

Learning Objects, Media Literacy and Dilemma Oriented Learning

Some thoughts on tomorrows learning society

:)icon identify formation in contextual media culture, a research project supported bij the European Commission

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Table of Contents

- 0 Foreword 4
- 1 The research 4
- 2 Media Literacy 5
 - 2.1 The learning object and media literacy 7
- 3 Learning Objects 8
 - 3.1 Definition 8
 - 3.2 Content Model 10
 - 3.3 Two examples of Learning Objects 12
 - 3.4 The learning objects and DOLM 12
 - 3.5 With respect to 'Living Apart Together' 15
 - 3.6 To live or to eat 21
- 4 Conclusion 25
- References 26

0 Foreword

In discussions on topics concerning education a central theme often mentioned concerns subjects and content offered to our young adult students. Updating and upgrading are often advised actions to be undertaken. Modern subjects, studied in a modern way with modern means. It means working on actualisation, working on broadening. It facilitates and works on new pedagogy, like self responsible learning, competencies learning and reflection learning.

This part gives a quick overview of the results of the Dutch survey and the skills youngsters are developing because of use of new media. Also attention is called to media literacy.

With this in mind, two learning objects are developed presented on:

<http://webpages.inholland.nl/Projects/DOLMasLO/>

This article gives a brief explanation of the basic principles used by developing these learning objects, as well as results of working with the model used within the learning objects.

1 The research

The Internet also plays a major role in young peoples relationships with their friends, their families, and their schools, this became clear in the research we did amongst almost 400 young people aged 13-19.¹

Most of the respondents spent three hours or more online. It appears available time is divided between activities, school and the internet.

The internet is mostly used for chatting on MSN and secondly for searching for information. The main interest groups are games, sports, music and movies.

There is a substantial difference between different age groups. Searching for information is more important for the older ones (16-18) in contrary to the younger ones, who like to chat more.

Boys and girls differ from each other in the way they use the internet. It is a matter of interest. Girls like to use the MSN just for chatting about fashion, to gossip and to exchange homework.

¹ :)icon identify formation in contextual media culture, a research project supported bij the European Commission. To be published in june 2005

Online gaming, downloading movies and music are more 'boys things' However maintaining contacts and relations, making dates are important for both of them

New media offers new means for social interaction; more often peer than family-focused interaction.

Internet is more and more becoming a way to keep in touch, many times of the day, a way to maintain relationships, exchange ideas, to communicate and to look for information on their own as well as with their friends, youngsters develop several skills with ease, but how should these skills be enhanced?

Within education this means

- Young people should be taught among other skills, 'to question the plausibility and value of the information found and how to collect, enter, analyse and evaluate it.
- They should 'use a range of ICT tools efficiently to draft, bring together and refine information and create good-quality presentations in a form that is sensitive to the needs of particular audiences and suits the information content'.
- They should 'develop and explore information, solve problems and derive new information for particular purposes'.
- They should learn to reflect to 'reflect critically on their own and others' uses of ICT to help them develop and improve their ideas and the quality of their work'.

To match educational demands with youngsters' abilities nowadays it becomes necessary to encourage the development of *media literacy*. Studying at institutes of Secondary Education and Higher Education asks for more classified training in nowadays ICT-environment.

2 Media Literacy

Information and communication technologies are rapidly reaching into every aspect of our everyday lives, modifying the minimum skills we require to be active members of society (as a student or member of the workforce, as a consumer and member of the community) with all the responsibilities and tolerance that this requires.

As the Internet links up with digital television and cell phones to become even more present and pervasive, increasing importance will be placed on information literacy that is the ability to use today's technology to receive and transmit information efficiently.

Media Literacy can be described as the ability to access, understand and create communications in a variety of forms.²

² www.ofcom.org.uk

Access.

Internet literacy is required to access both hardware and online contents and services, and to regulate the conditions of access.

This does not apply to physical Internet access –available in many countries through formal (schools or educational establishments) and/or informal opportunities (libraries, in the home or through youth clubs) – but to 'technological' literacy or the ability to manipulate the tools and mechanisms of the online environment. It is about awareness and knowledge of what is out there, how to protect oneself from unwelcome incoming information and how to avoid giving out inappropriate information, such as personal details

Understanding.

