

EMPLOYERS' REQUIREMENTS DURING UPDATING THE CONTENT OF DESIGNERS PROFESSIONAL TRAINING

Svitlana Borysova

Candidate of Pedagogic Science, Associate Professor,

Luhansk Taras Shevchenko National University, Ukraine;

Doctoral Candidate, Ternopil Volodymyr Hnatiuk National Pedagogical University, Ukraine

e-mail: svitlana.borysova@gmail.com, orcid.org/0000-0003-0610-644X

Summary

This research is aimed at determining the competencies expected by stakeholders from graphic designers, based on the method of analyzing job advertisements for graphic designers in Ukraine, taking into account the analysis of similar advertisements in Poland as an additional labor market (200 job advertisements in Ukraine and 100 job advertisements in Poland), to determine ways to update the professional training of graphic designers in the system of higher education. The systematized and processed results of the analysis indicate that the vast majority of employers need a universal specialist with project execution skills for static printed production, as well as developed competencies in the field of digital design to create visual communications for the online representation of companies while preserving visual identity. The results can be used to update curriculums, educational programs, the content of courses, forms, methods of teaching, methods of interaction between teachers and students of the "Graphic Design" specialty.

Key words: content analysis, content of education, design skills, job advertisement, future graphic designers, professional training.

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1. Introduction

The most important emphasis in the professional activity of graphic designers is visualization as the presentation of information in a schematic form for the visual representation of a set of data or the transformation of textual information into a graphic representation (*Kim et al., 2021; Bylinskii et al., 2017*); aesthetics, which gives the design emotional expressiveness and causes design consumers to feel satisfied with what they see (*Judelman, 2004; Quispel et al., 2018*) and the communicative aspect of presenting and implementing ideas, which involves stimulating the design consumer to informational, emotional, social, etc. exchange (*Günay, 2021; Bichler & Beier, 2016*).

Specific features of the professional activity of graphic designers are determined by several factors. Their activities benefit both non-profit organizations and enterprises of various industries related to the production of consumer goods and the application of various marketing strategies that use promotion through advertising and visualization (*Calabretta et al., 2012*). Different industries may use different software and tools for the digital workflow implemented by a graphic designer (*Li, 2021; Opoku et al., 2020; Zhao, 2020*), but the actual expansion of digital technologies (*Mohammed, 2022*), the increase in the volume of printing products, the representation of brands, organizations in the online environment has caused the gradual formation of requirements for a graphic designer as a rather universal specialist (*Dziobczenski &*

Person, 2017), whose job duties are becoming more and more complex and require a wider set of skills compared to an average company specialist (Borysov et al., 2022). To perform certain specific tasks in the field of professional duties of a graphic designer, separate software has been developed: for editing photos and images, creating scaled images, and drawings, layout, creating animated videos, editing videos, etc. (Peng & Li, 2021). From the combination of technologies mastered by a graphic designer, professional competencies, and personal qualities, both the field of professional implementation of a graphic designer and the position he can hold or the functions the employee is assigned to perform depend on him (Perks et al., 2005).

The consequence of the COVID-19 pandemic is the strengthening of the tendency to diversify the professional self-employment of a graphic designer, which is possible to implement not only in an office-production format but also in a remote one (Khlystova et al., 2022; Ibiwoye et al., 2023); both within the country and internationally (through online representative offices of companies, agencies, online platforms for project proposals), permanently or during the implementation of a separate project.

By the above-mentioned features of the modern state of the professional activity of a graphic designer, the challenges posed to teachers of higher education institutions become apparent: the expected variability of the professional environment, which takes into account changes in various software necessary for the performance of the professional duties of a graphic designer, objects design, necessary for designing, as well as changing the scope of responsibilities; covering a wide range of hard and soft skills that graphic designers need to realize themselves as professionals; formation of competences in a relatively limited period of study. Competencies should be formed actively, taking into account the practical aspects of professional activity (Tan & Melles, 2010).

