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Svitlana BORYSOVA,

orcid.org/0000-0003-0610-644X

*Candidate of Pedagogical Sciences, Associate Professor,
Associate Professor at the Department of Design
State Institution "Luhansk Taras Shevchenko National University"
(Poltava, Ukraine) svitlana.borysova@gmail.com*

HARMONIZATION AND MANAGEMENT OF STUDENTS' KNOWLEDGE USING MIND MAPS IN THE STUDY OF WEB DESIGN

The article highlights the multifactorial nature of the modern concept of education, according to which knowledge management is an expedient harmonizing factor, and teaching web design is a desirable component in the training of future graphic designers (which combines traditional and innovative approaches in teaching) both for wider opportunities for implementation in a professional environment, and for a conscious stay in the virtual information space. It is noted that in the modern world, the traditional training of a graphic designer is undergoing powerful changes, and for effective professional growth when mastering graphic design, students should realize opportunities to develop both aesthetic thinking and technological skills. The specific features of the professional activity of a modern graphic designer are analyzed, according to which he must be able to work with fonts and visualize information, taking into account the technical requirements and opportunities that appear thanks to new technologies. It is noted that a rational combination of aesthetic thinking and the necessary functionality is possible under the condition of correct knowledge management, which, when teaching web design, determines both the effectiveness of creative solutions and the effectiveness of the technical structure of the site.

The article outlines the features of the use of mind maps by teachers for the purpose of both harmonizing knowledge and developing the creative potential of future graphic designers during training. The basic features of creating intelligent maps are considered and examples of online resources that are useful in their design are given. Intelligent maps are considered as useful tools when solving web design tasks, both during the initial stages of research, and when directly designing the structure and visual characteristics of the site. By creating intelligent maps, future graphic designers have the opportunity to demonstrate their intellectual skills, creative thinking and ability to work with web technologies and to organize teamwork.

Key words: *harmonization, knowledge management, future graphic designers, web design, mind maps.*

Світлана БОРИСОВА,

orcid.org/0000-0003-0610-644X

*кандидат педагогічних наук, доцент,
доцент кафедри дизайну*

*Державного закладу «Луганський національний університет
імені Тараса Шевченка»*

(Полтава, Україна) svitlana.borysova@gmail.com

ГАРМОНІЗАЦІЯ ТА УПРАВЛІННЯ ЗНАННЯМИ СТУДЕНТІВ ЗА ВИКОРИСТАННЯМ MIND MAPS ПРИ ВИВЧЕННІ ВЕБ-ДИЗАЙНУ

У статті висвітлено багатофакторність сучасної концепції освіти, згідно якої управління знаннями є доцільним гармонізуючим чинником, а навчання веб-дизайну є бажаною складовою у підготовці майбутніх графічних дизайнерів (що поєднує традиційні та інноваційні підходи у викладанні) як для ширших можливостей реалізації в професійному середовищі, так і для свідомого перебування у віртуальному інформаційному просторі. Зазначено, що у сучасному світі традиційна підготовка графічного дизайнера зазнає потужних змін, і для ефективного професійного зростання при опануванні графічного дизайну студенти мають реалізовувати можливості розвивати як естетичне мислення, так і технологічні навички. Проаналізовано специфічні особливості професійної діяльності сучасного графічного дизайнера, згідно яких він має вміти працювати зі шрифтами та візуалізувати інформацію, враховуючи технічні вимоги та можливості, які з'являються завдяки новим технологіям. Зазначено, що раціональне поєднання естетичного мислення та необхідної функціональності можливе за умови коректного управління знаннями, які, при навчанні веб-дизайну, визначають як результативність творчих рішень, так і ефективність технічної структури сайту.