Internet literacy is crucial for effective, discerning and critical evaluation of information and opportunities online. It is important that literacy enables the user to understand what the material is saying and to understand what it is asking of the user (implying functional and media literacy). In terms of civic participation, where online techniques are used to collect information about public opinion, for example, it should be clear how the data are to be used and how anonymity (if appropriate) is to be preserved.

Literacy skills then, enable the user to participate in the material being offered, to understand the context and framework in which it is set. While this is recognisably difficult in an online environment where any one can create text, it is important that skills for competent literacy allow for textual analysis as well as the ability to use analytical tools, such as search engines.

Creation.

Internet literacy permits the user to become an active producer as well as a receiver of content, enabling interactivity and participation online. The new technologies, by providing greater freedom to be publisher as well as receiver, for example, allow one to create websites discussion panels and engage in the democratic process in a way which is far easier than in a more formal print-based system. Also the role of the reflective practitioner is translated to a production activity from the student by using a digital portfolio for instance.

2.1 The learning object and media literacy

Within the learning objects presented in this project, students are encouraged to use and develop their competencies and skills of media literacy. They have to access information, to evaluate it and to integrate it with their own knowledge. They have to be able to participate in online discussion panels; they are able to call in online experts.

New technologies provide access to a vast array of information, including digital libraries and connections to other people who provide information, feedback and inspiration. Students are used to being interactive, it is easy to create an environment in which students can receive feedback and continually refine their understanding and build new knowledge.

In the next chapter we present two learning objects in which teachers and students work together in discovering true values by using the DOLM model. Basic skills in Media Literacy help users to find their way. On the other hand, by using a learning object Media Literacy will improve.

3 Learning Objects

As an example this paper presents two learning objects. A *learning object content model* was chosen to make distinction between different elements of the Learning Objects. In this paper we will not answer the question whether these learning objects are reusable or adaptable. Two good practices of a learning object are demonstrated. Within the Learning Objects the DOLM model is introduced and some results will be evaluated.

3.1 Definition

It is difficult to give a clear definition of a Learning Object. For some it is a small reusable chunk of learning, for others it is a good alternative to an instructor-led course. A "course" is mostly a linear thing; it has a beginning and an end. Therefore it is difficult to repurpose. Learning objects are so difficult to define because it can be virtually anything, a video, a chapter in a book, a graphic, a simulation. What might be an entire learning object by someone might just be a component of a learning object to someone else. They vary in size, scope, and level of granularity ranging from a small chunk of instruction to a series of resources combined to provide a more complex learning experience.

Some definitions:

Wiley, 2002³:

Any digital resource that can be reused to support learning. The term "learning objects" generally applies to educational materials designed and created in small chunks for the purpose of maximizing the number of learning situations in which the resource can be utilized.

According to the learning Object Metadata (LOM⁴) a learning object is

'any entity, digital or non-digital, that may be used for learning, education or training.

This definition allows for an extremely wide variety of granularities.

Cisco Systems⁵ one of the pioneers of reusable learning objects (RLO) have precise rules for what constitutes a Learning Object or an information object. Their definition:

Ideally, a learning object is based on a single learning or performance objective, built from a

³ David Wiley: <http://wiley.ed.usu.edu/>

⁴ LOM: <http://ltsc.ieee.org/wg12/>

⁵ Cisco: <http://www.cisco.com/>

collection of static or interactive content and instructional practice activities. Any learning object can be "tested" through assessments that measure the learning or performance objective and are either positioned with the learning object or collected as an assessment group. Within the learning object, content, practice, and assessment groupings are built from raw media assets such as text, audio, animation, video, Java code, applets, Flash, and any other asset needed for the given delivery environment. Finally, everything found in the learning object is identified with metadata so that it can be referenced and searched both by authors and learners.

