TEACHER'S DIGITAL COMPETENCES FOR VIRTUAL TEACHING BEFORE UNDERGRADUATE STUDENTS IN PERUVIAN UNIVERSITIES DURING THE PANDEMIC

Section A-Research paper

TEACHER'S DIGITAL COMPETENCES FOR VIRTUAL TEACHING BEFORE UNDERGRADUATE STUDENTS IN PERUVIAN UNIVERSITIES DURING THE PANDEMIC

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ABSTRACT.

Focusing on professional training to enable competency-based learning during the pandemic has become a challenge for face-to-face teachers. In fact, the role of the teacher is the basis for developing adequate strategies to achieve and implement training based on competencies (concepts, procedures and attitudes); yes you can, but adaptation takes time, and perhaps most importantly, not trying, doing exactly what is done, the will to do it, what it means to adapt, is one of the positive lessons of this crisis. In addition, it is necessary to help students develop their problem-solving skills so that they can act appropriately and effectively in a given situation, which allows teachers to connect their learning and develop teaching strategies that promote learning. The sudden change has made teachers and students aware of the need to stimulate creativity and use digital skills to enable learning, which is not yet used to its full potential as part of the training of university students.

Keywords: competency-based training; digital skills; teaching strategies; new digital teacher.

INTRODUCTION.

The rapid and frightening expansion of the pandemic has had an unprecedented impact on humanity, so much so, that governments adopted actions to implement health emergency measures, restrictions and social distancing to prevent the spread of the virus, as recommended by the World Health Organization (WHO), the Pan American Health Organization and the Ministries of Health of different countries. The adverse effects of the pandemic are devastating in all areas of human life, from physical, psychological, economic, cultural, social and educational health. Coupled with this, the expansion of digital technologies in areas of social, economic and personal life have made digital information skills an important factor for success, not only in the labor market, but also in civic and social life. (Saikkonen & Kaarakainen, 2021).

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During this health crisis that plagues the world, education and training needs must be addressed at all levels, as governments, especially Peru, have taken measures to suspend face-to-face activities in classrooms and comply with the recommendations of the health sector to prevent the contagion and spread of the pandemic. UNESCO (2020a) noted that about 1.2 billion students worldwide are affected by the closure of schools and universities, and educational activities are suspended at all levels, the Ministry of Education (Minedu), has launched the digital teaching platform "Learning from Home", which provides online courses for students with ordinary basic students. Students, as for universities, have established agreements with virtual platform service providers through which students and teachers can continue their professional training.

All this in just six months (teachers and university students), they were forced to change to digital profiles without any excuse to combine their skills with digital ones. We didn't even think it would happen overnight. Also, in the context of the health crisis caused by the pandemic. Then teachers and students go digital, and who would believe this is already happening around the world, even though society is largely unprepared, let alone teachers, students, or families. Of course, digital skills are now fundamental to teaching, as our young people are digital and we find ourselves in situations where children cannot adapt to day-to-day changes as we thought; Because of the use of social networks for leisure and digital socialization, networks are different.

The era of online teaching has arrived, teachers are teaching live broadcasts and students are paying attention in real time. You can't make many connections, and you can't all connect to the same connection, because if the network fails, they can't understand the explanations like other students. One solution is to record the session for later download and viewing; in other cases. According to each entity, a virtual platform is being used. Some are established and known to teachers, families and students, but most only look for links or explanations at specific times. It is not the same to visit an instructor's blog for specific content than to enter a virtual space where you can find all the topics, calendars, forums, chats and work repositories. While it is important to continue to guide students through the classroom lessons and assessments they are preparing for, it is also important to keep students interested in learning by assigning them a variety of tasks to ensure continuity and consistency in learning. (UNESCO, 2020b).

The current education system cannot be understood without competencies in information and communication technologies, which has become more evident through virtualized education during the pandemic. Numerous authors highlight digital skills and the management of technologies as one of the features that characterize a good university teacher (San Nicolás et al., 2012). Programs or applications are increasingly virtual and interactive, which requires specialized training by teachers. The teaching of digital skills is understood as a set of knowledge, competencies, skills and competencies related to the use of technology, applied in educational scenarios and processes to achieve the purposes of professional training. The development of these skills will contribute to the fourth SDG 2030 Agenda: "Ensure inclusive, equitable and quality education and promote lifelong learning opportunities for all"; To achieve this, UNESCO seeks to increase the supply of qualified teachers in developing countries.

