

E-Learning Didactics and Teaching Scenarios

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ABSTRACT

Despite the fact that e-Learning exists for a relatively long time, it is still in its infancy. Current e-Learning systems on the market are limited to technical gadgets and organizational aspects of teaching, instead of supporting the learning. As a result the learner has become deindividualized and demoted to a noncritical homogenous user. One way out of this drawback is the creation of individual e-Learning materials. This study examines the pedagogical concepts of modern education, new approaches to the theory of didactics and e-learning didactics classical understanding, the impact of computer technology on the logic of the educational process and on pedagogical design development. The results show that the students can take the main program in the mode of synchronous or asynchronous learning and attend a university only during exams or introductory classes. The line between lectures and workshops is blurred often during such a work. The planning of distance courses is tailored according student's working hours, not just classroom hours laid down in a curriculum for a teacher and a student convenience in many universities.

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1. INTRODUCTION

The volume of data that we encounter daily grows exponentially. It becomes increasingly difficult to capture the desired signal in a general noise within the modern information flow. Against the background of fast social life changes, education was the most conservative element of society. The teaching methods remained unchanged for centuries, since the advent of industrial revolution origin and Ya. Komensky didactics appearance (Open Distance Learning, 2002). Didactics is the branch of pedagogical science, answering the following questions: "what to teach"? and "how to teach?" The first of these questions is divided into learning objectives and learning content. The second is divided into educational technology in general and specific methods and forms of training. The original meaning of the word "didactics" (from the Greek *didaskein*) means literally "to teach" and "to have the knowledge in the field of education". The first mention of didactics was in 1120. The French philosopher Hugo St. Victor published a book entitled «Didascalicon» (Grabmann, 1998), which was recognized as the basic work for higher education improvement during the Renaissance (Nordkvelle, 2003). Recent developments have increased competition in the sector for higher education, thus creating an educational market. Companies from the hardware and software industries, the media industry, and professional training institutions are trying to enter the market with corporate or virtual universities, with learning software, computer-based training, and other e-learning products. Many successful universities are trying to enter the e-learning market using different strategies. In this contribution, we describe recent trends in the educational market. This study identify and classify a university's portfolio and introduce branding as an appropriate means of marketing a university's offer.

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The development of e-learning as a teaching strategy in higher education has implications relating to student learning, the role of the teacher, and the institution of higher education. Muirhead (2007) debates the andragogical and pedagogical theories that support the development of e-learning to date. Leading to a discussion on how the process of e-learning may be contributing to the “stamp-me-smart” culture and restricting the development of critical thinking within student nurses. Concluding that e-learning has a top-down institution-led development that is contrary to the student-led development espoused by universities. Mari et al., (2008) analyzes the reciprocal influences between various teaching methodologies supported by information and communication technology (ICT) and the teaching objectives that are pursued by means of these methodologies. The authors present the main characteristics of the conceptual model which has led to the definition of the teaching objectives and the results of the experience of the “eLearning@LIUC” project, where the validity of the hypotheses underlying the model has been tested through their application within concrete contexts. They believe that the presented model, with its analysis of the possible correlations between teaching objectives, teaching methodologies and technological tools, can provide a new awareness of the opportunities offered by the adoption of ICT in teaching.

2. LITERATURE REVIEW

During a long period learning was dominated by the postulate that puts a teacher in the center of the pedagogical process. The traditional view assumed the development of the didactic triangle "a teacher, a student, taught knowledge and the interaction between them" (see Figure 1) (Chevallard, 1982; Hugh, 1961). This study offers to have a fresh look at the educational process during the age of scientific and technological process rapid development. Naturally, it must comply with modern requirements. The traditional model of education in which a teacher had the monopoly on knowledge and the problem of the education system reduced to the provision of this knowledge is irrelevant. The transforming impact of technologies on learning begins to be recognized by scientists in the end of XX-th century, and various attempts to review the goals and the objectives of didactics began to be offered. Such attempt is the rethinking of the didactic triangle in order to include such concepts as context and technology in it (Figure 2).