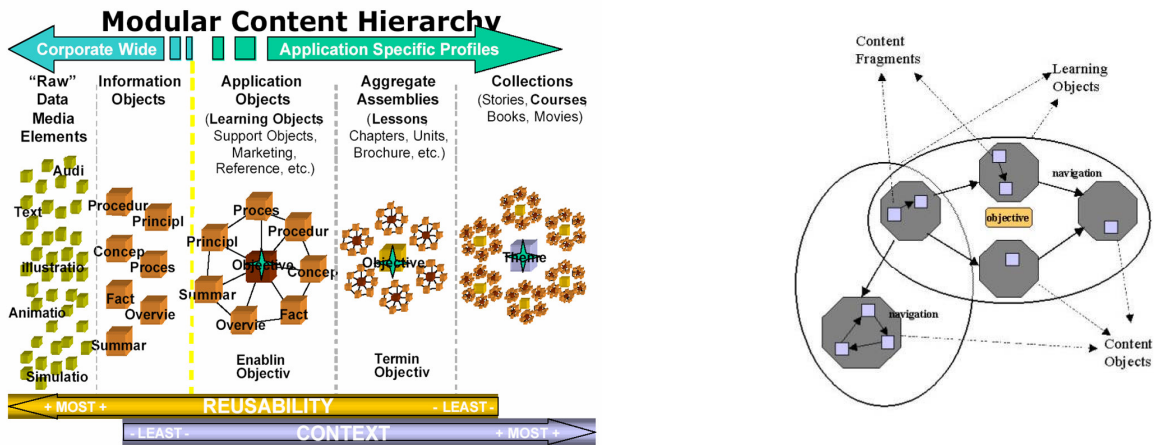
On some common characteristics of learning objects elements almost every author agrees about:

- A learning object is self contained, to be used independently of other objects
- It is a small unit of learning
- It is reusable; the same object can be used in a different context
- A Learning object can be aggregated around one ore more objectives
- A Learning object is tagged with metadata, which describes the objects, technical or educational and makes them traceable.

By identifying the different components of the learning object, repurposing will be much easier

Duval, Hodgins and others presented models to explain the methodological background of a learning model. Although the models differ from each other, it is clear that they focus upon reusability, metadata and contextualisation.

3.2 Content Model



(Wayne Hodgins & Learnativity)

A distinction could be made between:

- content fragments (raw data),
- content objects (information objects)
- learning objects.

Content fragments⁶ are learning content elements in their most basic form, like text, audio and video. They represent individual resources without any relation to other elements. A further specialization of this level will need to take into account the different characteristics of time-based media (audio, video and animation) and static media (photo, text, etc.).

Content objects are sets of content fragments. They aggregate content fragments and add navigation. Content fragments are instances, whereas content objects are abstract types. We can extend content fragments with activities and people, and analogously content objects with activity types and roles. A content object assembles also other content objects.

Learning objects aggregate instantiated content objects and add a learning objective. They define a topology between their components and can communicate with the outside world. Aggregations of learning objects can be made. We do not specify the number of aggregation levels. It seems rather arbitrary to specify 3 or maybe 4 levels of aggregation.

⁶ Towards a Global Component Architecture for Learning Objects: A Comparative Analysis of Learning Object Content Models Katrien Verbert, Erik Duval Dept. Computerwetenschappen, Katholieke Universiteit Leuven Celestijnenlaan 200A, B-3001 Heverlee, Belgium {Katrien.Verbert, Erik.Duval@cs.kuleuven.ac.be

Briefly stated, learning objects contain content objects, zero or more other learning objects and a learning objective. A content object contains content fragments, zero or more content objects and navigation. Navigation may not be confused with presentation, like formatting and layout.

Content fragments, content objects and learning objects have metadata.

Metadata provides guidance to describe learning objects and their components. Metadata are resource descriptors used to index a resource for later discovery, such as the resource's author, title, and date of publication. This information is similar to that used to catalog books in a library.

3.3 Two examples of Learning Objects

Within this project some learning objects are developed. The learning objects can be found at: <http://webpages.inholland.nl/Projects/DOLMasLO/> .

3.4 The learning objects and DOLM

Didactical approach of working with LO and DOLM

Raw data (learning fragments) can be structured in several ways into information objects and learning objects with their related learning objectives. For our learning objective we opt for value learning in higher education. Our students will be tomorrow's members of society (Boschhuizen et. al 2001). They have to be educated to be critical and responsible students in universities. And later on to be critical and responsible professionals, who make their own decisions. Schools also have a pedagogical mission based upon social responsibility and value learning. In the last two decades the pedagogical mission had no priority in school practice. It was thought that the pedagogical training was a task of the parents and educational formation was a task for the schools. In order to structure information with respect to the objective of value learning, an educational model to integrate pedagogical aspects of subject matters has been developed by the Vrije Universiteitsproject 'On Values': the Dilemma Oriented Learning Model (DOLM) Boschhuizen (1999, 2000, 2002, 2003, 2004). The DOLM describes a theoretical model with which it is possible to use real life situations as meaningful elements in secondary and higher education. Raw Data are source elements for making judgements upon dilemma's that come up (thirstily intuitive and later on also based on relevant information and philosophical reflection on that information. If we compare this phase with the model of Hodgins we can conclude that where Hodgins describes Application Objects and Aggregate Assemblies DOLM describes the phase of becoming expert.

