

COMPUTER DIAGNOSTICS OF LEVEL OF PROFESSIONAL COMPETENCE FORMATION OF FUTURE PHYSICAL CULTURE TEACHERS IN THE BIOLOGICAL DISCIPLINES STUDY

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Annotation. The analysis of the level of professional competence formation of future physical culture teachers in the biological disciplines study was provided. The study involved 79 students. It is applied methods of teaching observation and experiment. The computer program of monitoring of professional competence of future teachers of physical education was described in the study of the biological sciences. Analyzed the results of 448 students questionnaire of the first and second year, studying at specialty "teacher of physical culture." Found that the results of the formative stages of the experiments show significant positive changes in the levels of formation of professional competence of students of the experimental group. Found that the increase in the number of students with high and medium level of formation of professional competence and reduced the number of students with low level of formation of professional competence.

Keywords: computer, diagnostics, professional, competence, physical culture.

Introduction

In modern, quickly developing society, demand in professionally competent future teachers of physical culture is more and more growing. And that is why requirements to the quality of future physical culture teachers' training are increasing, that condition not only the necessity of constant training process perfection, application of its new forms, but also implementation of pedagogical diagnostics for checking, permanent control, evaluation, accumulation of statistics data and their analysis, for revelation of dynamics, trends, further progressing of students' knowledge and skills.

Theoretical foundation of pedagogical diagnostics' different aspects was reflected in the works both of domestic and foreign scientists, such as V.S. Avanesov [1], B.P. Bitinas and L.I. Katayeva [2], O.M. Demchenko [3], I.P. Pidlasiy [6], A.V. Khutorskiy [10] et al.

Conception "professional competence" was studied by such foreign scientists as R. Boytsis [11], B. Spenser [12], Ye. Short [13]. Different aspects of future physical culture teachers' professional competence were studied also by Yu.V. Dragnyev [4], L.O. Konoval'ska [5], N.M. Samsutina [7], L.P. Suschenko [8], O.V. Timoshenko [9] et al.

The results of contemporary literature sources' analysis witness that there has not been paid sufficient attention to pedagogical diagnostics problems in higher educational institutions. That is why, in our opinion, in conditions of heightened attention to the quality of specialists' training at higher educational institutions, the problem of pedagogical diagnostics becomes very urgent.

The work has been fulfilled as per plan of scientific & research works of National pedagogical university, named after M.P. Dragomanov (Institute of physical education).

Purpose, tasks of the work, material and methods

The purpose of the research was to analyze results of Ukrainian higher educational institutions students' questioning results; to describe computer software "VSD: monitoring of future physical culture teachers' professional competence in the process biological disciplines study", which was developed in co-authorship with L.P. Suschenko and V.A. Didenko; to carry out analysis of formation levels of future physical culture teachers professional competence in the process of studying of biological disciplines.

The methods of the researches: theoretical analysis and generalization of scientific literature, pedagogical observation, pedagogical experiment, methods of mathematical statistics.

Organization of the research.

Pedagogical experiment, which consisted of stating and formational stages was being carried out during 2010 - 2012 academic years.

At stating stage of the pedagogical experiment documentary sources was studied, accumulation of actual materials and their preliminary systematization were fulfilled, the status of future physical culture teachers' professional competence formation levels was studied in the process of study of such biological disciplines as "Vital functioning safety and civil defense" (1st year); "Common hygiene and hygiene of physical exercises" (2nd year), "Physiology of physical education and sports" (2nd year). At formation stage, students of National pedagogical university, named after M.P. Dragomanov, took part in pedagogical experiment as the members of experimental group (n=79).

Results of the research

In order to study contemporary status of future physical culture teachers' professional competence in the process of studying of biological disciplines, 448 students of higher educational institutions were questioned. In particular, they were: 86 students of Berdyansk state pedagogical university, 49 students of Volyn national university, named after Lesya Ukrainka, 63 students of Zaporozhskiy national university, 146 students of National pedagogical university, named after M.P. Dragomanov (Institute of physical education), 51 student of Lutsk University "Ukraine" (Institute of human being progress), 53 students of Cherkassk national university, named after Bogdan Khmel'nitskiy.