У статті окреслено особливості застосування викладачами дизайну інтелектуальних карт (mind maps) з метою як гармонізації знань, так і розвитку творчого потенціалу майбутніх графічних дизайнерів під час навчання. Розглянуто базові особливості створення інтелектуальних карт та наведено приклади онлайн ресурсу-

сів, які є корисними при їх проєктуванні. Інтелектуальні карти розглядаються як корисні інструменти при вирішенні завдань веб дизайну, як під час початкових етапів дослідження, так і при безпосередньому проєктуванні структури і візуальних характеристик сайту. Створюючи інтелектуальні карти майбутні графічні дизайнери мають можливість продемонструвати свої інтелектуальні навички, творче мислення та вміння працювати з веб-технологіями, організувати командну роботу.

Ключові слова: гармонізація, управління знаннями, майбутні графічні дизайнери, веб дизайн, інтелектуальні карти.

Formulation of the problem. Modern education is developing under the influence of various imaginative trends that affect the educational process sometimes contradictory. This circumstance requires certain efforts to optimize and harmonize the educational process to achieve results by the goals and values declared by universities. The transition to a fundamentally new civilizational order cannot be implemented without a change in the educational paradigm.

An important element of the knowledge strategy for the university is the stage of identifying resources and opportunities based on knowledge that is unique to the organization. It is a set of core competencies and an assessment of their capabilities to achieve real superiority in a competitive market. In other words, the university needs to determine the strategic content of knowledge, and the true position of consciousness to identify gaps in strategic knowledge.

However, each organization develops its approaches to the description and classification of strategic and competitive factors. The use of various services of digital and network devices allows you to involve more students in joint activities. Today, it is difficult to imagine life without the use of mobile digital devices. As compensation for growing dependence on the use of digital devices and network services, a person gets the opportunity to self-constantly plan their own time and work schedule. Mandatory use of modern technical means is compensated by the growing convenience and the possibility of using them at one's discretion. The diversity and the ever-increasing amount of information determine the importance of the conscious involvement of students in the design of the virtual information space, in which they are participants permanently. Accordingly, it is promising to involve students in the study of web design, which is a guarantee of both wider opportunities for further employment of future designers, as well as an understanding of the processes of designing sites with their potential to influence human consciousness.

Literature review. The social type of nature of the interaction between designers and consumers is fundamentally changing. The human community as a whole is moving to some other value level. Hence, the value orientations of design change. This entails a change in value orientations in education. It is education that has priority in the formation of new

social values. These features become more valuable: non-standardization of thinking in conditions of information-changing situations and uncertainty, the ability to create your picture, an image of the world from a variety of images characteristic of the diverse development of post-industrialism, and to be confident in this life since the time of amazing diversity role models and styles that have emerged from the demassification of the mass media in our days. "Modern graphic design has become broader and more technological due to using digital devices. There have been so many new trends in graphic design in recent years; hence it's very important to stay more up-to-date with the recent trends and upgrading technology of graphic design. Conventional training of graphic designers isn't enough now. Learners have to learn graphic design by developing an aesthetic mind as well as technological skills" (Borysov et al., 2022).

Modern graphic design actively uses innovative technologies. In connection with the development of the Internet in recent decades, a new space of communication between people has appeared, new ways to meet human needs, a significant number of types of human activities have become subordinated to the means of Internet technologies, as well as new types of activities aimed at ensuring the stable, well-established and productive functioning of the Internet (Sperka, Stolar, 2005). An important place among them is occupied by web design, the purpose of which is to create websites in all their diversity. Web design is a complex process that includes such stages as information design, aimed at organizing and structuring the site content, graphic design, and programming of the site with inclusive web design in mind (Belman-Adams, 2022).