This model offers a strategy in which students learn to question the plausibility and value of information needed to make choices with respect to dilemmas in real life situations. And to clarify, communicate and develop their values.

DOLM is a four-phase model

.Phase A - The intuitive phase

- Students read a short description of a case study involving dilemmas.
- In this specific situation they intuitively choose a course of action and formulate the arguments and moral values underlying their choice.
- The students discuss their choices and values

Phase B - The phase of knowledge acquisition

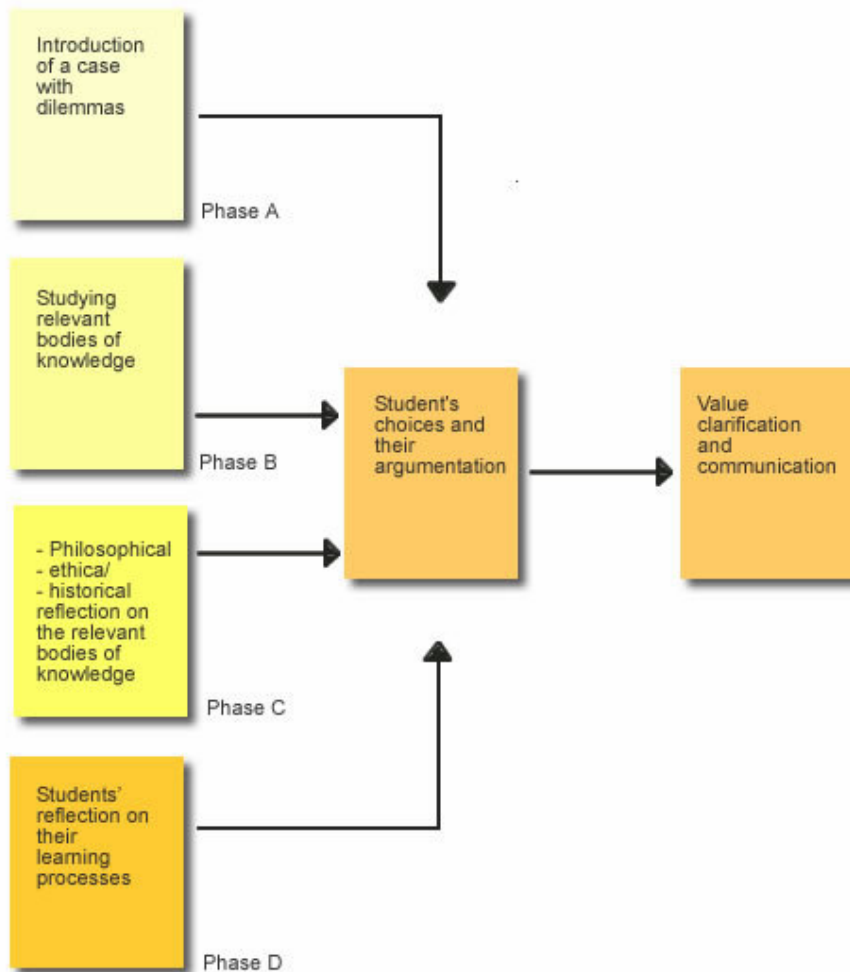
- The students study relevant bodies of knowledge.
- They again make another choice and offer their arguments and an explanation of their values
- A discussion between students on choices and values

Phase C - The phase of reflection on the relevant bodies of knowledge

- The students reflect on the truth (plausibility and value) of the relevant bodies of knowledge from a philosophical perspective
- They make their choices again,
- Present their arguments and clarify their values
- They discuss their choices and values with each other

Phase D - The phase of reflection on the learning process

- The students reflect on the three choices made in the earlier phases
- They give a verbal description of their learning process.



For a more concrete explanation of the concepts raw data, information objects and learning objects, in the next paragraph we make use of the description of some good practices of the DOLM : Living Apart Together (Boschhuizen & Brinkman 2002) and 'To live or to eat' (Boschhuizen 2002) in relation to the concepts of the Learning Objects: the raw data, the information objects and the learning objects. For some insight in the kind of value learning processes we will show some results of Boschhuizen's' research on these good practices.