Analysis of the students' answers witnesses that among 448 students, 76.76% consider pedagogical diagnostics of future physical culture teachers' professional competence in the process of studying of biological disciplines to be an efficient method. 7.42% do not consider it to be efficient, for 15.18% it was difficult to answer (see fig. 1).

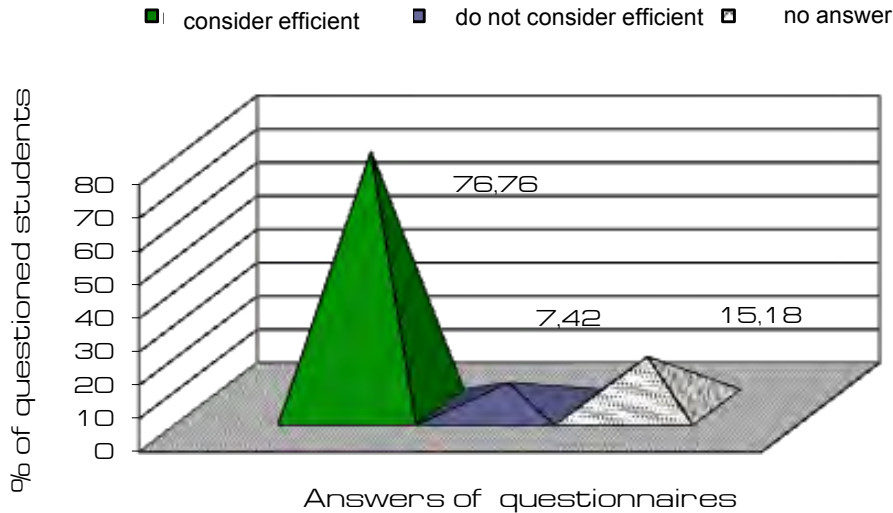


Fig 1. Distribution of students' answers to the question if pedagogical diagnostics of future physical culture teachers' professional competence in the process of biological disciplines study is efficient or not

So, majority of students consider pedagogical diagnostics of future physical culture teachers' professional competence in the process of biological disciplines study useful to be conducted.

The students' answers concerning efficiency of computer knowledge testing, which they received in the process of biological disciplines study distributed as follows: from 448 students, 57% consider computer knowledge testing, efficient, 27.26% do not consider it efficient, for 14.80% it was difficult to answer (see fig.2)

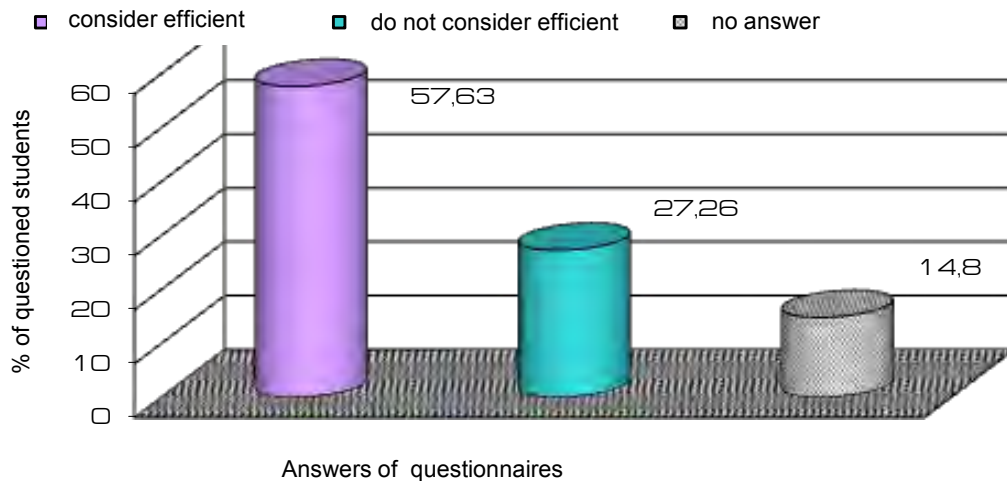


Fig 2. Distribution of students' answers to the question if computer testing of knowledge, which they received in the process of biological disciplines study is efficient or not (%).

In the process of students' training there were introduced the revealed organizational-methodological techniques of pedagogical diagnostics of future physical culture teachers' professional competence in the process of biological disciplines study.

