

An enhanced theory of learning including learning from the future

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Abstract

Previous studies showed that combining learning based on experiences in the past with learning from an envisioned future scenario results in more innovative and radical ideas as well as in a higher number of covered content domains. However, currently there is no holistic learning theory which integrates both sources of learning. The main purpose of our paper is to propose an enhanced theory of learning, linking the two most important sources of learning: learning from past experiences and learning from the future. Our suggested theory, which is based on the learning theory by Gregory Bateson, will be described in detail. Moreover, we will present some empirical experiences with the enhanced theory of learning.

1. Introduction

For an organization as well as an individual to evolve, individuals and organizations have to learn and to change. The ability to constantly generate new knowledge and to transfer, use and apply existing knowledge is vital for individuals and organizations if they want to be capable of meeting the future. Undoubtedly learning is the most important method for creating new knowledge.

Conventional experiential learning theory defines learning as “the process whereby knowledge is created through the transformation of experience. Knowledge results from the combination of grasping and transforming experience [1, p. 41]. Thereby learning is understood as an action-reflection process based on reflecting experiences from the past. Learning from the past, is well developed and underlies all our major learning methodologies, best practices and approaches to organizational learning. There are several learning theories which all are based on the paradigm of learning from past experiences. The most influential may be the theories developed by Argyris and Schön [2], [3], Kolb [1], [4] and Bateson [5]. An overview of some learning theories can be found in [6].

Learning from the future

Breaking with the view that learning is strictly and solely connected with our past experiences and

giving up the belief that the future is a forward projection of the past, several authors ([7], [8], [9], [10]) propose an alternative source of learning: learning from the future. The idea is to shift attention to the individual's inner world and to sense the very moment by “connecting with the source of one's best future possibility and of bringing this possibility into the now” [11, p. 25f.]. Thus, it is about learning “from a reality that is not yet embodied in manifest experience” [7].

Therefore in our work we define the concept of learning from the future as “learning from an envisioned future”, which embraces the imagination and the actual interaction with a desired future scenario. This means using the power and flexibility of imagination that we humans have and mentally pre-experiencing hypothetical future scenarios and personal events [21, p.143]. An example for learning from an envisioned future could be to envision an optimal and desirable future for the final result of a project and then using a backcasting approach [32], [33] to make explicit those learning outcomes which are relevant for the presence. Indeed we can talk about experiencing something that has not yet occurred, because it has already been discovered that re-experiencing the past and pre-experiencing the future are related in terms of cognition. They share the same cognitive resources and mechanisms. ([19, p. 537]; [20, p. 302]). Atance and O'Neill define it as “an ability to project the self forward in time to pre-experience an event” [19, p. 537].

There is a lot of theoretical work on for learning based on experiences from the past, but only few literature on the approach of learning from the future.

Research gap, research question and research methodology

One of the main research gap in this context can be identified as the lack of a holistic learning theory which integrates both sources of learning and therefore defines an enhanced theory of learning as well as a theory of how to learn.

So we can define the following research question: *What does an enhanced theory of learning look like, which integrates both sources of learning: learning from past experiences and learning from the future?*

To answer this research question, we use a

comprehensive literature review to build the ground for an explorative analysis and a theoretical foundation. For the theory building we follow a social constructionist research paradigm. Social constructionist theory building is concerned with seeking explanations about how social experience is created and given meaning [12, p. 361].

The remainder of this paper is organized as follows. First we introduce our enhanced theory of learning. Subsequently we give a practical example for the theory and some first empirical experiences. Finally we present limitations of our work as well as implications for further research.

2. Proposing an enhanced theory of learning

Our suggested theory is based on the learning theory by Gregory Bateson [5]. He proposed several levels of learning. The following table gives an overview about these learning modes.

- Learning 0: is characterized by the specificity of response, which – regardless if right or wrong - is not subject to correction.
- Learning 1: is a change in specificity of a response by correcting errors of a choice within a set of alternatives.
- Learning 2: is a change in the process of Learning 1, e.g. a corrective change in the set of alternatives from which choice is made, or it is a change in how the sequence of experience is punctuated.
- Learning 3: is a change in the process of Learning 2, e.g. a corrective change in the system of sets of alternatives from which a choice is made.