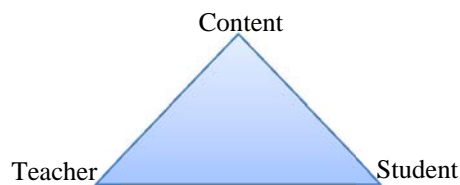


Figure 1.
Didactic Triangle

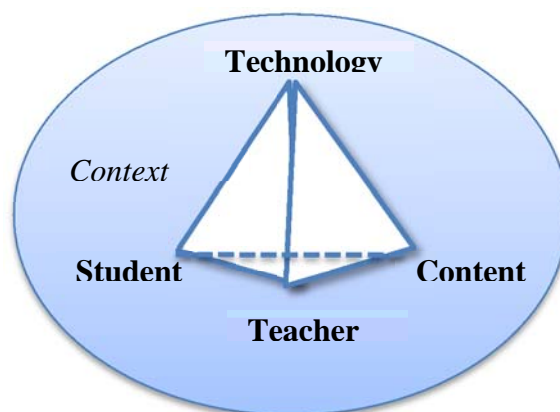


Figure 2.
Didactic Triangle Including Context and Technology

The Figure 2 shows that, nowadays, the training process is enriched by additional forms of interaction: the standard dialogues between teacher-student, teacher-content and student-content are added by the technological component. This didactic tetrahedron can be interpreted as follows:

- The technology-content-teacher edge shows that nowadays a teacher activity is based on technologies more and more during a teacher course development and it takes into account various ways of information provision.
- The student-teacher-technology edge allows you to think about the role of new communication tools that can be used in teaching (forum, chat, webinar, the system of electronic voting).
- The edge pupil-technology-content reflects the interaction between a student and the information which takes new forms: online resources, self-testing, simulation, and more appear instead of mainly text information.

The context in this diagram is the educational environment in the broadest sense of the word. A teacher offers a student to go beyond the traditional class-lesson system and to try new learning situations closely related to practice (joint work on projects for specific customers, visiting classes at enterprises, communication with students and teachers from foreign universities, etc.) more and more often. E-learning advantage is presented by the availability, flexibility and the efficiency of quality knowledge perception, respectively. Thus, it is necessary to create such a learning path that will pave the way for new knowledge and skills through teacher key points during the study of educational material, during workshops, etc. Here one needs the use of pedagogical design technologies. Today, they offer to use the English terms «pedagogical system design (instructional system design)», «instructional design» or ID-technology instead of "pedagogical design", which existed in Soviet pedagogy, long before the advent of modern trends. If we translate literally, an instruction is a command, a guidance, a detailed guide, a set of rules for doing something and Design has different meanings (purpose, projecting, construction, pattern, etc.) (Tikhonov, 1998).

Nowadays, unfortunately, only a few school teachers and university professors understand clearly, what is the "instructional design". There is not an unambiguous interpretation of the meaning and the scope of this concept yet. Let's try to lift a little the curtain of secrecy over this issue. Uvarov preferred to consider instructional design "as the systematic use of knowledge (principles) about an effective educational work in the process of designing, developing, evaluation and the use of training materials" (Edu Tech Wiki., 2007). The essence of instructional design is based on definite objectives and desired outcomes of "pedagogical designer" (a teacher, an educator) and the development of the most effective teaching methods through a planned educational material.

3. METHODOLOGY

One important element of instructional design is the selection of a learning approach. Obviously, the presence of technologies is unlikely to alter the established educational concepts developed for centuries. In order to offer students some qualitatively new courses that meet modern requirements, it is necessary to rethink the approaches to learning. Traditional teaching methods are based most often on the principles of behaviorism - the trends in pedagogy and psychology, the central tenet of which is the presence of a man's reaction to an external stimulus, and as a result, the change of a usual behavior under the influence of this stimulus. This postulate is applied to learning when a teacher establishes its course mainly on the presentation of theoretical information during lectures and on repetitive tasks during the practical sessions. In this context, a learner is required to show that he knows the only correct answer to the questions that are asked during an exam or a test. The pedagogical principles of cognitivism are based on the perception of learning as an internal process associated with memory and thinking. The pedagogical strategy serves to help a student to remember information, linking it with already known facts, and organize their knowledge (for example, using diagrams, drawings, conceptual maps, text analysis, etc.).

