

How can blended learning contribute to the development of dairy professionals within the global dairy sector?

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Abstract. This research focuses on the goal to determine the effect of blended learning in the global dairy sector and to what extent this method has an added value. It was carried out by a 4th-year thesis student from the Animal Husbandry study at the Van Hall Larenstein University in the Netherlands. This research is substantiated by information gathered while participating in creating blended learning modules with Triple Dairy, through literature research, interviews with ten stakeholders in the transfer of knowledge, and two different surveys with Dutch farmers and African trainers of the EARNED project. The research goal is to determine how blended learning is most effective in the global dairy sector and what added value this method has. This research aims to deliver a report, article, and consultation that clarifies how blended learning can contribute to the development of dairy professionals in the global dairy sector.

1 Introduction

The Teaching method of *blended learning* is the central topic of this research. *Blended learning* uses a mix of *didactic methods* in the learning process, frequently shaped by combining confront to confront instruction and another popular instruction frame: e-learning [1]. Based on the demand for knowledge, innovation, and *practical skills*, this research explores how *blended improve dairy professionals* in the *global dairy sector*. There is a need for knowledge. Triple Dairy believes that the blended learning method has the best outreach and highest impact. Triple Dairy wants to know how blended learning can create the highest value in the international dairy sector. Blended learning is already applied in formal education and has a positive learning effect [2]. Triple Dairy uses this method of sharing knowledge, skills, and innovation transfer and wants to know how to use it most effectively. The research goal is to determine how blended learning is most effective in the global dairy sector and what added value this method has. This research aims to deliver a report, article, and consultation that clarify how blended learning can contribute to the development of dairy professionals in the global dairy sector.

The world population is increasing from 7 to almost 10 billion people in the coming decades [3]. Food production and allocation are not keeping pace with the growth of the population. There is a need for food security and safety. The UN set Sustainable Development Goals in 2015 to create a better world by 2030. In 2030 there should be no

Poverty (SDG 1), zero hunger (SDG 2), quality education (SDG 4), and responsible production (SDG 12) (Global Goals, sd). Milk and dairy products are a good source of nutrition, especially in countries where nutrition is scarce; they also present livelihood opportunities. The development of the global dairy sector contributes to improving food security and food safety and can reduce poverty [4]. Agricultural production should increase by 50 to 60 % in the future [3]. Increase it, and there is a need for more knowledge, innovation, and practical skills. Knowledge is crucial to making improvements. Knowledge transfer in the dairy sector worldwide is currently practiced inefficiently. The effect is limited and not future-proof [5]. There is increasing pressure on dairy farmers to produce more sustainably; there is a need for knowledge to continue producing and delivering in the future. Blended learning is the solution, as believes Triple Dairy. This study aims to determine how blended learning is most effective in the global dairy sector and what added value this method has.

2 Literature Review

Blended learning combines digital or online learning and classroom or face-to-face learning. With the same budget, one can reach a much larger target group than currently because knowledge can be offered independently from time and place. There are a few conditions for blended learning: 1). There must be a good internet connection. 2). Access to proper equipment such as smartphones or laptops [5].

Blended learning is more sustainable because it has a significant effect, it is approachable, lifelong learning is started, and the link is made from learning to taking action. Blended learning can also be more environmentally friendly because fewer travels are made. On the one hand, work identity must be the connecting framework for the knowledge, skills, and attitudes involved in the training process. On the other hand, the guiding principle for learning and training processes design. The confrontation between externally provided images and one's views and wishes and their reflection form the core of such identity learning [6].

Kolb's learning style is a cyclical process. Kolb has four learning phases; he states that all four learning phases must be completed. It is less critical which learning phase is started with, but he indicated a preference for using the same sequence. Kolb argues that learning becomes easier by going through all four learning phases [7]. He discovered that people develop a preferred style, namely the learning phase, in which they are naturally strong. One can define *lifelong learning* as a dynamic concept concerned with finding different ways of responding to change. Lifelong learning is seen as an important concept for improving the employability and adaptability of people. The innovative dimension of lifelong learning is in a new approach to the process and context of learning. Learning is seen as a 'continuous process,' encompassing purposeful learning activities over a lifetime [8]. The Dutch dairy sector exports not only dairy products but also knowledge, technology, and dairy farmers. An example is Friesland Campina's Dairy Development Program, in which knowledge and people are used to help local dairy farming in Asia and Africa. Experienced people help dairy farmers increase productivity and connect to the international quality system [9].