Table 1: Levels of learning defined by Bateson [13]

Let us have some more detailed information about the levels of learning: Learning 0 is a habitual automatic response to a given stimulus. The emphasis of Learning 1 is change *within* a set of alternatives. Learning 1 is therefore a trial and error process of adaptation to the given environment, and comparable to Argyris and Schön’s single-loop learning [2], [3]. In an organization this could occur through seeking more efficient ways to manufacture an existing product or deliver an existing service. Learning 2 is a process of corrective change in the set of alternatives from which choices are made at level 1. Therefore in Learning 2, one not only learns but simultaneously learns how to learn. Learning 3, which from Bateson’s point of view rarely, if ever occurs, refers to the whole process of forming, exchanging and losing level 2 habits. Learning 3 is defined as ‘a corrective change in the system of *sets* of alternatives

from which choice is made’. So Learning 3 might be thought of as an entirely different system of grammar. Bateson said: ‘something of the sort does, from time to time, occur in psychotherapy, religious conversion, and in other sequences in which there is profound reorganization of character’ [5].

2.1. Six modes of learning

In the following, we use Bateson's learning theory (we won’t take into account Learning 0) as a basis for conceptualizing a coherent theoretical framework that integrates both learning from the past and learning from the future.

In a first step we will try to present the three different levels of learning in a more formalized way. For this we define the following domains respectively sets, which are relevant at each level of learning:

A:	is the set of (action) alternatives
G:	is the set of goals
R:	is the result (outcome, output) of a learning process
U:	is the set of underlying values, needs, assumptions, beliefs – “the underlying mental model”

Using these domains we can define Learning-1, Learning-2 and Learning-3 as follows.

Learning-1 (L-1): L-1 is described as change within a set of alternatives [5, p. 298]. So therefore it is some kind of optimizing the choices of alternatives taken out of A . This learning and optimization is based on experiences from the past, driven by the elements of U and controlled via the goal G and the resulting outcome R by taking the selected alternatives A' out of A , where $A' \subseteq A$. So the main learning outcome of L-1 is knowledge about the optimal choice of alternatives out of a static set of (action) alternatives.

Learning-2 (L-2): L-2 is described as change in the set of alternatives [5, p. 298]. So in L-2 the set of (action) alternatives becomes dynamical. This change in the set of alternatives is based on experiences from the past driven by the elements of U and controlled via the goal G and the resulting outcome R by taking the selected alternatives out of $A+$. As L-2 is a change in the set of alternatives, $A+$ refers to the changed set. So we can define that $A+ \neq A$. The main learning outcome of L-2 is knowledge about the changed set of alternatives along with knowledge about the new action alternatives, i.e. all elements of $A+$ which have not been elements of A . Methods like case based reasoning or forecasting enable L-2.

Learning-3 (L-3): L-3 is described as a corrective change in the system of sets of alternatives from

which a choice is made [5, p. 298]. So while L-1 optimizes the choice of alternatives out of a static set of action alternatives (A) and L-2 changes the set of action alternatives (A) and creates A^+ , the main focus of L-3 is U , which is the set of underlying needs, values, etc. – summarized as “mind set”. While Bateson points out that L-3 rarely if ever occurs, we propose that L-3 is of course a very challenging learning mode but nevertheless it may occur more often than not.

Remember that U mainly drives L-1 as well as L-2 and determines A as well as A^+ . U is a rather complex construct. In our approach, we propose that the current set of U is determined by two influencing variables:

- an internal motivated part UI and
- an external motivated part UE

UI furthermore can be split into a conscious part UIC and an unconscious part UIU . Needs, values or aspirations which I am aware of are examples for UIC , e.g. the aspiration of earning a lot of money or the need of receiving a lot of compliments; needs and values which I am currently not aware of are examples for UIU , e.g. the need for safety in different forms which strongly influences a lot of my actions but I wouldn't be able to articulate it. Examples for UE are expectations of others, general valid values and rules or widely acknowledged knowledge.

