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Львівський національний університет ветеринарної медицини та
біотехнологій імені С.З. Гжицького**

Кафедра філософії та педагогіки

Кафедра інформаційних технологій у менеджменті

ІНФОРМАЦІЙНО-КОМУНІКАЦІЙНІ ТЕХНОЛОГІЇ В ОСВІТІ

**Методичні розробки тем
для здобувачів другого (магістерського) рівня вищої освіти
ОПП «Освітні, педагогічні науки»**

Львів – 2022

Інформаційно-комунікаційні технології в освіті : Метод. розроб. тем / уклад.: О. Кіндрат, О. Смолінська. Львів, 2022. 17 с.

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Методична розробка розглянута та схвалена на засіданні кафедри інформаційних технологій у менеджменті

протокол № 10 від «02» червня 2022 року

Методична розробка розглянута та схвалена на засіданні кафедри філософії та педагогіки
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Погоджено навчально-методичною комісією
спеціальності 011 «Освітні, педагогічні науки»

(назва спеціальності)

протокол № 6 від 16 червня 2022 р.

Схвалено рішенням навчально-методичної
ради факультету громадського розвитку та здоров'я

(назва факультету)

протокол № 10 від 22 червня 2022 р.

Тема 1. Сутність інформаційно-комунікаційних технологій навчання: сучасний стан, перспективи розвитку та застосування в навчальному процесі

1. Ознайомтесь зі змістом статті.
2. Сформулюйте актуальність теми і доповніть її своїми міркуваннями щодо закладів освіти.
3. Визначте той структурний компонент закладу освіти як організації, щодо якого вже існують ІТ-розробки. Проаналізуйте спосіб їх застосування в нашому університеті.
4. Обґрунтуйте актуальність впровадження ІТ в сучасному управлінні закладами освіти.
5. Доповніть статтю своїми міркуваннями щодо підвищення конкурентоздатності закладу вищої освіти завдяки сучасним інформаційним технологіям (не менше 500, не більше 2 тис. знаків з пробілами).

Kindrat, O.V. Modern information technology – a promising investment in the development of the enterprise. *Scientific Messenger LNUVMBT named after S.Z. Gzhytskyj*. 2016. 18, 2(69), 72–74. URL : <https://nvlvet.com.ua/index.php/economy/article/view/3320>

Сучасні інформаційні технології – найперспективніша інвестиція у розвиток підприємства

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У статті аналізується стан використання сучасних інформаційних технологій на підприємствах. Існуючі умови ринкового середовища вказують на те, що підприємство знаходиться під постійним впливом факторів, пов'язаних з розвитком технологій, що спрощують роботу з великим обсягом інформації. Інтенсифікація інноваційних процесів, розвиток інформаційних технологій значно скорочують час на збір і обробку інформації. Нові економічні відносини потребують використання великих обсягів інформації та оперативних розрахунків, забезпечених сучасними інформаційними технологіями і системи. У роботі розглянуто проблему необхідності застосування й використання інформаційних технологій для вдосконалення діяльності підприємств. Показано, що ефективне застосування сучасних інформаційних технологій для підтримки, забезпечення й моделювання бізнес-процесів стає одним з вирішальних конкурентних переваг в сучасних ринкових умовах. Саме ефективність впровадження і використання інформаційних технологій є одним з основних чинників, що впливають на підвищення рівня конкурентоспроможності, що досягається за рахунок підвищення рівня гнучкості і ступеню використання економічного потенціалу. Проаналізовано, що на шляху впровадження інформаційних технологій підприємства стикаються з проблемами організаційного, економічного, технічного, соціального та іншого характеру. Розглянуті автоматизовані системи управління підприємством, що представлені на ринку України.

Ключові слова: інформаційні технології, інформаційні системи, підприємство, управління, програмні продукти, ефективність, перспективи, ІТ-технології, розвиток, запровадження.

Modern information technology – a promising investment in the development of the enterprise

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The article analyzes the state of modern information technologies on enterprises. The current conditions of the market environment indicate that the company is under the influence of factors related to the development of technologies to simplify the work with large amounts of information. The intensification of innovation processes, development of information technologies significantly reduce the time for gathering and processing information. New economic relations require the use of large amounts of information and operational calculations provided by modern information technologies and systems. This article examines the problem and the need for using information technology to improve the performance of enterprises. It is shown that the effective use of modern information technology to support software and business process modeling is becoming a decisive competitive advantage in current market conditions. That effectiveness of implementation and use of information technology is one of the main factors influencing the increase of competitiveness achieved by increasing the degree of flexibility and the use of economic potential. Exactly efficiency of introduction and use of information technologies is one of basic factors, that influence on the increase of level of competitiveness that is achieved by increasing the degree of flexibility and the use of economic potential. It is analysed, that on the way of introduction of information technologies enterprises are faced with problems of organizational, economic, technical, social and other nature. Reviewed the automated systems of enterprise management, presented on the Ukrainian market.

Key words: *information technology, information systems, enterprise management software, performance, prospects, IT technology, development, implementation.*

Вступ

Жодна галузь людської діяльності не зазнала такого розвитку, як інформаційні технології (ІТ). Саме вони були покликані збільшити ефективність та зручність використання різноманітних видів інформації. В умовах розвитку сучасного суспільства ІТ глибоко проникають життя людей. Вони дуже швидко перетворилися на життєво важливий стимул розвитку не тільки світової економіки, а й інших сфер людської діяльності. Зараз важко знайти сферу, в якій зараз не використовуються ІТ. Так, у промисловості ІТ застосовуються не тільки для аналізу запасів сировини, комплектуючих, готової продукції, але і дозволяють проводити маркетингові дослідження для прогнозу попиту на різні види продукції, знаходити нових партнерів і багато іншого. При цьому всі бухгалтерські операції на підприємствах і не тільки, зараз ґрунтуються на застосуванні ІТ. Застосування таких технологій не вирішує всіх проблем, але значно прискорює роботу на складних ділянках аналітичної діяльності (Klerikova, 2013; Kryvov'jazjuk and Kulyk, 2013). Бурхливий розвиток інформаційних комп'ютерних технологій, вдосконалення технічної платформи і поява принципово нових класів програмних продуктів привів в наші дні до зміни підходів до автоматизації управління підприємством. Сучасні інформаційні технології стали рушійними силами технологічного та економічного розвитку нашої країни (Jedynak, 2008).

