Value Innovation in Learner-Centered Design. How to Develop Relevant Digital Learning Tools.

Henning Breuer*[1], Heinrich Schwarz *[2], Kristina Feller*[1], Mitsuji Matsumoto*[3]

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*[1]Telekom Innovation Laboratories, Germany, *[2]Innovation Consultant, Germany,

*[3]Waseda University, Japan

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Abstracts

This paper shows how to address technological, cultural and social transformations with empirically grounded innovation. Areas in transition such as higher education and learning techniques today bring about new needs and opportunities for innovative tools and services. But how do we find these tools? The paper argues for using a strategy of (user) value innovation that creatively combines ethnographic methods with strategic industry analysis. By focusing on unmet and emerging needs ethnographic research identifies learner values, needs and challenges but does not determine solutions. Blue-ocean strategy tools can identify new opportunities that alter existing offerings but give weak guidance on what will be most relevant to users. The triangulation of both is illustrated through an innovation project in higher education in Germany.

Keywords: User needs and values, innovation, learner-centered design, ethnography, blue ocean strategy, triangulation

1. Introduction

The reality of university students is in transition. New rules and regulations govern their education. Expectations from industry and society and their own self-image change while emerging digital tools uproot time-tested methods of studying. In Europe the Bologna process fostering comparability in educational standards and ensuring quality of qualifications is only one visible cornerstone of substantial changes driven by trends such as globalization, mobile digitalization, and the knowledge economy. All stakeholders are being affected: Far from their old image of ivory towers, universities struggle to cope with the mass inrush of students. Still holding on to the Humboldtian model of unity between research and teaching, teachers are torn between their own scientific curiosity within an overwhelming body of knowledge and the demand to deliver innovative approaches to teaching and learning. Students are often overstrained by requirements resembling those of corporate managers but without having the resources and tools that professionals use. The scope and multitude of these transformations explain why educational technologies have struggled to keep up with providing the best potential support to students and professors. All this demonstrates the need for innovative tools and services outlining a new field for innovation in the higher education domain. But how can we support learners in dealing with the transformation in the educational systems and media landscapes? How can we grasp and specify opportunities for innovation in such a transitory field?

While numerous ways have been proposed to generate ideas at the fuzzy front end of innovation management and to position new products in a market, what is lacking is a consistent perspective on the theoretical and operational links between them. We suggest that the notion of value may provide such a theoretical perspective and a consistent anchor for the different activities involved in innovation. Our argument is based on the assumption that it is the purpose of business to create value for people and society. What is of value to individuals and to cultures, however, changes in eras and areas of transformation, like those currently taking place in domains like the financial systems or higher education. A profound understanding of what is of value at a given historical moment is required to create relevant value propositions and enable sustainable new business. In order to comprehend what is valuable to people we need to understand their needs and their values.

On a theoretical level, we contrast different notions of value and propose an integrated concept of "value innovation" in order to create solutions that are both, valuable and relevant as well as novel, innovative and different. Value innovation combines user-centered with market-strategic approaches in order to create substantial new value for users by serving new or insufficiently fulfilled needs or by supporting inadequately supported values. Ethnographic research is good at identifying learner needs, desires, values and challenges but cannot define which solutions are viable. Blue-ocean strategy techniques are able to identify new opportunities from existing offerings but can only provide weak guidance on what will be truly relevant to users. We illustrate our suggested approach of creatively combining both approaches through a recent innovation project in learner centered design in Germany. The project on learning management tools and services demonstrates how the triangulation of both approaches can help to generate qualified product ideas and maintain focus throughout innovation projects.

2. Value innovation in learner-centered design: Related works and theory

For laying out our thoughts on value innovation we build on scholarly work on learner-centered design (e.g. Breuer & Matsumoto 2011), ethnographic explorations of customer needs, and grounded innovation theorizing (Breuer & Steinhoff 2010).