At this point it must be emphasized that L-3 changes the current set of U and this change is based on experiences from the past. The main learning outcome of L-3 is threefold:

1. Creation of knowledge, which elements of UIC are currently strongly action driving when selecting alternatives and which other elements of UIC are – currently – more in the background. Hence the externalization of the elements of UIC and the roles they are playing at any given moment are one important aspect of L-3;
2. Becoming aware and making explicit the elements of UIU – as far as possible – is another learning outcome of L-3. L-3 is strongly connected with reflection work, may it occur in a therapeutical setting (psychotherapy, etc.) or in a consulting/counselling oriented setting (coaching, supervision, mediation, etc.) on an individual level as well as on an organizational level (group coaching, group supervision, etc.) or may it occur with self-reflection on one's own. Furthermore L-3 can be seen as a learning mode for becoming aware of some main components of the ideal self [14];
3. Knowledge is gained by focusing on the set of UE . This essentially means to consider consequences for those entities which are involved by the action

alternatives (A). This third learning outcome is strongly connected with the aspects of pronesis [15] or common good and with the whole field of sustainability.

All three learning outcomes together change the set of U to an updated current set U_{mod} .

In a second step we will enhance the described learning theory consisting of those three levels of learning by adding an alternative source of learning and another three levels of learning. Based on the idea of “learning from an envisioned future”, which embraces the imagination and the actual interaction with a desired future scenario, we are able to define Future-Learning-1, Future-Learning-2 and Future-Learning-3.

Future-Learning-1 (FL-1): FL-1 can be defined as a change within a set of alternatives based on experiences from an envisioned future. It refers to optimizing the choices of alternatives taken out of A . This learning and optimization is based on experiences from the envisioned future F determined by G . It is driven by the elements of U and controlled via a backcasting approach beginning in the envisioned future and ending in the presence based on which the selected alternatives A_F' out of A are identified, where $A_F' \subseteq A$. So the main learning outcome of FL-1 is knowledge about the optimal choice of alternatives out of a static set of action alternatives.

Future-Learning-2 (FL-2): FL-2 can be defined as change in the set of alternatives based on experiences from an envisioned future. So in FL-2 the set of (action) alternatives becomes dynamical.

This change in the set of alternatives is based on experiences from the envisioned future F determined by G , driven by the elements of U and controlled via a backcasting approach beginning in the envisioned future and ending in the presence. As FL-2 is a change in the set of alternatives, it creates A_{F^+} , where A_{F^+} denotes the changed set of alternatives. Therefore we can define that $A_{F^+} \neq A$. The main learning outcome of L-2 is knowledge about the changed set of alternatives and thus knowledge about the new action alternatives, more specifically those elements of A^+ which have not been elements of A .

Future-Learning-3 (FL-3): FL-3 can be defined as a corrective change in the system of sets of alternatives from which choice is made based on experiences from an envisioned future. Accordingly FL-3 changes the current set of U . This change in the current set of U is based on experiences from an envisioned future

determined by G , and controlled by an abductive reasoning process. Abductive inference may help us to construct an intentionalist explanation through motives (reasons) that makes the behavior intelligible. It is the only logical operation which introduces any new idea [16].

The main learning outcome of FL-3 is threefold:

1. Creation of knowledge which elements of UI are substantial for me in the long run;
2. Transcending existing boundaries by envisioning the future enables the creation of knowledge of how to serve the common good. This high-quality knowledge is described as phronesis [15]. Phronesis takes into account contextual circumstances, addresses particulars, and shifts aims in process when necessary and is guided by values and ethics.
3. Identifying and creation of knowledge about hidden needs [17] is another learning outcome of FL-3. Hidden needs are defined as requirements that customers or users have but which they have not yet directly recognized. As these requirements rest on a subconscious level, users are unable to articulate them [17]. So hidden needs are strongly connected with UIU in our theory.

All three learning outcomes together change the set of U to an updated current set U_{mod} .

2.2. Relationships between the six learning modes

By now our learning theory consists of six modes of learning L-1, L-2 and L-3, FL-1, FL-2 and FL-3. Analyzing those six modes of learning we can see that G plays an important role in this learning theory. On the one hand in the case of learning based on the experiences from the past, G determines R in L-1 and L-2 and enables as well as creates the experiences from the past which are essential for the learning modes L-1, L-2 and L-3. Hence, G also influences $A+$ and A' which are the main output of L-1 and L-2. On the other hand, G is an important driver for the envisioned future F in the case of FL-1, FL-2 and FL-3. G itself is determined by U , (respectively UIC , UIU and UE) which is changed by L-3 as well as FL-3, and so the twofold learning cycle is complete. Figure 1 depicts this twofold learning cycle.

The set of U is changed by L-3 and FL-3 as well and therefore it determines and may possibly change the goal G to a modified goal G_{mod} .