There are frameworks for teaching digital skills around the world that serve as a roadmap for the successful integration of technology into a teaching environment. UEP (2017) published the Common Framework for Teaching Digital Competences, a reference framework for diagnosing and improving teachers' digital competences. These digital competencies are defined as competencies that twenty-first century teachers need to develop to improve their educational practice and continuous professional development. The Common Framework of Teaching Digital Competences consists of 5 competence areas and 21 competences grouped into 6 levels of competence management. Each of these competencies provides detailed descriptions and descriptions based on knowledge, skills, and attitudes. The framework is the basis of the Digital Portfolio of Teaching Competences, the digital tool used by INTEF to certify these competences.

UNESCO (2018) published the third edition of the Information and Communication Technology (ICT) Competency Framework for Teachers. It improves the effective integration of ICT in schools and classrooms, can transform pedagogy and empower students. In this context, teachers' competencies play a key role in integrating ICT into their professional practice to ensure equity and quality of learning. Not only is it enough for students to know the basic tools for the search and management of information, but it is essential to develop skills in the proper use of ICT. (Medina Gamero, 2020). Teachers should also be able to use ICT to guide students in acquiring skills relevant to the knowledge society, such as critical and innovative thinking, complex problem solving, collaboration skills and socio-emotional skills. The training of teachers and their adaptation and continuous professional improvement are essential

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to benefit from investments in ICT. Ongoing training and support should enable teachers to develop the necessary ICT skills so that, in turn, they can enable students to develop the necessary skills, including digital skills for life and work.

In Latin America the reality is different and a standard scheme that can be applied at the regional level has not yet been developed, since the technological and generational gaps between the countries that make up the scheme are still very large. However, given the practice of virtualization during the pandemic in different scenarios, Suárez (2021) states that digital teaching competences should be oriented to:

- Computerization and Information Literacy; where teachers more frequently access and manage large amounts of information through computer channels. For this reason, it is important to keep updating your knowledge and discovering new things in the world of technology. In this digital skill, the ability to identify and locate relevant information and develop the teacher's ability to detect the validity of digital content plays a very important role.
- Communication and elaboration; where teachers must learn to communicate and articulate information using the digital tools at their disposal. This digital competence in teaching focuses attention on the creation of networks of knowledge and communication between teachers and students. To achieve this, teachers must develop the skills to create digital content and disseminate it through different networks and platforms.
- Creation of digital content; in this area we find important values such as the creativity and adaptability of teachers, as well as their ability to create, edit, review and integrate content through different digital channels. However, it is important to analyze whether the education system is prepared for the new paradigm presented by virtual teaching. This is where creating new content in a digital environment, it is important for teachers to develop digital creativity in order to learn to build and design teaching methods based on interaction with students. This digital instructional capability focuses not only on the creative process itself, but also on modifying content to suit students' needs. Teaching professionals with a high level of competence in digital content creation will be able to create versatile content that can be adapted and used across different courses, levels and modalities.
- Safety; The teacher should be cautious with the information they post and the information they receive as identity theft creates complications. Therefore, teachers and students must learn to take protective and preventive measures. It involves protecting the physical integrity of electronic devices, personal data, users or the conscious and sustainable use of digital systems.
- Troubleshooting; Teachers must have the training and knowledge to use digital tools, to solve everyday problems and mistakes, and to provide support to students. In addition, their knowledge must be reflected in a better use of technical resources and optimization of time.

The digital competences of teachers (TOC) are a key variable to integrate practices with Information and Communication Technologies (ICT) in the teaching-learning process. Its development has become one of the main training problems affecting the university environment in general. (Cabero-Almenara et al., 2021). The analysis of the influence exerted by new technologies on young people and their potential for employment in the training of university students, makes this research aim to make an assessment of the employment that is made to ICT in the training process in some universities in Peru with emphasis on distance education given the conditions imposed by covid.