Метою статті є дослідження стану використання ІТ як найкращої інвестиції у розвиток діяльності підприємства, відображення тенденцій впровадження

ІТ у діяльність сучасних підприємств, розкриття існуючих проблеми.

Основними завданнями є визначення впровадження ІТ як основного напрямку розвитку діяльності підприємства; зазначення основних проблем впровадження ІТ на сучасних підприємствах.

Матеріал і методи досліджень

Питання впровадження сучасних ІТ в управлінні підприємством та їх економічне обґрунтування досліджували багато вчених та спеціалістів: С.В. Войтко, С.Г. Діордіци, Т.В. Сакалош, З.М. Соколовської, В.Д. Шквір та інші. Серед світової наукової спільноти значний внесок щодо застосування ІТ та дослідження проблем інноваційного розвитку підприємств внесли такі вчені, як А. Абрамова, І. Ансофф, Д. Мошелла, Р. Нельсон, М. Потер, П. Самуельсон, Ю. Савінова, Б. Санто, Дж. Стигліц, Й. Шумпетер, К. Кольт, Е. Янч та інші.

Результати та їх обговорення

Існування сучасного суспільства не можливе без застосування інформаційних технологій, вони глибоко проникли в наше життя. ІТ – одне з найважливіших досягнень діяльності людини. Фінансово-економічна діяльність сучасного підприємства характеризується необхідністю проводити аналіз великих обсягів циркулюючої інформації. Своєчасно обчислювати та аналізувати інформацію без застосування інформаційних систем та ІТ неможливо (Zolotareva and

Dorohina, 2008). На даний час використовується велика кількість інформаційних систем у всіх галузях народного господарства в т.ч. і в АПК. Їх використання дає можливість: полегшити організацію комунікацій на всіх рівнях управління; стимулювати зростання продуктивності праці та підвищення заробітної плати; створити сприятливі умови для розвитку економіки; створити основу для прискореного розвитку інформаційного суспільства та укріплення демократії; швидко знижувати енергоємність окремого виробництва та національної економіки в цілому.

На ринку ІТ-технологій існує великий вибір програмного забезпечення, підприємство може вибрати програмний продукт в залежності від своїх цілей. Вибір програмного забезпечення повинен базуватися на розумінні його можливостей і недоліків, чіткому усвідомленні цілей використання. Найбільш перспективним напрямом представляється все більш повний взаємозв'язок систем бізнес-моделювання і аналізу з комп'ютерними інформаційними системами для більш якісного управління підприємством в цілому.

Нині на ринку представлено безліч систем управління підприємством: «ІТПредприятие», «ІС», «SAP», «Infor SyteLine ERP», «Microsoft Dynamics AX», «Microsoft Dynamics NAV», «Капітал», «Oracle EBusiness Suite», «BAAN», «Компас», «МОНОЛИТ SQL», «Scala», «Галактика», «АСТОР», «Business Control», «Global ERP», «Виртуоз», «PayDox», та інші. На шляху впровадження ІТ в управлінні сучасними підприємствами можна виділити такі перешкоди: ускладнення вивчення швидкозмінних інформаційних потоків як результат поглиблення експортної орієнтованості значної частки підприємств, погіршення процесів реалізації ринкових відносин внаслідок російської агресії та подальшого перерозподілу власності серед «нової» та «старої» олігархії; складність розробки та впровадження інформаційних і програмних систем для автоматизації управління компаніями через відтік ІТ-персоналу, нестачу фінансових ресурсів; відсутність у значній кількості керівників розуміння доцільності використання ІТ для удосконалення управлінської роботи; доцільність безперервного застосування Internet-технологій в організації і забезпеченні мобільного управління.

Під дією кризи в економіці змінилися і вимоги підприємств до впровадження ІТ: мінімум вкладень, швидкий результат, низькі витрати на обслуговування. В умовах кризи компанії бажають ті інструменти, які з мінімальними інвестиціями дозволяють отримати реальний результат – знизити витрати.

Постійно виникають нові питання і проблеми, які супроводжують запровадження ІТ, а тому потребують більш глибокого аналізу та вивчення можливих шляхів їх подолання. Вирішення проблем запровадження ІТ в управління сучасними підприємствами можливе завдяки змінам організаційного характеру (організаційна перебудова), підвищенням рівня кваліфікації управлінського персоналу, замінам застарілих інформаційних систем, переглядом стратегічних цілей та завдань розвитку підприємства, розробкою ефектив-

ної системи управління стратегічним потенціалом, де центральне місце буде належати застосуванню сучасних ІТ і систем.

Висновки

Щоб залишатися конкурентоспроможними в умовах прогресивного еволюційного ринку, що швидко змінюється, поряд з новими застосуваннями вже існуючих технологій і рішень вітчизняним підприємствам необхідно використовувати всі переваги новітніх технологій. Для того, щоб успішно вирішувати проблеми, пов'язані з ІТ, підприємствам необхідно постійно поновлювати свої системи і щорічно інвестувати засоби в їх удосконалювання на регулярній основі. Такий підхід дозволить зберігати високий технічний рівень і надійно захищати від зниження ефективності роботи. Активне впровадження ІТ в сфері управління підприємствами забезпечить підтримання необхідного рівня конкурентоспроможності економіки України, незважаючи на складну ситуацію.

