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THE ROLE OF VOCATIONAL TRAINING IN KNOWLEDGE INTENSIVE BUSINESS SERVICES

(Main conclusions)

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RESUMEN

En el modelo económico global el sector servicios continua ganando terreno al manufacturero y fenómenos como la integración de nuevas tecnologías en los procesos productivos avanzan inexorablemente. Las economías avanzadas se ven obligadas a especializarse apoyadas en sus sistemas regionales de innovación y las ciudades emergen como focos de actividad centrales y estratégicos. En esta dinámica los servicios avanzados (SSAA) se presentan como una actividad prioritaria por su capacidad para promover la innovación dentro del tejido productivo regional dentro de las estrategias de especialización inteligente y en especial en el impulso de la manufactura avanzada, la generación de empleo de calidad y el estímulo del crecimiento económico especialmente en entornos urbanos. Es por ello que el desarrollo de talento para poder responder a la demanda de empleo de estos SSAA se convierte en imprescindible en cualquier ciudad que priorice este ámbito en sus estrategias de desarrollo.

En paralelo los sistemas de formación profesional (FP), como el vasco, han desarrollado sus máximas fortalezas en el ámbito de las familias profesionales y comarcas más industriales. Por ello, la FP parece obligada a adaptarse a este nuevo escenario en el que sobresalen los SSAA y las ciudades para continuar manteniendo su nivel de excelencia.

Los SSAA han sido largamente estudiados pero hasta el momento nadie se había planteado las siguientes cuestiones: ¿Cuál es el rol de la FP en los SSAA? ¿Son y serán relevantes las personas con estudios de FP en los SSAA? En el presente estudio se mostrará una tendencia incipiente en el mercado laboral. Se trata de la creciente relevancia de los perfiles tecnológicos con estudios de FP en los SSAA, especialmente en los SSAA de tipo tecnológico. Los perfiles tecnológicos de FP pueden consolidarse como uno de los agentes implementadores principales de la transformación digital (ciberseguridad, blockchain, computación en la nube, diseño UX, inteligencia artificial, computación científica…). Para ello, la hibridación con otros campos de conocimiento pero también con estudios de otro tipo como los universitarios puede ser fundamental.

LABURPENA

Zerbitzuen sektorea manufakturari gailentzen ari zaio egungo eredu ekonomikoaren baitan eta ekoizpen prozesuetan teknologia berrien txertaketa handitzen ari den joera bilakatu da. Ekonomia aurreratuenak, euren erregio mailako berrikuntza sistemetan oinarritu eta espezializatzera behartuta daude. Hiriak erdigunean dauden eta estrategikoak diren foku bilakatu dira. Dinamika honen baitan, zerbitzu aurreratuak lehentasunezko jarduera dira. Batez ere, espezializazio adimendurako estrategien baitan lurraldeko ekoizpen ehunaren berrikuntza bultzatzeko duten gaitasunagatik (manufaktura aurreratuan, kasu), kalitateko enplegua sortzeko iturri direlako eta hiri inguruneetan garapen ekonomikoa sustatzeko duten ahalmenagatik. Hori dela eta, jarduera hau lehentasunezkotzat jotzen duen edozein hiritan, zerbitzu aurreratuetan jarduteko talentuaren garapena ezinbesteko bilakatzen da.

Bestetik, lanbide heziketa sistemen indarguneak, euskal kasuan adibidez, industriari loturiko lanbide-arlo eta eskualdeetan garatu dira. Hori dela eta, LH zerbitzu aurreratuak eta hiriak gailentzen diren errealitate berrira moldatu eta bikaintasun maila mantentzeko erronka agerikoa da.

Zerbitzu aurreratuak aspalditik ikertu izan dira baina honako galderak ez dira planteatu orain arte: zein da LHren rola zerbitzu aurreratuetan? LHko tituladunak garrantzitsuak dira edo izango dira zerbitzu aurreratuetan? Txosten honetan hasiberria den joera bat erakusten da: LHk dituzten profil teknologikoek zerbitzu aurreratuetan duten eta handitzen ari den gailentasuna. LHko profil teknologikoak eraldaketa digitalaren inplementaziorako eragile bilaka litezke (zibersegurtasuna, blockchain, lainoko konputazioa, UX

diseinua, adimen artifiziala, konputazio zientifikoa, etab.). Horretarako, beste ezagutza esparru edota ikasketa motekin –unibertsitatea kasu- hibridazioa giltzarria izan liteke.