Assuming that G_{mod} could be the starting point for the subsequent learning cycle, this learning theory describes a recursive and iterative process of holistic learning.

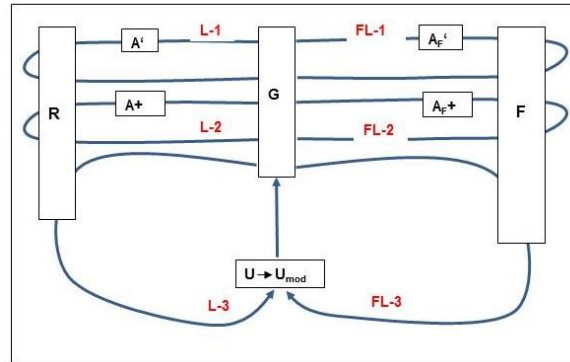


Figure-1: twofold learning cycle

Now let us have a look at the relation between G and R and the relation between G and F . The result R is the concrete output by taking actions in order to achieve the goal G , whereas F is the consequence of a fulfilled goal, without taking into account in which way it has been reached. Therefore, we can compare R and G and describe respectively “measure” the differences between them. This measurement constitutes experiences which are more oriented towards the past. F gives a good orientation and description of what it actually looks and feels like when G has been reached optimally. So F is some kind of corrective whether G is a “good and correct goal” and it constitutes experiences which are more future-oriented.

Hence, we have **two kinds of experiences** which determine the learning outcome and are responsible for the continuous change and development of U as well as G and A .

In his theory Kolb [1] emphasizes the central role that experience plays in the learning process and gives a citation from Dewey’s work: “Experience does not go on simply in a person. It does go on there, for it influences the formation of attitudes of desires and purpose. [...] Every genuine experience has an active side which changes in some degree the objective conditions under which experiences are had. [...] Any normal experience is an interplay of these two sets of conditions. Taken together they form what we call a situation. [...] An experience is always what it is because of a transaction taking place between an individual and what, at the time, constitutes his environment, whether the latter consists of persons with whom he is talking about some topic or event, the subject talked about being also part of the situation; the book he is reading [...]. The environment, in other words, is whatever conditions interact with personal needs, desires, purposes, and capacities to create the experience which is had. Even

when a person builds a castle in the air he is interacting with the objects which he constructs in fancy.” [1, p. 35]

Kragulj [18] suggests that, from a cognitive science perspective, it has already been discovered that re-experiencing the past and pre-experiencing the future are related in terms of cognition. They share the same cognitive resources and mechanisms. ([19, p. 537]; [20, p. 302]). The neural mechanisms underlying memory for personal events in the past are similar to those underlying the simulation of personal future episodes. ([21],[22, p. 642]) This has been shown in fMRI studies as well as in clinical psychology experiments on amnesia patients [23, p. 1363]. There is neuroscientific evidence that a set of brain areas is equally active in remembering the past and imagining the future. This common region is engaged in visual-spatial tasks which suggests that future events are represented in visual-spatial context [22].

In short, it is evident that experiences play a central role in the learning process and it is also evident that experiences can have a source in the past as well as a source in the future. Therefore it is important to an enhanced theory of learning includes learning modes which cover both sources of experience.

2.3. Enabling spaces and *ba* in the context of the enhanced learning theory

Ba is a time-space-nexus which can be described as a “shared space” of interaction, interpretation and dialectical processes, a form of “learning foundation” in its own right which generates knowledge [24]. *Ba* can be thought of ‘...as a shared space for emerging relationships. This space can be physical (e.g. office dispersed business space), virtual (e.g. e-mail, teleconference), mental (e.g. shared experiences, ideas, ideals), or any combination of them’ [25]. It is ‘...a shared context in motion because *ba* are constantly moving and changing. [...] *ba* is a process of dwelling in a “here-now” situation that transcends time and space. This means that *ba* emerges not only from the interpenetration of environment, structure, and agency in the dimension of space, but also from the simultaneous occurrence of the past, present, and future in the dimension of time. A good *ba* both transcends and emerges in a time-space nexus’ [26]. A very similar concept to the concept of *ba* are ‘enabling spaces’ [27]. An enabling space is described as a multidimensional space enabling and facilitating the processes of knowledge creation. This enabling space comprises of a physical, social (trust, etc.), mental/cognitive, epistemological, as well as a technological dimension [28].