Перспективи подальших досліджень. В умовах важкої фінансової та політичної ситуації в країні вкладень в нові ІТ практично немає. Повне відновлення їх можливе лише після стабілізації ситуації на Сході країни. Перспективою подальших досліджень може бути детальніший розгляд проблем впровадження сучасних інформаційних технологій на підприємствах окремого типу.

Бібліографічні посилання

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Тема 3. Використання сучасного програмного забезпечення для організації і підтримки навчального процесу із застосуванням ІКТ

1. Ознайомтесь за змістом статті
2. Сформулюйте актуальність теми і доповніть її своїми міркуваннями
3. Які засоби були запропоновані/використані для організації відеозв'язку. Чому?
4. Яку освітню спрямованість носило використання ІКТ щодо професійної підготовки фізичних терапевтів, ерготерапевтів?
5. Яким засобом організації відеозв'язку Ви б надали перевагу (як педагоги)? Обґрунтуйте свою позицію.
6. Наскільки повно використаний потенціал ІКТ в описаному кейсі?
7. Запропонуйте свій варіант практичного навчання фізичних терапевтів, ерготерапевтів з використанням ІКТ (від 500 до 1000 знаків із пробілами).

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1. INTRODUCTION

In 2017, the World Health Organization initiated a meeting «Rehabilitation 2030: A Call for Action» [1] which resulted in a decision to coordinate actions and joint commitments of participants in order to improve the management of rehabilitation and investments, as well as to prepare a qualified workforce and rehabilitation services and to improve data collection. Within this initiative, another global meeting was held in July 2019, where the strategies of transformation of rehabilitation into a political priority were discussed. A. W. Heinemann et al. [2] note that the shift of rehabilitation from a medical to a political plane is caused by, firstly, aging of population and, secondly, by the availability of these services to low and middle-income nations. The authors [2] report that the need for physical therapy and rehabilitation institutions is increasing significantly per capita, as well as the percentage of total years lived with disability worldwide and across countries with different income levels. This increase was greater in lower-income countries where rehabilitation was underestimated because of low labor costs, worse working conditions, unresolved environmental problems, wars and so on.

The content analysis of the standard of higher education at first (bachelor's) level of the branch of knowledge 22 «Healthcare», specialty 227 «Physical therapy, occupational therapy» proves that the formation of integrated competence in terms of the basics of psychological and pedagogical sciences is due to different general competencies. In addition, it also implies the necessity to apply «principles, theories and methods of medical, biological, social, psychological and pedagogical sciences» [3, p. 6]. There are such general competences as «skills of interpersonal interaction» (LC 03), «ability to motivate people and move to a common goal» (LC 05), «ability to act socially, responsibly and consciously» (LC 13). Besides, there are also special (professional, subject) competencies, especially «ability to take medical, psychological and pedagogical, social aspects into account in the sphere of physical therapy, occupational therapy» (SC 04), «ability to implement a program of physical therapy and/or occupational therapy effectively» (SC 08) [3, p. 8]. The same standard of higher education provides for such a learning outcome as: «to implement individual programs of physical therapy, occupational therapy» (PR 09), «to choose the most suitable forms, methods and techniques that would ensure respect to a patient / client, his safety / protection, comfort and privacy» (PR 13). Moreover, this standard aims at the ability «to communicate verbally and non-verbally with individuals and groups of interlocutors of different age, level of education, social and professional affiliation, psychological and cognitive qualities, etc. in a multidisciplinary team» (PR 15), «to instruct and train clients, members of their families, colleagues and small groups» (PR 16) [3, p. 9].

The researchers of the problem of psychological and pedagogical aspects of physical therapists training focus on the following problems: the correlation of direct and indirect interactions in both

professional and educational activities (Rezaei M., Jalali R. et al. [4], Fukumoto M., Watanabe T., et al [5], Hughes E., Bradford J., Likens C. [6]). They also concentrate on the impact of socio-demographic and personal, the so-called, contextual, factors, on the effectiveness of interactions of the rehabilitation process (Coenen P., Hulsege G., Daams J. G., et al [7], Covington K. and Barcinas S. J. [8], Mun C. J., Davis M. C., et al. [9], Morera-Balaguer J., Botella-Rico J. M., et al. [10], Yehorova Y. V. and others, edited by Ihnatovych O. M. [11], Andriychuk O. [12]). The works of Bazylchuk O. [13], Burka O. [14] actually highlight the pedagogical aspects in their articles while Rean A. [15], Barchi B. [16] investigate the problems of readiness for a professional activity.

The results of the above analysis show that the psychological and pedagogical component of physical and occupational therapists training is essential in the structure of professional training of specialists in this specialty. Besides, telenursing has been characterized by researchers as «bioinformation cornerstone in healthcare for the 21st Century» [17], and COVID-19 only promoted the understanding of it. Therefore, the relevance of the research and the content is obvious.

The choice of the theme is preconditioned by the lack of publications on the topic and methods of training for physical therapists and occupational therapists due to the conduction of individual and group classes remotely, which was caused by the pandemic COVID-19. Especially, this concerns the classes on postoperative rehabilitation of patients with diseases of musculoskeletal system.

The hypothesis, which had to be verified in the course of the research, is that the practical implementation of the functions of physical and occupational therapists at the initial period of training improves their conscious attitude to the chosen profession. Furthermore, psychological and pedagogical competencies play a key role and enable quick introduction to professional activity. On the one hand, they form important professional competencies: sociability, responsibility, time management (soft skills) and on the other hand, practical skills to provide a professional support during postoperative period of hip arthroplasty (hard skills). This surgical procedure is quite common, that is why a support of a physiotherapist at the recovery stage will be in great demand.