A key role is played here by the **notion of value.** Often in discussions in economic or business contexts the notion of value refers to monetary value or price, what Marx had called exchange value, and is closely linked to profit considerations. Yet in our discussion on value innovation we understand the term "value" to refer to the value that products have or create for the user outside of its exchange value – how valuable it is for them in their use or in their life. There are several ways, however, in which a product can have value for users (Boztepe 2003). Of interest here at least three: products can be valuable because they have utility, because they fulfill people's (emotional) needs, or because they support their values (note the distinction here between "values" and "value"). We argue that in order to be successful, value innovation needs to take seriously the latter two meanings of value.

The most common view of value when referring to use, points to a product's utility, its practical purpose and functionality. Accordingly a wide-spread strategy for developing new products is making them useful in new ways or enabling new uses. Along these lines, in the Marxist tradition use value refers to utility and the physical properties of a product in use (Marx 1962). Marx pointed out that in order to create use value the producer had to imagine what is useful to people and build that into the product. This imagining of usefulness is not a trivial task, however, and Marx did not specify how to determine what is useful, nor did he move beyond a quite practical but somewhat limited understanding of use and usefulness. Baudrillard (1991) later criticized Marx' "naturalistic phantasm" of utility value and complemented the functional dimension with a symbolic dimension of products, which are not only appreciated for what they do but for what they signify, resulting in their sign value. This way Baudrillard emphasized the importance of an understanding of value that includes emotional, social and identity-related aspects beyond purely functional ones.

We believe that a forward-looking understanding of user value needs to move beyond utility and pay attention to people's needs (especially their emotional needs), and values. Although the attention in the business world to customer need fulfillment has been growing in recent years, this perspective is far from a given and there are still a lot of innovation attempts that fail by failing to serve people's needs. Yet while needs are on the radar of companies at least to some degree, the value of supporting customer values and goals has received less attention. A notable exception is Schrage (2012) who demands that product innovation should not only address customers' needs but also their desired futures – answering the question who customers want or need to become. Therefore it is important to analyze their personal, communal and cultural values. The distinction between needs and values may be worth pointing out. Needs always refer to a lack; they are experienced individually and often emotionally as part of a mental state of being. Values in contrast are directions for human action by pointing to ideals. They do not just belong to one individual, rather they are shared by cultures or communities or social groups, and like needs are not always conscious. Values can motivate and guide needs, preferences, wants and goals of people, and influence the interpretation of needs as well as decision making.

A focus on both needs and values is especially crucial when innovation is planned for domains in transformation, as it is the case in our example of digital learning tools or techniques in higher education. Change, whether it is technological, social or cultural, often changes existing or generates new needs and values. The task and opportunity for value innovation lies in uncovering and addressing these shifting and newly emerging needs and values. In short, a comprehensive notion of value innovations should recognize and include the value created by fulfilling people's emotional needs and by supporting or promoting their values, in particular if applied to shifting everyday practices, social domains or technological fields. In order to involve customers to help create value

and to inform the innovation processes companies (or administrations) have employed a range of structured approaches, from traditional market research to advanced user studies.

In recent decades especially **ethnographic research** has become a preferred approach to see the world from a customer point of view, by studying them in their natural habitat and by using observation and participation as research techniques in addition to conversation and interviews (Atkinson & Hammersley 1994). The key reason for the growing attention to ethnography in commercial contexts lies in its promise to enable the creation of value for customers and thus ensure the relevancy of new products, services and marketing activities.

The characteristics and specific qualities responsible for the claimed success of ethnographic insights have been widely discussed in the last decade (Sutherland & Denny 2007, Cefkin 2009, Jordan 2002, Mariampolski 2005, Bockhahn & Schwarz 2010): Ethnographic insights are seen as more real and more true to the actual way people behave, think and make decisions than other methods. They are seen as going further and deeper than traditional market research in that they capture not just the rational but also the emotional side of people's experience and their interactions with the world. They are seen as less reductionist since they see people as part of social and cultural systems rather than simply as individuals with independent behavior. Finally, ethnographic insights are seen to capture not just behavior and opinions but moreover uncover intangibles such as e.g. needs and problems, fears and hopes, ambitions and values of people. In short, ethnographic research has been established as a source of deep insight into why people behave the way they do and what they intimately wish and need.