So in our enhanced theory of learning *G*, *R* and *U* generate and define a kind of *ba* which we can call past-experience *ba* (*PE-ba*) and *G*, *F* and *U* generate and define another kind of *ba* which we can call future-experience *ba* (*FE-ba*).

While the *PE-ba* is an enabling space for the learning modes based on past experiences and therefore supports L-1, L-2 and L-3, the *FE-ba* enables learning from an envisioned future in its different modes FL-1, FL-2 and FL-3. Figure-2 shows the *PE-ba* and the *FE-ba* schematically.

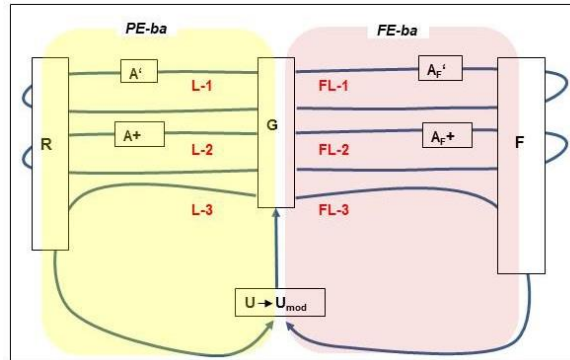


Figure-2: *PE-ba* and *FE-ba*

For example a *PE-ba* could be enabled by implementing a well-structured workshop using several applied systemic questioning techniques such as „exception in the past – solution-focused“ or scaling questions, etc. An example for a *FE-ba* would be a workshop or interview setting that encourages participants to imagine and report from an ideal future scenario. This process of “time travelling” can be facilitated by using rituals like music and change of physical gesture (e.g. changing the sitting position).

Given the *PE-ba* and the *FE-ba* we can define an overall *ba* which can be seen as a *learning-ba* for meta-learning [29] and learning to learn. Hence the *learning-ba* is some kind of “control center” which serves as an enabling space for deciding which learning mode and which *ba* is currently more useful and helpful. Therefore this *learning ba* (shown in figure-3schematically) as a control center enables a movement on a time continuum (learning from the past experience to learning from an envisioned future) as well as on a quality/intensity continuum (optimization out of existing strategies to the touch of an existential level that includes the person and his/her attitudes, values, habitus, etc.).

To sum up, our enhanced learning theory consists of six learning modes (L-1, L-2, L-3, FL-1, FL-2, FL-3) and three *ba* (*FE-ba*, *PE-ba*, *Learning-ba*).

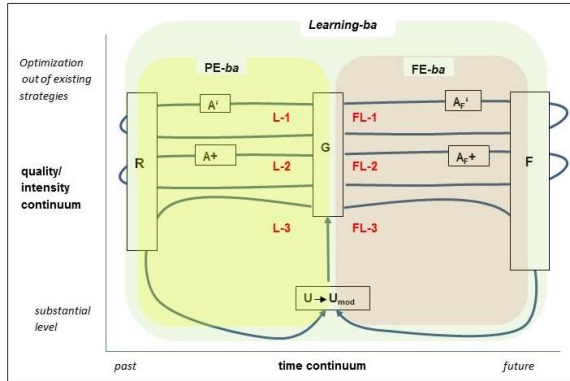


Figure-3: *learning-ba*

2.4. The enhanced learning theory as a control system

Using and adapting some main ideas and approaches from the field of control and feedback theory [30], [31] we can describe our enhanced theory of learning as a control system.

Control theory deals with the behavior of dynamic systems receiving inputs, and how their behavior is modified by feedback. Figure-4 illustrates a control system and the main elements.

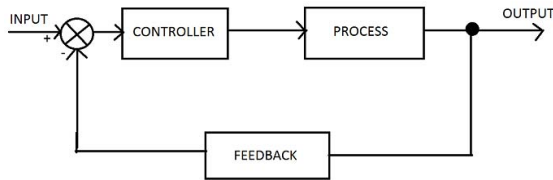


Figure-4: control system

Applied to learning theory, the system to be controlled (process or control object) is the whole learning space defined and determined by the 6 different learning modes and the two main *ba* as proposed and described before.

The controller is the social system itself which is learning, no matter if it is an individual or a social system of any size. This controller monitors the output (learning experiences, output, etc.) and compares it with the reference (satisfiers, desires, needs, ...). The difference between the actual and the desired output, called the error signal, serves as feedback to the input of the system, to bring the actual output closer to the reference. Of course, the reference is not static but dynamic and evolves during the iterative and recursive learning process as described before.