Finally we will come to some conclusions and suggestions for the future.

3.5 With respect to 'Living Apart Together'

The case study contained two fragments of a conversation between A and B. The conversation concerned the question of whether their mutual friends should live together. B's turns of phrase showed a more emotional, or romantic, approach to their relationship while A's approach was more rational.

Raw data

The raw data in this case are the paragraphs in the books. Every paragraph is one set of raw data.

Information objects

By packaging all the literature items, an information object is created. The information objects within this course are:

- The DOLM Model
- The reference list
 - Armstrong, John (2001) '*Conditions of Love. The Philosophy of Intimacy*' Allen Lane, The Penquin Press, chapters 1, 2, 9, 12, 16, 17, 22.
 - Becker, Gary S. (1993), Nobel Lecture: 'The Economic Way of Looking at Behavior', *Journal of Political Economy* 101, 385 – 409.
 - Becker, Gary S. (1991) '*A Treatise on the Family*'. Cambridge (Mass.), London: Harvard University Press. Chapters 1, 2, 8, 10.
 - Blinder, Alan S. (1974) 'The Economics of Brushing Teeth', *Journal of Political Economy*, 82, 887 – 891.
 - Coase, Ronald H. (1977) 'Economics and Contiguous Disciplines'. In: Mark Perlman (ed.) *The Organization and Retrieval of Economic Knowledge* pp 481 – 495.
 - Etzioni, Amitai (1988) *The Moral Dimension. Toward a New Economics*. New York/London.
 - Kee, B. (2002) *Economische Filosofie en Wetenschapsleer. Cursusjaar 2002 – 2003*. Reader I & II. Faculteit der Economische Wetenschappen en Bedrijfskunde.
 - McKenzie, Richard B. & Tullock, Gordon (1975) *The New World of Economics. Exploration into the Human Experience*. London, Georgetown: Richard D. Irwin, Inc.
 - Nelson, Julie A., Thou, I, & Them (1994) 'Capabilities, Altruism, and Norms in the Economics of Marriage', *American Economic Review* 84, Papers and proceedings, (pp. 126 – 131).
 - Pont, Steven (2001) 'Maak de balans op van je relatie. Liefde is pure economie' In: *Vriendin* 10 t/m 16 oktober. Pp 38 – 41.
 - Slater, Don (1998) 'Needs/Wants'. In Chris Jenks (ed) *Core Sociological Dichotomies* (pp. 315 – 328). SAGE.
 - Visser, Welmoed (2002) Vriendschap als toevalstreffer. In: Ad Valvas, 22 augustus.

The learning object

Phase A

The students were asked to put themselves in this situation, to choose A's or B's approach, to offer arguments to support their choice and to identify their underlying values.

Phase B

Students were required to study literature about building relationships from two perspectives:

- a. The rationalistic view of economic imperialism, which claims to be able to explain all kinds of social phenomena, not just those traditionally classified as economic.
Authors: Richard B. McKenzie and Gordon Tullock (1975), Gary S. Becker (1991), Steven Pont (2001), Ad Valvas (2002).
- b. The romantic view
Author: John Armstrong (2001).

After their academic study of the literature, the students were asked to reconsider their initial choice, arguments and underlying values.

Phase C

The students were asked to study some literature that presents and discusses (the) presuppositions of the economic (rationalistic) approach in order to judge for themselves how far the disciplinary approaches were adequate in the case at hand.

Authors: Bas Kee (2002), Gary S. Becker, (1993), Alan S. Blinder, (1974), Don Slater (1998), Amitai Etzioni (1988), Julie A. Nelson (1994), Ronald H. Coase (1977).

After studying this more reflective knowledge, the students were again asked to reconsider their initial choice, arguments and underlying values.

Students' value development and DOLM

Three types of learning processes were found (Boschhuizen, 2000): The processes of confirming, broadening and changing.

The process of *confirming* occurs when something confirms someone in his or her beliefs, opinions and intentions. It can make such a belief, opinion or intention stronger.

The process of *broadening* occurs when a student adopts alternative values, but the initial values remain dominant.

The process of *changing* occurs when a student changes his/her initial values into alternative ones.