The main idea of the third approach -constructivism- is that the knowledge of reality is developed independently by each person under the influence of the environment. Knowledge and skills are not the result of information memorization, but the result of its assimilation by own experience rethinking method with an outside world. Within the part of this pedagogical approach the role of a teacher is to push a student to the search for information, answers and solutions with the help of specific problem development or correctly asked questions, to stimulate the interest for discoveries and to accompany a student all the way to the development of competencies. The social constructivism also proposes to add to this the work in groups, in which the knowledge and competences are developed together. During the past few decades, the introduction of technologies in the educational process was the impetus for the rethinking of teaching methods.

Current research on pedagogy, as well as the use of new technologies in the learning process, are often based on the tenets of cognitivism and constructivism. It is interesting, that these pedagogical approaches that are at the peak of their popularity, are now among researchers. They are not new, they were developed during the mid-twentieth century, and were used by the leading the teachers of that time. What is the difference between the different training approaches and what's the role of these approaches in the creation of specific courses? The table below helps to compare different approaches and gives the examples of information technology use in each of these contexts.

Table 1. Different Approaches

	Behaviorism	Cognitivism	Constructivism
Learning process determination	Changes in behavior	Change in mental processes	The development of knowledge by students in social context
Student	The "sponge", absorbing information (passive position)	"Computer", systematizing information (active position)	The development of knowledge and decision making (proactive position)
Teacher	People responsible for the transmission of information	Assistant	Guide and provocateur
Knowledge	Objective reality, which a student has to absorb	The objective reality that a student must organize using mental processes	Reality created by each person individually
Teaching methods	Lecture, repetitive tasks in practice	Individual and interactive approach for information supply and development	Support training and consultations
Information technology use examples	Tests Short videos that explain specific concepts	Interactive multimedia resources Simulations	The programs used for project work and group work. Online portfolio Electronic means of communication

Many researchers note that the introduction of information technologies into the educational process resulted to education paradigm change towards constructivism at the end of the 20th century. A pupil who becomes the center of the pedagogical process and the focus of learning (teaching, a teacher teaches) is shifted to the study (learning, a learner studies) (Uvarov, 2003). In this paradigm of learning, a teacher becomes a mentor, a mediator between organizational and technological learning environment and a learner. Traditional teaching, in which a teacher is a "higher" authority for a student goes to the pedagogy of cooperation, in which a student becomes a learning process co-manager and a teacher becomes a trainee assistant (facilitator - contributing, helping in studies). Taking into account the mentioned above, the modern didactics brings the following innovative complex to the learning process:

- Training in a virtual e-learning environment, developing the information competences directly in the process of educational program development studied by students;
- Individual training plan and training schedule;
- Individual organization and teaching methods;
- Continuous monitoring of knowledge assimilation;
- Reliance on a teacher-tutor;
- Quality assurance objectivity in respect of educational material development;

- Self-esteem in the process of training and the assessment of learning outcomes - the program during current and intermediate certification;

- A clear structure of the information educational environment with a design substantiation of its resources.

It should be noted that the greatest didactic freedom of a university lies in the development and the implementation of educational material presentation forms. The evolution of the classic forms in the organization of training in higher education and the organizational forms of education is the result of the basic elements transformation in classical didactics. A classical lecture evolves in the following forms: lecture-dialogue, lecture-visualization, lecture-problematization, etc. Practice takes on the character of continuous internship, workshops provide practical orientation of the learning process. At that the content of learning is developed from a problem state-ment for students. The problem can be stated directly and may be provided as a problem. In this case, the students formulate the problem to be solved by themselves. The tasks can be allocated by students from the provided information. The primary analysis, criticism, interpretation lead to the transformation of a training text by the valuable exchange of ideas, the evaluation of personal positions: personal experience, value orientations, etc. The next step is an action and a decision. They also can and should be considered as the elements of the education content. They represent information that is issued in the form of a judgement, a project and a program. The next stage of training is discussion and presentation.

4. RESULTS AND DISCUSSION

Before describing the scenarios within various models of e-learning in detail, as well as present their examples, let us determine what will be understood by a pedagogical scenario. Let's pay attention to the following definitions, which, in our opinion, are the most capacious ones in existing works of researchers:

"A pedagogical scenario is the description of a lesson process, the definition of training goals and objectives, as well as the descriptions of student's actions and assessment forms" (Lando, 2003 cited by Villiot-Leclercq source, 2007).