The aim of the study is to demonstrate the role of telenursing as a distance practice-oriented method of physical therapists and occupational therapists' training, using ICT tools, as well as one of their professional competencies.

2. THEORETICAL FUNDAMENTALS OF THE RESEARCH

Overall, the problem of telemedicine in general and telenursing in particular is urgent not only because of the pandemic, but also due to the fact that it creates new opportunities for remote care services, which is a positive factor in the availability of rehabilitation services. The Health Resources and Services Administration (HRSA) of the US Department of Health and Human Services defines telehealth as the ensemble of telecommunication technologies that «support and promote long-distance clinical health care, patient and professional health-related education, public health, and health administration» [18].

The study of the scientific literature on the problem of professional support of postoperative patients revealed that, first of all, first month is the optimal time to start as it has the highest efficiency, secondly, it can be done both remotely (telenursing) and directly (face-to-face). Although, the data on the level of their effectiveness vary. Researchers M. Rezaei, R. Jalali, et al. [4] compared the effectiveness of indirect impact of a physical therapist and face-to-face meetings on the quality of life of patients with burn injuries. They concluded that the difference in the effectiveness of these two types was insignificant; however, both groups with telenursing and face-to-face interaction with an occupational therapist proved to be much more effective than patients in the control group, who received regular care. Considering these results, we have chosen telenursing as a form of professional support. Thus, the interference in the client's personal space was minimized during the simulated recovery.

The authors of the article M. Fukumoto, T. Watanabe, et al. [5], analyzing the impact of home visits of physical therapists to patients after being discharged from an acute care hospital, noted that such visits reduced the prevalence of falls but had no significant effect on ability to perform activities of daily living, quality of life or mood. It is necessary to mention that home visits were paid a month after surgery to restore self-care skills. To sum up, the time of the highest efficiency of the physical therapist and occupational therapist is the first month after injury, surgery and so on. According to this

research, we have defined that the first month after returning from a clinic is the most suitable to train students and simulate rehabilitation.

Although, the information on the key criterion of the effectiveness of rehabilitation is quite homogeneous. Thus, P. Coenen, G. Hulsege, J. G. Daams, et al. [7] came to the conclusion that the effectiveness of integrated care programs and rehabilitation for postoperative patients should be measured by their ability to participate in work and sport. Next, the authors conducted meta-analysis, which shows that insufficient attention of researchers to the criterion of returning of postoperative patients to other activities, besides domestic self-care, is the reason for the distortion of data on the quality of rehabilitation. The information presented by the authors [7] is used together with authors' data [10] while choosing the subject of the experimental rehabilitation experiment (teacher), as well as while teaching the students the basics of psychological support of a client.

The article [8] presented the results of the research, according to which five types of behavior of physical therapy students were identified and they contributed to students' early professional progress. These types are the following: adapt, prepare, enhance, connect, and develop. The authors K. Covington and S. J. Barcinas emphasize that these types resulted from the ability of physical therapist to improve the functional ability of patients after injury and disease, thanks to the quality of their own movements. In this regard, the training of students should be also based on professional motor practice from the initial stages. Obviously, this is the reason why students studied pedagogical and psychological techniques while studying practical sets of exercises, which were recommended by the clinic [19], [20].

The researchers [6], who study the possibilities of using new technologies (such as Kahoot! and Google Suite) during physical therapists' training in the early stages of professional development, affirm that the students who were trained with the application of new technical innovations demonstrate better learning outcomes via collaboration, communication and critical thinking. In our research, we base on the ideas of these authors as to the educational effectiveness of technological innovations. The participants of the experiment used the means of video communication such as Viber and Messenger to conduct telenursing. This corresponds to the content of telenursing, as an interaction that is «mediated by devices that overcome barriers of distance and time» [21], namely information and communication technologies (ICT). Among the most widely used ICTs are telephones (landline and mobile phones), copiers (fax machines), Internet, video and audio conferences, computerized information systems and data transmission devices in general [21]. That is why the most popular means of communication were chosen for potential patients. However, after the experiment, students pointed out that it would be rational to use the tools, focused on regular interaction with a fixed meeting time, such as Microsoft Teams or Google Meet. It should be indicated that as the rehabilitation was carried out by a teacher familiar with the methods of physical education, so he could correct the actions of students, if it was necessary.

Ukrainian authors, O. Bazylchuk in particular, analyzing practice-oriented approaches to the training of physical therapists and occupational therapists, mention that the usage of case method (case study) in addition to providing an interdisciplinary, integrated approach to professional issues, also forms independence and initiative. At the same time, its functional didactic purpose is determined by «the development of algorithms for analysis of typical situations..., as well as intensification of exchange of experience between students, gaining teamwork skills in a single problem field» [13, p. 316]. A practical case study was introduced in order to help while teaching the students and practicing their professional skills.

Nevertheless, our research had some limitations due to following factors: firstly, the size of a group of participants, namely the number of first year students. Secondly, it is impossible to check the structure of professional motivation and the degree of satisfaction with professional choice among undergraduates because this is the first enrollment of students in the specialty «Physical therapy, occupational therapy». Finally, the possibility of emotional infection among the study participants existed, as moderators had many roles at the same time (teachers, instructors, administrators, even a client), but this limitation was eliminated by the participation of a specialist from another educational institution.

