

INTERDISCIPLINARITY AS A MODERN GLOBAL TREND OF PROFESSIONAL TRAINING OF HIGHER EDUCATION GRADUATES IN THE FIELD OF CULTURE AND ART

^aOLENA TRYHUB, ^bMARIIA BILIANSKA, ^cSVITLANA SHULIAK, ^dANDRII MANDRA

^aSeparated Subdivision of Mykolaiv Branch of Kyiv National University of Culture and Arts, 17, Dekabrystiv Str., 54017, Mykolaiv, Ukraine, Kyiv National University of Technologies and Design, 2, Mala Shyianovska Str., 01011, Kyiv, Ukraine

^bKyiv National University of Technologies and Design, 2, Mala Shyianovska Str., 01011, Kyiv, Ukraine

^{c,d}Separated Subdivision of Mykolaiv Branch of Kyiv National University of Culture and Arts, 17, Dekabrystiv Str., 54017, Mykolaiv, Ukraine

email: ^aetryhub82@gmail.com, ^bm.mbilianska@gmail.com, ^cshulyak@ukr.net, ^dmandraandrew@gmail.com

Abstract: The article examines modern culture and art as an area of interdisciplinary knowledge and practices, in the context of both evolutionary and philosophical-anthropological understanding, and pedagogy of higher education. Based on a review of the literature and available evidence of university practices in various regions of the world, the vectors of development, possibilities and potential of interdisciplinarity in professional training of higher education graduates in the field of culture and art are outlined, in particular, with the consideration of STEMAC (Science, Technology, Engineering, Mathematics for Arts & Culture) educational paradigm.

Keywords: interdisciplinarity; higher education; culture; art; STEMAC.

1 Introduction

Modern society requires higher educational institutions to train specialists who are capable of not only reproducing acquired knowledge, but also creatively using it in everyday professional activities, freely handling information, and being able to predict the further development of their field of activity. Creative self-realization contributes to the formation of a personality capable of meeting the requirements of modern times. The formation and development of initiative and independence of specialists in the field of culture and art is one of the leading tasks of professional creative education [18]. In the implementation of this task, a significant place belongs to interdisciplinary connections and an interdisciplinary approach.

At the turn of the 20th and 21st centuries, theoretical and methodological studies of many sociocultural phenomena began to be carried out within the framework of an interdisciplinary approach, which has become one of the characteristic features of modern humanities. The "leading paradigm" of this type of science is anthropocentrism, where a person becomes the center of active comprehension of all social processes, including sociocultural ones.

It should be noted that interdisciplinary and transdisciplinary trends in the development of art studies also reflect the objective processes occurring in modern contemporary art. By the second half of the 20th century, the relationship between art and other local forms of culture became increasingly active. This process is noted by philosophers and art theorists as one of the key trends of the postmodern era. While in traditional classical fine arts it was possible to clearly distinguish the local area of activity of the artist - painting, sculpture or graphics, then by the second half of the 20th century not only the intraspecific boundaries in the fine arts, and not only the boundaries between fine arts and other types of art were blurred, but also the boundaries between art and philosophy, art and other forms of culture (rites, spiritual practices, scientific experiments, etc.).

A number of genres and even types of art have emerged and are actively developing, in which transdisciplinarity becomes decisive. These are, for example: performance, happening, installation, video art, land art, etc. According to the artists themselves, a representative of contemporary relevant art "does everything"; he "articulates a certain type of human behavior and fitting into society. He represents an adaptive sociocultural model" [21]. And, creating such a model, the artist uses in his art

projects the expressive capabilities of all forms of art and culture, which are able to fully reveal the idea that excites him. At the same time, he is least concerned about observing the 'interspecies' boundaries of art and culture. In other words, by the beginning of the 21st century, both art criticism, in its desire to understand art as "artistic-imaginative human knowledge", and art, in its desire to remain "self-consciousness of culture", are in search of a commonality of "anthropological foundations", including along the paths of trans- and interdisciplinarity. This kind of search, of course, involves the structures of art education in its orbit. In this regard, the new standards of higher education suggest the possibility of introducing interdisciplinary approach to the study of art - and on this basis, the development of transdisciplinary integrative disciplines in order to try to solve the task set by the time: "to teach future specialists to use an interdisciplinary approach to solve complex problems of nature and society" [2].

Contemporary art is a complex and difficult subject for scientific study and for students to master. On the one hand, in order to comprehend the author's intention, it is necessary to have encyclopedic knowledge of the history of art, since turning to historical heritage and playing with existing images and styles has become a common place in modern art practice. A separate issue is determining the novelty of an artistic gesture, the fine line between a legitimate quotation, author's reinterpretation and outright plagiarism, opportunism. Therefore, mastery of a variety of methods of modern scientific analysis, combined with fundamental knowledge, is an important element in the training of an artist, art critic-curator, or art scientist. On the other hand, masters of modern art often turn to understanding issues that are relevant here and now, to sociocultural reality, and not to the eternal and sublime, which requires a sociocultural, philosophical, psychological approach. This applies to both themes and forms of contemporary art. Since the avant-garde era, mastery of artistic materials, knowledge of the basics of classical art, and craft artistic skills have also ceased to be a prerequisite for recognizing a particular author as an Artist. For art practice, such things as speed and sociocultural recognition become important. It can be argued that the issue of speed is the main issue of our millennium. The same can be said about art. An artist does not have time to create a work for a long time, especially one dedicated to a super-relevant, quickly becoming obsolete topic. He strives to be relevant here and now, rather than to relate his work to eternity or the transcendent. Speed has become one of the most important cornerstones of modern culture. Acceleration of production and speed of communications force modern people to look for new, quick ways to present a creative idea [19].