Of particular note is the introduction of web resources using cloud technologies to demonstrate and organize the research work of students (Hevko et al., 2021). It deserves interest in the aspect of harmonization of knowledge management in the preparation of graphic designers and consideration of the engineering aspect of the modern concept of professional education of artists and designers when performing tasks in drawing an academic figure (Vasilenko et al., 2020). Interesting is the research of Y. Beris and Í. E. Gulacti who conducted a survey that provided information on the attitude and approach of modern

art lovers and innovative art presentations, regardless of whether they are made by the classical method or digital technology, they are approached with enthusiasm and interest. "This digitalized age offers the possibility to follow cultural and artistic events easily. Another result that underlines appreciation and interest is that the respondents find it attractive to view and buy fine art print, a new type of artistic production, according to their taste and purchasing power. It is a remarkable result to see this view in the responses of highly educated and professional art lovers. Considering this data, it indicates that the relationship between the level of education and the art audience, especially the art education received before and during college is an essential factor influencing the affiliation with the art audience" (Beris, Gulacti, 2022, p. 27).

An interesting area of research within the concept of knowledge management is the study of encouraging students' soft skills through a web-based approach to e-colloquium learning to improve prior feedback. Familiarity with the publications suggests that most researchers are inclined to believe that the electronic platform can be an alternative medium for students. Especially students who take courses to be able to use it as part of the process of disseminating suggestions they have made, and receiving feedback from various parties to improve the suggestions that have been made. For example, based on the results of the expert assessment and the feedback from students, which were processed and analyzed based on common tools, the researchers concluded that the electronic platform should be used and used as a teaching aid (Idris et al., 2021). In addition, electronic platforms and resources can be effectively used as tools for harmonization and management of the acquisition of competencies by students of higher education (Idrees et al., 2021).

The study of knowledge management as a factor of harmonization, in particular, in teaching web design, involves taking into account several circumstances: a) It is important to remember that cognitive dynamics can lead to the depreciation of previously important flows of contextual information and information; b) one should consciously reach out to interdisciplinary and interdisciplinary junctions of new flows of information and facts of social and socio-economic reality.

The aim of the article is the goal is to find and implementing tools for harmonization and knowledge management, in particular, when students study design.

Methodology. The initial stage of the research involved a comprehensive analysis of artistic and communicative patterns, requirements and norms in the design of websites, as well as revealing the sig-

nificance of the interaction of aesthetic and functional aspects of the site to ensure maximum efficiency of its use. The expediency of determining the effectiveness of the interaction between the aesthetic and functional aspects of the site is made using mental maps. In the process of studying the problem, the methods of logical analysis were used. The work uses structuring of websites, arranging according to the content of the site pages. Issues related to web design and traditional graphic design technologies are controversial.

Results. An important element of the knowledge strategy for the teacher is the stage of identifying resources and opportunities based on the knowledge. In other words, the teacher needs to determine the strategic content of knowledge, and the true position of consciousness to identify gaps in strategic knowledge. However, each teacher develops its own approaches to the description and classification of strategic and competitive knowledge. Knowledge management scenarios are a set of procedures, schemes, and technological and organizational solutions for the tasks of knowledge management in a course. Knowledge management elements include: people (establishing contacts and interactions between people, possessing knowledge); processes (procedures for knowledge exchange, mechanisms motivating and involving individuals in the exchange of knowledge); technologies (development of technological infrastructure to preserve experience and for communications).

Personalization in a course provides the approach focused on the preservation of informal knowledge through the formation of groups, in which there is an exchange of knowledge, and involvement of experts for separate areas and creates conditions for the exchange of knowledge. Even more, Knowledge Management is responsible for organization's efficiency, effectiveness, and innovation (Idrees, 2023). When using this approach can also apply some technological solutions to solve problems: Mind Maps are a graphical display of resource structure when performing individual short-term or long-term tasks, may include both internal and external resources; Customize Knowledge is a creation of conditions when the student receives only the knowledge (information) that he needs at the moment. With, customization of knowledge and information solves the problem of "information overload"; Knowledge Packs are structured set links on certain topics. Usually include the internal resource. As a rule, "knowledge packages" are developed for a group of students for a short time; Training Programs are developed and are held for individuals or groups and aimed at studying: resource of knowledge or information; areas of knowledge; information products.