3. THE RESEARCH METHODOLOGY

The authors analyzed the data of the conducted research [5], [16], [22] and the motives of professional choice, which were predetermined by the need for security and protection, accelerated making pragmatic decisions on high and fast profitability [23]. We investigated the structure of motivation of professional choice among 46 first-year students of specialty «Physical therapy, occupational therapy» at Stepan Gzhytskyi National University of Veterinary Medicine and Biotechnologies Lviv (motivation of professional activity (K. Zamfir's method in A. Rean's modification [24])).

In addition, these students were asked to assess the level of subjective satisfaction with their professional choice by answering the question «Are you satisfied with your choice of profession?» It was done by means of indication at a satisfaction scale ranging from «very satisfied» to «very dissatisfied».

Simulated professional support was provided 10 months after the last surgery and it was done for educational purposes. The circumstances of the patient's recovery during the first month after surgery were simulated. In general, there were two stages in the simulated experiment. Stage 1 is called training, which comprises the acquaintance with the method of professional support of postoperative recovery and is implemented using telenursing. It involves practical online study of exercises during their performance, pedagogical methods of work of physical therapist and occupational therapists (according to the sample); as well as the formation of such professional abilities as empathy, facilitation, ability to the distribution of attention. Stage 2 is a practical professional support-simulation of the alleged postoperative recovery during the first month and conducted in the form of telenursing, using the following online means of communication (Viber, Zoom, Messenger and Skype). Sets of exercises were recommended by the clinic where endoprosthesis was performed [19], [20].

In a final interview, with the help of Google Forms, students were asked: «Has your attitude toward the chosen profession changed?» In addition to confirmation or objection, they were asked to explain their answer concisely. Another question of the interview was: «Do you consider yourself practically ready to provide professional individual support of postoperative recovery to a patient with musculoskeletal diseases?» Moreover, the students indicated telecommunication means that were the most convenient for them. The sex and age of the students were insignificant, concerning the objectives of the study. All the participants were adults. Participation in surveys and training was voluntary (all the participating students signed an informed consent to participate in the study, which consisted of 2 initial surveys, training, conduction of simulated professional individual support and a final interview). The client gave us consent to form a case study, to conduct simulated professional support in a remote mode as well as prepare and publish relevant materials.

3. THE RESULTS OF THE RESEARCH

The result of the initial research revealed that 32 students (69.6 %) out of 46 had the best ratio of professional motivation in the version IM>EPM>ENM, where IM stands for internal motivation, EPM stands for external positive motivation and ENM stands for external negative motivation. The worst complex (ENM>EPM>IM) was not found and 1 questionnaire was invalid. In terms of efficiency, 13 participants of the research (28.3%) showed intermediate indicators. The structure of professional motivation [20] is represented in Fig. 1.

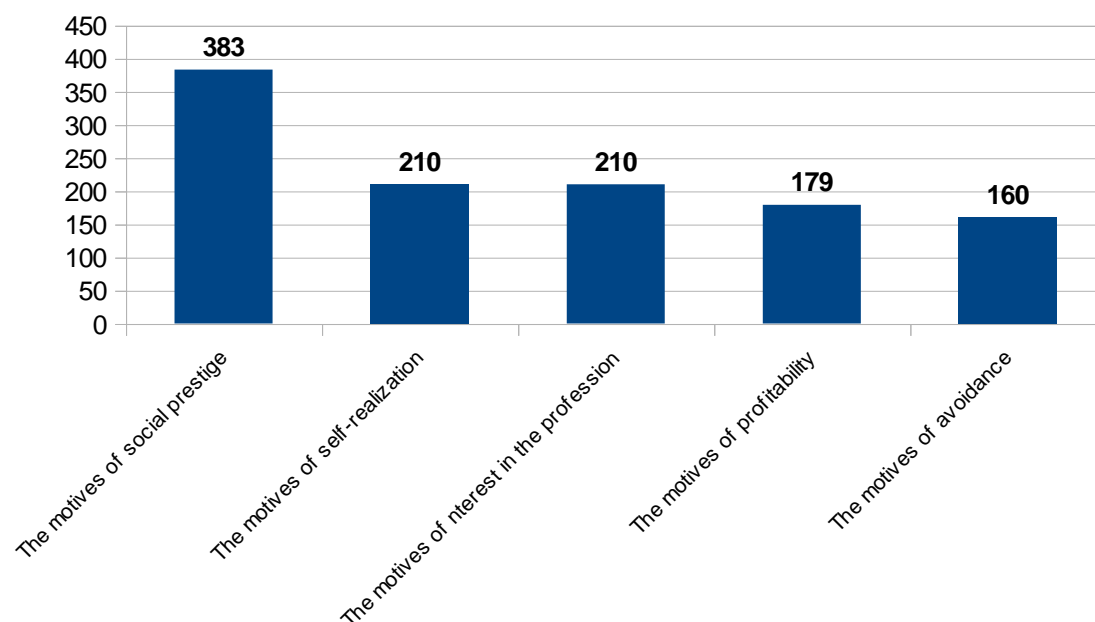


Figure 1. The structure of professional motivation of the participants of the research, points

Internal motives got the highest score at the assessment scale of importance (satisfaction with the process itself and the result of work; the possibility of the most complete self-realization in this activity) – 210 points for each one. Next motives were a career building, the need for respect, achieving a certain status and profitability (in terms of money), the desire to avoid possible punishments or troubles and the desire to avoid criticism from parents (friends). Motivational attitudes of the participants are represented in Fig. 2.

The client's choice of the desired telecommunication means from the offered ones showed the following preference (from the most widely used to the least one): Viber, Zoom, Messenger and Skype.