Another important aspect is the development of new forms of communication, in which art becomes a tool for creating information flows and a platform for personal self-realization. Artists more often try to gain fame by using advertising and marketing strategies from non-artistic fields, fearlessly promoting themselves to different target audiences with varying degrees of success. If a modern author wants to be in demand, he must know the aspirations of his target audiences or be able to attract managers and curators who will be his agents.

The entire culture of mankind, like nature, has become both a material for assembling art objects and a theme for their creation. Cultural problems, cultural stamps, cultural heritage, ready-made natural forms have replaced paint for most artists. The desire to be understood by many determines a return to the languages of art of the past. Methods for contextualizing the old are deconstruction (J. Derrida), irony, intertextualization, double coding (U. Eco). Within the framework of these processes, the content of the concepts of "art" and "creativity" changes and is clarified. Here, postmodernist discourse turns out to be connected with the modernist understanding of creativity, the romantic recognition of art as a special cognitive process that

actualizes personal, individual experience. The modern artist "is in the state of a philosopher," since he is not looking for an event as such, but is looking for rules for what will happen, since creation is an event that does not obey pre-established rules [28].

Interdisciplinary integration in higher education should be determined not only by the traditional combination of academic disciplines into blocks, complexes, or modules based on interdisciplinary connections. Its new essence is substantiated by modern sociocultural conditions of globalization, informatization, scientific convergence and interdisciplinarity, socio-economic integration, labor market dynamics, etc. Interdisciplinary integration in the modern understanding consists in coordinating in the logic of the applied orientation of all components of the educational process (goals, results, content, forms, and teaching methods) and is characterized by the content-technological relationship of educational disciplines with the content and technologies of professional activity of future specialists, with current scientific and applied problems, as well as the unity (coherence) of the processes of training and education [10].

The pursuit of transdisciplinary linkages is a driving force in modern science. The intricacy and diversity of modern art are addressed via an interdisciplinary approach. The synergetic paradigm is not the sole way to foster interdisciplinary discourse; its accomplishments can be beneficial in a number of areas. The system approach in conjunction with synergy serves as the primary means of facilitating interdisciplinary discourse, which is critical for maintaining consistency in the application of methodologies from other disciplines rather than from a mindless transfer of concepts and ideas from one field to another. Using a synergetic approach within the context of an interdisciplinary paradigm allows viewing contemporary art as a self-organized, nonlinear system that incorporates many trends from both other areas of human endeavor and art history.

In particular, synergetics makes it possible to combine the achievements of reductionism and holism, to search for general laws of self-organization of complex and super-complex self-developing systems, to study the processes taking place in culture and art, taking into account patterns, without losing sight of the unique, random. The synergetic paradigm is also a bridge between the exact sciences and the humanities. The influence of technological advances on modern culture and art is difficult to underestimate, therefore their use in humanitarian research is adequate to the complexity of the phenomenon being studied.

A synergetic approach combined with a systematic approach in such a situation acts as a generalizing strategy that allows for interdisciplinary dialogue, which is important for the consistency of the use of methods from different disciplines, and not for the blind transfer of concepts from one to another. With the right methodological approach, the field of contemporary art becomes a platform for creativity for the researcher, because today an author's commentary or personal view can easily become an independent work of art. The use of a synergetic approach within the framework of an interdisciplinary paradigm makes it possible to consider contemporary art as a nonlinear self-organized system, which contains many trends related both to the history of art itself and to other spheres of human existence: culture, politics, sociology, religion. Within the framework of teaching disciplines related to the art of the second half of the 20th century and current artistic practices, the introduction of elements of a cultural approach, a body of philosophical, sociological knowledge and the achievements of psychology becomes significant. It is justified to build a course based on the study of the transformation of artistic ideas at various stages of art of the period under study, comparison with the paradigms that existed in the understanding of art earlier. For example, from the point of view of synergetics, the culture of postmodernism is more open both externally and internally compared to the modernist project. Modernity represents, from this position, a multitude of nonlinear processes taking place in an aggravated mode, which leads to unprecedented pluralism, on the one hand, and to an increase in conflicts, on the other [26].

The use of synergetics within an interdisciplinary approach when working with contemporary art has several directions. The first direction is theoretical. Synergetics allows building interdisciplinary bridges when analyzing the artistic process as a whole, the work of a particular artist, or in the study of various aspects of a work of art. The second direction consists of practical work on creating projects for presenting products of current relevant artistic practice. The third, methodological direction, implies the use of a synergetic approach in the formation of strategies for the presentation of educational material, the development of practical assignments for courses related to the art of the 20-21st centuries.

Comprehension of modernity in all its diversity is a difficult task for both the researcher and the student. In the post-information era, knowledge becomes a special value, part of power strategies, so it is necessary to find points of interaction, scientific methods that can describe the complexity of the processes taking place in modern culture and art.