We developed diagnostic tools for monitoring of future physical culture teachers' professional competence formation levels in the process of biological disciplines study, which included criteria, indicators and the levels (low, middle and high) of future physical culture teachers' professional competence formation in the process of biological disciplines study. The developed diagnostic tools become a basis of algorithm of computer software "VSD: monitoring

of future physical culture teachers' professional competence in the process biological disciplines study", which was developed in co-authorship with L.P. Suschenko and V.A. Didenko.

The program was designed for testing of students' group up to 100 persons each. To work with this program, start file "Testing. Exe", which is located in working folder. After starting of the program the window with program title appears. To start testing student should enter his name, surname and patronimic and select the stage of experiment. If any of the mentioned fields is not filled it becomes of red color after pressing "Start" button. If to enter data, which are not available in data base, there will appear window with message "User has not been found". If all fields are filled correctly, with pressing button "Start", user will see list of tests. He should select the test, which he wants to pass or tick "Pass all tests", to pass all the tests one-by one and press button "Next".

On screen he will see a dialogue with the name of test, question and list of answers. In order to pass to the next question, user must select only one answer.

After passing the test user will see the window with the name of the passed test, level and quantity of points, gained during testing. In order to pass testing again, it is necessary to press button "End", then press "Exit" or cross in the right upper corner of program window.

As a result of test's passing the program creates report, which is located in file "report" and contains: mark for answer, total quantity of points and total level of readiness, which are located in other documents: "Text1.xls". Test tasks for evaluation of students' level of biological disciplines' knowledge. "Test2.xls" is a card for evaluation of formation level of future physical culture teachers' procedural competence in the process of biological disciplines studying; "Test3.xls" – is experimental analysis of evaluation of future physical culture teachers' communicative skills formation level; "Test4.xls" is experimental analysis of evaluation of future physical culture teachers' organizational skills formation level. Report consists of three pages. The first and the second pages consist of students' P.I.B., the points, which were gained by them during testing and level, but the first page contains the points at the beginning of the experiment and the second page contains the points, gained at the end.

The third page contains statistics of students' testing. This statistics reflect total quantity of students, who passed testing and total indicator of readiness level, average value, quadratic mean and representation error.

With passing all tests, student's readiness is calculated; these data are registered in file "MainSheet.xls". Student's P.I.B., points for each test are entered into report; criterion t-student is calculated as well as the levels for all tests at the beginning and at the end of experiment and the difference between them. Besides, statistics is calculated: the quantity of tested students and quantity of gained levels, average value, quadratic mean and representation error.

At the beginning of pedagogical experiment with the students of NPU, named after M.P. Dragomanov 10.13% had high level of professional competence formation, at the end of pedagogical experiment – 18.99% of students had high level; concerning middle level 37.97% had this level at the beginning of pedagogical experiment and 58.23% of students – at the end of the experiment; low level was manifested by 51.90% of students at the beginning of pedagogical experiment and 22.70% - at the end. By knowledge criterion the quantity of high level students increased by 8.86%, middle level – by 20.25%. By knowledge criterion the quantity of students with low level in experimental group reduced by 29.11%.

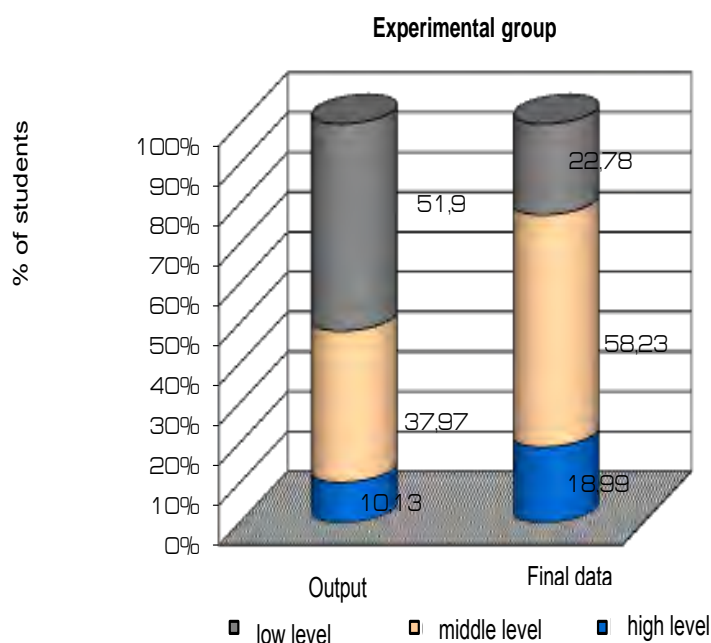


Fig.3 Dynamics of professional competence formation levels by knowledge criterion, manifested by students of NPU, named after M.P. Dragomanov (%)