ABSTRACT

In the global economic model, the service sector continues to gain ground on the manufacturing sector and trends such as the integration of new technologies into production processes are advancing inexorably. Advanced economies are pushed to specialise, supported by their regional innovation systems, and cities are emerging as key and strategic centres of activity. In this context, Knowledge Intensive Business Services (KIBS) are presented as critical due to their capacity to promote innovation within the regional productive fabric and smart specialisation strategies, the promotion of advanced manufacturing, the generation of quality employment and the stimulation of economic growth, especially in urban environments. This is why many cities, prioritizing KIBS to stimulate their economy, need to create and retain talent for this sort of industry.

Likewise, vocational and education training (VET) systems, such as the Basque VET system, have so far developed their greatest strengths in the field of manufacturing knowledge.. Due to this, VET seems to be obliged to adapt to this new scenario, in which KIBS and cities stand out, in order to continue to maintain their level of excellence.

KIBS have been extensively examined, but until now no one had posed the following questions: What is the role of vocational training in KIBS? To what extent are VET profiles (and will VET profiles be) relevant in KIBS? This study will show an emerging trend in the labour market. This is the growing relevance of technology profiles with VET background in KIBS, especially in technology-based KIBS. VET technology profiles can be consolidated as one of the main implementing agents of the digital transformation (cybersecurity, blockchain, cloud computing, UX design, artificial intelligence, scientific computing...). To this end, hybridisation with other fields of knowledge but also with studies of other kinds such as university studies may be essential.

1. INTRODUCTION

Bilbao, through Bilbao Ekintza, aims to promote its socio economic development, contribute to the urban and regional smart specialization strategy, position itself internationally and improve the life of its citizens, and has committed itself to providing Knowledge Intensive Business Services (hereinafter, KIBS) as its main driver for growth. Within this vision, this Orkestra's report gathers the conclusions of the analyses carried out on the role of Vocational Education and Training (hereinafter, VET) and its potential within KIBS.

Orkestra's analysis and the current report is part of an action research process that began in mid-2018. They highlight a number of issues. First, it should be noted that, due to their symbiotic nature with urban environments and their capacity to boost regional development, KIBS are a key type of activity for the economy of the future. Second, the occupational structures related to KIBS have not been analysed in sufficient detail. While there is extensive literature on KIBS in areas such as innovation, less focus has been placed on understanding how employment is structured internally according to types of occupation in KIBS. If, in addition, the focus is on VET, the references are non-existent since there are currently no academic publications or research focused on this connection, which has traditionally been associated with university studies. Bridging this gap, the analysis of occupational structures in KIBS allows the development of policies aimed at promoting these services, since there is basically a direct connection between occupations and the skills provision system. This makes it possible to work on adjusting business needs to the current evidence-based range of training and skills development programmes. Finally, the Basque Country has one of the most dynamic and innovative VET systems at EU level, which has stood out to a larger extent in the manufacturing rather than in the services sector. However, at present, it would be a mistake to consider VET as a traditional learning environment. Thanks to a variety of initiatives and programmes, it is being consolidated as a flexible learning space, capable of adapting to business needs more quickly than its "big brother", university. All these issues have been addressed to conduct this report.

A wide range of actors have taken part in the aforementioned action-research process, such as: the Basque Government's Vice-Ministry for VET; Lanbide, the Basque Employment Service; GAIA, the Basque cluster of knowledge-based companies; companies in the field of KIBS and VET centres in the Greater Bilbao area. This report, beyond the analyses carried out by Orkestra, includes the knowledge co-generated in this multi-actor space and, in turn, it provides further input to continue facilitating the co-generation process.

2. THE FEASIBILITY OF VET WITHIN KIBS. THE CASE OF THE BASQUE COUNTRY AND BILBAO

The production system is currently undergoing a period of change; the services sector continues to gain ground on the manufacturing one and a set of phenomena such as digitisation, automation and the integration of new technologies into production processes are advancing inexorably. Advanced economies are forced to specialise, supported by their regional innovation systems, and cities are emerging as central and strategic focal hubs of activity. In this fast-moving context, Knowledge Intensive Business Services (KIBS) are presented as a priority activity due to their capacity to promote innovation within the regional production fabric related to smart specialisation strategies or the promotion of advanced manufacturing, the generation of quality employment and the stimulation of economic growth, particularly in urban environments.

KIBS benefit from urban features to succeed, that is: they attract highly qualified and specialised labour, tend to be based in well-connected locations both a regional and global level, take advantage of the concentration of other types of actors such as business organisations, training providers, public administration, chambers of commerce, media, etc. and generate direct quality employment and indirect employment. Furthermore, KIBS are a key area of activity for Bilbao as part of the Basque Country's smart specialisation strategy, but also within a wider territory of an industrial nature that includes Autonomous Communities such as: Navarre, the north of Castile and Leon, La Rioja, Cantabria and Aragon. Taking this broad territorial environment as a reference, Bilbao aims to become a hub of excellence in knowledge and skills and training, taking advantage of the regional manufacturing and services sectors to develop high quality consultancy in areas such as the application and deployment of new technologies, engineering, architecture, design, innovation, etc.