In addition, as a result of the expansion of the scope of application of information technologies, digital culture is emerging as a variety of practices in the use of information technologies in the material and spiritual spheres of society. The strengthening of techno-discourse in culture was accompanied by the emergence of new forms of convergence of socio-humanitarian knowledge and information technologies. Directions for the development of digital culture represent diverse practices in scientific knowledge (Digital Humanities, contextual epistemology), in education (Art-&Science, gamification), in art (post-digital art, video installations).

With the development of various areas of analysis of digital culture as an area of interdisciplinary research, various methodological approaches have emerged. Representatives of these approaches strive to express the essence of changes caused by digitalization processes in culture as a whole or in its individual area, based on their value orientations (humanitarian or technocratic) and analysis methodology.

The interdisciplinary level of digital culture research is represented by a variety of digital culture paradigms formed at the intersection of social sciences, humanities and information technologies. In the interdisciplinary field of digital culture, various areas of research into its individual sublevels have emerged, which can be considered as subject-based practices.

Genuine digital art is characterized by such qualities as nonlinearity, openness, nonequilibrium, chaos, entropy, indeterminateness, dissipation; it can be noted that the same properties are inherent in synergetics, which signifies "the rejection of the image of the world as built from elementary particles - bricks of matter - in favor of picture of the world as a set of nonlinear processes" [14].

All this determines the need to integrate interdisciplinary approaches into the professional training of higher education graduates in the field of culture and art, the basis of which should be a comprehensive study and benchmarking of modern world trends and best practices in this area.

2 Materials and Methods

The methodological basis of the research was philosophical, epistemological, scientific theories about the unity of scientific and practical knowledge, pedagogical research in the field of interdisciplinary interactions, works on art history and aesthetics, and modern concepts of modernization of education. Based on an integrated approach, we consider the main problematics of research within the unity of philosophical, general scientific, and special scientific knowledge.

3 Results and Discussion

The need for interdisciplinary integration in the educational process has always been recognized. Most often, in pedagogical practice, one encountered such an approach as adjusting the

content of individual courses in accordance with the content of other humanities disciplines studied in parallel. This approach made it possible to more fully solve the problem of overcoming fragmentation in the study of individual courses.

But by the beginning of the 21st century, the feasibility of closer interdisciplinary integration became increasingly clear. Thus, in the text of the "World Declaration on Higher Education for the 21st Century: Approaches and Practical Measures", adopted by the participants of the International Conference on Higher Education, held in October 1998 in Paris, at UNESCO Headquarters, it was recommended: "Innovation, interdisciplinarity and transdisciplinarity ... to be encouraged and strengthened in programs with a long-term orientation to social and cultural goals and needs" [26].

Of course, the essence of the interdisciplinary approach cannot be called completely new. Features of interdisciplinary integration can be noted both in the works of art historians and cultural historians, and in the works of philosophers who addressed the problems of culture and creativity even in the process of forming the above-mentioned disciplines. And this is no coincidence. Indeed, despite the fact that there was an active development of cultural studies, history and philosophy of art as independent sciences with their own scientific methods for solving various research problems, among representatives of these independent spheres of humanitarian knowledge there was an understanding of the inseparability and commonality of the processes occurring in different spheres of art and culture. There are many examples of this.

One of the first grandiose systems of historical retrospective of the development of art was the philosophy of Hegel's three world eras of art. It also became one of the textbook examples of interdisciplinary integration. In particular, reflecting on the essence of art, Hegel notes: "one can speak, for example, about the state of education, science, religious feeling, as well as the state of finance, legal proceedings, family life and other private phenomena. But all these sides are in reality only forms of the same spirit, the same content..." [14].

In the first half of the nineteenth century, not without the influence of the Hegelian concept, a certain tradition of interdisciplinary research in the field of art history as part of world history developed. A range of similar works include: "Handbook of Painting - German, Flemish, and Dutch schools" (1833) by G. Waagen, "Handbook of Art History" (1842) by F. Kugler, the eight-volume "History of Fine Arts" (1843-1879) by K. Schnaaze, and others. All these researchers are united by the desire to comprehend the development of art and its history as part of the historical process in the context of universal history, in the context of the spiritual coordinates of a particular era. The desire to understand the role of art in the social life of society has led art historians to the need to use interdisciplinary approaches.

The appeal to methods of interdisciplinary integration in the study of art and culture continued in the works of historians and philosophers of art in the second half of the 20th century. H. Taine, as one of the initiators of the cultural-historical study of art, as well as other representatives of the cultural-historical school - E. Fromentin, J. Burckhardt, and others - proceeded from the need to recognize the serious influence of general cultural attitudes on the development of art. He argued that "at all times" works of art arise "in the necessary correspondence and close connection between them and the environment" [26]. Moreover, the "environment" in Taine's understanding is not only geographical conditions, climate, but also the worldview of a certain era, morals, etc. - that is, everything that is the subject of the study of cultural history. In other words, trying to identify the patterns of development of art and create his own system of philosophical understanding, Taine resorted to methods of interdisciplinary integration.