The modeling of professional training of a graphic designer should take place in close connection with the needs of stakeholders (ideally – in cooperation and at the workplace in a specific employer) to stimulate the career development of students upon completion of education in this direction. One of the available ways to obtain valuable information about specific labor market requests for graphic designers is the analysis of job advertisements, which contain detailed information about employers' needs, working conditions, requirements for potential employees, and personality qualities valued by the company or the employer.

Updating the content of the professional training of future graphic designers should take into account not only updating the list of structural components, courses of the educational program, but also improving their content and structure, determining priorities in the presentation of information, foreseeing opportunities for the development of competences in adjacent, related areas, where already formed skills are useful, but not determinative; acquisition by students of soft skills leading to the chosen professional path, because a high level of development of soft skills (teamwork, interpersonal communication skills, creativity, problem-solving joint implementation of projects) under relatively equal conditions is an employment advantage (Kanupriya, 2022). In addition, critical thinking and analysis, ability to solve problems, self-control and active learning skills, stress resistance, and flexibility are identified by employers as skills that are important and leading when evaluating a job seeker (The Future, 2020).

The purpose of the article is to clarify certain ways of improving the professional training of future graphic designers through the definition of competencies expected by stakeholders (employers) from graphic designers, based on the method of analysis of job advertisements for graphic designer vacancies in Ukraine, taking into account the analysis of similar advertisements in Poland as a potential additional labor market.

2. The method of analyzing job advertisements

The method of analyzing job advertisements is considered an easily accessible indicator of changes in the profession, contains organic results that can be documented, measured, compared, and can be applied to real support for job seekers. This method is effective, despite certain caveats that should be taken into account in the analysis process: the excess (or lack) of information in the job advertisement, which is caused not by real requirements for the applicant, but by desired, ideal ones; or inconsistency of the provided information with real duties; legal restrictions (*Harper, 2012*).

The analysis of job advertisements from the standpoint of labor market requirements was considered in several studies. The effectiveness of job advertisements and their influence on the intention of potential workers to apply for a job were investigated (*Ganesan et al., 2018*), attention was focused on the description, the ratio of technical skills and communication skills in job advertisements in various industries (*Ooi & Ting, 2015*), in graphic design (*Nugroho et al., 2023*); a content analysis was conducted with a qualitative approach of the labor market demand for the position of secretary (*Purwanto et al., 2020*), to study the labor market conditions of event managers (*Arcodia et al., 2020*), civil engineers (*Efeoglu & Gerek, 2015*), library and information science workers (*Kim & Angnakoon, 2016*), graphic designers in Great Britain (*Dziobczenski & Person, 2017*), in Finland (*Dziobczenski et al., 2018*), the method of analyzing job advertisements was considered as an opportunity to identify current professional requirements, guidelines for participants in the educational process (*McArthur et al., 2017*).

To carry out a planned analysis of job advertisements to clarify the requirements for the position of a graphic designer in Ukraine in the initial years of career development of students or graduates of higher education institutions majoring in "Graphic Design" (with subsequent comparison with data obtained from a similar analysis of job advertisements in the neighboring Poland) research methodology was developed by the standards of theoretical and applied research. The analysis of job advertisements involved a combination of content analysis as a study of the document, which involves reading and interpreting the text to build assumptions about words based on given characteristics (*Bowen, 2009*), and thematic analysis, which allows for a more qualitative interpretation of the content of the text through the grouping of content based on the identified common characteristics (*Braun & Clarke, 2006*).

3. Methodology

The main stages of the research were the following. 1. The preparatory stage, which included: the definition of research tasks, selection of platforms for analysis of job advertisements, time and geographical boundaries. 2. Office study, which included: content analysis of job advertisements for graphic designers in Ukraine (collection of information about employers' expectations from graphic designers); summary of the obtained results; analysis of the current state of the graphic design market in Ukraine, events, trends affecting it; content analysis of job advertisements for graphic designers in Poland; summary of the obtained results. 3. Systematization of the data obtained during the research, comparative analysis of all the obtained results, and formation of conclusions from the obtained results, which are designed to contribute to updating the content of the training of graphic designers in higher education institutions.

