International Journal of Contemporary Management
Volume 17 (2018) Number 4, pp. 109–132
doi:10.4467/24498939IJCM.18.039.10025
www.ejournals.eu/ijcm

INTELLECTUAL CAPITAL REPORTING OF UNIVERSITIES – A THIRD MISSION ORIENTED APPROACH TO COMMUNICATION WITH STAKEHOLDERS

*Justyna Fijałkowska** http://orcid.org/0000-0002-4236-1491
*Dominika Hadro*** http://orcid.org/0000-0001-7904-7685

Abstract

Background. Universities worldwide have been called to (re)consider their role in society; to evaluate their mission and their interrelations with various stakeholders. At the same time they are going through transformation aiming to make them more autonomous, economically efficient and competitive. Both this reasons lead to the pressure on universities to prove their efficient resource management that may be realized via intellectual capital disclosure.

Research aims. The objectives of this paper is to present the 'third mission' approach adoption of universities imposing on them the need for greater accountability, transparency and more effective communication that may be realized via IC reporting, the second is to review and discuss the qualitative and quantitative empirical research in IC reporting of universities worldwide.

Methodology. The research method consisted in a critical literature and inductive reasoning. The resources theory, stakeholders' theory, legitimacy theory, and signaling theory as well as the New Public Management (NPM) and post-NPM concepts gave the foundation of this research.

Key findings. The conclusions of the research confirm that the implementation of IC reporting in universities is still a challenge for practice. IC disclosure lags behind the needs of stakeholders and should be improved. Greater awareness and effective implementation of IC reporting in universities could improve their future potential, quality and competitiveness.

Keywords: intellectual capital, reporting, third mission.

JEL Codes: I20, I29, E22, M49

* Faculty of Management, University of Social Sciences, Sienkiewicza 9, Łódź 90-113, Poland. E-mail: jfijalkowska@san.edu.pl

** Faculty of Economic Sciences, Wroclaw University of Economics, Komandorska 118/120, 53-345 Wrocław, Poland. E-mail: dominika.hadro@ue.wroc.pl

INTRODUCTION

Universities play a central role in the development of societies across the world with their teaching and research missions for centuries (Olcay & Bulu, 2017). While engaged in this historic missions universities increase the education level of the society, extensively contribute to the development of knowledge and technologies. Although teaching and research are important objectives, the scope of universities is much wider (Sánchez et al., 2009). As it is underlined by Secundo et al. (2017, p. 229): "since the 1990s, European universities have moved from focusing exclusively on the two core missions, teaching and research, to gaining a leading role in economic growth and regional development". This movement has been frequently described as the "third mission", that is concerned with the "generation, use, application and exploitation of knowledge and other university capabilities outside the academic environment" (Molas-Gallart et al., 2002, p. 2). Given the significant role of universities in the realization of the third mission, the effective communication with the wide range of their stakeholders has become crucial. One of the important ways of the disclosure of information concerning the universities outcomes and performance is Intellectual Capital Report (ICR).

The objective of this paper twofold; on one hand, to present the 'third mission' approach adoption of universities imposing on them the need for greater accountability, transparency and more effective communication, that may be realized via IC reporting, the second is to review and discuss the qualitative and quantitative empirical research in IC reporting of universities worldwide.

The resources theory, stakeholders' theory, legitimacy theory, and signaling theory as well as the New Public Management (NPM) and post-NPM concepts gave the foundation of this research. It also falls in line with the call of Bisogno et al. (2018) that 'IC in education needs to expand its boundaries so it does not lose its relevance, and thus be able to contribute to wider policy debates'.

Universities are considered to be key agents of economic and social progress. This paper contributes to IC literature by discussion on the third mission approach application by universities and the comparison of IC voluntary disclosure practices by universities. It provides an insight into the findings of early adopters of the IC reporting concept in universities from eight different countries worldwide.