Today, the desire to develop a universal interdisciplinary mechanism for studying art is becoming one of the leading trends. A number of major art historians, noting the multifaceted

nature of art and the impossibility of its single-line study, tended to use in their research extra-artistic concepts of various humanities disciplines: philosophy, cultural history, psychology, sociology, linguistics, etc. Each of them built a logical hierarchy of research tasks in their own way, but in many of their works features of interdisciplinary integration can be noted.

The presence of mathematical and technical disciplines enhances the appeal of electronic music composers to the theory of sets, probabilities, information, chaos, used in the creation of algorithmic music, created by the computer executing a predetermined sequence of rules - algorithms written in a programming language. Programming uses numerical mathematical theories and operations as the basis of programming techniques. The probabilistic method, widely used in creating algorithmic compositions, is associated with the elements of the game, such aspects as random selection in the presence of certain rules [9].

New generation computer monitors are capable of displaying millions of colors and shades. Along with others, these technological breakthroughs contributed to the emergence and development of digital painting. Thanks to the unlimited color range, the possibilities for implementing the artist's artistic vision have expanded significantly. The digital platform allows embodying an idea without traditional tools, brushes, paints, etc. Unlike traditional painting on a stretcher, when creating his virtual works, the digital artist does not know in advance what size his work will be after visualization. That is why, when working on a composition, the artist is forced to create an image that would retain its artistic and aesthetic qualities within a fairly wide scaling range. Thus, in contrast to the clearly established size of the stretcher in traditional painting, the digital artist builds a composition in relative quantities [8].

The emergence and development of digital painting technology has had a strong influence on many areas of modern fine art. However, modern fine art and technology are developing in conditions of mutual influence and interdependence. The dialectics of the development of culture and art stimulates the improvement and further development of digital technologies in artistic creativity and their software [20; 23; 24]. Accordingly, this determines the need to include modules dedicated to this evolution in its interdisciplinary context in the curricula of universities that train graduates in the field of culture and art.

In general, a powerful leap in the development of computer technology and digital technologies has had an unprecedented impact on artistic culture as a whole, on all types of classical, traditional art and stimulated the emergence of the latest hybrid varieties of art [3]. Fundamentally new types of digital art have emerged, not only new art languages are being formed, but also an artistic consciousness of the newest type.

A noticeable property of digital art is precisely its interdisciplinarity, which involves the joint influence of individual parts of the system, leading to its self-organization, which corresponds to the scientific tasks of synergetics. Studying the interaction of digital art with the exact and natural sciences will inevitably lead to the "transplantation" of such methodological aspects, both from the field of synergetics and other sciences, which is necessary for its comprehensive study. A prerequisite for synergetic research is mastery of mathematical tools, which include the theory of dynamic systems and mathematical modeling [28]. Synergetics allows combining such complementary ways of comprehending the world as "comprehension through an image and through a number" [6].

In recent years, there has even been a shift from the concept of STEM to STEAM. The difference between STEAM and STEM is just one letter A (Art), but the difference in approach is very big. Recently, namely STEAM education has become a real trend in the USA and Europe, and many experts call it the education of the future. Today, Art has been actively introduced into STEAM technology. The implementation of integrative connections makes knowledge practically more significant and applicable, which makes it possible to apply knowledge in a

specific situation, also in the course of considering particular issues of educational and extracurricular activities, in the further industrial, scientific, and social life of graduates.

Moreover, a new transdisciplinary and interdisciplinary field emerges in culture and art pedagogics today – STEMAC. Arts coupled with Science, Technology, Engineering and Mathematics (STEM) is the STEM with Arts (STEAM). It introduces educators and students to a classroom that uses a holistic approach. Wonder, critique, inquiry, and innovation take the place of constraints when using STEAM [25]. STEMAC represents further step toward embracing culture. This is a new and undoubtedly integrated reapprachment known as STEMAC (Science, Technology, Engineering, Mathematics for Arts & Culture), which strengthens the shaky connections and general lack of coherence between the natural sciences, engineering, and technology, as well as the humanities (art and culture) (see Figure 1).

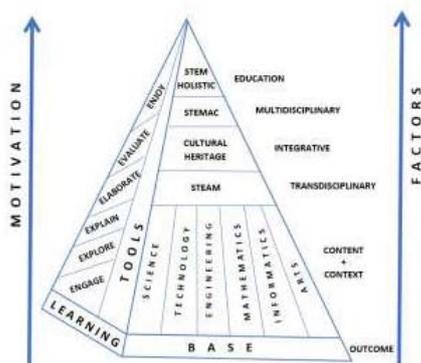


Figure 1. STEMAC: Motivation, tools, factors [16].

STEMAC “aids the transculturation via STEM in a globalized society preserving the cultural roots and interrelated the beginnings and common traits of humanity, diversified from various environmental factors” [17]. The introduction and execution of educational programs that combine the various left and right brain functions - from STEAM to STEMAC - satisfies the established effective learning procedures. One can begin working with STEAMAC and on numerous archaeological, anthropological, artistic subjects, monuments, tangible and intangible cultural heritage concerns by using software from computer sciences and maths (PHP programs, online games, Java script programming, and other algorithms and software).