The main task of the research was to create a list of basic and specialized, mandatory and desirable competencies expected by stakeholders (employers) from graphic designers, based on

the method of analysis of graphic designer job advertisements in Ukraine, taking into account the analysis of similar advertisements in Poland as a potential additional labor market. The main two research questions were: what skill set is in demand and desired by employers according to graphic designer job descriptions and what are the responsibilities of a graphic designer. To use the method of analyzing job advertisements, data was collected from July 2023 to September 2023 in four stages: the formation of predicted results of the division of the obtained results, the initial accumulation of information based on the analysis of job advertisements in Ukraine, refinement of the segmentation of information based on the search for common features, relationships connections and regularities; subsequent accumulation of information; primary accumulation of information based on analysis of job advertisements in Poland, refinement of information segmentation; subsequent accumulation of information. In total, 300 job advertisements were analyzed.

Search requests on job search platforms in Ukraine contained the phrases "hrafichnyi dyzainer" (ukr), and "Graphic Designer" (eng) in the job title or the description of professional duties; searches on job search platforms in Poland contained the phrases "Grafik" (pol), "Grafik Komputerowy" (pol), "Graphic Designer" (eng) in the job title or description of professional duties. In the selection process, alternative titles of professions that included the responsibilities of a graphic designer in the job description were taken into account, since graphic designers have various career paths related to digital communications, digital mass media, media, branding, web design, etc. In the search results, one vacancy was saved once, duplicate job advertisements were removed from the collection results. Motion Designer vacancies were also excluded from the search results, which, based on the contextual analysis, did not include the duties of a graphic designer in the job description.

4. Findings

When forming the predicted results of the division of the received results, their division into two categories "Requirements" and "Duties" was provided, as well as the name of the vacancy, the name of the employer, and the location of the employer (work format) were recorded for each announcement. The "Duties" category contained 7 groups of duties related to skills: working with Internet resources; projecting images and corporate style; designing layouts, printed products, and layout; and presentations. The "Requirements" category included 5 groups of requirements: mandatory and desirable skills for working with specialized computer programs; educational requirements; competence in the field of design; soft skills, work experience. The division of skills for working with specialized computer programs into mandatory and desirable took place according to the contextual analysis of the description of the requirements in the job advertisements. Quantitative analysis of the obtained data was based on determining the frequency of mention of components in the total data set.

By the above-described phasing and features of conducting research based on searches on job search platforms in Ukraine for the keywords "hrafichnyi dyzainer" (ukr), and "Graphic Designer" (eng) in the title and/or description of the professional duties and the vacancy requirements (submitted in Ukrainian and/or in English) a list of 200 job advertisements was formed, and based on searches on job search platforms in Poland for the keywords "Grafik" (pol), "Grafik Komputerowy" (pol), "Graphic Designer" (eng) in the title and/or description of professional duties and job requirements (submitted in Polish and/or English) a list of 100 job advertisements was created.

Thus, in Ukrainian, the three job titles "hrafichnyi dyzainer" (Graphic Designer), "dyzainer hrafichnykh robot" (Designer of graphic works), and "dyzainer-hrafik" (Designer graphic) correspond to the title "Graphic Designer" in English, and the position "Hrafichnyi dyzainer pakuvannia" (Graphic designer of the packaging) corresponds to the position title "Packaging Designer" in English; in Polish, the job title "Grafik komputerowy" has a direct translation of "Computer designer", but the correct understanding is "Graphic Designer" or "Computer Graphic Designer", the title "Młodszy Grafik komputerowy" has the correct translation of "Junior Graphic Designer", the short job title "Grafik" corresponds to the English job title "Designer" and "Graphic Designer".

The resulting list, illustrated in Table 1, contained both names of professions (vacancies) that exactly corresponded to the keywords and were relevant to them.