As per procedural criterion, at the beginning of pedagogical experiment high level of professional competence was manifested by 11.39% and at the end of the experiment – 23.78%; 36.71% of students had middle level at the beginning of the experiment and 58.23% - at the end. Low level was manifested by 51.90% at the beginning of pedagogical experiment and 18.99% - at the end (see fig.4).

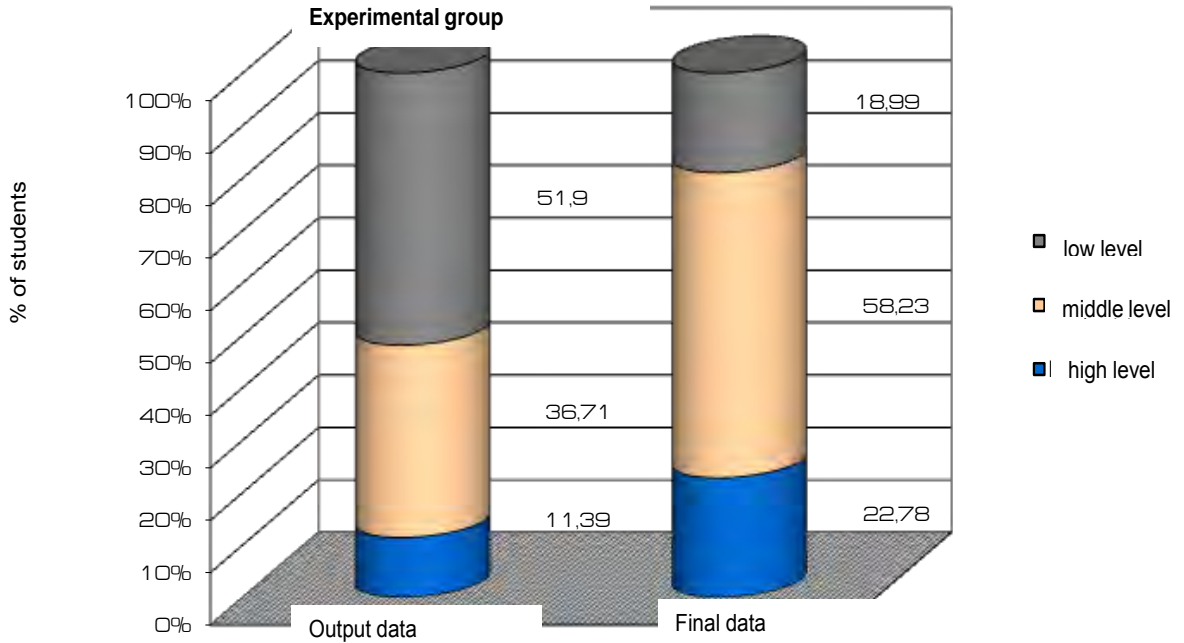


Fig.4 Dynamics of professional competence formation levels by procedural criterion, manifested by students of NPU, named after M.P. Dragomanov (%)

By procedural criterion the quantity of high level students in experimental group increased by 11.39%. The quantity of students, who manifested middle level, increased by 21.52%. By procedural criterion the quantity of students with low level in experimental group reduced by 32.91%. So, as per the results of pedagogical experiment, analysis of professional competence formation levels by procedural criterion witnesses about positive changes in experimental group.

As per communicative criterion, at the beginning of pedagogical experiment high level of professional competence was manifested by 10.13% and at the end of the experiment – 25.32%; 40.51% of students had middle level at the beginning of the experiment and 64.56% - at the end. Low level was manifested by 37% at the beginning of pedagogical experiment and 10.13% - at the end (see fig.5).