The analyzed IC reporting practices may have two main practical implications: they may be used as an internal management tool, aiming at improving the performance of universities' management processes and may play a role of the external accountability tool, legitimizing the universities' activities and outcomes. The results of comparison of practices give important directions for future development of the concept of IC reporting by universities.

THIRD MISSION OF UNIVERSITIES

Universities have been called to (re)consider their role in society; to evaluate their mission and their interrelations with various stakeholders, as well as their contribution to democratic and sustainable society. Higher education is interacting with an increased number and variety of communities and each of these has its particular demand on the higher education sector (Jongbloed et al., 2008). Universities are supposed to foster progress, build social capital, prepare students for outside realities, provide access to knowledge, and extend the bounds of justice. Many of HEIs has a mission of shaping the world of tomorrow. Universities, as the centres of knowledge generation and sharing, play a very important role in solving world's problems by ensuring a sustainable tomorrow (Asemah et al., 2013, p. 198). Higher education institutions bear a profound, moral responsibility to increase the awareness, knowledge, skills, and values needed to create a just and sustainable future. Universities prepare most of the professionals who develop, lead, manage, teach, work in, and influence society's institutions (Cortese, 2003). Universities are increasingly expected to be more socially accountable, to collaborate more and therefore contribute more to different public and private domains of the society; they are impelled to assume their 'third mission' and to engage in various forms of interactions with local, regional, national and international business and social partners (Ćulum et al., 2013). This third mission is a role of the university that goes beyond teaching and research and centers specifically on the contribution to regional development (Charles & Benneworth, 2002; Chatterton & Goddard, 2000; OECD, 2007). The emergence of the 'third mission' of universities is a critical (but not new) dimension of university activities (Laredo, 2007). The articulation of a 'third

mission' has emerged since the 1980s as a consequence of global pressure on universities to play a more central role in the knowledge economy (Venditti et al., 2011). It relates to widely understood social contribution of universities, however today this idea is widely perceived and promoted as being chiefly an economic contribution (Vorley & Nelles, 2008). It bases on the notion that universities are gaining a leading role in economic growth and regional development (Secundo et al., 2017). Therefore 'third mission', focusing on knowledge transfer, commercialization and innovation has been perceived often more frequent as the third pillar of university (Laredo, 2007; Zomer & Benneworth, 2011).

The recognition of the third mission importance falls in line with the concept of "triple-helix" proposed by Etzkowitz and Leydesdorff (1995) that imposed a new function of facilitating research and technology transfer on universities in the model embracing interrelation between university – industry – government. Third mission of universities is also connected with the so called "entrepreneurial university", alerted to the world by Etzkowitz (1998) and Clark (1998). In such discourses, the entrepreneurial institution is seen as an 'engine of economic growth' (Yusuf, 2007). Entrepreneurial model with active university – industry partnerships and technology commercialization efforts has been framed and increasingly normalized and promoted in public policy around the globe via the notion of a third mission (Vorley & Nelles, 2008). Entrepreneurial university relates to the commercialization of sciences and the crucial role of university in regional systems of innovation as the primary driver of economic development (Bercovitz & Feldman, 2006; Guan & Zhao, 2013). The notion of the 'third mission' of the universities is also related to the sustainability concept (Carayannis & Campbell, 2011; Etzkowitz & Zhou, 2006; Puukka, 2008). Partnerships and collaboration between academia, industry, government and civil society are increasingly seen as a prerequisite for tackling various sustainability challenges (Talwar et al. 2011; Whitmer et al., 2010). Within third mission universities have important objectives and responsibilities. They are powerful generators of social and technological innovation (M'Gonigle & Starke, 2006), with an innate ability to link vast areas of expertise and activities across society (Arbo & Benneworth, 2007).