MATERIALS AND METHODS.

The objective of this research has allowed to reflect on the lack of mastery of digital skills in teachers for the development of classes in the virtual modality, with a good development of the same and quality in the training of students, for this reason the research methods used consist of:

- Historical-logical: which allowed to determine the antecedents in the formative process of the inclusion of information and communication technologies, as well as their benefit within it throughout the transformations that occurred.

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- Inductive-deductive: which allows to verify the factors raised regarding the research topic in addition to structuring the research profile for its application given the problem in the actions of teachers to achieve a good preparation in ICTs and their application to the training process.
- Analytical-synthetic: to compare all the phenomena involved in the investigation and the causes that originate it.
- Observation: it allows to analyze the existing deficiencies in the use of ICTs within the training process, as a current tool of great importance in the educational teaching process of the new generations.
- Interview: which enables the exchange with managers, teachers and students in order to verify the current situation in the preparation, mastery and application of ICT to the training process within the teaching of students from the various areas and processes.
- Statistical-mathematical: in order to analyze the data collected during the process and the review of documents.

For the development of the research it was necessary to carry out an analysis of the training processes that have the greatest impact on students and from this, make a selection of directors, teachers and students who had a direct action in them. The selection was made, taking into account that the teachers have a similar influence and preparation both in their academic training and in the training process with the students and the mastery of current technologies. The students who participated in the research were selected in correspondence to their preparation, mastery and possession of the technologies and their application for the different actions related to the studies. All this allowed the selection of 9 directors, 16 teachers and 48 students.

RESULTS AND DISCUSSION.

In recent years, universities have detected the need to train people with key or transversal competences that enhance them to adapt to the rapid changes of the 'knowledge society', and help in their learning and self-development throughout life. (Astray et al., 2019). Providing good digital teaching skills both inside and outside the classroom is fundamental, classroom management and active leadership, emotional education, the implementation of positive approaches such as collaborative learning or lifelong learning, are skills that allow describing the purposes of the teacher's digital competence. It is important to know not only what digital skills are, but also why, i.e. what purpose these skills pursue. Therefore, it is necessary to know the roadmap for teachers to acquire teaching digital skills. In this sense, the digital competences of the teacher should not be limited only to the academic or professional field, but also to be part of other areas of our lives.

Therefore, according to Moll (2021), digital capabilities also focus on the following purposes:

- Leisure; refers to using technology for personal or recreational purposes (gaming, reading digital books, watching live web videos, listening to music through digital tools).

- Social; It is the use of digital tools to interact with friends and colleagues (send emails or instant messages, participate in social networks, connect with others through online communities).

- Commercial; Use network resources to buy and sell goods, e-commerce and online consumption.

- I am a student; use lifelong learning technologies (use of reference software when writing a university essay, use of the web to search for information, use of online communities, use and mastery of virtual classrooms such as Moodle).

- Employability; Use technology for different types of jobs (use software to record customer orders and calculate invoices at the bar, use spreadsheets to calculate budgets, understand the wireless configuration of mechanical machines).

- Citizenship; The usefulness of technology becomes an active part of the lives of citizens and the use of services (online banking, electronic administration and electronic commerce).

- Welfare; use technology for health-related purposes (medical consultation) review of web information on health-related topics, use of system log data for physical activity tracking.

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The inexorable development of digital technology and the democratization of the use of the Internet reflect dramatic changes in the environment that are modifying the educational process. Many teachers proactively decide to update themselves to continue preparing students for their world, however, there are also many opposing responses that lead to the rejection of these changes driven by the technification of life and school. According to Blanco and Cuenca (2016) they affirm that, in the digital age, learning styles have changed and, consequently, teaching styles must adapt. This means that both the image of the teacher and the teaching method must adapt to the way knowledge is conceived according to the generational changes and peculiarities of interactive native youth who demand an education adapted to their needs.