The Basque Vocational Education and Training system has so far developed its greatest strengths in the field of professional families and more industrial regions. The change in the production model and its subsequent change in the demand for skills and new competences means that the education system must be effective in increasing workforce participation. Therefore, Vocational Education and Training (VET) seems to be compelled to adapt to this new scenario in which KIBS and cities stand out to continue maintaining their level of excellence.

On the basis of the above, the feasibility of VET profiles within KIBS as a strategy for developing talent in Bilbao has been analysed and it has led to the following conclusions.

Importance of KIBS in the current economy and as a driver of development in Bilbao

- Since 1990, employment in the services sector in the Basque Country has grown from 51% to 71%. Within the services sector, KIBS are the greatest driving force in the current economic model. Economic forecasts indicate that economic development will be closely linked to their development.

- The role of KIBS is especially important in advanced regions such as the Basque Country, where competitiveness increasingly depends on the knowledge provided by highly specialised providers. Their main assets are: providing research or design services such as infrastructure, engineering or design for new products or services; developing and enabling the implementation of technological innovation; the same applies for organisational innovation, for example, through the reorganisation of value chains in production or marketing in corporate customers; offering strategic knowledge of market development and acting as nodes of connection with international environments and markets; providing legal services, for example, related to the organisation of intellectual property or of a fiscal nature, or on acquisition for a corporate customer, etc.

- The relevance of KIBS is not only based on their capacity to boost territorial development and the dynamics of innovation and globalisation; forecasts indicate that the number of people working in KIBS will increase. According to Futurelan, almost 50% of employment under KIBS will be replaced in the Basque Country. The

activities with the greatest need for replacement will be Telecommunications (66.8%), Research and Development (63.6%) and IT (62%).

- Half of all the KIBS (55%) in the Basque Country are located in its three capital cities: Bilbao, San Sebastian and Vitoria. This confirms that urban environments are their natural location and that these activities are very sensitive to the positive effects of agglomeration economies. The transmission of information and the access to qualified labour are two basic requirements for the development of KIBS. The combination of competition, cooperation and sharing of information to enhance productivity and innovation, largely favours KIBS.

- The fact that KIBS are activities that are very sensitive to agglomeration economies positions Bilbao and its metropolitan area as a potential strategic axis for their development. Bilbao and the Greater Bilbao area are home to 27% and 45% of all KIBS establishments in the Basque Country, respectively.

- If a wider geographical area than the Basque Country is taken as a reference (Basque Country's neighbouring provinces), the province of Biscay comprises the largest number of KIBS. Specifically, it has 83,532 establishments compared to 54,278 in Gipuzkoa, the next most important province.

Occupations held by VET graduates in KIBS in Bilbao

- According to the 2011 census, 21% of the workforce in KIBS have VET qualifications, 5% at intermediate level and 16% at higher level. This has been the case over the last 8 years and the labour market has changed during this period. In this regard, forecasts indicate that the level of hiring of this type of profile is increasing and furthermore, other analyses carried out by Orkestra reveal that the Basque labour market presents a high level of over-qualification (1.51 compared to the European average of 0.84). This shows that there are jobs that are currently filled by university graduates that could potentially be filled by VET graduates.

- At present, if we divide KIBS into technological, professional and other services, it is the Technological KIBS (T-KIBS) that employ the greatest number of VET graduates, 47%. This is followed by Professional KIBS (P-KIBS) (34%) and, finally, other types of services (19%). In this regard, it should be recalled that the number of establishments providing T-KIBS is much lower than those offering P-KIBS. In Bilbao, T-KIBS account for 8% of the total number of establishments compared to 80% of those providing P-KIBS. Therefore, it can be said that the importance of VET graduates in T-KIBS is much greater than that in P-KIBS.

- The occupation most in demand among VET graduates within the group of KIBS is that of Information and communications technology technicians (according to the Spanish Occupational Classification- CNO No. 38), which accounts for 29.2% of all VET graduates. The second most relevant occupation is Science and engineering technicians, with 10%, and the third is Other administrative employees without customer service tasks, with 9%. Among the three, they account for almost 50% of the VET graduates in KIBS.