Third mission of university may be concerned with e.g. the transfer of highly educated academics to the industry, codification of the

knowledge produced by the university in form of patents, knowledge transfer through entrepreneurship, e.g. in form of spin-offs, knowledge co-production and circulation to industry, the "public service" dimension of research activities, involvement in the shaping and/or implementation of policies, involvement of HEIs in social and cultural life (usually 'city life'), engagement of universities in public understanding of science (Laredo, 2007; Schoen & Theves, 2006). Jongbloed et al. (2008) indicate the economic and social expectations placed on higher education by the society: the first one reflect both the knowledge and skills needs of workers in modern knowledge-based economies and the demands for relevance in research and knowledge creation that underlie the successful development of these economies (Enders & Fulton, 2002; Etzkowitz & Leydesdorff, 1995). The social expectations reflect the centrality of educational credentials to opportunity and mobility structures in modern societies and the access to such structures among, for example, different social classes, ethnic groups and geographical regions (Shavit & Blossfeld, 1993). Therefore, in today's world the goal of the universities should be to contribute significantly to developing and sustaining democratic education system, but also to communities, and the whole societies (Harkavy, 2006).

Even though there are some critics concerning the idea of universities turning towards the development of especially business relations with the environment, geared towards profit gaining by universities, concerns about the deterioration of the traditional culture of open science (Heller & Eisenberg, 1998), the fact of the impact of universities on the environment and strong ties that are created by universities with the society and institutions from surroundings, the importance of this dimension of their activities cannot be neglected. Trencher et al. (2014) proposed that the emerging function of co-creation for sustainability should be viewed as the potential seeds of a new mission, replacing the conventional third mission geared mainly towards the economic development. However, despite some critical voices and the attempts and efforts of its renaming we need to agree that apart from teaching and research, an alternative mission and 'social contract' between academic science and society (Gibbons, 1999) has never been greater.

The intensified interrelations of universities with the society result in increased accountability requirements geared towards universities (Parker, 2011) e.g. concerning funds spending and university outcomes. Universities have a wide spectrum of stakeholders

that ask for accountability; i.e. governors and legislators, internal governing bodies of universities, deans, professors, researchers, the general public, the community in which the university is located, accrediting bodies, media, students, their parents, alumni, business representatives, sponsors, social and civic organizations. There are growing expectations facing universities that should account for the use of public and private funds. Universities are expected to prove the compliance with a growing array of national regulations and guidelines. Universities need to present evidence that they fulfill their various obligations and responsibilities, that the goals are being accomplished and that money was spent wisely. According to stakeholders theory, universities' should discharge accountability to their stakeholders, meet their information needs and reduce information asymmetry. Given the significant role of universities in the realization of these three missions, the measurement and assessment of universities' performance becomes crucial for a wide range of their stakeholders that should be disclosed to them.

THE NEED TO MEASURE AND MANAGE INTELLECTUAL CAPITAL OF UNIVERSITIES IN A HOLISTIC WAY CONCERNING THREE MISSIONS

"Evaluation, assessment and assurance of academic quality is intrinsic to higher education" (Brown, 2004, p. X). The transformation of universities raises new challenges for their management and reporting tasks (Secundo et al., 2017). To fulfil the duties embedded in their third mission, universities need to improve their reporting mechanisms (Kapetaniou & Lee, 2016). While several measures, mainly based on ranking approach, exist for the first and second mission of universities, those concerning teaching and research, there is still a lack of comprehensive and complete way of evaluation and reporting of all the achievements within all three pillars of universities. Empirical studies reveal that universities still do not apply specific information and tools to monitor and evaluate their performance especially on their third mission performance (Wright et al., 2004). Kapetaniou and Lee (2016, p. 170) underline that "Universities undertake a wide range of activities and engage in various economic, social and political relationships". Assessment

indicators should present a balanced picture of their performance across all the main activities: teaching, research and innovation. Measuring the third stream activities of universities "needs a holistic approach that examines the main channels that bind universities to the rest of society" (Molas-Gallart et al., 2002, p. iv).