Yet such a rich and deep understanding of customers' needs does not per se lead to novel and innovative solutions. But we argue that ethnographic inquiry can encourage new ideas, for one due to its exploratory nature. In contrast to hypothesis-based research or testing methods, the open mind approach of ethnographic practice leaves the door open to findings and observations that are not pre-defined, anticipated or expected and therefore carry the potential to be surprising and new (Lindlof & Taylor 2002). Yet more importantly ethnographic research can **facilitate the development of new solutions in at least four ways**: by focusing on unmet needs; by concentrating on latent or hidden needs, values and motives; by aiming at newly emerging needs and desires; and by paying attention to workarounds.

First, focusing on unpacking people's needs that are currently not or not sufficiently met, the product opportunities defined by these needs are by definition not already filled by existing products. If the right offerings were already available to customers these needs would not remain unfulfilled. For reasons ranging from a lack of knowledge, accessibility, availability, to a poor overall configuration of products, the unmet need indicates openings for an innovative product offering, communication or distribution system.

Second, by uncovering latent or hidden needs, problems and values, ethnography increases the likelihood to discover new or untapped opportunities. If needs or values are hidden they are not easily discovered by traditional research approaches and thus are probably not yet part of the public discourse and general awareness. Invisible cultural patterns and taken for granted cultural beliefs and preferences are unknown to most people. People also do not always have access to the emotional drivers underlying their own decisions; rather motives tend to get rationalized after the event. Finally, people's ideals and impression management often obscure the reality of their lives and selves, not only to outsiders but also to themselves. By not solely relying on what people consciously

articulate but rather by utilizing nonverbal cues, material artifacts, situational contexts and actual behavior and taking seriously seeming contradiction, ethnography may both circumvent the impression management of people and unpack hidden drivers and motives.

Third, investigating newly emerging needs and desires is likely to point towards new opportunities that can lead to novel solutions. Needs change in accordance with societal structures, cultural practices, and new means of satisfying needs. New needs surfacing in a situation of cultural or social transformation and technological change are different from existing and established needs, and so must be the solutions designed to address them. For instance, the unfolding needs and desires of students, who find themselves in an environment with heightened expectations on their performance and defined by a challenging mix of analog and digital learning tools and techniques, tend to resonate with this unique situation and cannot be served with old solutions, products and services.

Fourth, by paying attention to everyday practices and routines, ethnography frequently finds workarounds that people use. These are ad-hoc, improvised and often personal strategies that people employ to reach their goals in the face of challenges or in situations lacking established solutions and existing products. Sometimes workarounds carry the seed for the type of solution that is required. When a mother tapes her phone to the baby stroller so that she can write text messages while pushing her child, there is a cue to a potential design solution. Like the inventions of lead users, workarounds found by ethnographic research can provide interesting pointers towards innovative solutions.

In sum, a focus in ethnographic research on unmet, hidden and newly emerging needs, motives and values and on everyday workarounds may guide the search for new solutions into new and uncharted territory. Yet, despite directing a guiding light into untapped directions and offering some inspirations for solutions or user requirements, an ethnographic approach cannot pre-determine these solutions, guarantee their novelty, and ensure their potential for business. Other techniques must complement the ethnographic approach.

Particularly, in order to turn ideas on potentially valuable solutions into an innovation on a marketplace knowledge of this marketplace is required. Strategic approaches like **blue ocean analysis** (Kim & Mauborgne 2005) aim at such an understanding of the strategic market value that new products and services can capture. Referring to the renewal of corporate strategy rather than to incremental innovation in established business Kim & Mauborgne (2005, 218) remark that “value innovation is about redefining the problem an industry focuses on rather than finding solutions to existing problems”. Putting a notion of (buyer) value and a focus on non-incremental innovation into the center of attention blue ocean analytical tools and frameworks suit to the attempt to drive innovation based on empirical customer values.