In recent years, digital skills have developed rapidly around the world to the extent that tremendous advances in technology, computing, and communications have placed us in a time and space commonly known as the digital age; Without information and communication technology, it is impossible to imagine global development. For Díaz and Loyola (2021), the pandemic generated that teachers and students immediately develop new skills, turning digital competences into an important tool for continuity and development in many areas of human endeavor. But, ultimately, it is not enough for digital teachers to have digital skills, they must adapt to their roles. "The teaching profession is in a period of change" (Area, 2016). Increasing the digital competence of future teachers is indeed a crucial aspect, given the current social and pedagogical scenario. (Meroño et al., 2021).

Given the context of the pandemic, it is important to teach digital skills with the participation of people from different sectors of society: economic, social, educational, etc. (Sá and Serpa, 2020). ICTs have emerged as a form of development with a high probability of success by facilitating greater interaction with students, so they also appear as facilitators to build educational activities and meaningful mechanisms of learning, delivery and evaluation (Zárate et al., 2020). Likewise, Holguín (2021) Research on digital skills of managers and teachers in distance education scenarios due to the health emergency in Peru; concluded that the teachers of the educational institutions selected for the sample had greater competencies in digital skills of the managers; The first area of communication, the collaboration and creation of digital resources stands out. Finally, in the UN report on education policy during COVID-19, it recommends supporting teachers in preparing to ensure equitable and inclusive education in all learning environments.

The exchange carried out with the directors of the institutions showed that they recognize that in the current era ICTs constitute a tool of great importance for social development, which well used within the process of training students, facilitate learning and give them new learning options (Figure 1).
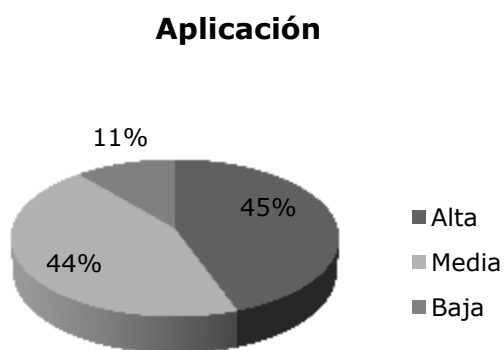

Figure 1. Level of importance of ICT in the training process.

Source: Authors.

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However, it is recognized that managers still have a low mastery of all the potentialities that ICT possesses for its use in the various actions that can be developed with students (Figure 2).
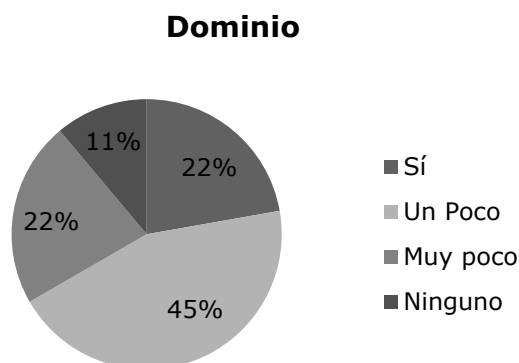
Dominio

Legend:
- Sí
- Un Poco
- Muy poco
- Ninguno

Values shown: 22%, 45%, 22%, 11%

Figure 2. Mastery by managers of the potential of ICT.

Source: Authors.

When analyzing the levels of demand and control that managers have over teachers, so that they increase their levels of preparation in the use of ICT and the use that is made in teaching activities, it is noteworthy, as this does not constitute an element of high follow-up by them, but the subject is treated within the orientations that are carried out and the process is more to spontaneity by teachers (Table 1).

Table 1. Managers who demand and control the use of ICT in classes with students.

Yes	Sometimes	Very little	No
1	5	2	1

Source: Authors.

From the interview with the managers it has been possible to determine:

- Managers have little knowledge of all the potentialities offered by information and communication technologies, for use in the process of training students
- The use of ICT is not an element of demand within the educational teaching process in universities but is more to the spontaneity of teachers
- The conditions imposed by the effects of covid have been more affected in the development of distance teaching, since the use of ICT has not been an aspect of marked and widespread interest within the teaching-learning process
- The lack of mastery by ICT managers in all their potential has limited the effective development of the training process in the circumstances imposed by covid.