Table 1

Job titles in job advertisements in Ukraine and Poland, with English translation.

Job title (Ukraine)		Job title (Poland)	
Name	qty	Name	qty
Graphic Designer (ukr)	151*	Graphic Designer (pol)	31****
	11**	Graphic Designer (eng)	21
	4***	Designer (pol)	23*****
Graphic Designer (eng)	23	Designer (eng)	2
Designer	4	Creative Designer (pol)	14
Junior Graphic Designer	2	Creative Designer (eng)	1
Graphic, Web Designer	1	Junior Graphic Designer (eng)	3
Visual, Graphic Designer	1	Junior Graphic Designer (pol)	1
Graphic Designer (SMM)	1	Graphic 2D (pol)	2
Packaging Designer	1	Graphic & Motion Designer	1
E-commerce Graphic Designer	1	Visual content creator	1
Total	200	Total	100

Original titles: * hrafichnyi dyzainer, ** dyzainer-hrafik, *** dyzainer hrafichnykh robot, ****Grafik komputerowy, *****Grafik

At the stages of the initial accumulation of information under the two main categories "Requirements" and "Duties", the segmentation of information within groups of components was refined, as a result of which the final list of components was formed for the two countries (Table 2.). The revised list included components corresponding to job duties assigned to the graphic designer; skills in using graphic editors and other software, possession of which is mandatory or desirable for compliance with the proposed position; professional competencies necessary for the performance of functions expected by the employer in the position of a graphic designer in a specific work environment; personal traits that are extremely important for the effective performance of job duties by a graphic designer and which stakeholders-employers have formulated according to the requirements for the proposed vacancy.

Updating the content of professional training can refer to the starting, redistribution of courses in educational programs. Block of mandatory specialized training courses should provide for the formation of competencies in the field of: social network design (expansion of skills is possible due to elective courses with the study of digital marketing); website design (as potentially important design competence together with prototyping skills for example Figma should

Table 2

Component division of graphic designer job advertisements content

Category "Duties"	Category "Requirements»
<i>Working with online resources group:</i>	<i>Group Design Technology Use:</i>
Design of landing pages, sites;	Photoshop; Illustrator; InDesing;
Design for social networks.	Coral Draw; Figma, Adobe XD**,
<i>Group Image creation work:</i>	html**, SketchUp; 3-D;
Creation of illustrations;	ZebraDesigner*, Google Slides,
Taking photos;	Canva; Animation, After Effects*;
Photo processing.	Video *; AI*.
<i>Branding group:</i>	<i>Educational characteristics group:</i>
Creation of logos;	Higher Education; Art education;
Branding, corporate style.	Ability to draw/paint by hand * **,
<i>Group Advertising, visualization:</i>	on the tablet * **, English level.
Creation of outdoor advertising;	<i>Design and Marketing Knowledge Group:</i>
Creation, editing of layouts	Design principles; ***
for advertising; Visualization.	Color science, typography,
<i>Printed products group:</i>	composition; Knowledge of trends;
Design of printing products;	Pre-press preparation;
Packaging design development;	Digital marketing.
Layout; Printing.	<i>Soft skills group:</i>
<i>Group Presentation:</i>	Teamwork in the project,
Creation presentations;	Communication skills,
Animation ****, video. **	stress resistance, organization.
<i>Group Creativity:</i>	<i>Group Experience:</i>
Generating ideas.	Experience; Portfolio.