The control process identifies and describes the actually useful and helpful learning mode having in mind, that there are a lot of different learning modes and of course two extreme points on a thought

learning continuum, namely L-1 and FL-3

Let us now turn to the “inner mechanisms” of the process (control object). Its core are the six different learning modes (L-1, L-2, L-3, FL-1, FL-2, FL-3) and it is crucial to emphasize that those six learning modes are not in any hierarchical connection to each other. For example we cannot say for example that L-2 is “better” than L-1 or FL-3 is better than FL-2. Likewise, we cannot say FL-2 is “better” or on a “higher level” than L-2 is. All six learning modes are equivalent in importance and value. It is the same in real life. Sometimes a learning individual or a learning organization is well served and satisfied with L-1 or FL-1 to manage a specific situation in an optimal way. At another time FL-2 or even L-2 or a combination of them may be the most helpful and useful way of learning, and sometimes it may be necessary to work with L-3 or FL-3.

We want to stress that, following our enhanced theory of learning, for learning in an optimal way we have to be aware of those six learning modes described above. Thus learning as a whole (meta-learning) means to have the ability to choose an appropriate and optimal learning mode or a combination of learning modes for a specific situation.

Therefore, the process of learning to learn (meta-learning, learning as a whole) can clearly be defined as a L-1 learning mode on the meta level. Thus the inner mechanism of our control system “learning system” is a L-1 learning mode which optimizes learning modes out of a given set of alternatives namely L-1, L-2, L-3, FL-1, FL-2, FL-3.

We may illustrate our point with a metaphor to describe vividly how our learning theory and learning as a control system works.

Consider the keypad of a piano. There are a lot of piano keys and each of the piano keys produces a distinct sound. None of these sounds is more valuable than another sound, neither is there a hierarchy of sounds in the sense that one single sound is part of another single sound. Playing the piano means to know which piano key produces which sound and to know which sound I need for what I want to play. A piano player knows that a “G” sounds different to a “C” and he/she also knows, that using a combination of some piano keys – let’s say C-E-G – sounds different than playing each of these sounds alone or behind on another.

It is the same in our learning theory. Social systems as well as individuals that have learnt to learn know the different learning modes (they stand for the piano keys) and the impact of these learning modes (they

stand for the sounds). Social systems as well as individuals that have learnt to learn are also aware that learning modes can be combined and that such a combination has a different impact than using these learning modes individually.

3. Practical example for our enhanced theory of learning

In this section the six learning modes of the enhanced theory of learning are explained along with an example which is taken from a concrete coaching process we have accompanied in the last months. The coaching client is a 49 year old trainer and seminar facilitator who is learning about the marketing and organization of a training course with a huge number of participants in order to earn a lot of money as well as having a big audience for communicating the interesting contents of the course. The client's codename is John.

L-1: In this example, Learning-1 means to define a goal $G=\{25 \text{ participants for the course}\}$, take some actions $A'=\{\text{promotion with newsletter, email to participants of previous courses}\}$ out of a set of given and possible alternatives $A = \{\text{promotion with newsletter, email to participants of previous courses, promotion in social media, email to all customers}\}$ and then analyze whether the goal has been reached or not. If there are less than 25 participants, L-1 will mean to take other actions out of the same set of alternatives.

L-2: Learning-2 means that the goal $G=\{25 \text{ participants for the course}\}$ is still the same as in Learning-1, but the output of Learning-2 are new ideas for actions which haven't been in the set of alternatives before. In this example $A^+ = \{\text{place an advertisement in a journal}\}$. As in L-1, John had to analyze whether the goal has been reached or not. If there are less than 25 participants, L-2 will mean to find other additional actions.

L-3: Learning-3 means that during the coaching John has become aware that the element $\{\text{earning a lot of money}\}$ out of other elements of UIC is currently strongly action driving and an important factor. Furthermore, he has learned that the optimal size of a learning group is 12 to 15 participants. This has become an important (explicit) element of UE . Additionally he has become aware of an important element of his UIU during the coaching, namely the need of inspiring a huge number of people.

Together these learning outcomes lead to a modified goal $G_{mod} = \{\text{training course with only 15 participants, writing and selling a textbook}\}$ and subsequently to a modified set of A_{mod} which consists of (partly) other elements than A .