- If occupation is analysed at a higher breakdown level for T-KIBS, the following results can be observed: the category Information and communications technology (ICT) technicians has the greatest presence and brings together more than half of the VET graduates who work in them (53%). Within this category, two sub-occupations stand out: Computer programmers (43%) and Web technicians (26%). This is followed by Workers specialised in electricity and electrotechnology (12%). Within this occupation, installers and repairers of information and communication technologies are underemployed (74%).

- Regarding P-KIBS, none of the occupations held by people with a VET background exceeds 20%. The most widely represented are: Other administrative employees without customer service tasks and Science and engineering technicians, both reaching 18%. In third place, we find Employees in accounting and financial services, and Production and transport support services (12%), where the Accounting employees occupation stands out

significantly, representing 96% of the total. It is observed that administrative functions have much more bearing in this type of activities.

- In the case of other KIBS, the participation of VET graduates offers a less specialised and lower value-added hiring pattern than those provided in T-KIBS and P-KIBS. The main occupations held by VET graduates in this area are related to cleaning and security tasks. These two types of activities account for 35% VET graduates in KIBS. In addition, other KIBS have the lowest number of graduates, which positions them as a type of KIBS with less strategic value.

- Some Spanish occupational categories at two-digit level can be found in different types of KIBS (Technological, Professional or Other types) but vary when examined at three-digit level. Thus, while in the T-KIBS the main occupation held within the Science and engineering technicians category is Technicians in physical and chemical sciences with 21%, in P-KIBS it is Draughtsmen/women and technical designers with 59%. This means that both breakdown levels must be taken into account if the type of employment required for each type of advanced service is to be known in depth.

- The analysis has shown that there are 13 professional families in VET that support KIBS. However, it is noteworthy that 4 of the 5 main occupations (60% of all VET jobs in KIBS) are mainly supported by a single professional family.

- Within T-KIBS, demand by type of occupation is less dispersed. In Spain's National Classification of Economic Activities (CNAE), category 62 (Programming, consultancy and other IT-related activities) the occupation Information and communications technology (ICT) technicians brings together 75% of the VET graduates employed in it. In the remaining CNAE categories, within the T-KIBS, there are always two outstanding occupations that bring together the majority of VET graduates. In both P-KIBS and other KIBS, the percentage weight of occupations is divided into a greater number, although in many cases there is one occupation that stands out above the rest.

- Information and communications technology (ICT) technicians are not only the occupation with the greatest demand, but also the most transversal one, which comprises the greatest number of activities. On the contrary, the second most demanded occupation, Science and engineering technicians, is much more specific regarding the activities in which it is demanded. Administrative occupations are more relevant in P-KIBS (Financial services, insurance, accounting, etc.), although they present a significant level of transversality.

- The survey of employers provides a complementary view to the data on Lanbide's VET graduates, based on the Spanish Occupational Categories (CNO). It reveals that the main occupations held in companies are programmers, web and ICT technicians, clerical staff, Installers, draftsmen/women, and maintenance technicians. There are differences in terms of working conditions and the possibilities of internal promotion offered by each of them. Technological occupations are those that have the greatest relevance in companies and offer the greatest possibilities for professional development.

- In general, companies show a high degree of satisfaction with the knowledge acquired by people with a VET background during their training stage, although excellence is not achieved. In this area, administrative occupations are the least valued. One aspect that has been enhanced by some of the employers interviewed is the adequacy of the skills acquired by VET students to meet business needs. This fact stands out as an asset compared to people from the university sphere.

- The data show that technological occupations and technical draughtsmen/women provide added value to KIBS. These two occupations, as shown in the Lanbide survey, employ the greatest number of VET graduates. On the other hand, there are electronic occupations (which correspond to installation and maintenance) and those of an administrative nature. The level of relevance within companies corresponds to the wage level. According to the survey of Lanbide graduates, for example, Information and communications technology (ICT) technicians

earned 12,000 euros net in their first year of employment, as compared with Other administrative employees without customer service tasks, who earned 9,000. This shows that the wage level in these occupations is close to the legal minimum wage.

- The starting salary is important and of course arguable regarding the wage level but the possibilities for professional development are also a key aspect in understanding the relevance of any occupation. In this regard, both technological occupations and technical draughtsmen/women and designers are the categories that allow to develop a career in KIBS businesses to a greater extent. Both the survey and discussions with employers reveal that Administrative and Electronic occupations offer much more limited possibilities for career development.