Application features: * desired components (Ukraine), ** desired components (Poland), *** typical for job advertisements in Ukraine, **** typical for job advertisements in Poland

be provided in the block of main courses, but can be proposed for the block of elective courses); creation of illustrations, taking photographs, their processing, logos, branding (possible interdisciplinary approach in the formation of competences together with mastering the skills of working with Adobe Photoshop and Adobe Illustrator, if necessary, meeting the requests of students to master the skills of digital painting using graphic tablets); design of advertising and printing products (it will be necessary to ensure the formation of competencies in pre-press preparation and printing, materials science, process technologies, packaging design, which can be implemented both in a number of elective courses and in the content of mandatory courses for the formation of work skills in graphic editors); presentation of projects (competency can be manifested in various areas, from the presentation of ideas during conceptual search, presentation, visualization of design results to the customer, design of the completed project for adding it to the portfolio of the graphic designer, the relevant such a wide field of application can also provide for a variety of implementation of means of competence formation in the educational process); 3D design, animation and video processing (trends that need to be taken into account when determining the place of the courses that forms the specified competencies in the general structure of professional training); principles and means of design, composition, typography,

working with color (as competencies that directly and indirectly affect the quality of executed projects). Students' activities should include such a format of work that will contribute to the formation of soft skills that students must acquire for effective future work as graphic designers.

5. Conclusions

The development of the graphic design market demonstrates a steadily growing demand for both traditional and digital graphic design services. Companies whose main activity is meeting the needs of clients in the design and production of printed and static, digital and interactive design, provide the development of visual communication for the transmission of messages, design of visual identification, branding, the provision of services for the design of printed materials, design of shop windows in retail outlets, development of packaging and creation of corporate identity. The increase in the number of means of communication and media (personal computers, laptops, tablets, mobile phones) also led to the expansion of the area of graphic designers' professional responsibilities. The analysis of graphic designer vacancies is useful for the analysis of current educational practice in terms of meeting the needs of employers, the requirements and criteria for evaluating student projects, and the formation of proposals for updating the content of education in the field of graphic design for higher education institutions, bringing the professional training of future graphic designers closer to the real needs of employers, which at the same time should support students on the path of formation and development of their professional career. According to the data obtained from the analysis of graphic designer job advertisements in Ukraine and Poland, it can be concluded that today employers are looking for graphic designers who can design both printed and digital products and have developed competencies in various areas, from idea generation skills to project management skills, mastery of software application skills, which is inherent in the implementation of projects in the field of graphic design and related areas. Also, for employers, formed soft skills, personal characteristics that ensure independence in decision-making, stress resistance, and timely completion of tasks are important.

When updating the content of educational programs in the "Graphic Design" specialty, it is advisable to take into account the trend of increasing demand for design for social networks as a component of the professional duties of a graphic designer, website design and animation, designing products that support brand identity and their presence on the Internet. The improvement of technology leads not only to the expansion of the functions in graphic editors (for example, as with the Adobe Creative Cloud package), but also to the offer of simpler, but convenient tools for the high-quality performance of professional duties (Google Slides, Canva), one cannot but predict familiarization with template graphic editors. To meet the needs of students in the acquisition of competencies corresponding to the career path predicted by students, the formation of the structure and content of the courses can be developed taking into account the division of skills into mandatory and desirable, basic and specialized with a breakdown into mandatory and optional courses according to the degree of priority and the projected change in the scope of executed projects from the traditional sphere of duties to the virtual space, digital products.