Similar behavior can be seen in the teachers, in whose interview, it could be evidenced the little mastery of the potentialities that ICT possesses, for its efficient use within the classes, so that it contributes to the formation of students (Figure 3).
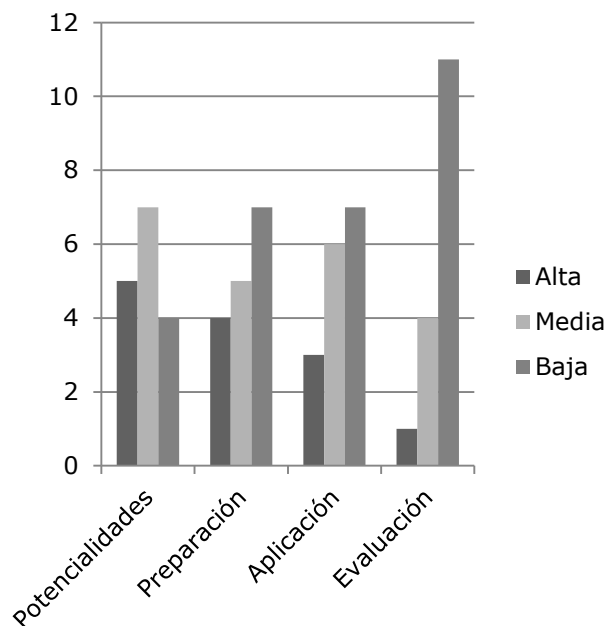
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Figure 3. Domain and use by ICT teachers.

Source: Authors.

It is evident that the lack of knowledge on the part of teachers of all the potentialities that ICT possesses for the development of the student training process has made few interested in achieving greater preparation in this regard. The preparation and knowledge that most possess, are based on the elements related to the Office package, which facilitates the writing of works with better quality and the search for information through the use of browsers, to expand certain knowledge through the use of the internet.

In line with this, the use of professional software, of own elaboration, of specific sites in academic information, the works destined to the elaboration by the students of this type of options within the technologies or other more advanced variants is limited. At the same time, it is recognized that on a very small scale, ICT is used as a way to carry out evaluations to students, which promote distance exchange between teacher and student, the recovery of teaching activities and the development of new evaluations as a way to reevaluate some activity in which the student has failed.

The analysis of the areas of knowledge that employ the greatest number of activities, in which the use of technologies is required, showed a higher level in the exact sciences, with the humanities being the laggards in this regard (Figure 4). In all cases, however, the limitation on the large-scale implementation of these activities in distance learning and evaluations remains.
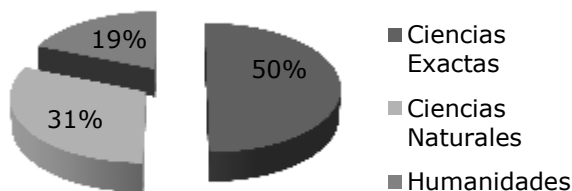
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Aplicación

Figure 4. Use of ICT by branches of science.

Source: Authors.

From the interview with the teachers, it was possible to verify:

- The knowledge that teachers have about the different potentialities of ICT for their use in the training process of students is insufficient
- The preparation that teachers have on ICT is low, it is given mainly in the use of operating systems, office package and internet browsing
- There are few activities that are oriented to students making efficient use of the potential of ICT.
- ICTs are not generally used as forms of student assessment, nor do they foster exchange between students and teachers.
- There are few professional softwares that are used within the training process of the different careers
- Teachers of exact sciences are those who use the potential of ICT on a larger scale
- The current use of ICT still limits the training of students in distance education, mainly in the conditions imposed by covid, where they play an important role in the training process.

Similar results were evidenced in the interviews with the students, with the difference that they have a greater knowledge and mastery of ICT and its potential, showing ample opportunities for its use as ways to expand knowledge. When referring to the knowledge of the potentialities of ICT, the results obtained are reflected in Figure 5.