It is sometimes difficult for an art student to switch to understanding current artistic practice after several years of studying ordered classical art, with a clear system of styles, hierarchy of genres, and evaluation criteria. Most often, the first step for a student is to try to use the already existing art historical tools: the biographical method, iconology, iconography, and formal stylistic analysis. Students feel dissatisfied with the result; they feel like they missed something important. Similar dissatisfaction is felt by students of cultural studies who master generalizing strategies, but have gaps in the skills of art historical analysis [29]. Therefore, it becomes extremely important to search for a methodology for teaching contemporary art that corresponds to its nonlinearity and integration into the sociocultural environment. At the same time, it is unacceptable to lose the necessary skills of art historical analysis for accurate verification and reliability.

However, interdisciplinarity from the perspective of synergetics makes it possible to comprehensively identify the principles of self-organization in open systems subject to external influences, marked by nonlinearity of internal processes that do not obey the laws of thermodynamic equilibrium, which explains the attention to the phenomenon being studied from the standpoint of the synthesis of knowledge from different sciences: physical and mathematical, technical, natural science cycles, humanitarian ones.

In particular, for example, in digital musical art, interaction with physical, mathematical, and technical disciplines is increasing. It is no coincidence that the word “digital” appears in the name of art, since computers were initially interpreted as computer technology that works with arithmetic operations. Over time, computer programs began to become more complex and imitate both mental and creative processes.

Due to the fact that the sound production of electronic music is associated with electroacoustic transducers, instruments implemented in hardware or software, and computer music programs, the importance of acoustics in digital musical art is growing - an interdisciplinary science of sound, which studies, among other things, processes from the perspective of physics. In acoustics, various transformations of sound and its synthesis are becoming widespread, the methods of which are constantly increasing, thanks to the improvement of numerical modeling methods necessary for solving equations that calculate the acoustic parameters of sounds.

Electronic compositions contributed to the expansion of the serial method, thanks to the electronic comprehension of the structure of sound, the building of acoustic and rhythmic structures of varying complexity, allowing the construction of a serial organization at all levels of composition. As an example, let us mention the work of K. Stockhausen *Studie I*, where parameters such as timbre, interval, volume, and sound microstructure are serially built. The series row was calculated by the composer based on the frequency parameters of the sinusoidal signal. The initial value was taken as the tone frequency, calculated in Hertz, which changed proportionally throughout the series in relation to both low and high frequencies.

The nonlinearity of contemporary art also manifests itself at the level of analysis of the work of a particular master. If we do not consider artists whose style was transformed throughout their lives (D. Hockney), the work of many authors contains traces of various styles and trends. D. Jones is a pop art artist whose work also includes an appeal to primitivism, ready-mades, and elements of expressionism. Using the example of the work of these authors, different in style and artistic tradition, such ideas of postmodernism as repetition, the “death of the author”, the interaction of the elite and the mass, the death of metanarrations, the commercialization of art, and consumer culture are clearly visible [6].

Another manifestation of the interdisciplinarity of art is its involvement in social systems. Communication emerged as an independent object of research in the social sciences precisely in connection with the development of technical means of transmitting information. Combining in itself the knowledge of such socio-humanitarian, natural science, and scientific-technical disciplines as cybernetics, computer science, semiotics, communication acquires an interdisciplinary character.

For example, turning to the consideration of painting from the point of view of sociology, one can talk about the sociology of painting - a related field of sociology and art history, the subject of which is the social functions and dependencies of painting. In a broad sense, the sociology of painting is the study of certain interdependencies between the state of society as a whole (or social institutions) and painting as a form of fine art [6]. More specifically, the sociology of painting is a branch of sociology that studies, using a set of sociological research methods, the impact of painting on the audience, social mechanisms and means of distributing works of painting, the artistic taste of the public, its differentiation, its impact on artistic production.

Currently, the influence of painting as a form of fine art on human psychology is also being studied. Psychology can use works of art in studying the mechanisms of action of consciousness, memory, will, emotions, imagination, intuition, innate and acquired abilities, etc. The motives of creativity can be explored using concepts such as need, inclination, attraction, desire, motivation. The psychology of artistic creativity allows shedding light on the difficult-to-explain processes of birth,

gestation and implementation of an artistic idea [3]. The influence of a work of art is determined not only by the properties of the finished work of art, but also by the nature of its perception. Numerous interpretations of a work of art show the influence of objective and subjective factors on the process of artistic perception. To understand the nature of artistic perception, it is equally important to grasp the relationship between fantasy and emotion. The study of social and psychological issues of perception represents the coexistence in the same culture of different types of perception of painting, which is very important for the formation of the competence of a modern specialist in the field of culture and art.

As a result, universities can no longer prepare graduates to handle every problem that arises in the present or in the future from a single discipline. Using interdisciplinary (ID) approaches to teaching and research is crucial to meeting the changing needs of today's college students.

Among the most influential organizations advocating higher education ID activities, there are the Association for Interdisciplinary Studies, American Educational Research Association, Association for the Study of Higher Education (ASHE), National Academy of Sciences, National Art Education Association, Association des États Généraux des Étudiants de l'Europe and Interdisciplinary Research Group in Organizational Communication at the University of Ottawa, Canada. "While these organizations have specific structures in place to advance ID within higher education, the increase in ID research, instruction and degree programmes will undoubtedly lead to future support of ID higher education activities among other leading academic associations in virtually every discipline" [11].