As it was only the first enrollment of first-year students of this specialty at our higher educational institution, so it was impossible to find out the dynamics of satisfaction with the professional choice among the surveyed participants. However, according to the obtained results, 45 people (97.8 %) declared being very satisfied, satisfied, satisfied to certain extend. The degree of subjective satisfaction with the professional choice was determined according to a six-point scale ranging from «very satisfied» to «very dissatisfied». The results demonstrate that most students chose such a positive assessment as «very satisfied», in general 25 people (54.3 %). Data of other authors indicate that this figure will slightly decrease in the future [15], an effective precaution of which can be supported by «competent conceptions about the profession. Only then, do the students begin to understand the sense of their own work, ways of self-expression and self-realization in the activity» [25]. In order to prove this statement, we have chosen such a component as a psychological and pedagogical readiness. This approach is practically implemented within a simulated experiment, basing on a case study.

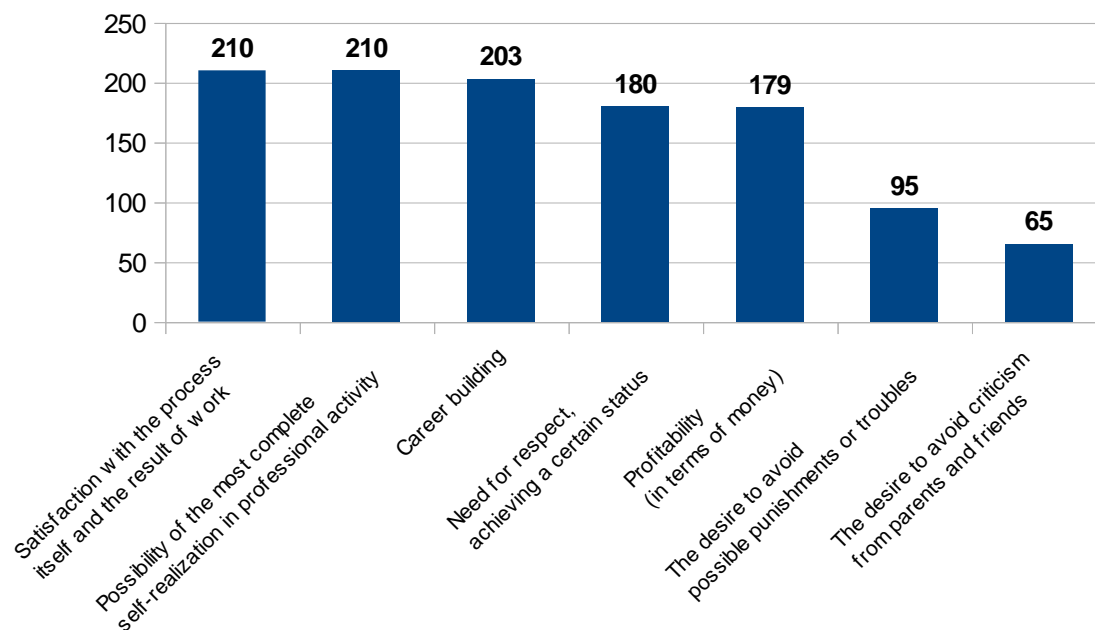


Figure 2. Motivational attitudes of the participants, points

The conduction of a final survey was considered inexpedient due to such reasons as: only first-year students were trained, the number of group members was small and its short duration. Interviews were conducted and students indicated that their attitude toward professional activities had somehow changed: on the one hand, romantic component was lost («helping is not saving, but working together»). According to B. Barchi, «romanticization» of the professional choice may be stipulated by the sources that influenced it, for example watching a film (by the way, the film «Intouchables (1+1)» shot in 2011, could influence the romanticization of the choice of physical therapist, occupational therapist's profession). In any case, such a choice is «based on a superficial, external impression or supported by the advice of parents, friends» [16]. Furthermore, the profession is considered as a systematic, well-organized, planned team work of a specialist in physical therapy or occupational therapy and a patient, who is motivated and determined to restore functioning after disease and surgery (involving the assistance of a physiotherapist). 31 students (67.4 %), who were surveyed, showed their desire and ability to provide a service of postoperative recovery of patients with the musculoskeletal system diseases.

4.1. Case study for students of the specialty «Physical therapy, occupational therapy»

A 47-year-old patient has been suffering from bilateral dysplastic coxarthrosis for more than 10 years. He underwent two surgeries with three-month intervals (joint arthroplasty) at the third stage of the disease. After a week of rehabilitation at the clinic, the patient returned home, where he had to do exercises, recommended by the clinic [20], perform activities of daily living to develop a range of motion and improve muscle activity after a long period of the disease.

The main educational task is simulation of practical implementation of professional physical therapy and occupational therapy support during the first month after surgery in remote mode (telenursing).

Teachers conducted preparatory work to accomplish this task with students online (using Zoom). Its task was to prevent communicative barriers [21], namely the following psychological and pedagogical aspects were clarified and specified:

- special training course, aimed at the formation of empathy, the ability to facilitate and to distribute attention, was conducted;
- the peculiarities of occupational therapy, after a joint replacement, were explained (climbing and going down the stairs; sitting / lying-standing up; turning to the side while lying; going into and out of the bath / shower; turning / changing the direction; tilting, lifting from the floor; walking with

crutches; getting into and out of a car; temporary and lifelong prohibitions and restrictions);

- two sets of exercises (according to the recommendations of the clinic, first complex was performed lying down, the second one – sitting and standing) and pedagogical techniques of their implementation were studied.

Overall, students were taught the basics of professional support of this category of clients using Google Meet and methodological materials were provided via Google Classroom.

Students conducted classes 4 times a day (except for the morning set of exercises) and repeated the basic rules of ergonomics of movement, temporary and permanent prohibitions according to the peculiarities of the postoperative period. It was done at the request of the «client» and basing on the popularity of such information and communication means as Viber and Messenger in this age group (based on own observations of the authors).