"The scenario is determined as the description of a specific learning situation, the result of which is the obtaining of certain knowledge. This description provides roles, tasks, resources, through which the actors of a process will manipulate this knowledge, as well as the tools and the results associated with tasks (Pernin & Lejeune, 2004).

This definition brings pedagogical scenario to a lesson plan, familiar and close for each teacher. And a script, and a plan are intended to help a teacher to plan a lesson correctly.

What is the difference between these two concepts? Speaking of a pedagogical scenario they usually involve an activity or a course, which uses e-learning elements. That is why an important place in a script will occupied by the tools (or the means) of training, and their compliance with the set goals and objectives. For example, if a teacher wants to use, say, an online forum, the script will specify a point and an educational purpose of this element in a course, the way it will be related with classroom lessons, if forum texts are estimated and so on. A pedagogical scenario has a particular importance in the mixed and in the distance learning, as an inverse relationship between students and teachers is complicated, and one should immediately think about the availability of material and its perception by the target audience during the planning of activities. One should also clarify that the term "teaching scenario" is used to designate the whole course script, and one lesson and even one pedagogical resource, often interactive one. In this chapter, we consider mainly the educational scripts of a training course and a class.1

4.1 Pedagogical Scenario Preparation

A pedagogical scenario often includes the following elements (Edu Tech Wiki, 2007):

- Learning objectives and tasks
- The description of tasks, actions, and the one who carries out these actions (a teacher, a student, a tutor)
- The description of learning environment (educational materials, resources, tools, etc.)
- Evaluation

These elements can be described in different forms. The most simple form, in our opinion, is the drawing up of a simple table or a text description. These documents can be more or less detailed depending on a teacher's wish and the one who will read or add this scenario. In the case of several teachers work over one course, a scenario can be developed jointly and one may also include tutors in a distance learning situation for this work. For those who wish to plan in detail the conduct of studies, as well as for working teams of teachers working with experts in e-learning, it may be useful to take advantage of special programs that allow you to describe a pedagogical scenario using symbols and pictograms (see; for example, the software Sceniform <https://sites.google.com/site/jacquesrodet/sceniform>). Here are some general guidelines for the preparation of scripts:

1. Start the thinking over of a script, from the determination of course goals and objectives as a whole and each lesson and task individually.
 - a. What knowledge or competences should be received or developed by a student during a course?
 - b. What pedagogical theory will be used to develop a scenario (behaviorism, cognitivism, constructivism)?
 - c. How can we evaluate the obtained knowledge, what tools shall be chosen for a current and a final evaluation?
2. The evaluation as the final and the current one, must be clearly specified in a script. The current assessment is particularly important to consider in a distant and mixed learning, it will help to monitor a student's progress throughout a course and will prevent the loss of student motivation.
3. Such tools like forums, online resources, videos, forums, web conferences, and so on should be selected in accordance with the purpose of a lesson and pre-tested prior to the use with students.
4. Paying a special attention to the planning and dates, as well as explain the essence of the tasks in detail. It would be better if all this information is presented in a written form: this will help to avoid numerous issues during the carrying out of difficult works on the organization of tasks and the work in groups. A plan located on a course page, including goals and objectives, key dates and evaluation criteria will help the students with remote and mixed forms of training to plan their time in advance and be better prepared for classes.
5. The actions of a teacher as a mentor and an accompanying person play an important role in a script. A teacher helps students to learn material and operate the acquired knowledge. Within the distance learning, a regular presence of a teacher in the online environment, such as the answers to the questions of students, the reminders about works, the presence on forums and the organization of web conferences is the fundamental condition for the success of students.

4.2 S Scenarios in Different learning Models

Let's consider now various options for scripts that may be applicable in traditional, mixed and remote learning models. In this guide, we consider only pedagogical scenarios, which involve e-learning elements. Let's note also that a teacher can offer students to take part in the creation of electronic resources and the preparation of electronic manuals.

- Traditional Model of Learning

Within the traditional class-lesson model, a student attends lectures, seminars and workshops. What is the purpose of e-learning use in this context? Here are a few situations in which the use of e-learning elements can be an advantage.