According to Jacob [11], Big Data technology can be applied to all facets of industry and stimulate the rapid advancement of all spheres of life due to the influence of the internet. The complete integration of big data technology into digital media art has the potential to enhance the instructional approach and advance the process of teaching technology's digitization. Initially, students majoring in digital media should have been able to fully benefit from the internet's big data. However, because of a variety of factors, including teacher structure, leadership theory, management style, and inadequate equipment, big data application technology is either behind or not applied deeply, and the interdisciplinary skills needed to use it are not able to be taught at the professional or academic levels. The aforementioned symptoms of digital media art education indicate that the growth of digital media art is being hampered by individuals and the big data media technologies they are proficient in, regardless of the interdisciplinary, curriculum, or technological interaction.

Regular courses are not the same as interdisciplinary cutting courses. Interdisciplinary courses are more linked to and expanded upon other professional specialties than regular courses, which have a more separate professional framework [28]. Multidisciplinary education is a crucial component of all forms of art. Majors differ in what their fundamental requirements are. The integration and penetration of diverse knowledge, methodologies, and research techniques are facilitated by interdisciplinary education centered around each major. The particular way that multidisciplinary curriculum directivity manifests itself is: Basic interdisciplinary courses are those that have similar teaching contents but are more basic in nature. For instance, a "Design Drawing" class opened to industrial design majors should emphasize the sketching object's structural performance; similarly, a class opened to graphic design majors should emphasize the sketching object's key performance; a class opened to environmental art design majors should emphasize the relationship between each sketching object and the environment as a whole [22]. The art and design disciplines also offer interdisciplinary courses where the system of competence creates comparable questions, which are finally resolved by the features of the professional organization. Adding more knowledge and technology to the specialization through new ideas, approaches, and organizational frameworks is the answer. For instance, "virtual reality" design courses are offered

in the professional curriculums for digital media art, interior design, and product design. Virtual reality technology is applicable to many other fields and sectors. However, virtual reality should tilt toward the virtual process and virtual details in digital media art, and toward the virtual environment scene and the display of product details in interior and product design specialties [27]. Interdisciplinary-practice courses, or just cross-practice courses, are those that combine design practice. As a result of practice projects, it takes the form of multi-professional technical cooperation challenges that are investigated and implemented. Multidisciplinary practice is far more difficult than the previous two. The duration of study, the breadth of the multidisciplinary scope, the quantity of participants, and the intricacy of the process can all be used to assess a student's overall quality and aptitude for art and design.

Universities in China and South Asia are currently working hard to advance the practice of teaching specialists in culture and art in multiple disciplines. The percentage of class hours in cross-curricula at Daye University of Taiwan and the Chinese University of Hong Kong is significantly higher than that of regular courses. Similarly, the percentage of class hours in practice cross-curricula is higher than that of basic and professional interdisciplinary curricula. The percentage of class time for each of the four courses, as indicated in Figure 2, is favorable to students' thorough, in-depth, and comprehensive adoption of diverse knowledge and technology.

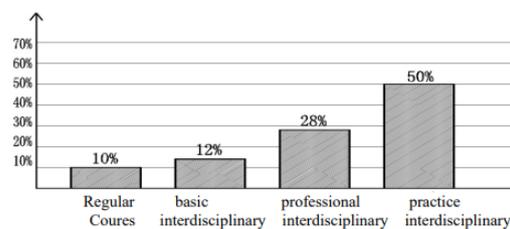


Figure 2. Proportion chart of class hours of four courses in Chinese University of Hong Kong and Daye University of Taiwan [27].

A description and actual efficiency of the interdisciplinary technique in art instruction are presented by Leonido et al. [15]. In order to create artistic, cultural, pedagogical, and didactic events in European, Luso-Brazilian, Luso-African, and Hispanic American territories, the Interdisciplinary Method of Musical Literacy, Education, and Artistic Awareness (MILMESA) was developed and is primarily used in higher education (artistic, cultural, and teacher training courses). It also fosters effective endogenous (interarts) and exogenous (artistic and other non-artistic areas) interconnection of an inter and pluridisciplinary matrix. It was developed, tested, and assessed over the course of five consecutive quadrennia (2002–2023). It was continually expanded upon, altered, and adjusted in response to the realities that were observed, deepening new concepts and models of intervention in these areas (such as expressive and proximal didactics).

The objectives of the Art&Culture disciplines presuppose the presence in it of at least five main sections, reflecting, respectively, the philosophical-aesthetic, cultural, philological, communicative, and religious aspects of modern art history [12]. This, as mentioned above, also includes elements of mathematics, physics, and IT disciplines. Thus, modern interdisciplinarity of higher education in the field of culture and art represents the integration of Humanities and STEM.

Anna Karasi argues that in practice, an interdisciplinary approach can be implemented in two main formats, scenarios, or approaches. In the first format, the most common one, interdisciplinarity figuratively builds bridges between different sciences, informally unites them without violating their individuality, uniqueness, and originality. Here, pluralism and differentiation of sciences are preserved and may even increase, and interdisciplinarity is built on, connects, and unites them in the methodological and instrumental dimensions. In this format,

for example, the academic discipline “Evolution of artistic styles in art” “builds bridges” with such disciplines as: philosophy, historical sciences, foreign language, general psychology, cultural studies, sociology, artistic culture, aesthetics. In another format, interdisciplinarity is presented as a real tool for unifying sciences, the emergence of integrated products, projects, interdisciplinary research objects, the further mastery of which is fundamentally important for both science and education. In this format, “The Evolution of Artistic Styles in Art” provides for an organic combination of disciplines: history and theory of music, theater, ballet, history of art, philosophy, artistic culture and literature, analysis of musical form, choir class, musical psychology, instrumental studies [13, p. 62].