Below these processes are illustrated with two students' statements per process. One of the two students at first (intuitively) decides for the position of A (the importance of the emotional aspect in the decision to live together dominates over the rational one), while the other student initially emphasizes the rational aspect (the position of person B). The comparison of the initial choice with a choice in phase B or C provides insight into the learning process of the student.

Confirming

Below, the intuitive reaction (phase A) of student Marionne is given with her reaction after studying the economic subject matter. Marionne intuitively decides for person A and after studying the economic subject matter she maintains her point of view. She remarks that her choice has been sharpened after reading the syllabus.

Student Marionne:

Phase A

"I decide for person A

-A argues much more from her feelings. In my opinion she is a woman. She emphasizes 'love.' Person B perceives the dilemma in a more businesslike manner and puts forward arguments such as 'we have much in common', and 'we have to weigh the costs and benefits. I am more a person who speaks his feelings. Especially in affairs such as love.'"

Phase B

"After reading the syllabus I did sharpen my choice for person A by asking the question 'whose actions within the case have been described realistically? One could say that person B's actions could be explained economically. Person A's action is to be explained more sociologically. But which of these acts offers an explanation for this relationship coming into being? In my opinion it is the action of person A. B did argue from a rational point of view but if it matters, in my opinion he will act as person A. Person B acts economically and argues rationally, but the foundation of a relationship remains the action of person A.'"

Student Peter chooses intuitively for person B and after studying the economic subject matter he persists. He remarks that initially he made his choice from his feelings and now it is put in the words of the presented theory. Here he sharpens his point of view.

Student Peter:

Phase A

"In this case I am party B. Person B has a rational point of view. He has a cynical view on life. In my opinion his views on the motives of people are more real than those of person A.. Person A is very vague She starts with ideals. For her the words themselves are enough. Thinking about a deeper meaning put her off her stroke.you see the rational side of B directly. Person B offers a number of examples, very concrete, while quite to the contrary person A starts with 'love,' a very vague concept."

Phase B

"My choice for B remains the same, namely B. For me the economical point of view of this person (although perhaps a little exaggerated) still seems to be logical. After reading the literature it strikes me that I cannot understand the sociological side. A good basis exists for theorizing. In my opinion on the basis of each theory we found an economic framework. Ultimately sociologists speak of 'needs' and 'wants;' they do not explain the source of 'needs' and 'wants.' Their starting point is that these are present in everyone, and therefore they are a given. My first argument originates from my feelings, such as: how is it possible to think about this in another way? Now I say: the idea of families who produce 'commodities' rests on the basis of the ideas of person B. By saying 'caring for another is caring for yourself,' he suggests that time and goods will be translated in the production (within the household) of 'care' and 'good feelings of both of the partners.' These were also my feelings during my first choice; but now I can describe it with a part of the theory."

Broadening

Inez intuitively decides for A and after studying the economic subject matter, because of the importance of the emotional side of a relationship, she sticks to her choice. But rationality comes into existence.

Student Inez:

Phase A

"I decide for party A.

Love cannot be rational, in the way that B remarks. Person B is very scheming on whether to live together or not. He wants to live together, because he sees more advantages than disadvantages. In person A's decision to live together, feelings do weigh heavily with her."

Phase B

"I maintain that love between men and women (or two of the same sex) and the decision to choose each other have to be based on emotional / irrational grounds. But it is partly true. According to the economic model of explanation of McKenzie/Tullock, next to the first requirement, love, both people must have the same values and enjoy the same preferences, to match totally."

Elwin decides intuitively for B and after studying the economic subject matter he persists, because of the importance of the rational side to a relationship; but aspects of relationships which cannot be explained scientifically also get some play. Now the reactions of A are not defeated totally.

Student Elwin:

Phase A

"Party B's point of view has more appeal for me than that of party A. I have the following reasons:

**Party B passes judgements supported by arguments. After each statement a reason for his opinion follows.*

**Party B supports his statements with facts. Party A is apt to pass judgements with the support (if so) of short, emotional arguments.*

**Party B does not pass his value judgements directly about what A says, whereas person A reacts directly, without explaining her reaction."*

Phase B

"The second time I would choose for B, because of their rational acting. It will be effective in the possibility of their living together. To make agreements provides that later conflicts can be settled quickly. As a comment on this, it has to be remarked that the scientific approach may not carry too much weight; the approach of person A in the case must not be rejected totally. Within relationships aspects exist which up until now cannot be explained scientifically."