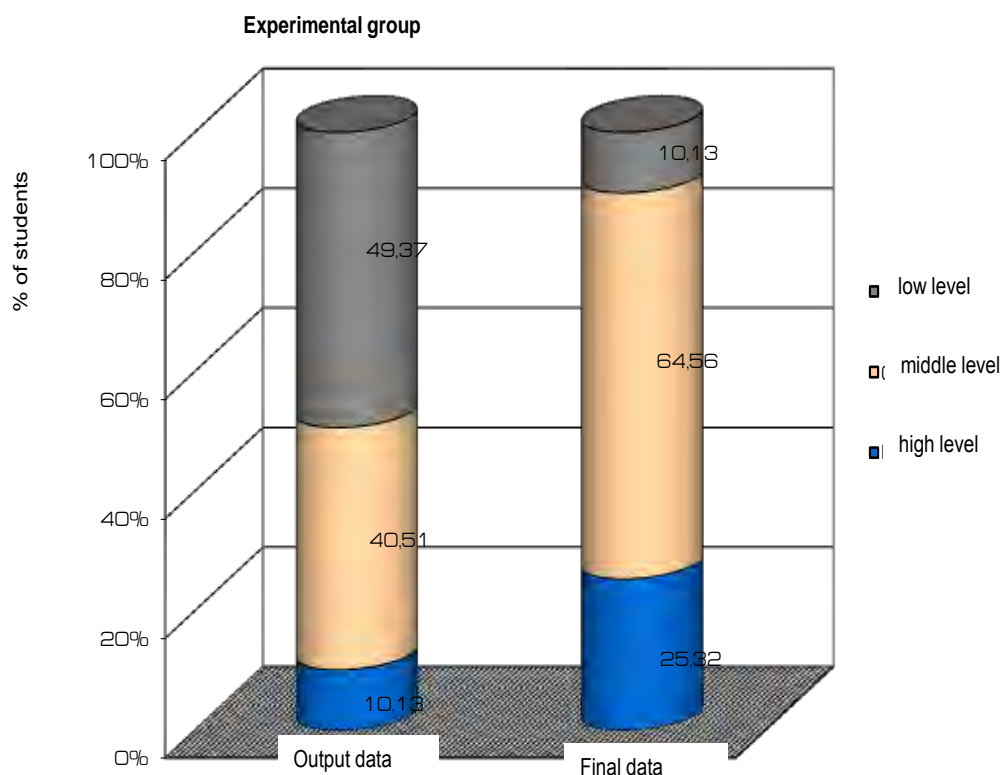


Fig.5 Dynamics of professional competence formation levels by communicative criterion, manifested by students of NPU, named after M.P. Dragomanov (%)

By communicative criterion the quantity of high level students in experimental group increased by 15.19%. The quantity of students, who manifested middle level, increased by 24.05%. By communicative criterion the quantity of students with low level in experimental group reduced by 39.24%. So, as per the results of pedagogical experiment, analysis of professional competence formation levels by communicative criterion witnesses about positive changes in experimental group.

As per organizational criterion, at the beginning of pedagogical experiment high level of professional competence was manifested by 8.86% and at the end of the experiment – 27.85%; 37.97% of students had *middle level* at the beginning of the experiment and 59.49% - at the end. Low level was manifested by 53.16% at the beginning of pedagogical experiment and 12.66% - at the end (see fig.6).