The main results of knowledge management (which determined by the attributes of knowledge, methods, and the relationship between knowledge) at university are: preservation and use in new conditions past experience and knowledge of students; availability of constant access to the necessary information (knowledge); exclusion of the possibility of “information overload”; reduction of time spent on search information; customization of knowledge and information; obtaining the necessary professional information support; raising the general level of awareness students.

Working with knowledge is a rather complex multi-stage work a process with a certain life cycle that needs conscious management to adhere to a certain consistency and coherence and ensure the desired level of effectiveness and achievement of goals.

One of the tools for organizing knowledge in which knowledge management becomes a harmonization factor in teaching web design is mind maps (knowledge maps, mental maps). A mind map is a graphical representation of the location of the knowledge and information; a visual presentation of information. The main characteristics that are important for the design of mind maps (according to T. Buzan) are: the center of the map is the object of attention, the topics related to the object are placed in the form of branches that depart from the central image and are indicated by the corresponding key concepts, and all branches with concepts form a connected nodal structure (Buzan, 2020). Maps can be used in the organization of various forms of classes (Romanovskiy, 2018). Mind maps will allow: reduce the time spent searching for resources and sources of information and knowledge; ensure transparency and availability of resources; and create a complete picture of the resource base of the design type and its subspecies.

To facilitate the process of creating knowledge maps, numerous tools are used that can be found on specialized sites (Canva, BubblUs, Freemind, MindMeister, WiseMapping, Xmind, Coogle, etc.). One of the recognized leaders in the field of computer-thorny mind maps is the MindManager program, developed by Mindjet 49. The program has been developed for many years and has a powerful set of features. MindManager is based on the problems of thinking T. Buzan, who became a prop-promoted the idea of mind maps as an effective tool and structuring and analyzing information (Buzan, 2020). T. Buzan paid attention to the fact that our brain tends to think associatively, from the “center to the periphery”, and proposed the concept of radiant thinking. T. Buzan noted that mind maps can be extremely useful in joint, col-

lective active work. His experiments showed that the set of associations of each person is very individual, so the team can create much more powerful and developed intellect cards than one person can do. According to T. Buzan, the collective creation of mental maps is a much more powerful and advanced tool for generating new ideas than traditional brainstorming.

The slogan “Bring Informa to Life” well reflects the purpose of MindManager: systematically analyze, memorize, develop knowledge, and use using effective visualization tools. MindManager is an effective tool for resolving many problems, including brainstorming, organizing group work on a project or problems according to the principle of the collective mind, introspection, problem-solving ions, the study of large amounts of information, short-term and long-term planning, and many others. Structure nodes can be linked to hyperlinks to text documents, tables, Internet sites, to other maps and objects. MindManager has its own graphics library, which makes it possible to insert visual imagery: drawings, markers, prioritization symbols, and relevance of information.

When building mind maps in the process of teaching web design, it is very important to highlight the categories of knowledge (branches in mind maps) (Fig. 1).

Active application of the latest achievements of information technologies in the process of knowledge formation among students requires the formalization of this process, as well as the creation of a resource management subsystem in the knowledge management system. When teaching students how to build websites, special attention is paid to the harmonious combination of functionality and aesthetics. Here, the mutual understanding of graphic design and web design is especially important. In general, such mutual understanding can be achieved through the use of mental maps. “Graphic designing is a work that is full of art, creativity, and innovation. Modern graphic design trends have brought a great number of opportunities for designers. Many people prefer graphic design as their profession. Therefore, the training of graphic designers is very important. An efficient design training can produce a lot of skilled graphic designers” (Borysov et al., 2022).

But still, the effectiveness of the site depends both on its functional convenience and on its aesthetic design, the proportional ratio of which depends on the purpose of the site. We tend to consider the importance of aesthetics and functionality. On the one hand, the site should arouse interest and curiosity among people, and on the other hand, it should be “friendly” enough in terms of its functionality (Fig. 2).