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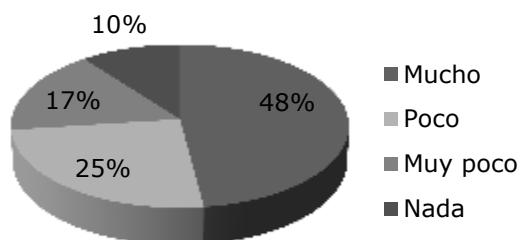*Section A-Research paper*

Potencialidades

Figure 5. Knowledge of the potentialities by the students.

Source: Authors.

The largest number of students has somehow reached a broad level of preparation in the domain of ICT, its different applications and various forms that can be used for the development of academic or other activities, which can enhance their training and facilitate in some cases their social life (Figure 6).
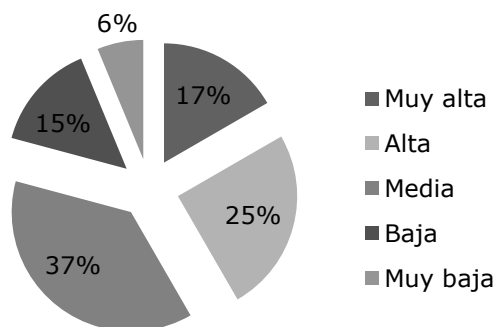
Preparación

Figure 6. Level of preparation of students in ICT.

Source: Authors.

Students consider that the materials they have for study activities through the use of ICT are insufficient to have a good preparation even more in the conditions imposed by covid, where students have very little direct exchange with teachers, they require the support of technologies and materials they have in digital. The most used applications and

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systems are those established for messaging and mail communication, so it is not always feasible to exchange and clarify the difficulties they present in the contents (Figure 7).
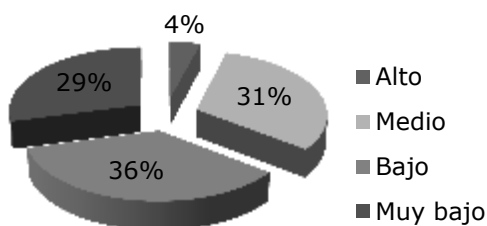
Intercambio

Figure 7. Current level of exchange between students and teachers through ICT.

Source: Authors.

Students consider that, through the use of technologies in the training process, they can achieve greater learning, in a dynamic and interactive way, more motivating and facilitating the updating of contents, depending on scientific-technical advances.

From the interviews conducted with the students, it was possible to determine:

- In the training process, ICT is currently very little used in all its potentialities, so learning through this modality is not favored
- Students have a greater mastery of ICT than teachers, which limits the development of teaching activities through these pathways
- The full potential of ICT in the training process is not exploited, which limits learning in the conditions imposed by covid.

The advances achieved in information and communication technologies make the training processes of university students require greater use of their potential. For the achievement of a higher quality in this process, it is necessary that teachers have a greater preparation in the use of them and the mastery of their potentialities. To achieve progress in this regard, a set of actions to be developed by managers is proposed, so as to favor the quality of the training process:

- Carry out a diagnosis of the main information and communication technologies that can favor the teaching-learning process in careers
- Determine the potential of ICT in terms of its use in the process of training students
- Carry out a diagnosis of teachers' mastery of ICT and their skills for employment in the training process
- Develop activities to prepare teachers in the use of ICT
- Carry out activities with teachers that serve as modeling for the use of ICT in classes with students
- Develop and socialize guidelines on the use of ICT in different subjects
- Increase the use of distance activities by modality that favor individual exchange between teachers and students
- Implement the use of ICT as forms of learning assessment in the different subjects of the learning process.

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CONCLUSIONS.

- The democratization of digital technologies and the use of the Internet has resulted in the digitization of most human behavior in one form or another. Young digital natives develop in a digital environment, so teachers must adapt to their way of behaving and conceiving learning, in that sense, teachers must also be digitally competent.

- Teaching methods must be adapted to the new environment, teachers have the challenge of acquiring knowledge, skills and digital attitudes that can motivate students not only in the classroom but also at home and socially, an aspect that is currently still limited.

- In the stage affected by the pandemic, teachers have managed to develop digital skills and literacy, so it is essential to implement a comprehensive skills development plan as a strategy to achieve quality teaching in the context of the pandemic and post-pandemic.

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