPEJAR

Online-based learning which is run at the UM, the SIPEJAR platform provides a heutagogy vehicle (Figure 2). Students as learners are not an object of learning. Students as adults need to be approached in an adult manner such as learning andragogy. Commandments are not the only way to get them to learn. The convenience of the learning environment needs to be realized in the technical aspects of introductory text in online learning [18]. As in the picture SIPEJAR, I try to build togetherness with students.

The wind direction is always changing. Nothing is eternal in the life of the world. It needs to be a joint study that the weakness of learning which is still seen as a mechanical activity cannot be applied in all fields of learning. Freedom of thought by scientists and practitioners of education is a “lawsuit” against the empowerment of students. Learning must be student centered learning. Rogers and Freiberg (1994) explaining the power to learn is truly in the hands of learners and not just teachers. Rogers and Freiberg (1994) also realize, that humans grow up from early childhood actually have potential but are not anticipated by the education system.

The learning that is carried out only meets the target user graduates, even confusing learning activities [20], [21]. The learning system that becomes the autonomy of lecturers can interfere with the natural ability of students of the department of UM to: (1) explore, (2) ask questions, and (3) make connections, and to learn. The heutagogy approach implemented is a continuation of the humanistic view of how people learn in student centered learning [22] as well as some recent research on student centered learning environments as opposed to teacher centered learning [23]–[25].

Human thinking is an individual and social creature is the key to learning. Each individual will learn if the

learning environment is supportive. As a case that might represent the case of UM Students majoring in Educational Technology who are familiar with various new technologies (Figure 3). If technology is used, it will create new behaviors and cultures for its users. Media and technology have the potential to develop students from both creative and innovative sides, but at the same time they also have the potential for abuse and even more harshly help verbal, physical “harassment” etc. [26], [27].

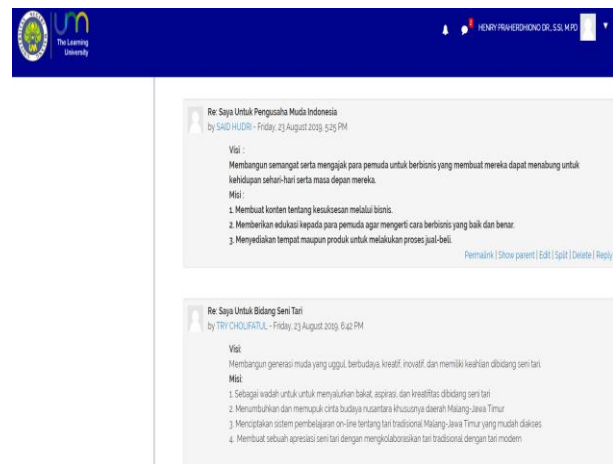


Figure 3 Students as Personal Beings

Some of the facts experienced by students are that the presence of technology in learning does not always benefit the majority of students or always improves learning [28]. There is no guarantee that learning will work best with digital learning resources alone. Students who are active in social media technology do not necessarily increase their digital literacy. We cannot deny that fact. Social media is a medium that has been a trend in Malang and even Indonesia. However, it could be that in other countries (outside Indonesia) the opposite is true.

4. SCIENCE BECOMES A PRESENTATION OF LEARNING DESIGN?

Educational Technology is a building on a sand which has an impermanent structure which is likened to a sand of relativity [29]–[31]. Education and scientific disciplines are constantly changing based on the philosophical development of learning. The construction of science and technology becomes uncertain, scientific theory is growing. So that learners really need answers. When slow answers arrive and uncertain in technical language the answers are hard to find, the void is filled with wild speculation and philosophical extremism. Because a brief statement is needed to attempt to clarify the teacher’s belief that teaching is a scientist and learning design is a technology that is founded in science.

A small question is if learning and teaching are to be transformed through design practice, what approach should be taken? A statement appears. Too much of the structure of educational technology is built on the sands

of relativism, not on the rock of science [31]. When the winds of the new paradigm blow and the sands of the old paradigm shift, then the structure of educational technology slides into a sea of pseudo-science and mythology. We stand firm against the shifting sands of new paradigms and “realities.” We’ve drawn a line in the sand. We boldly reclaim instructional design technology that is built on the rock of instructional science.

Science as a learning metaphor builds accuracy in design practices which is essential for successful learning. Because science is described as a systematic enterprise that builds and organizes knowledge in the form of explanations and predictions that can be tested at any time. Science as a learning design metaphor supports design practices that aim to increase understanding of both existing knowledge and the generation of new knowledge.