It is important to point out the differences between our concept of ‘value innovation’ based on real customer insights and the notion of value innovation on a corporate strategy level used in the literature on blue ocean strategy. Kim & Mauborgne (2005) discuss value innovation as strategic renewal impacting the corporate activity system rather than innovation in the sense of new product development. Their concept focuses on the notion of exchange value as discussed above, and defines value through the alignment of innovation with utility, price and cost positions (2005, 13) and distinguishes between buyer value and company value. As buyer value is comprised of utility and price of a product, and company value is comprised of price and cost structure both may be remodeled in order to create or enter into an “uncontested market space”. Trying to transcend established market boundaries and industry structure blue ocean strategy remains related to both as

defined by the competition on the rather macroscopic level that is closely related to business model innovation. While such market analysis can identify potential new markets, the relevancy of the assumed, the potential real values for users, cannot be determined by it.

Combining market analysis and ethnographic approaches through the notion of value, in this paper we follow a user-centered and learner-centered paradigm, in which value is defined by the user or learner. The **value proposition** links business to the existential needs and motivations of different groups of people, and thereby the existential reason for the whole endeavor, the job to be done. A value proposition not only describes the functional utility, or what something can do, but also implies personal needs and values. Value innovation then refers to the empirically grounded development of new and relevant value propositions. Value innovation in our understanding is based on functional, emotional and symbolic user needs and values, backed up by cultural trends, intersecting with novel product value factors (functional, emotional and symbolic ones) backed up by market trends.

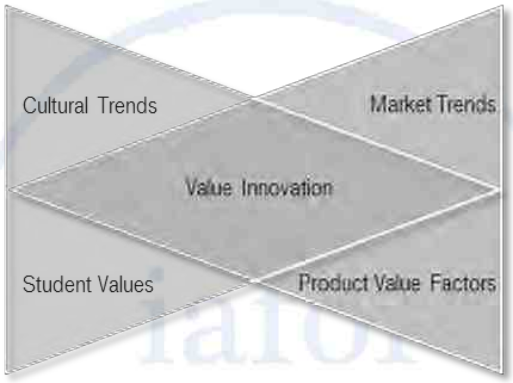

Figure 1. Value Innovation is based on an understanding of user / student values (backed up by cultural trends) intersecting with new product utility factors (backed up by market trends).

3. Methodology for identifying a potential value innovation

Based on this understanding of value innovation we suggest the following methodological approach within fields of cultural transformation such as today's higher education domain.

- A deep immersion into the world of the customer through ethnographic methods.
- Competitive analysis and contrasting market boundaries based on desk research and expert driven business modeling.
- Triangulation of both perspectives supports the creative generation of qualified product ideas and value propositions that also allow to maintain focus throughout innovation projects.

Immersion into students' lives is meant to yield insights into the nature of learning activities and challenges, reoccurring routines, obstacles, workarounds and problems as well as unfulfilled needs and values. **Participant observers** of students focus on unmet, hidden and newly emerging needs, values and motives and pay attention to workarounds in order to lay the direction for potentially novel perspectives and solutions. In order to do so it may be important to observe students in key learning situations, individual and social ones, in their homes and at other learning locations; to explore both digital and analog ways of studying, organizing material and note-taking etc.; and to

investigate what it means to be a student today more broadly. In order to analyze the current market **desk research** may proceed top down starting from global trends (such as the trend towards lifelong learning or the increasing importance of peer learning), or bottom up looking up relevant keywords in order to retrieve inspiring cases in terms of new products, new business (e.g. startups and corporate ventures) and emerging platforms and ecosystems. Most interesting cases may be shortlisted based on criteria such as e.g. market reach, novelty, time to mainstream adoption and attractiveness of the business model being pursued.