- A teacher wants to make lectures and seminars more interactive and rich, to offer more examples and practical studies.
- A lack of classes for a discipline in a curriculum, which can be compensated by several tasks in a distance learning format.
- The shortage of teachers for this discipline or of classrooms for lectures.

The following mentioned examples describe only some possible scenarios with e-learning use.

Table 2. Scenario 1, Lecture

Course/class element	Time (student's work)	Learning goals and objectives	Electronic means	Evaluation
Traditional lecture	2 h.	<i>Determined by a teacher depending on a course content</i>	PowerPoint presentation	Absent
Student access to lecture materials	1 h.		PowerPoint presentation on a course site or LMS	Absent
Online debate A teacher publishes the questions for a discussion on a forum.	1 h.	<i>Determined by a teacher depending on a course content</i>	Forum	Current: extra points for an active participation in a forum

In order to increase the activity of a student, a teacher can also offer students to participate in the creation of electronic resources for a course, to find the additional sources of information on a subject on internet or to assess and comment on the works of classmates using LMS or specialized forums.

Scenario 2. Lecture

Course/class element	Time (student's work)	Learning goals and objectives	Electronic means	Evaluation
Student access to lecture materials	1 h.	Determined by a teacher depending on a course content	A text or a video on a course site or LMS	Absent
A lecture, focused on the discussion and the analysis of specific examples.	2 h.	Determined by a teacher depending on a course content	Electronic voting system (classroom response system)	Absent

A mixed model of learning is often the model in which a student is partially present in a classroom (approximately 20-50% of time) and partially studies material remotely.

Scenario 3. Workshops and Seminars

Course/class element	Time (student's work)	Learning goals and objectives	Electronic means	Evaluation
Working with thematic animations and simulations	1 h.	Determined by a teacher depending on a course content	Electronic animations and simulations	Absent
Practical lesson. Manipulation with devices, experiments.	2 h.	Determined by a teacher depending on a course content	-	Evaluation of laboratory work in groups
Training tasks	2 h.	Determined by a teacher depending on a course content	Tests and training tasks in LMS	Absent, but there is the access to job performance statistics

This model is used in the situations when the students can not attend classes for some reasons during the entire period of study (students living in remote areas, working students, etc.). In these cases, it is possible to offer distant lectures or remote practical works for students. Table 3 is presenting scenario 1 (a), when the lectures are conducted remotely, practical exercises in a classroom, also, scenario 2 (b), when the lectures are held in a classroom and practical exercises are held remotely.

Table 3. (a), Scenario 1

Course/class element	Time (student's work)	Learning goals and objectives	Electronic means	Evaluation
The view of instructional 5-10 minute videos by a student	1,5 h	Determined by a teacher depending on a course content	A video on a training server or as the part of an electronic resource	Current: the testing of 5-7 questions after each video
The preparation of questions on video content and the publication of questions on a forum. A teacher reads a forum for a practical class and prepares answers to questions.	30 min	Determined by a teacher depending on a course content	Forum	Absent
Practical lesson in a traditional form.		Determined by a teacher depending on a course content		

(b), Scenario 2

Course/class element	Time (student's work)	Learning goals and objectives	Electronic means	Evaluation
Lecture in a traditional form. It offers a variety of research issues (or problems). Students are divided into groups, each group is given a problem to solve.		Determined by a teacher depending on a course content		Absent
Remote work in groups: assignment discussion, selection of materials, preparation of a solution. The role of a teacher is consultancy		Determined by a teacher depending on a course content	Forum, software for web conferences, collaborative remote work service (Google Drive or other)	Absent
The presentation in a webinar form. Each group presents its solution. Other students comment and ask questions. The role of a teacher is the adjustment and the provision of additional information.		Determined by a teacher depending on a course content	Software for a webinar	Evaluation of presentations and group work

Learning is considered as a remote one, when the physical presence of a student at a University makes less than 20% of the total training time. This means that students can take the main program in the mode of synchronous or asynchronous learning and attend a university only during exams or introductory classes. The line between lectures and workshops is blurred often during such a work. The planning of distance courses is tailored according student's working hours, not just classroom hours laid down in a curriculum for a teacher and a student convenience in many universities.