The principle of interdisciplinarity in modern humanitarian knowledge is usually understood as the simultaneous presence in a specific scientific study of different methodological paradigms, responsible for their “subject” of the general “field” of research, which expresses a tendency towards the integration of scientific knowledge (as opposed to tendencies towards its differentiation). In art history, such a “field” is the entire artistic practice, which includes at least three aspects: the work of art itself, the process of its creation, and its subsequent use, that ensures the inclusion of related disciplines in art history [29]. The “field” of interdisciplinary research in the structure of modern art criticism is very extensive: from sociology and psychology to semiotics and linguistics [7]. Such complexity predetermines difficulties in mastering this subject area through scientific and pedagogical practice. Related disciplines may be different, in some cases these are archaeology, local history, history, source studies, statistics, demography, natural sciences, etc. It all depends on the need to clarify the meaning of a work of art, the history of its creation and understanding. As we can see, there is a very wide range of disciplines that can be included in the context of the study. Traditional sciences and research areas close to art criticism are philosophy of art, aesthetics, cultural studies, sociology and psychology of art, semantics and semiotics of art, including literary, religious, and hermeneutical approaches.

The flexibility of meaning in the arts has been compromised by post-structuralism, making inference, intuition, and creativity essential abilities. The author should not be the exclusive source of meaning for student readers. Rather, it is their duty and obligation to deduce, sense, and conceive. Teachers might encourage readers to experience pleasure, even joy (jouissance), by actively and freely engaging with, and even re-enacting, the text, as Barthes [1] advises in “*The Pleasure of the Text*,” rather than sending them on a treasure hunt for the golden nugget of meaning. Critical thinking, creativity, cultural awareness, and contextualization can all be fostered by the interdisciplinary turn by utilizing Dewey’s spinning and weaving, Eoyang’s sifting and sorting, Lyotard’s imagination, and even Barthes’ ecstasy [5].

In the twenty-first century, many visual art departments have reorganized into interdisciplinary clusters: “Expanded Practice”, which encompasses all art forms; “Two-Dimensional Art”, which includes painting, printmaking, photography, and other media; “Foundations”, which establishes fundamental art principles and practices that apply to all media; “Expanded Practice”, which encompasses all art forms, and “Three-Dimensional Art”, which includes woodworking, sculpture, and ceramics, among other mediums. Some dance, film, and theater institutions have combined to provide students training and possibilities in a variety of artistic fields. While there may be some efficacious claims in these cases, the true objectives are to foster multidisciplinary creativity and collaboration.

This approach provides interesting perspectives of interdisciplinary practice as Carp [4, p. 17] stated: “The creative process as seen through the eyes of an artist gives the course its authentic foundation”. Carp thus underlined how critical thought on artistic processes may be used by artists to foster students’ creativity in an interdisciplinary setting. Carp [4], for example, went deeper into the work of artist-teacher Henk Schut, who was among the pioneers in establishing Interdisciplinary Artistic Collaboration as a platform for artistic study that graduate

students from a wide range of art education fields could use. According to Carp [4], this method of experiential education taught research skills through the use of scaffolding, critical reflection, and group creation of research topics and experiments. Through group work and collaborative reflection, participants in this program were able to gain new perspectives and exchange skills. Students were free to draw connections between their experiences and theoretical frameworks, apply ideas, and come to their own conclusions because the approach was inductive.

The new student body that is forming has the power to bring about change, just as student activists did in the 1960s when they called for radical reform, the abolition of academic departments, and real-world research. Interdisciplinarity can be a progressive force for creativity and change both now and in the past. Many of the earlier proposed improvements are still unfulfilled, but many of the aspirational aims, objectives, and visions have motivated many professors of today. Even with the continuing power of disciplines, interdisciplinarity proponents would be well to pursue such unattainable objectives. The current interdisciplinary trend in the humanities and arts is made feasible by these options.

Literature:

1. Barthes, R (1975). *The pleasure of the text*. New York: Hill and Wang.
2. Bossio, D., Loch, B., Schier, M., & Mazzolini, A. (2014). A roadmap for forming successful interdisciplinary education research collaborations: A reflective approach. *Higher Education Research & Development*, 33(2), 198-211.
3. Buffington, M., Williams, A., Ogier, E., & Rouatt, L. (2016). Telling our tales: Becoming art educators. *Studies in Art Education*, 57(4), 329-340.
4. Carp, D. (2017). *Teaching interdisciplinary artistic research*. Amsterdam, NL: Artist in Residence Programme. Amsterdam University Press. https://www.eno-net.eu/sites/default/files/teaching_interdisciplinary_artistic_research.pdf
5. Condee, W. (2016). The interdisciplinary turn in the art and humanities. *Issues in Interdisciplinary Studies*, 34, 12-29.
6. Cilea, M., & Tupan, M.-A. (2013). *Relativism-relativity: An interdisciplinary perspective on a modern concept*. Cambridge Scholars Publishing.
7. Davies, R., & Trowsdale, I. (2021). The culture of disciplines: Reconceptualising multi-subject curricula. *British Educational Research Journal*, 47(5), 1434-1446.
8. De Rijke, V. (2019). *Art and soul: Rudolf Steiner, interdisciplinary art and education*. Springer.
9. Fenyvesi, K., & Landesmaki, T. (2017). *Aesthetics of interdisciplinarity: Art and mathematics*. Birkhäuser.
10. Graff, H. J. (2016). The “problem” of interdisciplinarity in theory, practice, and history. *Social Science History*, 40(4), 775-803.
11. Jacob, W. (2015). Interdisciplinary trends in higher education. *Palgrave Communications*, 1, 15001. <https://doi.org/10.1057/palcomms.2015.1>
12. Karnthaworn, N. (2020). Interdisciplinary artists: The collaboration of interdisciplinary artists foster interdisciplinary education. [Master’s Thesis]. University of Tennessee.
13. Karasi, A. (2019). Interdisciplinary approach – an innovative approach is studying evolution of art styles discipline. Artistic Education Fields Integration: Theoretical and Methodological Framework. Challenges. Perspectives. The Scientific International Symposium Materials ehe International Scientific Symposium October 18th 20th 2018. BălIndigou Color, pp. 61-65.
14. Klein, J. T. (2010b). A taxonomy of interdisciplinarity. In R. Frodeman, J.T. Klein, & C. Mitcham (Eds.), *The Oxford handbook of interdisciplinarity* (pp. 15-30). Oxford: Oxford University Press.
15. Leonido, L., Pereira, A., Mendes, L., Rodrigues, J.B., Morgado, E (2023). Art education: Two decades of creation, evaluation and application of an interdisciplinary method of artistic literacy. *Education Sciences*, 13(6), 589. <https://doi.org/10.3390/educsci13060589>

16. Liritzis, I. (2018). STEMAC (Science, Technology, Engineering, Mathematics for Arts & Culture): The emergence of a new pedagogical discipline. *Academia Scientiarum*. <https://euro-acad.eu/library?id=17>
17. Liritzis, I., & Castro, B. (2013). Delphi and Cosmovision: Apollo's absence at the land of the hyperboreans and the time for consulting the oracle. *Journal of Astronomical History and Heritage*, 16(2), 184-206.
18. Mozgovyi, V., Shuliak, S., Pikhtar, O., Sologub, V., Grynenko, S. (2023a). Post-industrial education: Artistic and cultural aspect. *Ad Alta-Journal of Interdisciplinary Research*, 13(1), 53-57.
19. Mozgovyi, V., Shuliak, S., Odobinsky, Y., Yermolayeva, G., Tryhub, O. (2023b). Culture and art: Models of social communications. *Ad Alta-Journal of Interdisciplinary Research, Special I* (13/01-XXXIV), 104-109.
20. Popko, L., Kizim, S., Mironova, T., Brovchak, L., Zhadeyko, O. (2022). Digital technologies: Cultural approach. *Ad Alta-Journal of Interdisciplinary Research*, 12(2), Special Issue XXIX, 189-192.
21. Poplavskyy, M., Kostyrya, I., Korniienko, N., Horban, Yu. (2020). *Culture, art, education in the space of the 21st century: Interdisciplinary discourse*. Lviv-Toruń: Liha-Pres.
22. Rohotchenko, O., Zuziak, T., Kizim, S., Rohotchenko, S., Shpytkovska, N. (2021a). Graphic design in the professional training of future specialists. *Ad Alta-Journal of Interdisciplinary Research*, 11(1), Special Issue XVIII, 143-146.
23. Rohotchenko, O., Zuziak, T., Chuyko, O., Kizim, S., Ospishcheva-Pavlyshyn, M. (2021b). Virtual Reality in Training specialists of the industry of culture and art. *Ad Alta-Journal of Interdisciplinary Research*, 11(1), Special Issue XX, 131-135.
24. Rohotchenko, O., Zuziak T, Kizim, S., Rohotchenko, S., & Shynin, O. (2021c). Information and communications technology in the professional training of future professionals in the field of culture and art. *Postmodern Openings*, 12(3), 134-153.
25. Rolling, J. H. (2016). Reinventing the STEAM engine for art + design education. *Art Education*, 69(4), 4-7.
26. Sriraman, B., & Freiman, V. (2010). *Interdisciplinarity for the 21st Century: Proceedings of the 3rd International Symposium on Mathematics and its connections to the Arts and Sciences*. Information Age Publishing.
27. Tong, Y., Wu, J., & Zhang, X. (2021). Research on interdisciplinarity-teaching of digital media art under Big Data. *Journal of Physics: Conference Series*, 183, 012145. doi:10.1088/1742-6596/1883/1/012145
28. van der Tuin, I., & Pekal, A. (2023). On generative and generational interlinkages and intersections: Interdisciplinarity in Humanities, Culture, and Art. *Qualitative Inquiry*, 29(1), 45-54.
29. Wang, Z. (2021). Intersection and integration: Interdisciplinary design practice and new media art design teaching. *Advances in Social Science, Education and Humanities Research*, 643, 271-275.

Primary Paper Section: A

Secondary Paper Section: AM