Looking into a specific market or product category (such as learning-management systems or digital textbooks) competitive factors of existing offerings represent the dimensions on which products within this category compete, e.g. the price or feature range or editing capabilities of a digital textbook. In **blue ocean strategy** a "value curve" is used to depict corporate or product scores on the main competing factors. The value curves of competitors are used to identify potentials for variation and extension. The so-called "four actions framework" promotes four kinds of variation to the main competing factors within an industry in order to generate a new buyer value curve. Variation eliminates, reduces or raises factors below or above the industry's standard or (in line with our approach to identify empirically grounded value innovation) creates new factors. It aims at increasing buyer value by optimizing utility and price, and to increase company value by optimizing price and cost structures (Kim & Mauborgne 2005, 17). The identification of new competitive factors plays the decisive role in the attempt to create substantially new value for users. Several methods may be applied to identify new and unique product factors (such as a learner-centered modularity of content organized around learning goals in the case of digital textbooks). The ethnographically grounded approach to value innovation bears the greatest potential to introduce new product factors to blue ocean analysis based on a profound understanding of changing values of individuals and society. Such understanding is a sound basis for knowing which factors to eliminate-reduce-raise-create, and for knowing why to do so.

Triangulation makes it possible to scrutinize a problem from various sides in order to validate results and enable a broad understanding from multiple angles. The methodological and data sets triangulation suggested here can be also complemented by a triangulation with respect to researcher According to Denzin (1970) researcher triangulation involves different researchers during observation or data analysis. It is based on the assumption that participation of more than one researcher can mitigate the problem of conflicts of interest that may appear if it is the same researcher who both formulates a theory and empirically examines its research results. Also, different skills and backgrounds on behalf of different researchers may enrich the elaboration of results.

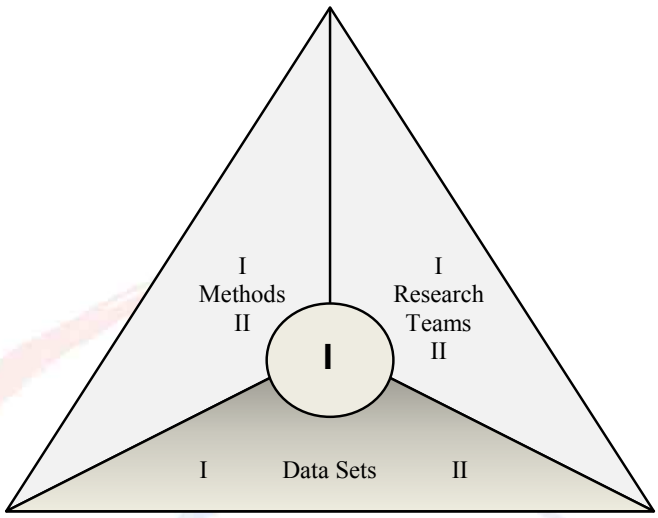

Figure 2. Triangulation of methods (I ethnography and II blue ocean), research teams (I anthropologists and II market researcher) and data sets (I on student life and values and II market state and benchmarks); results are synthesized in workshops aiming to find ideas for value innovation through interference of diverse knowledge types.

In this case, triangulating an empirically grounded understanding of learner values with knowledge about alternative market positions creates a productive foundation for identifying qualified ideas for new value propositions and offerings. Doing so still requires a vivid confrontation of different perspectives and (implicit and explicit) knowledge. The typical format for this is a workshop where carefully selected representatives bringing to the table different kinds of knowledge interact in a live environment. A moderator and group exercises push participants to take their thinking off the beaten tracks of convention. Shifts in perspective are further encouraged through external participants, a thorough preparation and utilization of instructions and media, and specific communication techniques like ad-hoc visual documentation of discussions. Such an interactive environment of changing conditions aims at helping the actors generate new knowledge and ideas.

4. A Case on Learner-Centered Design

As an illustration for describing the approach and methodology for identifying a potential value innovation we use a recent innovation project in higher education in Germany. The project had the goal to identify potential new learner-centered tools and services for university students with high business potential. As suggested above, three different research methods were applied and combined to achieve a broader and deeper understanding of the topic at hand: Ethnography, desk research and blue ocean market analysis. The ethnographic part and the analytical part were each performed by two different research teams from different service providers, one specialized in market analysis, the other in ethnographic research.