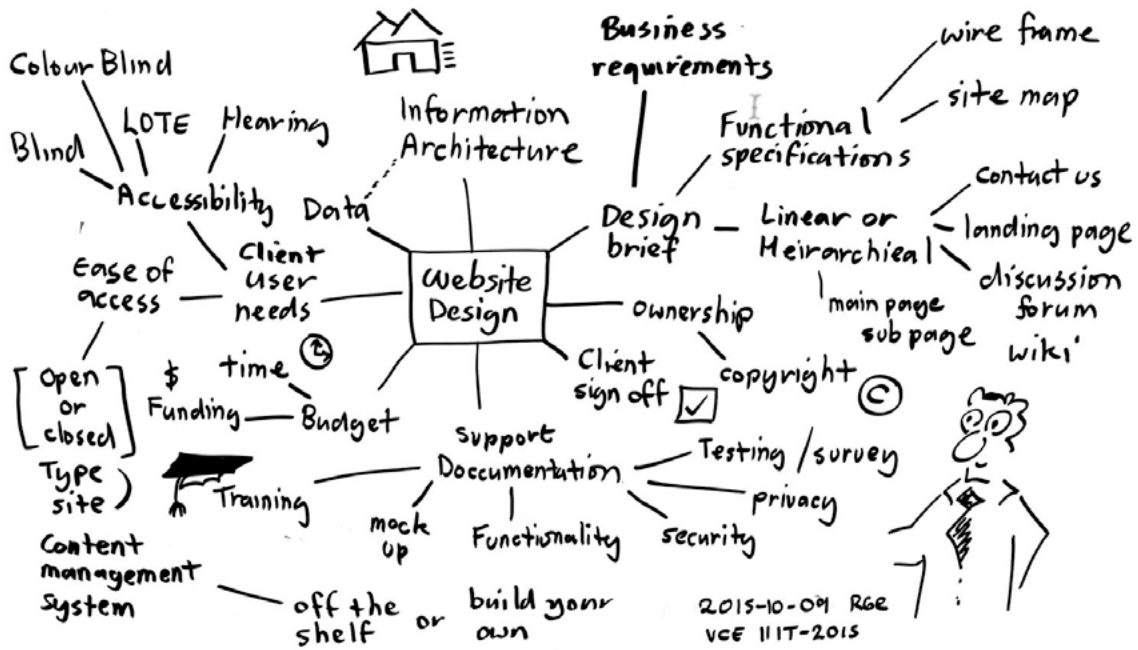


Fig. 1. Web design mind map. Source: R. Gesthuizen
<https://twitter.com/rgesthuizen/status/652333898047684608>