However, problems arise from the form of science as a metaphor for learning design. Science in the metaphor of instructional design in learning technology has had an impact on the learning experience, teaching and design leading to the question whether instructional science includes all the elements needed to meet the changes experienced by learners. How is the rigidity of the form of science expected from a scientific approach in line with the emergence of open learning (MOOC, SPOC) and the diversity of student characteristics? Can the educational design variables (learning, outcomes, learner characteristics, knowledge domain) be fully addressed by a scientific approach (science)? Can science as instructional design fulfill the roles of learners, teachers, and designers through online interactions and connections?

5. CHOOSING ART AS A LEARNING DESIGN METAPHOR?

A designer is a planner with an aesthetic sense [32]. Learning designers must have a visual opening in different learning to be able to see the world in other ways and be able to convey to the learner the information needed to expand his field of view. Students must be able to see the world through the eyes of others [33].

Thus, the task of the teacher is to create a new kind of artist, a creator who is able to understand every kind of need, not because he is miraculous, but because he knows how to approach human needs according to the proper method. We wanted to make him aware of his creative powers, not afraid of new facts, and not dependent on formulas in his own work [32].

As an alternative to the scientific approach to learning design, what is the perspective when design is viewed as art? Can the creation of a learning and teaching environment also be an artistic expression? Does the delivery of ideas, ideas to learning have to be beautifully designed? Is it not quite a functional construction, and

easily accessible? Various problems may arise in this design but the view of art as a learning metaphor provides an interesting perspective of learning design and learning.

Each of these metaphors puts the designer into a very different mindset compared to the scientist, and this sentiment is also in line with the design learning and learning approaches to design, especially those related to: (1) learner-centered strategies, (2) seeing the world through the eyes of technicians, practitioners, technologists and scientists, and (3) know how to approach human needs. Therefore, an artistic approach to design can involve creating learning experiences that focus on the visual experiences of the environment and the aesthetic interactions provided through technology.

6. SCIENCE BECOMES A PRESENTATION OF LEARNING DESIGN?

Mission that is impossible to complete is a challenge in today’s era. Learning Design is the art and science of creating an environment and teaching materials that will take students from being unable to complete certain tasks to being able to complete those tasks [34]. Science and art as a framework in learning design, becomes clear, as explained by Siemens (2002), that design for education must involve both. However, based on engagement and observations in the field, it appears that design practices tend to be more often scientific, focusing on methods, processes and results, rather than artistic. In seeking to integrate these two approaches, the practice of alchemy needs to present a perfect metaphor, integrating science and art, while also working to unravel the mysteries and workings of the universe (Figure 4).

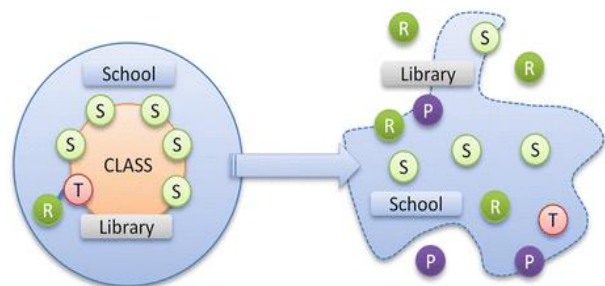


Figure 4 Alchemy [1]

To provide a rigorous yet practical and efficient method to meet the ever-changing educational environment, Alchemy Design introduces a practice known as the flexible and contemporary Learning Design metaphor. To provide a context for the alchemy learning design framework, it is necessary to clarify why alchemy which is considered ancient is an appropriate metaphor for the skills of teachers and learners to construct the learning designs needed today. Alchemy design in learning involves motivated learners. Old alchemy designs have been drawn on alchemy illustrations (Figure 5).



Figure 5 Illustration of Alchemy [35]

7. CONCLUSION

The relationship between science and art becomes clearer when it is an important feature of alchemy. Alchemy contributed to the development of modern chemistry and medicine and represents a philosophical tradition that practitioners claim profound power. The aims of defining alchemy usually include the creation of the philosophers' fairy tales; the ability to turn base metals into gold or silver and the development of life elixirs, which give youth and longevity.

While alchemists developed basic laboratory techniques that are still recognizable today, they differed significantly from modern science by including practices related to mythology, magic, religion, and spirituality [1]. Therefore, design alchemists embrace the available science (what is known about teaching, learning, and design) and use creative thinking to tap into human spirituality and diversity. Given the need for design change, diversity and quality, alchemist concepts of design are perfect, because their focus is on turning all programs into amazing learning and teaching.

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