3 Methodology

This research examines whether the blended learning method can contribute to the improvement of dairy professionals and in what way. The primary research methods for this study are literature review, surveys, and interviews to get insight into blended learning and how blended learning can contribute to the development of dairy professionals in the global dairy sector.

3.1 Research design

This research is qualitative. Non-numerical data will be collected and analyzed to understand concepts, opinions, and experiences with blended learning and learning of professionals in the global dairy sector. The research is limited to the research questions, and it should not go beyond it. These limits are prevention the study from going off-topic and staying within the boundaries of the subject of blended learning in the global dairy sector.

3.2 Data collection

A performed desk research gained important information about didactics, learning styles, teaching styles, and blended learning. But also about the developments in the global dairy sector. Main desk research sources used Google, Greeni, ResearchGate, Books. It seems an excellent way to hold surveys to collect data. Seven participants in the pilot training Master class 2030 by Triple Dairy have responded to the survey. Nine trainer-trained to train for the EARNED project answered to determine the learning and teaching styles of the dairy professionals. Interviews and conversations were held with professionals in the dairy sector and professionals in agro education. Nine stakeholders have answered the interviews with open questions. By participating in the development of the blended learning modules, such as making blueprints, validating modules with Triple Dairy. This information also contributes to the answers to the research questions.

3.3 Data processing

For the answers to the survey, Microsoft Office Suite Excel 2016 is used to process and analyze them. Processing and analysis have taken place after collecting the information. Microsoft Office Suite Word 2016 was used to write the report. A SWOT analysis describes the strengths, weaknesses, opportunities, and threats of the contribution of the training methodology blended learning among dairy professionals in the global dairy sector.

4 Result and Discussion

4.1 Blended learning

The definition of *blended learning* outlined in the literature is as follows: "a combination of digital or online learning and classroom or face to face learning" In the interviews with stakeholders in the transfer of knowledge in the dairy sector, a definition of *blended learning* method was asked. The descriptions vary, from concise "a mix of online and offline learning" to a more comprehensive definition of "a mix of didactic methods." Figure 4 shows the definitions of *blended learning* given by the stakeholders. *Blended learning* makes it possible to provide high-quality education efficiently. Using a platform, knowledge innovations and *practical skills* can be distributed faster in a blended manner. *Blended learning* makes use of *digital resources*.



Fig. 1. Definitions of blended learning by involved stakeholders

The definitions from the literature and those given by the stakeholders are all formulated differently, but they come down to the same. There is a mixture of online resources and physical meetings to transfer knowledge, innovation, and *practical skills*. *Blended learning* includes *digital resources*. In *developing countries* such as East Africa, with the EARNED project, digital resources are challenging when it is first necessary to inventory whether WIFI and computers are available.

The equation made by one of the parties during the interview is very appropriate for the dairy sector and covers the load well. The equation is as follows: "*blended learning* is like a total mixed ratio for a cow." *Blended learning* is also a mix that must be tailored to the needs and will be different and adapted in every situation.

4.2 Method of knowledge transfer in the international dairy sector

The knowledge, innovation, and *practical skills* sharing in the dairy sector occur differently. The literature describes the traditional way of sharing knowledge: a Dutch expert goes to an area, gives his training, and leaves again. In the interviews with those *involved*, *other methods* also came up. Figure 5 describes those methods.