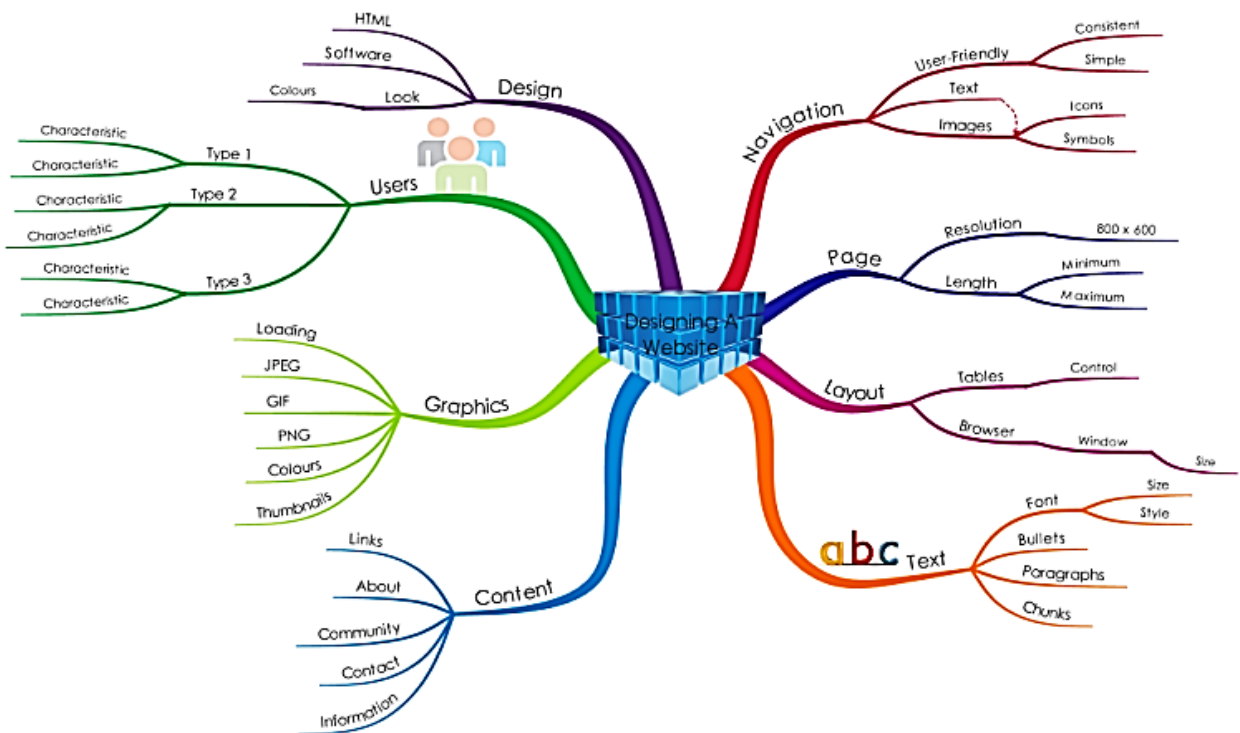


Fig. 2. Web site creating mind map. Source: iMindMap
<https://www.biggerplate.com/mindmaps/CNjY8eme/designing-a-website>

A nice and accessible site is what a designer should aim for. The combination of aesthetics and functionality must be taught. The designer must see the beauty and at the same time be aware of how this beauty will work. All the functional elements on the finished site

should work as a single well-coordinated mechanism. Therefore, the functional and aesthetic aspects of the site are designed to effectively help each other, so that the site as a whole makes a good impression on the user (Fig. 3).

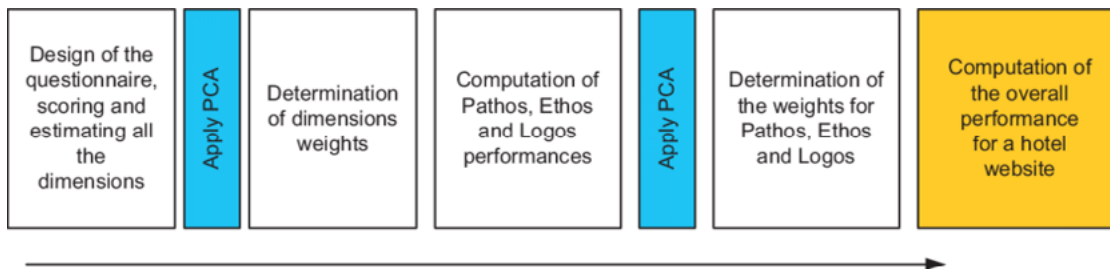


Fig. 3. Our research workflow. Source: author's own development

Whether the user-friendly interface, a good navigation system, or the speed of work this will become clear only after the user starts working online, but first of all, you need to “lure” them to the site.

The external design of the page should attract and hold the user's attention for as long as possible. Aesthetic appearance and proper color selection make pages more attractive and visible, strengthen connections with users, and ensure that your address is re-accessed on the Internet. To choose the right style and nature of the site's graphic solution, you need to understand what the potential audience is, who the main user is: their place of residence, age, gender, the language of communication, level of technical training, habits, clothing preferences, favorite types of recreation. Based on this information, a visual series of Web pages is created (Fig. 4).