Intellectual capital measurement and reporting may be treated as a mechanism of quality assurance and accountability capturing the holistic outcomes and performance of universities. Secundo et al. (2017, p. 230) underline that "the academic work related to measure the intangible assets and Intellectual Capital (IC) of universities, which is rooted in the accounting and management literature, offers a new perspective to measure and capture the third mission of activities of universities".

During the last decades, the growing interest regarding intangibles and IC has extended from firms to public institutions, such as universities. Universities play an important role in the society: they are essential partners of the knowledge creation and knowledge exchange networks, catalyst of innovation, suppliers of tangible outputs of research results, institutions providing consulting and advisory services. Knowledge in universities represents both the input and the output of their activities. Intellectual capital serves as a key resource for those institutions. Moreover, nowadays universities are facing an increasingly competitive environment in which they operate. There are also growing expectations placed on universities by their stakeholders that request accountability for funds spending and university outcomes. Intellectual capital reporting could be an important tool of the improved internal management of universities and in the same time a tool of communication, transparency and accountability for external purposes and could embrace the performance within all three dimensions of universities' activities.

Universities compete not for academic staff and students, for funds from public and private sources, for social acceptance that translates into brand and image. For this reason, they need to prepare and disclose reports that allow other bodies to evaluate their performance (Sánchez et al., 2009). Today, the important challenge for the future still remains fostering of the awareness concerning the need of new management and reporting systems in universities. The evaluation of universities should be based on more consistent, objective and common shared measures and should strengthen links between universities and

companies from business sector, by establishing a common language, which is not yet established (Secundo et al., 2010).

Intellectual capital analysis is critical for the improvement of internal management and for facilitating benchmarking analysis in European Universities. Different European universities are beginning to manage their Intellectual capital through different models; they also attempt to measure and report IC. The main motivation for universities to manage and disclose their IC on a voluntary basis are: the reduction of the information asymmetry; the discharge of universities' accountability to various stakeholders; and signalizing the organizational legitimacy and excellence/quality to society.

Following the literature of Bisogno et al. (2018) concerning future directions for IC research in education, it may be state that the social dimension of IC is extremely important for universities considering their third mission. It falls in the so called 'fourth stage' of IC research (Dumay, 2013; Dumay & Garanina, 2013; Guthrie et al., 2012) that focuses on discriminating and connecting the human capital inside the organization with relational capital outside the organization (Dumay, 2013; Dumay & Garanina, 2013). Consequently, even though the general understanding of IC in universities reflects the three dimension approach, known form business cases, in this more mature stage of research, the description of universities' IC components may be defined as it is presented in the table 1.

Table 1. Description of universities' IC elements

Elements	Description
Human capital	Referring to the intangible value that resides in the people individual competencies, this includes the expertise, knowledge and experiences of researchers, professors, technical and administrative staff and students' competencies
Structural capital	Referring to the resources found in the organization itself, i.e., what remains without the employees, this includes the databases, the research projects, research infrastructure, the research and education processes and routines, the university culture, image and reputation, and so on
Relational capital	Referring to the intangible resources capable of generating value linked to the university's internal and external relations. This includes its relations with public and private partners, position and image in (social) networks, the brand, involvement of industry in training activities, collaborations with international research centers, networking with professors, international exchange of students, international recognition of the universities, attractiveness, and so on

Source: Secundo et al., 2016, p. 302.

Bisogno et al. (2018, p. 24) underline that definitions identify the main features of each IC component and, at the same time, provide a deeper understanding of the relationships between each element and with technology transfer in the pursuit of the third mission.

The framework of IC measurement and reporting could be used as a heuristic tool with which to measure a more complete picture of universities' activities and outcomes as well as the value creation in these institutions (Leitner, et al., 2005; Mouritsen et al., 2005).