Technological profiles in VET are strategic within KIBS

- Technological profiles are in demand, particularly in T-KIBS, but are also in demand in other KIBS. Moreover, they provide the greatest added value within companies. Employers, through in-depth interviews, have stressed the fact that these profiles are increasingly relevant within companies. In this regard, they have reported that there has been an internal evolution within companies. Until now, technological profiles were only filled by people with university studies, but given the scarce number of this type of profile, they have been forced to employ VET graduates to fill some jobs. This has enabled them to discover that the profiles with a VET background are capable of successfully performing certain jobs. In this regard, VET centres have reported that the professional family of IT and communications, after a few years in which enrolment fell, has picked up again. They state that they have overcome a stage in which technological infrastructure was deployed and implemented and is now moving towards the generation of value in companies. It has gone from "wiring and installing equipment and programming carelessly" to having greater relevance in corporate production processes. This has led to an increase in enrolment.

- Furthermore, the data on occupations and the transversality observed in technological profiles in KIBS allow us to foresee the increasing growth of hybrid profiles that combine IT and administrative knowledge (in fields such as ERP and CRM) as well as industrial knowledge, although basically, this second profile is perhaps closer to the manufacturing field (Industry 4.0) than to that of KIBS.

- There is another trend that can be observed within KIBS that shows that this type of profile will become increasingly important. P-KIBS are becoming more technological and entering fields such as cyber security, Insurtech, Fintech, CRM, etc.

- In general, taking into account all the contributions received for this report, a trend in the labour market can be seen. Technological profiles in VET can be consolidated as one of the main implementing actors of digital transformation (cybersecurity, blockchain, cloud computing, UX design, artificial intelligence, scientific computing...). To this end, as mentioned in the previous point, hybridisation with other fields of knowledge and with other types of studies, such as university studies, may be essential. The future of VET will be one ideally adjusted to KIBS and intertwined with university studies.

- However, this fact should not overshadow the potential for other types of VET occupations in KIBS, such as those of an administrative nature. Although they do not currently have the same status as technology, they are a fundamental part of P-KIBS, which are by far the most numerous. In Bilbao, specifically, they account for 80% of the total number of P-KIBS.

KIBS and VET Ecosystem

- 75% of the companies participating in the survey indicate that they maintain or have maintained, in the near past, relations with VET centres, compared to 25% who say they have not. Among those that do, the main contact is with Workplace Training. Dual Vocational Training is a relatively widespread form of collaboration (32%), as is participation in employment exchanges (25%) in VET centres. The rest of the options proposed, such as participation in training for employment, discussion forums or through support for production, are of a minority nature.

- The channels of communication between both systems are generally informal. Employers and most of the vocational education centres report that information on new market trends is exchanged on a timely basis. In this type of information exchange, information related to the needs of VET centres and new market trends is transferred. In the case of some employers, this relationship went beyond mere informal meetings and they participated in forums, meetings and other types of formal meetings. In general, the information from the companies is not captured and processed in a systematized way, and subsequently it is not recorded either. In this regard, it should be considered that if the information obtained by each centre can be valuable, the information captured by all and shared would multiply its value.

- One of the great assets of Basque VET has been its involvement with the industrial fabric and in the regional reality. This permanent dialogue, both on an informal and daily basis, and with official bodies, has made it possible for both systems to grow through different channels such as: training for employed and unemployed people, collaboration in applied innovation programmes, identification of training needs and development of specialisation courses, among others. In this regard, the centres interviewed, all in the Greater Bilbao metropolitan area, consider that in this area it may be more complicated to develop lasting relations with the ecosystem (companies, associations…) as opposed to other types of municipalities where proximity facilitates meetings. It seems that the familiarity and proximity of the metropolitan area for the centres in Bilbao is blurred, making certain types of synergies with the ecosystem difficult. In any case, although organisations, companies and personal contacts are more dispersed in Greater Bilbao, the number of opportunities is also greater, so it seems necessary to generate channels and spaces of communication that facilitate these meetings.

- 89% of the participating companies have revealed that their workforce actually participate in training actions, 97% per cent of which do so through private providers. Only 15% use VET centres as a provider. One of the main ways of financing VET centres for employed people is through vocational training quotas contributed by companies and workers to the Social Security. 82% of the participating companies use this modality when developing internal training. This offers an opportunity for VET centres to become providers of this type of training. Unfortunately, KIBS providers do not seem to consider VET centres potential training providers. The relevance of this type of training is gaining in importance as the pace of changes taking place in the labour market as a result of technological advances demands frequent updating of knowledge and skills, and therefore, the role of the centres here may be key.

- In general, there is room for improvement in the connection between VET centres and KIBS companies. No vocational training for employment associated with them is developed, collaboration in innovation projects is still limited, as well as participation in forums for information exchange. VET centres, within the ecosystem, stand out as particularly interesting to develop initiatives or improve the relationship with universities.

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