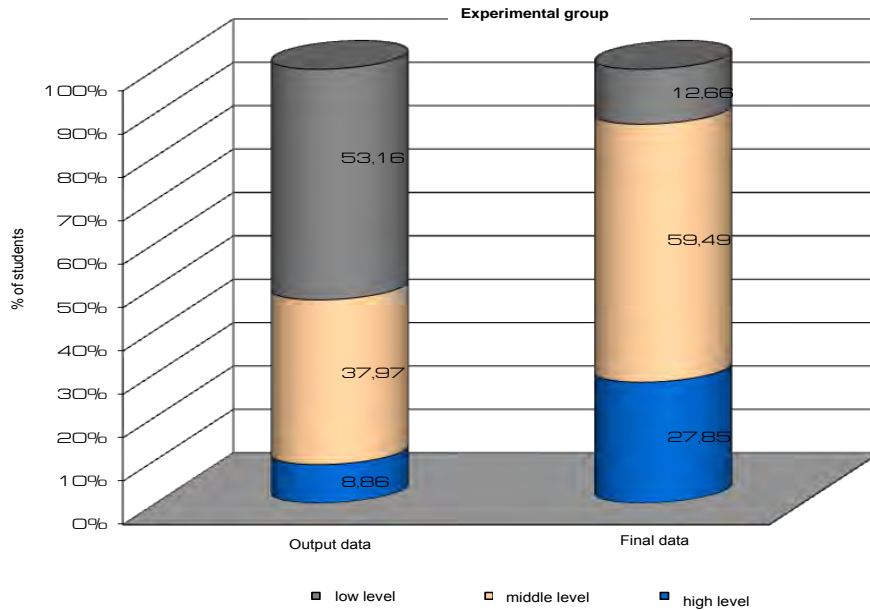


Fig.6 Dynamics of professional competence formation levels by organizational criterion, manifested by students of NPU, named after M.P. Dragomanov (%)

By organizational criterion the quantity of high level students in experimental group increased by 18.99%. The quantity of students, who manifested middle level, increased by 21.52%. By communicative criterion the quantity of students with low level in experimental group reduced by 40.51%. So, we impressed that by the end of pedagogical experiment, we observe positive changes in experimental group as per organizational criterion.

At the beginning of pedagogical experiment high level of professional competence in the process of biological disciplines' studying was manifested by 10.13 % of future physical culture teachers and at the end of the experiment – 23.73%; 38.29% of students had middle level at the beginning of the experiment and 60.13% - at the end. Low level was manifested by 51.58% at the beginning of pedagogical experiment and 16.14% - at the end (see fig.7).

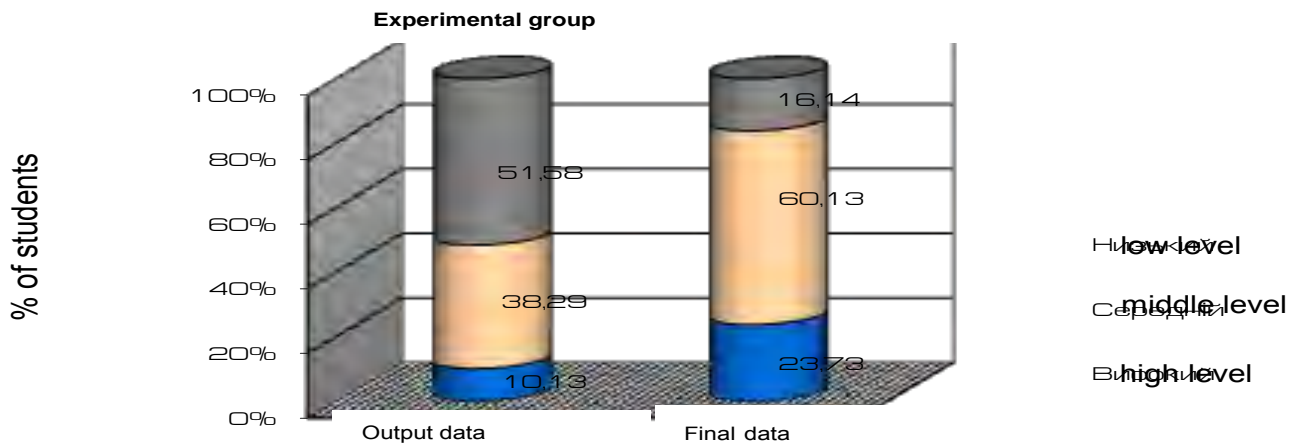


Fig.7 Dynamics of professional competence formation levels, manifested by students of NPU, named after M.P. Dragomanov (%) in the process of biological disciplines' studying

The quantity of high level students - future teachers of physical culture in experimental group, increased by 13.61% in the process of biological disciplines studying. The quantity of students, who manifested middle level, increased by 21.84%. The quantity of students with professional competence's low level of future physical culture teachers in experimental group reduced by 35.44% in the process of study of biological disciplines.

Summary

So, the efficiency of computer program “VSD: monitoring of future physical culture teachers’ professional competence in the process biological disciplines study”, which was developed in co authorship with L.P. Suschenko and

V.A. Didenko has been established. It has also been established that formation stage of pedagogical experiment' results witness about significant positive changes of professional competence formation levels of experimental group students.

The prospects of future researches lie in implementation of dissertation research materials into the practice of educational process at higher educational institutions of Ukraine.

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