4.1. Ethnographic research setup and results

One of the main challenges was to capture the broad variety of today's students' learning activities interests and values – and to find corresponding participants. Our sample contained 11 students between 19 and 27 who studied in or around Berlin, Germany. We strove for a balance between

female and male, freshmen and advanced students, and students from different disciplines (law, business, and social sciences & humanities). The context and content of learning, learning techniques applied, as well as learning problems and needs differ widely depending on the discipline or desired degree. We wanted to understand not just learning activities in a narrow sense but also the organization of university life including issues like time management and collaborative learning.

The ethnographic research had two parts: participatory observation with ethnographic in-depth interviews followed by self-observation with online diaries. The observation aimed at understanding students' daily routines and different learning situations in order to identify latent, unmet or newly emerging needs and problems. Researchers participated in lectures and seminars, accompanied the students to study groups or library visits. The observations usually took two to three hours and were followed by a three-hour semi-structured interview in the student's familiar environment, usually their home. The interviews were designed to explore students' motivation, their social interactions, their learning behavior and strategies, the digital and analogue tools they used and student life in general. The second research part consisted of a five-day online diary. Students were asked to describe their learning activities, the use of digital and analogue tools, and potential problems and challenges. They were also encouraged to describe their motivation, dreams and ambitions by using pictures and short texts. The self-descriptive data helped to enrich and put into perspective the insights gained during field research.

The results were analyzed in a ten-day process of identifying patterns in the data collected and subsequent insight development. One result, for example, revealed that most of the students were struggling with time problems. Due to increasing study and difficulties to efficiently manage the time, nearly every student complained about running out of time and time pressure. Literature research, for example, appeared to be an especially time-consuming and costly activity. One of the students complained about finding and getting literature: "I usually dedicate my Saturdays for searching for books, getting them, going through them and copying the chapters we need." Other students reported on their struggles with limited access to online books and journals, especially from home, difficulty in assessing which article or book is worth reading, lack of overview and centralized control over different lending sources and costs caused by purchasing articles and lending fees. The observations also revealed some workarounds such as for instance checking reviews in Amazon before lending a book in order to save time.

More specifically, ethnographic research and analysis led to four different need or value clusters:

1. "Quality of learning" was reflected by students' complaints about poor quality of educational materials and a lack of support when needed. The cluster also refers to students' concerns about the quality of their education and their needs for effective learning techniques, from note taking and marking up digital content to understanding and memorizing content.
2. "Motivation" illustrates students' needs for motivational support during the semester and the whole period of studies, their wish to sweeten study activities through little rewards and pleasures, their strong desire for feedback on learning outcomes, and their need to assess labor and time investments and progress in knowledge and skills.
3. The "efficiency" cluster describes students' need to manage time and organize learning activities efficiently in an environment free from distractions. This includes the need to coordinate group activities and exchange insights and materials, also easy literature searching and quick access.

4. "Productivity / organizing" deals with students' need for easy-to-use resources, well organized and managed study material, a flexible move between analogue and digital material, as well as ubiquitous but one-place access.

These results were then explored in a concept workshop with the goal to develop product ideas based on the obtained student needs.

4.2. Desk Research and Blue Ocean

In order to understand the educational market and educational trends a comprehensive desk research was conducted based on a wide screening of relevant publications and start-ups in the field of education. It identified a number of socio-economic and technological drivers, such as a growing demand for education and reorganization of knowledge, to name just a few. Based on these drivers six key educational trends were derived. Examples include:

- Open education: the growing amount of teaching content online and learner-generated content available (Breuer & Matsumoto 2011),
- Edutainment – implementation of game mechanics in processes of learning, and
- Enriched content – integration of audiovisual interactive and social media elements into traditional content formats.