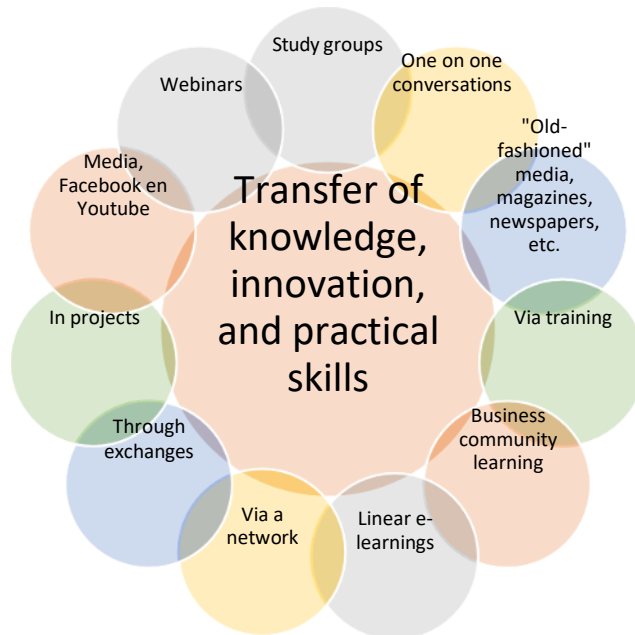


Fig. 2. Methods transfer of knowledge innovation and practical skills

Based on the experiences in the international dairy sector, the transfer of knowledge takes place in a very traditional way, just like informal education. In this traditional method, the focus is on knowledge, and practical skills and innovation are not or rarely addressed. There is an international lack of *practical skills transfer*, while practical experience is essential. The current method of knowledge transfer in the dairy sector is inefficient and focuses on knowledge, *practical skills*, and innovation are lagging.

4.3 Learning and teaching styles and needs of dairy professionals

The personalities with which the participants feel connected vary; Kolb states that all people differ; this applies to the Dutch farmers and the trainers from East Africa. The

The affinity that the Dutch farmers and trainers from East Africa preferred are "cow and entrepreneurship," crop, manure, and soil were the other aspects to be chosen.

Below, the survey results with the participants of the Master class 2030 are shown. The learning preference is mainly verbally shown in figure 3. According to the participants, figure 4 shows the ideal learning method is a classroom lesson. Furthermore, the choice for learning formation is working together as a team according to t 3.