FL-1: Future-Learning-1 means for John to envision an optimal and desirable future F with 25 participants for the training course ($G=\{25 \text{ participants for the course}\}$) and a lot of additional persons who are on a waiting list for this course. Starting from this envisioned future F , a backcasting approach [32], [33] has generated those elements of A_F' out of $A=\{\text{promotion with newsletter, email to participants of previous courses, promotion in social media, email to all customers}\}$ which are useful in the presence to take. A_F' consisted of $\{\text{promotion with newsletter, promotion in social media}\}$.

FL-2: In our example Future-Learning-2 means that the envisioned and desirable future F (25 participants for the training course and a lot of additional persons who are on a waiting list for this course) is still the same as in Future-Learning-1, but the backcasting approach has led to new ideas for actions which have not been in the set of alternatives before. As those new ideas are based on an envisioned desirable future and not on experiences from the past they could be more unconventional and creative than ideas generated with Learning-2. In the case of John A_F^+ was $\{\text{creating a short video about the learning course and uploading this video on youtube}\}$.

FL-3: Future-Learning-3 means that the trainer has become aware of these elements of UI which are substantial for him in the long run. In our example John has become aware of an element of UIU $\{\text{autonomy}\}$ during a special coaching sequence which focuses on learning from an envisioned future [34]. Furthermore John has become aware of hidden needs which will be important to satisfy in the future. In the example of John the element of UIU $\{\text{relief}\}$ has been a very important aspect. In contrast to L-3 which is based on experiences in the past, the learning source of FL-3 is the fulfilled, desirable future of the trainer and therefore the learning outcomes are probably different to those generated with L-3. Boyatzis [35], [36] has shown that even from a psychophysiological point of view, coaching which mainly focuses on a desirable vision for the future arouses the positive emotional attractor (PEA) more than the negative emotional attractor (NEA) while conventional coaching arouses the NEA more than the PEA.

Furthermore transcending existing boundaries by envisioning the future enables the creation of knowledge of how to serve the common good. This high-quality knowledge is described as phronesis [15] and takes into account contextual circumstances, addresses particulars, and shifts aims in process when necessary and is guided by values and ethics.

In short this example illustrates that John gained a lot

of experiences on a meta-learning level by using the different learning modes and becoming aware of the various *ba*. Independent of the concrete situation and the primary goal $G=\{25 \text{ participants for the course}\}$ John has learned about the effect of the six different learning modes and has therefore gained knowledge on how to use these learning modes in the future.

4. Some first empirical experiences with the enhanced theory of learning

Over the last years we conducted several case studies where we used a framework for the creation of knowledge about needs in organizations [37]. Here we give a summary of two of these studies in order to show that a combination of learning from the past and learning from the future leads to a more holistic outcome both in terms of quality and quantity.

Case study 1:

In total, a number of 31 pupils and teachers participated in a study, which was embedded in a large research project with a high school in Lower Austria. The participants were split in two groups. In group 1, we used the approach of Learning from an Envisioned Future. In group 2, the pupils were asked to think of an ideal future scenario while taking into account their past experiences. Group 1 was exposed to a setting, which is designed to facilitate to fantasize about their ideal future scenarios. Thereby, a facilitator made them imagine that they were actually present in a scenario taking place in the year 2020; the narrative time journey took up to several minutes. In group 2, the pupils were exposed to a traditional learning setting where they were asked to reflect on their previous experiences in the school and to subsequently think of what they would like to change today in order to have an ideal school in 2020. The goal for both groups was to define suggestions for an ideal, exciting and perfect school in 2020. According to our proposed enhanced theory of learning we could therefore define $G=\{\text{generate ideas for the school in 2020}\}$

Both groups generated a total number of 520 ideas (including double count). Overall, the participants came up with ideas of 70 different domains. 50 of them were represented in both groups by at least one idea. The students participating in the group that was learning from past experiences came up with 9 additional and unique domains whereas the group with learning from the future workshop delivered 11 additional unique domains.

This leads to the finding that by combining the outcome of both learning sources increases the number of created domains by a considerable number of 19.3%. Although the number of different domains should not be taken as a guarantee for a higher

quality per se, we can argue that a more diverse output provides an additional and valuable scope for action. Furthermore, it increases the possibility that less obvious but possibly important topics are revealed. For a detailed description of this case study see [38].