References

1. Arcodia, C., Novais, M. A., & Le, T. H. (2020). Using Job Advertisements to Advance Event Management Research. *Event Management*, 24(5), 661–664. <https://doi.org/10.3727/152599520X15894679115529>
2. Bichler, K., Beier, S. (2016). Graphic Design for the Real World? Visual Communication's Potential in Design Activism and Design for Social Change. *Artifact*, 3(4), 11.1–11.10. <http://dx.doi.org/10.14434/artifact.v3i4.12974>
3. Borysov, V., Borysova, S., Prodan, I., & Borysov, G. (2022). Graphic Designing as a Source of Student Earnings: A Workspace of Aesthetics Arts. *International Journal of Computer Science and Network Security*, 22(1), 650–658. <https://doi.org/10.22937/IJCSNS.2022.22.1.85>
4. Bowen, G. A. (2009). Document analysis as a qualitative research method. *Qualitative Research Journal*, 9(2), 27–40. <https://doi.org/10.3316/QRJ0902027>
5. Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77–101. <http://dx.doi.org/10.1191/1478088706qp0630a>
6. Bylinskii, Z., Kim, N. W., O'Donovan P., Alsheikh, S., Madan, S., Pfister, H., Durand, F., Russell, B. C., & Hertzmann, A. (2017). Learning Visual Importance for Graphic Designs and Data Visualizations. *UIST '17: Proceedings of the 30th Annual ACM Symposium on User Interface Software and Technology*, 57–69. <https://doi.org/10.1145/3126594.3126653>
7. Calabretta, G., Gemser, G., Wijnbreg, N., & Hekkert, P.P.M. (2012). Improving Innovation Strategic Decision-Making through the Collaboration with Design Consultancies. *DMI 2012 International Research Conference: Leading through Design*, 165–173. http://www.crisprepository.nl/_uploaded/Improving-innovation-strategic-decision-making-through-the-collaboration-with-design-consultancies.pdf
8. Choi, Y., & Rasmussen, E. (2009). What Qualifications and Skills are Important for Digital Librarian Positions in Academic Libraries? A Job Advertisement Analysis. *Journal of Academic Librarianship*, 35(5), 457–467. <https://doi.org/10.1016/j.acalib.2009.06.003>
9. Dziobczenski, P. R. N., & Person, O. (2017). Graphic designer wanted: A document analysis of the described skill set of graphic designers in job advertisements from the United Kingdom. *International Journal of Design*, 11(2), 41–55. <http://ijdesign.org/index.php/IJDesign/article/viewFile/2790/779>
10. Dziobczenski, P. R. N., Meriläinen, S., & Person, O. (2018). Designing Career Paths in Graphic Design: A Document Analysis of Job Advertisements for Graphic Design Positions in Finland. *The Design Journal*, 21(3), 349–370. <https://doi.org/10.1080/14606925.2018.1444874>
11. Efeoglu, I. E., & Gerek, I. H. (2015, May). What Qualifications and Skills are Important for Civil Engineers? A Job Advertisement Analysis. Paper presented at the International Conference Make Learn & TIIM 2015, Bari, Italy. <http://www.toknowpress.net/ISBN/978-961-6914-13-0/papers/ML15-132.pdf>
12. Ganesan, M., Antony, S.P., & George, E.P. (2018). Dimensions of job advertisement as signals for achieving job seeker's application intention. *Journal of Management Development*, 37(5), 425–438. <https://doi.org/10.1108/JMD-02-2017-0055>
13. Günay, M. (2021). Design in Visual Communication. *Art and Design Review*, 9(2), 109–122. <https://doi.org/10.4236/adr.2021.92010>
14. Harper, R. (2012). The collection and analysis of job advertisements: a review of research methodology. *Library and Information Research*, 112(36), 29–54. <https://doi.org/10.29173/lirg499>