Some of the trend fields that resulted from desk research (e.g. enriched digital content) were selected for close examination. A blue ocean workshop was designed to identify various value curves of brands and products in order to distinguish the potential new business from its competitors. Creative sessions involving "learning from other brands" and "brainstorming with megatrends" revealed competitive factors for developing an innovative learning management system e.g. based on an increase or creation of flexibility, openness, personality development, emotions, fun and world of experience. Informed by the trend of *enriched digital content* and the empirical student need to quickly assess and find suitable literature, the attendees created new ideas for modular digital textbooks such as the concept of "Digital ConText Book".

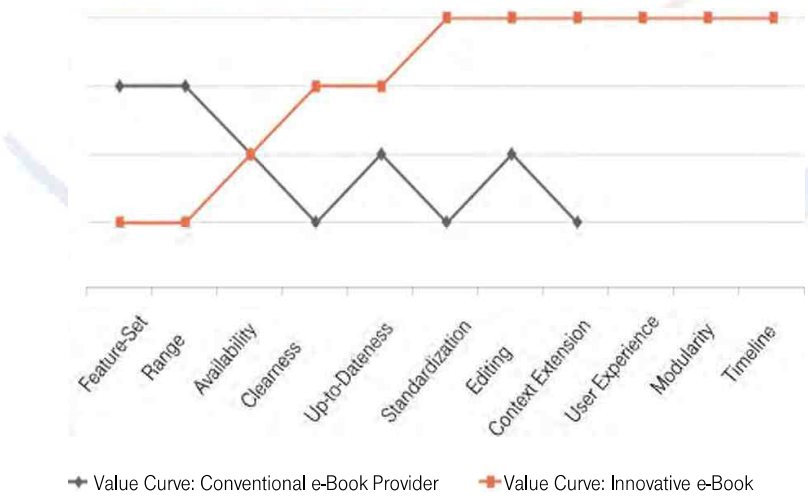

Figure 3. The value curve depicts depict corporate scores on the main competing factors of digital content providers.

Its modular structure allows to focus on educational content and learning goals. Students can purchase and work with relevant parts of a publication and do not have to buy an article or a book as a whole. They can also subscribe to topics they are interested in to get content from different journals, papers, single chapters of a book. In addition, learning materials, learner-generated content and documents can be matched to one's personal learning progress. Students can view and edit content that is created or organized and validated by a lecturer. The idea of a "Digital ConText Book" satisfies different needs identified through ethnographic research, e.g. the need for easy literature searching and access from different work locations. It offers efficiency that do not exist on the market yet and an added value by guaranteeing high quality of materials, providing flexibility in note taking and text marking, and allowing feedback on the progress in knowledge and skills, thus providing for a sense of overview and success.

4.3. Synthesis

Due to integrating the two perspectives of ethnographic research and blue ocean analysis the obtained results enriched and encouraged each other. On the one hand student needs and values, desires and problems described above could not be identified through desk research or blue ocean strategies but rather only through a deep immersion into the students' worlds by using ethnographic methods. On the other hand ethnographic research cannot yield an overview over the educational market, its competitors and market niches. Only in combination can the derived ideas create a new market and meet customers' needs at the same time. Results of each methodological approach have not only enriched each other but also encouraged the project teams' assumption that the search field of higher education bares substantial and qualified business opportunities. These are based on uncovered customer values and needs and may be served by an industry that currently does not provide them.

5. Conclusions

We described a green-field approach on how to drive innovation in user- and learner-centered solutions based on an empirical understanding of student values, needs, and requirements (e.g. in terms of efficiency and time-management). Ethnographic results and a clear understanding of the strategic market position based on extended value curves informed strategic decisions and specification of propositions. Novel solutions were generated e.g. providing enhanced contexts to learning materials. Encouraged through their participation in the discovery of real user needs, values and strategic options the business owners gained sufficient confidence in the concepts to invest in their development within a newly found business unit. First patent applications are underway. Their specification, implementation, marketing and validation in the marketplace are work in progress. Future review must show if a potential success of propositions may be traced back to these value-based concepts. So far, understanding user values, needs and desires, and strategic market analysis already created the indispensable basis for the attempt to develop new and relevant products and to establish sustainable business.

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