4.2. The content of psychological training for providing professional support to patients with musculoskeletal system diseases at the stage of postoperative rehabilitation

According to a research of J. Morera-Balaguer, J. M. Botella-Rico, et al. [14], there has been a paradigm shift towards patient-centered biopsychological care model in physical therapy. The authors [10] state that, there is a growing interest to the understanding of the contextual factors that influence the patient's individual experience of illness, pain and recovery (this corresponds to the study of C. J. Mun, et al. [9]). It means that the building of therapeutic relationships, which comprise not only the personal qualities of a professional, but also the relationship between medical workers and care recipients, is a guarantee of successful therapy. The authors also highlight the need for physical therapists to rethink the situation of interaction with a patient and the choice of methods to improve it. Therefore, our main aim concerning psychological training of physical therapists and occupational therapists, who provide professional support of a patient during postoperative recovery period, was to develop professionally important qualities («a set of the most important individual psychological person's characteristics that determine the success in mastering the profession and in professional performance» [11, p. 231]). Other domestic researchers state that the first thing, which ensures the formation of readiness of physical therapists for practical work is the presence of appropriate features and qualities, in particular O. Burka [14] defines this component as necessary at the first stage of her author's model. In our research, referring to this aspect of the profession, these qualities are empathy [12], facilitation and ability to distribute attention.

The students were explained the level of pain that the client felt before the operation and after the first and second operations, this was done in order to form their empathic attitude towards the client. Before the first operation, pain could be comparable to the fracture (according to the client's words) and the patient had lived and experienced it for years. During the first postoperative period, in addition to pain, there was a need to do exercises for patient's sore leg, but the level of pain changed (weakened significantly in intensity and localization). After the second operation, the pain was much weaker than before, and besides, the client was not stressed because of fear, as he was aware of the finiteness of pain, as a result, the second recovery period was under more favorable psycho-emotional conditions.

A group of researchers C. J. Mun, et al. [9] studied the interdependency between the intensity of chronic pain and personal resources. According to J. Dahlhamer, et al, in the United States the number of adults suffering from chronic non-cancerous pain was raging from 11 to 40 % in 2016 [26]). We did not come across such information concerning Ukraine, as only those who need palliative care, especially analgesia for cancer, are registered. Thus, C. J. Mun, et al. [9] found out that personal resource variables could influence the negative consequences of pain (such as reduction of the quality of life, striving for the goal achievement, negative expectations, limitation of social contacts). The authors enumerate the following personal resource variables: sense of resilience, self-efficacy, purpose in life, positive self-acceptance, perceived social support, satisfaction with social roles, pain acceptance, sleep quality, etc. In conclusion, the authors suggest that there is [9] an inverse relationship between economic well-being, personal resources and pain (the better financial condition and more powerful personal resource is, the less intensity and impact of chronic pain on various spheres of life is and vice versa).

Thus, the assistance provided by students was aimed at different factors: it was voluntary, so it

didn't threaten material well-being, at the same time it helped to restore social ties (in our case – social roles as well, because the case concerned a teacher of the same educational institution). In fact, this assistance was a kind of social support. All the additional information was also explained to the students.

Such kind of information contributed to the formation of conscious attitude of students to the implemented professional functions, made it possible to predict the improvement of the patient's condition, provide the necessary emotional and professional support, as well as carry out facilitation.

The ability to distribute attention is an important individual characteristic of a physical therapist and occupational therapist. This ability has been constantly developing, since the childhood. Since such kind of specialist must keep in sight a lot of things: the quality of exercise, patient's condition, his own movements, the decision-making process as to the intensity of exercises, so the practical work with a client-teacher contributes to the development of this ability.

4.3. Pedagogical methods of work of a physical therapist and occupational therapist

The pedagogical component of preparation of future physical therapists and occupational therapists for work implied practical mastering of some pedagogical methods and studying of different sets of exercises.

1. The first one is the dosage of intensity and pace of exercises with the help of verbal commenting of actions. Counting is not recommended because, in this case, a client associates it with training load in sports, which is not desirable, as there are significant differences in the dynamic characteristics of movements and pain. During the recovery period, a client is not allowed to make sharp, jerky movements and pain is a signal either to stop exercising, or significantly reduce the amplitude and soften the manner of movements. Whereas, moderate pain or fatigue is not a direct indication to stop for a healthy person who is exercising. In such a way, the commands, which explain the manner of movement, are the most acceptable, for example: «Raise the right (operated, injured) leg, counteracting with the hand and creating a load». This formulation of the command significantly reduces the pace (speaking time prolongs the exercising time), besides, the client remembers better methodically correct algorithm of doing exercise. The usage of a pronoun «we» is also the method of psychological association between a physical therapist and his client / rehabilitation group.

2. Simultaneity between voice accompaniment and exercise performance is the second method. According to the consistency of time, performance and commenting, two types can be distinguished: synchronous and asynchronous. During synchronous voice accompaniment, commands coincide in time with their execution by a client(s). Asynchronous can be carried out both before an action, and after it. Anticipatory voice accompaniment is used at the initial rehabilitation stage, when it is important to master the technique of movement, while voice accompaniment, which is after the movement aims at the controlling the quality of understanding and, at the same time, activates the attention of a rehabilitated person (people). There is another technique connected with the simultaneity of voice accompaniment and aimed at activation of client's attention (it is used at the appropriate level of mastering the methodology of exercises). This is the wrong support, or support with errors. To some extent, this is a game component, but it has some advantages, in addition to the degree of mastering the exercises: firstly, the presence of good personal contact between a therapist and a client (rehabilitation group); secondly, stable positive psycho-emotional physical condition of a rehabilitated person /people and its positive dynamics. The degree of errors should not completely confuse the client, but only attract his attention. An example of such error can be a command to do an exercise for the same arm (leg) twice in a row. Although, errors should not be abused both in order not to interrupt the rhythm of exercising, and to form a verbally dynamic connection «command-movement-muscle memory», the quality and strength of which help to form a dynamic stereotype (I. Pavlov), and therefore skills and abilities, which is a guarantee of client's independence while exercising..