15. Ibiwoye, T. I., Ejem, A. A., & Kanu, E. U. (2023). *Graphic Design Industry in the Post-Covid-19 Era in Nigeria*. *Journal of African Studies and Sustainable Development*, 6(3), 146–156. <https://doi.org/10.13140/RG.2.2.14569.6768>
16. Judelman, G. (2004, July). *Aesthetics and inspiration for visualization design: bridging the gap between art and science*. Paper presented at the Eighth International Conference on Information Visualisation, London, UK. <https://doi.org/10.1109/IV.2004.1320152>
17. Kanupriya, T. (2022). *Employing project-based learning to foster essential professional skills in students of graphic design area*. *International Design and Art Journal*, 4(2), 173–184. <https://www.idajournal.com/index.php/ida/article/view/171/65>
18. Khlystova, O., Kalyuzhnova, Y., & Belitski, M. (2022) *The impact of the COVID-19 pandemic on the creative industries: A literature review and future research agenda*. *Journal of Business Research*, 139, 1192–1210. <https://doi.org/10.1016/j.jbusres.2021.09.062>
19. Kim, J., & Angnakoon, P. (2016). *Research Using Job Advertisements: A Methodological Assessment*. *Library and Information Science Research*, 38(4), 327–335. <https://doi.org/10.1016/j.lisr.2016.11.006>
20. Kim, N. W., Joyner, S. C., Riegelhuth, A., Kim, Y. (2021). *Accessible Visualization: Design Space, Opportunities, and Challenges*. *Computer graphics forum*, 40(3), 173–188. <https://doi.org/10.1111/cgf.14298>
21. Li, R. (2021). *Analysis of the Combination and Application of Design Software in Computer Graphic Design*. *Big Data Analytics for Cyber-Physical System in Smart City*. BDCPS 2020. *Advances in Intelligent Systems and Computing*, 1303, 1730–1734. https://doi.org/10.1007/978-981-33-4572-0_256
22. McArthur, E., Kubacki, K., Pang, B., & Alcaraz, C. (2017). *The Employers' View of "Work-Ready" Graduates: A Study of Advertisements for Marketing Jobs in Australia*. *Journal of Marketing Education*, 39(2), 82–93. <https://doi.org/10.1177/0273475317712766>
23. Mohammed, N. J. (2022). *Graphic Design in the Age of Digital Transformation*. *Rimak International Journal of Humanities and Social Sciences*, 4(1), 417–431. <http://dx.doi.org/10.47832/2717-8293.15.30>
24. Nugroho, S. A., Hadi A. P., Rudjiono, R. (2023). *Design Exploration as a Research Discovery Phase through Graphic Design Job Advertising*. *International Journal of Graphic Design*, 1(1), 55–76. <https://journal.stekom.ac.id/index.php/ijgd/article/view/1101/895>
25. Ooi, K. B., & Ting, S. H. (2015). *Employers' Emphasis on Technical Skills and Soft Skills in Job Advertisements*. *The English Teacher*, 44(1), 1–12. <https://meltajournals.com/index.php/TET/article/view/87/84>
26. Opoku, N., Appiah, E., & de Graft-Yankson, P. (2020). *Competencies of the present-day Graphic Designer: A document analysis of online job ads in Ghana*. *Journal of graphic engineering and design*, 11(2), 37–45. <http://dx.doi.org/10.24867/JGED-2020-2-037>
27. Peng, B., & Li H. (2021). *Analysis of Computer Graphic Image Design and Visual Communication Design*. *Journal of Physics: Conference Series*, 1827 012141. <https://doi.org/10.1088/1742-6596/1827/1/012141>
28. Perks, H., Cooper, R., & Jones, C. (2005). *Characterizing the Role of Design in New Product Development: An Empirically Derived Taxonomy*. *Journal of Product Innovation Management*, 22(2), 111–127. <https://doi.org/10.1111/j.0737-6782.2005.00109.x>
29. Purwanto, P., Wahyu, R., & Yudit, A. R. (2020). *Analysis of Secretary Job Advertisement Content for Secretarial Skills Needs*. *Jurnal Economia*, 16(1), 44–55. <http://dx.doi.org/10.21831/economia.v16i1.29872>

30. Quispel, A., Maes, A., & Schilperoord, J. (2018). *Aesthetics and Clarity in Information Visualization: The Designer's Perspective*. *Arts*, 7, 72. <https://doi.org/10.3390/arts7040072>
31. Tan, S., & Melles, G. (2010). *An Activity Theory Focused Case Study of Graphic Designers' Tool-Mediated Activities During the Conceptual Design Phase*. *Design Studies*, 31(5), 461–478. <https://doi.org/10.1016/j.destud.2010.05.002>
32. *The Future of Jobs Report 2020*. (2020). *World Economic Forum*. http://www3.weforum.org/docs/WEF_Future_of_Jobs_2020.pdf
33. Zhao, X. (2020). *Application of computer graphics and image software in the graphic advertisement design of marine industry*. *Advances in Coastal Research: Engineering, Industry, Economy, and Sustainable Development*. *Journal of Coastal Research*, 106, 526–530. <https://doi.org/10.2112/SII106-119.1>