The following main reasons can be described for introducing IC measurement, management and reporting systems in universities (Leitner et al., 2014, p. 10):

- University's main inputs and outputs are basically intangibles (mostly knowledge and human resources). However, only a small part of these are identified and very limited instruments exist to measure and manage them. Particularly, traditional financial accounting and reporting system fail to recognize these assets and resources.
- Universities have to be more transparent and, thus, to disseminate more information to stakeholders.
- Universities are being provided with more autonomy to manage their own affairs, which necessarily requires new management and reporting systems.
- The increasing cooperation between universities and firms has resulted in the demand for similar processes of evaluation for both players. Accordingly, universities would have to implement new management and reporting systems, which necessarily incorporate intangibles.
- IC management can help to shift strategic focus of universities towards intellectual resources.
- The ranking of education and research organizations should be based more on consistent, objective and shared metrics.
- IC measurement could bring the "ivory tower philosophy" of researchers closer to real requirements of the public and industry, resulting in a more transparent assessment of performance.
- Finally, IC should play a key role in human resource management (HRM) within organizations.

The measurement of ICU may be run following frameworks proposed by different institutions (e.g. DATI, 2003; MERITUM, 2002; PRIME

Project, 2006; RICARDIS, 2006) and legislators, as for example in Austria with the University law UG, 2002 (e.g. Ramírez et al., 2007). Set of indicators that may be used in order to measure the ICU were proposed by e.g. (Bueno et al., 2002; Leitner et al., 2014; Leitner, 2004; OEU, 2006; Vught et al., 2011). In a consequence of measurement process the Intellectual Capital Report of University (ICU Report) may be prepared and disclosed.

IC REPORTING IN UNIVERSITIES

The IC report should contain information on the work carried out by the institution in order to develop, maintain and manage its intangible resources and activities (MERITUM, 2002). Its main objective is to help universities to identify and deliver information on strategy, aims, visions, activities and resources, based on (financial and nonfinancial) indicators. IC management and reporting systems should provide information about the specific strengths and value of the IC of an organization and addressed different stakeholders (Leitner et al., 2014, p. 10).

The attempts and trials to disclose the IC of universities are taken by many universities worldwide. A first attempt to provide a homogenous and comprehensive framework for managing and reporting IC in universities was developed by the Observatory of European Universities (OEU, 2006). The aim of the Observatory was to develop a common framework for the IC reporting at universities. Fifteen universities and research institutes from eight European countries (Germany, Spain, France, The Netherlands, Hungary, Italy, Portugal and Switzerland) have worked together during two years in order:

> (…) to develop a common framework and build a battery of indicators to measure and compare the intangible elements related to research activities. Its main objective was to provide universities and research centers with the necessary tools for the governance of research activities (Sánchez et al., 2007, p. 5).

As the result, the Strategic matrix was proposed which represents the relations between strategic and transversal issues (Autonomy, Strategic Capabilities, Attractiveness, Differentiation Profile and Territorial Embedding) and five thematic dimensions (Funding, Human

Resources, Academic Production, Third Mission and Governance). The analysis of the inter-relations was made first by formulating key questions and then by suggesting precise indicators to answer such questions. As a result, a specific framework for IC reporting for European universities was developed. It was structured in a way to enable the three main sections of IC:

- Section reflecting the vision of the institution (strategic objectives, strategic capabilities and key intangible resources that are the driving forces of any enterprise).
- Summary of intangible resources and activities (intangible resources the institution can mobilize and the different activities undertaken to increase the value of those resources).
- A system of indicators; the 43 indicators proposed were classified following the most common and widespread IC taxonomy, into human, organizational and relational capital.

The main idea of all the works within OEU was the improvement of quality and competitiveness of universities as well as setting out the framework for comparisons. As it is underlined in the OEU Guidelines for the management of research activities „disclosure is the next natural step after management, in order to increase the quality of research systems as well as their transparency and competitiveness as required by the Bologna process" (OEU, 2006, p. 226). The intellectual capital disclosure results in a higher transparency of the institution, increased user satisfaction and improved credibility, image and reputation of the University, while it is the lack of internal systems of identification and measurement of intangible elements the main reason for not disclosing information on intellectual capital (Córcoles & Ponce, 2013).