When considering navigation and information design fundamentals, it was found that the interface of a web page should help the user get an answer to three basic navigational questions: “Where am I?”, “Where have I been before?”, “Where can I go?” The answers to such questions are reflected in a typical web page design called a “three-page layout”. Each of these questions should be answered by certain elements located on the site. Information from the site becomes the basis for obtaining certain knowledge, the lack of which was felt by the user.

Knowledge management mustn't be limited to their accumulation within a group of specialized designers, knowledge needs to be disseminated among all participants in the process of creating a website design and constantly using them. Knowledge sharing is a mandatory element of the management system knowledge, because if

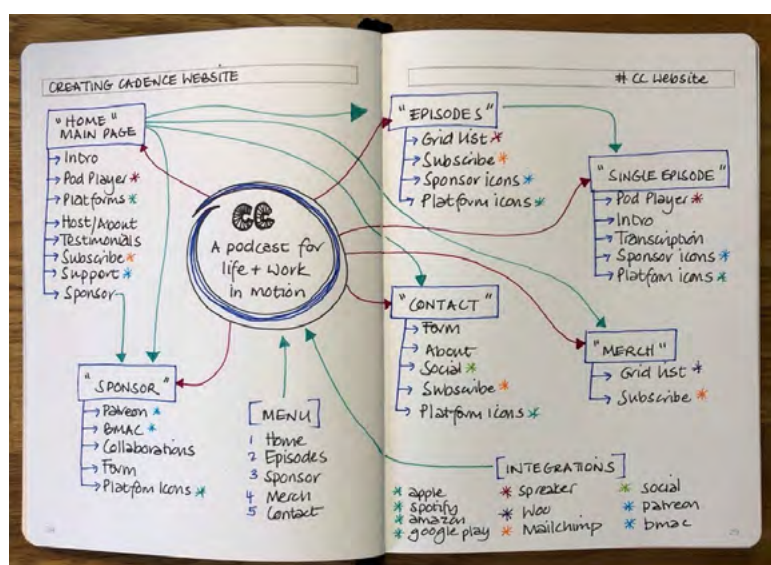


Fig. 4. Web site structure creating mind map. Source: J. Morris <https://thinkersnotebook.com/blogs/news/clarify-and-simplify-your-goals-with-mind-maps>

knowledge remains with its owners, then it is impossible to manage it (save, structure tour, and carry out other operations that will allow the use of them for the company). Therefore, it is important for a teacher in the process of teaching web design not to lose sight of the aspect of knowledge management. In addition, it is necessary to organize and reduce the accumulation and constant renewal of communication resources in society (articles, books, presentations, recordings of webinars, conferences, rations), to develop learning and feedback, and interaction along with other communities.

Conclusions. Summing up the consideration of the organization of training in web design based on knowledge management, the following conclusions were

formulated. Building mental maps in teaching web design can be used to solve any problem that requires the systematization, development, and organization of information continuity. The structure of the organization of information in maps is such that it is a multi-level scheme with nodes, branches, and links. You can combine into one graphic designer's knowledge map, typographer's knowledge source map, design best practice maps, and smart card assets and not get lost in this huge hierarchical map. Such mind maps may be stored in electronic form and allow students with access to them to edit nodes, structure, and data, and add links to various materials, Internet resources, and other maps.

The process of developing the principles and norms of mind maps in web design may differ at all

stages but coincides with the final stage. Knowledge management when managing the process of harmonizing knowledge when designing mind maps is both a feature of direct creativity and a feature of combination, a combination of one's own acquisitions with the experience of other students and the professional community. The purpose of further research is to develop an integrative model of knowledge management in which the relationship between personality-motivational characteristics, cognitive parameters, and academic performance is indicated. This model suggests that personality-motivational characteristics, intelligence, cultural potential, and academic achievement can serve as mutual factors of change that must be taken into account in knowledge management.

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