Learning preference

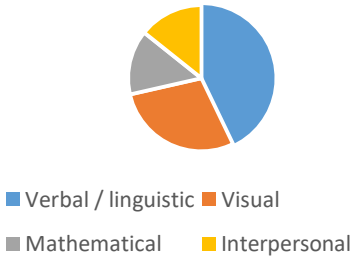


Fig. 3. Learning preferences of Dutch farmers

Learning method

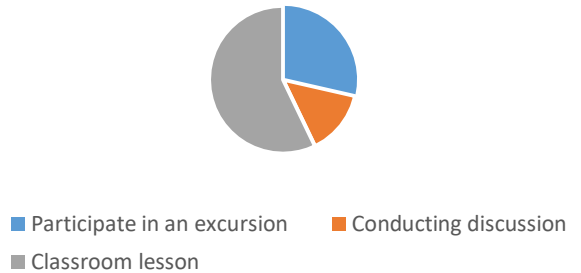


Fig. 4. Learning methods Dutch farmers

Learning formation

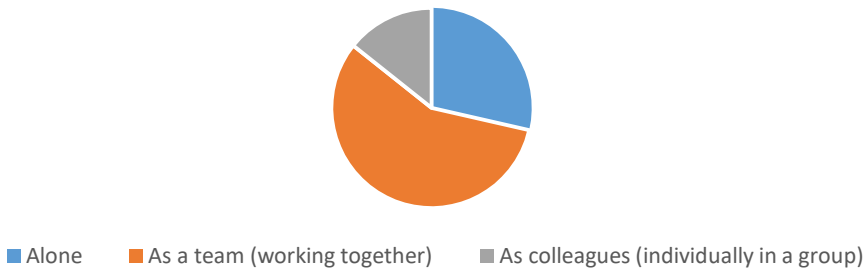


Fig. 5. Learning Dutch formation farmers

Essential aspects of a training

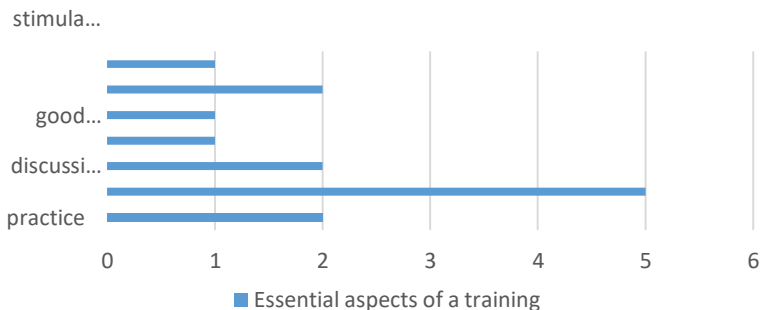


Fig. 6. Essential aspects of training by Dutch farmers

Figure 6 shows the essential aspects that should be present in training according to the Dutch farmers. It is also indicated how often these are mentioned. Interaction is an outlier, but practical discussion and own input have also been mentioned several times.

The Dutch farmers indicate that interaction practices are important aspects of training. The Dutch farmers are quite progressive. Because they are pioneers, they are less concerned with practice but more with entrepreneurship. Trainers look from a different perspective; they focus on didactics. Furthermore, they are aware because they also receive training on a blended way of training in the Earned project.

There is little affinity with manure, soil, and crop, but these points are necessary to make the dairy sector more sustainable and improve. Personalities are different, as outlined in the literature. Interaction is an important point that came back from the Dutch farmers. The dairy professionals need to connect with practice and practical skills in learning, as shown by the interviews and surveys. As Confucius said, practice is so enormously important.

4.4 Opportunities for the development of the global dairy sector concerning blended learning

Based on pressure from the government and because farmers themselves need to be future-proof. Many farmers must produce more sustainably, and knowledge is needed to change to a more sustainable way of farming. In order to implement change and improvement, vision, skills, incentives, resources, and an action plan must be present, as mentioned in figure 3. Only if these components are present will a successful change take place. In figure 7, several sentences are shown that the persons interviewed gave. Some are positive, but others are skeptical or negative about blended learning in the dairy sector.

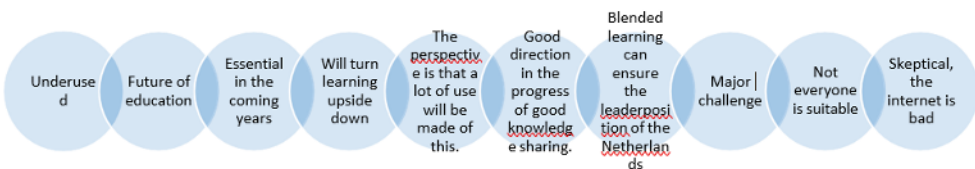


Fig. 7. Statements about integrating blended learning in the dairy sector

The Netherlands is a forerunner in dairy knowledge, but something must be done to stay one of the best. *Blended learning* on a platform such as Brainstud builds provides a stable basis to stay a frontrunner in dairy knowledge.

Blended learning can stabilize the position of the Netherlands and contribute to the improvement of the dairy sector worldwide.

Blended learning can help this success by providing vision, skills, incentives, and action plans. Sometimes the government or the secondary sector will have to facilitate resources or other lacking parts. Using blended learning enables more practice; using a mix of teaching methods can also positively influence the implementation of practical skills. Blended learning can also contribute to the commercialization of the dairy sector in developing countries.

5 Conclusions

Blended learning is a catch-all term in blended learning, the components of online learning and physical meetings in which different didactic methods are used and tailored to the situation. Blended learning uses digital resources, a challenge in the global dairy sector. The Covid pandemic makes digital resources essential, but blended learning can be put to good use in these times. Using blended learning enables more practice; for example, the theory can be discussed in advance so that there is more time for practice during the training. Using a mix of teaching methods can also positively influence the implementation of practical skills.

Blended learning can contribute to the improvement of the sector if didactic methods are used properly. The right mix of the right methods is relevant and attractive to dairy professionals at the right time. Having local people train and setting up a platform on which the information can easily be ensured a large outreach.

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