The usage of information and communication means justifies the expediency of an asynchronous anticipatory voice accompaniment, preventing a possible desynchronization of an image and sound.

3. In addition, demonstration is an important practical method. Lack of demonstration or careless attitude to this stage of exercising is the reason for low efficiency of work. Careless,

unaesthetic, inaccurate, undisciplined movement of a physical therapist or occupational therapist demonstrates his indifference to the quality of performance of the same movement by the client.

Concerning the stages of mastering the movements, we can distinguish such a technique as a demonstration-performance with a division into operations (specific «storyboarding»). At the same time, special attention is paid to the demonstration of correct options of exercises (for example, the exercise can be done either sitting or standing). In addition, a rehabilitated person should be warned against significant errors, which can potentially harm his health. There are at least two conflicting approaches to errors demonstration among physical therapists practitioners, according to the first one, the method of errors demonstration should not be applied in order to prevent from being engraved in memory; however, others believe that the display of an error exposes and disavows it, so the awareness of performance increases. Although, each separate case demands an individual solution. Moreover, a physical therapist must always take into account the degree of intellectual and emotional development of his patient, as well as his age, attitude to health and individual concept of recovery.

Another type of demonstration is a performance by a physical therapist. It takes place either in front of or simultaneously with a client and at his pace. First of all, the task is to demonstrate the correct movement and to show the desired range of motion, strength, etc.; secondly, the projection of the beauty of movement on a client, who is striving to repeat the demonstrated movement as accurately as possible, psychologically identifies his movement with the one he saw, thus progressing and improving. In this case, a physical therapist or occupational therapist should explain to his ward that, for example, toe stretching is not an obligatory task at a certain stage of restoration of motor function of a lower limb, but only an aesthetic component.

The next type is a demonstration-correction. During this stage, it is not necessary to demonstrate an error in order to prevent it, but the correction of the error is an essential task of a physical therapist. In fact, there are two possible approaches to the demonstration-correction: the first one is to stop exercising, according to the practice of positive reinforcement, and demonstrate slowly the correct one – «storyboarded» (divided into separate actions). The second option is to show the actual error, explain its origin, help to understand it, and thus to correct. At the same time, a physical therapist makes decisions individually as well as in case of a demonstration-performance.

4. Another method is counting the multiplicity of repetitions. It is done silently in mind not to distract a client from focusing on the quality of exercise and safety. It is possible to use the following methods of counting:

- counting each cycle of actions (for example an exercise consisting of several movements is done both by right and left limb);
- counting while performing the initial or final movement of the cycle (rise-lower, turn-return to starting position, etc.);
- performing two-stroke movement, it is possible to count «and» in the first stroke, «one» in the second, «two», «three» and so on (actually multiplicity of performance). Other options are: only the first or only the second stroke counting or; counting each movement but with reduplication (if it is necessary to perform 5 times, we score up to 10).

One more option to replace the verbal form of counting is bending of fingers (if it is suitable for the type of exercise).

5. Tactile interaction with the client may result from the need to bring the movement to necessary and appropriate amplitude at this stage of rehabilitation. The trajectory of movement may also require direct contact. It is important to remember that a physical therapist or occupational therapist is a person who provides additional support, guarantees the safety of client's movement at the initial stage and / or due to the physical weakness of a rehabilitated person. Tactile interaction was not applied in the given case due to the fact that our research dealt with the investigation of indirect interactions.

5. CONCLUSIONS AND PROSPECTS FOR FURTHER RESEARCH

The study of scientific sources, the organization and conduction of the experiment proved that in terms of quarantine restrictions in the educational process, the implementation of practical training of bachelors of the specialty «Physical Therapy, Occupational Therapy» becomes more and more acute.

In these circumstances, basing on the authors' data and information on the introduction of

telecommunications technologies in medical practice, it can be argued that telenursing can be a method of learning. This method facilitates both in terms of gaining additional practical, psychological, pedagogical, communicative competencies, and in terms of increasing the motivation of professional choice among first-year students, as well as increasing personal interest in educational results.

The results indicate that the usage of the telecommunication means while implementing the curriculum of telenursing proved to be effective (all the students have completed the full cycle of the experiment). However, there is a discrepancy between the intended distance learning tools (Microsoft Teams and Google Meet) and telecommunication means, which were actually used for telenursing (Viber and Messenger).

The article demonstrates practical pedagogical methods of work of a physical therapist and occupational therapist within the framework of the given case.

Consequently, early (starting from the first year) inclusion in practical professional activity, with the help of information and communication technologies has a lot of advantages. Firstly, it gives the satisfaction with a professional choice; secondly, the correction of the motivational sphere of professional activity, as it stimulates internal motivation and external positive motives; thirdly, it enables to assess the importance of routine professional procedures and personal features and characteristics, to argue the need for their further development. Furthermore, we found that additional results of the research and training were: productive communication and interaction between «teacher-student», «physiotherapist-client» and the possibility of earning an income for students.

The prospect for further research consists in finding new information and communication methods and means for the development and improvement of the practical component of physical therapists and occupational therapists' training. The implementation of new educational cases that facilitate the development of both professional psychological and pedagogical competencies as well as professionally important personality traits, thus building professional competencies at the stage of getting higher education is another prospect.

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