Changing

For student Julian it is a difficult task to make a choice between A or B, but he decides intuitively for A on the basis of the importance of the emotional point of view. After studying the economic subject matter Julian shifts the helm and the rational approach takes preference.

Student Julian:

Phase A

"It is quite difficult to make a choice for A or B, for both parties offer something of importance. But A settled the matter, for the following reasons:

**One has to do everything for the other*

**One has to offer up oneself for the other, because you love each other. This also has to do with my first point.*

**You have to think of each other, to take into consideration the other's feelings and whether your lover has the time to do things in addition to his studying.*

**To live together you have to make agreements beforehand, but only agreements with respect to material questions.*

**In my opinion this is the right sequence, because the basis of a relationship lies in feelings and emotions. If one does not accept each other's feelings and emotions then you do not have a good relationship and the relationship will break down. If you accept each other's feelings and emotions then you can make further agreements."*

Phase B

"After reading the syllabus I changed my mind. At first I made my choice for A, for she spoke about feelings which have to be the basis for a relationship. But now I decide for B, because of the importance in a relationship of comparing the benefits and the costs. If you do not compare the benefits and the costs very well, the relationship is doomed to fail. You also have to make agreements beforehand, so that everyone knows what to do. Therefore only love? It doesn't get you anywhere."

Student Renske also changes her mind substantially. After studying the economic subject matter she thinks that comparing the costs and the benefits is of great importance for living together. After the philosophical reflection (Phase C) she returns to the importance of feelings:

Student Renske:

Phase B

"After reading the syllabus it is my opinion that it is very important for living together that one makes good agreements. Without love probably you would not decide to live together. But it's not enough. It's only possible to live together if you think that you are happier or you will derive advantages from it in other ways. It's really a comparison of costs and benefits."

Phase C

"With regard to my last reaction, my reaction now has been adjusted a little. The conceptual framework of the economics is a little one-sided. I persist in my opinion that B makes an important point. But in the first instance the feelings of A have to be present. Without such feelings it is possible that living together may not fail, but in that case we have another type of relationship than the love relationship mentioned here. Feelings are really prerequisites for living together. Rules and agreements make living together easier. When you live together those rules and agreements are important for the decision to

continue living together or to bring about failure. Therefore the decision to live together originates from feelings, for the most part."

3.6 To live or to eat

This case study is about a virtual developing country called Abundantia. The situation in Abundantia is as follows: Abundantia has 50 million people and is poor but is a relatively stable country. President Chakula is head of this virtual country. Abundantia is suffering from a major food crisis because of continuing drought over the preceding years. President Chakula wishes to intensify farming in his country to be able to feed his people. He is seeking good sustainable solutions to bring his country to a higher level of development. On the video, President Chakula is debating with various experts and members of international and local organizations as well as with ministries about the question: how to achieve stable sustainable food production and food security in Abundantia without damaging the environment of his country? This is the main dilemma of the case study. The students act as scientists of a research institute on poverty studies focusing on food security. The students are asked by the President to give advice to solve this major food crisis and on the possible directions in which sustainable solutions can be sought." (Van Langen and van Straalen, 2002).

Raw data

The raw data in this case:

- (a video of) lectures about the subject
- Weblinks

Information objects

The information objects within this course are:

- The DOL Model

The learning object

Phase A:

The course started with an introductory lecture about sustainable development, its history and the different views and opinions. Then a case study, 'feeding Abundantia', was introduced. The students were divided into groups. The first task (task 1) was to write an individual piece of advice based on the student's own intuitive ideas.

Phase B:

In the second week, three guest speakers, all experts on the issue of food security, were invited. The speakers were members of the Centre for World Food Studies. This research centre provides support at both national and international levels for the formulation of food and agricultural policies and policies aimed at poverty reduction. The guest speakers gave information on the issues of health, trade, economics and agriculture in relation to food security. They also gave more specific information about the different topics related to these issues. The students were given a folder with literature and a list of websites on which they could find more information on the issues discussed. The task for the second week (task 2) was to write a recommendation, collectively as a group, to the President. They had to decide what advice to give to the President concerning the dilemma of their issue and they had also to take the new information into account. This phase involved much discussion between the students. They found out that they all had different opinions based upon different personal values. They had to learn to deal with these opinions and they had to reach a compromise concerning the advice to be given to the President.