Case study 2:

We conducted a study [39] with 25 students from the specialization field “Information Systems and Operations” at the Vienna University of Economics and Business. In this study we tried to identify the substantial needs of students in an university environment. Again we separated our participants into two groups. The students of the first group were introduced to the approach of Learning from an Envisioned Future. *Furthermore* we facilitated a process of “mental time travelling” for these students by providing an enabling space, using rituals like music and change of physical gesture (e.g. changing the sitting position). Not until then they were asked to write down ideas of their ideal future university environment in the year 2020. The students of the second group were not introduced to our future-based learning approach. Instead, they were asked to write down their ideas for an ideal future academic environment based on their past experiences. According to our proposed enhanced theory of learning we could therefore define $G=\{\text{generate ideas for an ideal university environment in 2020}\}$

Both groups together produced a total number of 572 ideas and suggestions (including double count). While analyzing the pupil’s ideas and suggestions in case study 1, we now laid the overall focus on investigating the underlying needs of students. Both groups together came up with 19 different need clusters. 5 clusters emerged regardless of the respective learning approach, 6 clusters emerged from the ideas and suggestions collected in the past-oriented learning approach and 7 clusters emerged from the ideas and suggestions collected in the future-oriented learning approach. Similar to the results of case study 1 this finding suggests that applying both learning sources leads to a significantly higher number of ideas and suggestions as well as a higher number of resulting need clusters. More precisely, using Learning from an Envisioned Future as an additional source of learning led to an approximately 64% increased number of covered need clusters.

The two case studies showed that combining learning based on experiences in the past with learning from an envisioned future scenario results in more innovative and radical ideas as well as in a higher number of covered content domains.

It is evident that the two case studies of course did not cover and analyze all aspects and features of our enhanced theory of learning. It would be interesting if the studies were repeated with more senior members of organizations where the participants had experience in the workforce. However it has been shown that enabling the *PE-ba* and the *FE-ba* leads to different learning outcomes, which has significant positive effects on the overall learning outcome.

5. Discussion and conclusion

5.1. Implications for theory and practice

Learning is the most important method for individuals and organizations for creating new knowledge in order to be capable of meeting future demands. While experiential learning based on experiences from the past is well developed, learning from the future has not been based on a strong theoretical foundation so far. Therefore the overarching goal of this paper has been to establish a solid theoretical foundation for this alternative source of learning and to propose an approach for the integration of both learning sources.

The primary theoretical contribution of this work is the definition of an enhanced learning theory which integrates both sources of learning and based on this to establish a theory of meta-learning. To the best of our knowledge it is the first theoretical work that defines and describes the integration of learning from past experiences and learning from future experiences in a methodologically way.

Moreover our work provides the basis for further research in building a general holistic theory of learning to learn.

This research has several implications for practice. As our projects with students and pupils have shown, an enhanced learning approach dramatically increases the learning outcomes on a quantitative level as well as on a qualitative level. Furthermore the awareness of different learning sources and different learning modes on the one hand and knowledge about the implementation of enabling spaces (*PE-ba*, *FE-ba*) to support these various learning modes on the other hand, helps organizations to generate new knowledge and create innovative and sustainable solutions, products and services.

5.2. Limitations and future research

A potential limitation of our research is the fact, that we currently do not have enough empirical data on the organizational level for a solid empirical verification of our enhanced theory of learning. However, in the studies we have already conducted in the fields of vision development and identifying

needs in organizations, we found strong suggestions that the main aspects of our learning theory can be observed in organizations.

Another limitation of our work is the scope of enabling spaces that we have mentioned in our paper. Although we have some experiences and ideas about the essential factors that enable a *PE-ba* or a *FE-ba*, it is evident that a systematic view on this important issue is still missing. Finally, it is currently not clear, whether the enhanced learning theory is (exactly) the same for individual learning and organizational learning.

Based on these limitations, our future research will cover the following areas:

- Implementing, analyzing and evaluating additional case studies with organizations in order to prove, modify or reject our theory.
- Investigating the key factors for enabling spaces in the context of enhanced learning from a theoretical point of view as well as from a practical one.
- On the individual level it seems that our enhanced learning theory can be connected with coaching processes in the fields of vision development or developing the ideal self [40]. It would be worthwhile to analyze such coaching processes in order to get information whether the enhanced learning theory is valid for all levels of human organizations (individual, team, organization, community, etc.).

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