Planning takes an important place in a distance course. A student must be clear about the time he should view the training materials, hand over works to get in touch with a teacher and other students. For example, suggest a weekly planning of a course, in which reference materials, assignments, webinars, as well as the time that a student will spend each week on a course will be marked for each week. The remote presence of a teacher becomes an important factor for a student's success: a teacher must not only think out a course script and a separate class script properly, but also constantly "attend" remotely via forums, chats and webinars.

Table 4. Scenario Example for a Course in Distance Learning

Course/class element	Time (student's work)	Learning goals and objectives	Electronic means	Evaluation
Introductory lesson. Analysis of the video clip with a problem situation. The discussion of the situation on a forum.	1 hour of individual performance during a week	Determined by a teacher depending on a course content	Forum or LMS	Bonus from forum activity
Theme 1. Webinar. A teacher's comments on a proposed problematic situation. The explanation of objectives and tasks, the main topics of a course and the assessment. The explanation of the first theme with a presentation use. Questions and answers.	2 h.	Determined by a teacher depending on a course content	The program for webinars	Absent
Theme 2. Several educational videos for 10 minutes each + test after each video. Students offer additional resources on a forum topic.	2 hours of individual work within a week	Determined by a teacher depending on a course content	LMS or an electronic resource with video and tests, forum	Bonus from forum activity
Theme 3. The articles for reading and written analysis by choice. The work shall be provided to an instructor through an electronic system.	5 hours of individual work within a week	Determined by a teacher depending on a course content	LMS	Evaluation of written works
Project work (group work) Students work in a group on a problem situation (e.g., the preparation of an enterprise financial plan, the analysis of a region environmental strategy, etc.). Students work in synchronous and asynchronous mode.	6 hours of individual work within a week	Determined by a teacher depending on a course content	Software for joint remote work (Google Drive, Skype or similar programs)	Group participants evaluate the work of their colleagues in a group
Presentation of each group of works in the form of a webinar	2 h.	Determined by a teacher depending on a course content	Software for webinars	Evaluation of presentations for each group

The purpose of a teacher is to accompany a student in material learning, encourage and motivate to action, and to organize the work in groups. Without a teacher's constant presence, the students learning remotely can feel themselves isolated, and it makes a negative impact on learning outcomes and motivation often.

5. CONCLUSION

The use of information and communication technology (ICT) is becoming an inherent part in higher education. According to recent reports, however, the actual use is concentrated on its qualities as an organisational and logistical tool. The didactical potential does not come into account in teaching scenarios where learning management systems or the like are used to spread materials and announcements. Teachers should become aware of the didactical values new media can bring about through a large diversity of scenarios. In order to realise an appropriate use of ICT in higher education, a variety of competences is needed in the scope of the four dimensions in e-learning (didactics, technology, strategy and multi-media based learning objects).

This study examines the pedagogical concepts of modern education, new approaches to the theory of didactics and e-learning didactics classical understanding, the impact of computer technology on the logic of the educational process and on pedagogical design development. The results show that the students can take the main program in the mode of synchronous or asynchronous learning and attend a university only during exams or introductory classes. The line between lectures and workshops is blurred often during such a work. The planning of distance courses is tailored according student's working hours, not just classroom hours laid down in a curriculum for a teacher and a student convenience in many universities. The purpose of a teacher is to accompany a student in material learning, encourage and motivate to action, and to organize the work in groups. Without a teacher's constant presence, the students learning remotely can feel themselves isolated, and it makes a negative impact on learning outcomes and motivation often. Finally, the remote presence of a teacher becomes an important factor for a student's success; a teacher must not only think out a course script and a separate class script properly, but also constantly "attend" remotely via forums, chats and webinars.

Conflict of Interest

The author confirms that the presented data do not contain any conflict of interest.

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Endnotes

1- Many English-language Internet resources are devoted to the creation of scripts for electronic educational resources. You can read more about it using this website: <http://elearningindustry.com/the-basics-of-scenario-based-e-learning> or in this blog: <http://blog.cathy-moore.com/2011/07/checklist-for-strong-elearning/>

2- The examples provided in this study can be considered as the "basics" of pedagogical scenarios that can be filled with content, or as a collection of ideas for your own scripts. Obviously, teaching scenario will be different for each specific class. The purpose of this chapter - not to offer a finished product, with which a teacher can work, but to show what elements a scenario may provide and the way it can be drawn up independently.

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