Phase C:

In the third week a professor of ethics of the 'Bezinningscentrum' at the VU gave a lecture. The Bezinningscentrum is conducting research on the interactions between religion, ethics and science in contemporary society. The students gained more information about dealing with dilemmas and could improve their advice given in task 3. In the last week the students presented their advice to their fellow students. In a subsequent debate with the other students and a panel of experts from the Centre for World Food Studies and the professor of ethics they defended their advice. Much discussion took place because of the different priorities students had set in their recommendations.

Phase D:

The last task was about the reflection of the learning process. The students were asked to look back upon their learning process and if they changed their opinion or choices in the dilemma and for what reason they changed it.

Student results

The students' reports show the three learning processes, while using DOLM. More often confirming is shown, sometimes broadening and a few times changing processes.

Two student's reports are observably clear and communicable, from Julian and Robin.

Julian's report:

The case of Abundantia confronts the students with different dilemmas. One of the dilemmas in which students are asked to make a choice and to justify that choice is the question as to whether the president of Abundantia has to decide to clear a part of the rainforest (new possibilities for agriculture, justice for people) or not (justice for all organic life on earth).

After phase A (the intuitive phase) student Julian advises the president of Abundantia not to clear part of the rainforest for the moment. He emphasizes the value of justice for all organic life on earth.

"The loss of the rainforest will be felt for decades. It cannot go on in this way, just a little bit more and no beauty spot will be left. The rainforest is the most important ecosystem on earth and that may not be forfeited.

The president has to opt to forbid clearing at the moment. He has to realize the consequences of clearing in both the short and the long term. In the short term clearing may be an answer, but in the long term it is becoming steadily more problematical; farmers will increasingly exhaust their agricultural land which leads to clearing more rainforest and so on. Eventually there will be no more rainforest."

During phase C/D Julian does not change his choice. 'Justice for all organic life on earth' remains an important value:

"For me in the long term the consequences of clearing or not clearing (consequences for future generations and all species, including nature) take precedence over those in the short term (consequences for the people of Abundantia). It is self-evident to me that I do not agree, increasingly, with clearing. In my opinion there has now been enough clearing. One has to find a more sustainable solution."

I believe this report demonstrates an example of value-learning of type 3: confirming the value of justice for all organic life on earth.

Robin's report:

Given the same dilemma as shown above, in phase A student Robin advises the president not to clear the rainforest, because of the value 'justice for all organic life':

"Do not clear..... In the long term we have to consider the future of our planet and with it the rainforest plays an essential ecological role. Clearing rainforests means we lose something that perhaps we can never regain. Right now we have to take nature very seriously. The concept of 'nature' carries a lot of weight."

During phase C/D Robin does not change his underlying value of 'justice for all organic life on earth', but he adopts the alternative value of 'justice for people':

"Because there's a need to combat hunger, my personal advices would be now to clear only small areas of rainforest. In fact I believe one should not clear rainforest, but it is simply not ethical to let hungry people die.

As a temporary solution I would suggest it be permitted to clear small rainforest areas to provide agricultural and on very small scale, being very selective. However long-term solutions must be sought straightaway. Biodiversity carries a lot of weight for me, while beauty spots such as the rainforests have to be maintained, as far as possible, but at the moment while people are dying of hunger, this is simply unethical if it represents a way in which people can be saved."

I believe this report to be a good example of value-learning process type 6: Robin confirms the value of justice for all organic life on earth, but the alternative value of justice for people is beginning to play a role.

4 Conclusion

The approach of learning objects as a method to develop unities to work with on primary, secondary and higher educational level is based upon Modular Content Hierarchy (Wayne Hodgins & Learnativity). In its Hierarchy real life is to be considered as Raw data media elements, with which you can learn anything. Opposite to this corporate wide element he describes Application Specific Profiles.

Raw Data Media elements can be used and reused; they are in itself not context related. The more specific Raw Data are used the more context related they are.

Our Learning Object combines DOLM with the Theory of Modular Content Hierarchy. The two Good Practices above show that value learning can be integrated in the common theory of learning objects.

Modern subjects, studied in a modern way with modern means, above we proved that with a didactical approach towards Learning Objects it becomes possible.

Still there are some questions left. For instance how can we make sure that our raw data is reusable and adaptable? To what extent is basic Media Literacy a precondition for working with Learning Objects? How do we monitor growing Media Literacy?

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