The proposal of OEU (2006) underlines that it is necessary to treat ICU report as new model to provide homogenized information, presenting IC information in a single document. The starting point for the preparation of ICU report is the defining the strategic objectives of University. Than appropriate indicators should be created. OEU indicates that the ICU report should have three different parts which depict the logical movement from internal strategy (design of vision and goals of the institution) and management to the disclosure of a system of indicators. Besides indicators, it requests also the inclusion of descriptive elements that are crucial to contextualize and better understand the information provided by the indicators.

WORLDWIDE APPLICATION OF ICU REPORTING

In the realm of practice, an increasing number of universities and research centers in Europe have developed IC management and reporting models (Leitner et al., 2014). The majority of approaches and measurements/reporting practices were used on the voluntary bases. One of the most outstanding and longest experiences in preparation of IC reports is the Austrian Research Centers ARC. The ARC model and principles have become the main foundations for IC reporting in Austrian universities. The Austrian case is a remarkable example since it has established a law that includes the compulsory delivery of an Intellectual Capital Report ("Wissensbilanz") by its publically funded universities since 2006. In ARC the focus is around five "knowledge goals": Knowledge Transfer, Interdisciplinarity, Research Management, Internationality and Spin-offs & Investments. It is worth mentioning that although Austrian public universities were the first in Europe forced by law to implement so called Knowledge Balance Sheets (KBS) and detailed intellectual capital reporting, these organizations are relatively under-researched concerning new reporting practices and their consequences (Habersam et al., 2013).

Beside Austria, Spain has the most active community aiming to establish IC reporting for university sector (Leitner et al., 2014). The Spanish experience concerning IC reporting is to a great extent based on the research performed by the Autonomous University of Madrid (AUM), as a pilot university within the PRIME Network of Excellence and OEU. Following the pioneer approaches, different European universities are beginning to manage their Intellectual capital through different models and disclose ICU reports. The examples embrace Italy, Lithuania, Poland, Czech Republic, Romania, Greece, Latvia, New Zealand, Australia, the UK and Colombia. In the table 2 the main characteristics of qualitative and quantitative empirical research in IC reporting of universities are presented.

In table 3 the main findings and conclusions of qualitative and quantitative empirical research in IC reporting of universities are presented.

Table 2. Main characteristics of qualitative and quantitative empirical research in IC reporting of universities

Study	Country of Study	Scope of research	Methodology	Sample
Ramírez, Tejada & Manzaneque (2016)	Spain	Analyze the relation between IC reporting and transparency	Questionnaire divided into two main categories: analysis of current accounting information model in Spanish universities and importance of IC reporting	Members of the Social Councils of Spanish universities (327 questionnaires were returned, response rate of 28.09%)
Ramírez & Gordillo (2014)	Spain	Provide a model, recognition and measurement if IC	Questionnaire to identify the expectations of stakeholders regarding intangible elements	Members of the Social Councils of Spanish universities (247 questionnaires were returned, response rate of 22.57%)
Kuralova & Margarisova (2016)	Czech Republic	Analyze the extent and quality of IC disclosure in relation to the needs of one group of stakeholders – students	Content analysis using IC disclosure index, questionnaire to evaluate the importance of variables in IC disclosure index	26 annual reports of Czech public universities (content analysis), students of Czech public universities (595 questionnaires were returned)
Siboni, Nardo & Sangiorgi (2013)	Italy	Analyze what Italian public universities consider as IC in their performance plan (since 2009 performance plan with the section devoted to IC has become a mandatory document for universities)	Content analysis of IC in performance plans based on Danish guidelines, which divide information into 3 areas: management challenges, actions and initiatives and indicators	44 performance plans (out of 67 Italian public universities) published in the year 2011
Sangiorgi & Siboni (2017)	Italy	Analyze the amount and nature of voluntary IC disclosure	Content analysis of IC disclosure in voluntary Social Reports, questionnaire to evaluate the opinion on IC managing and reporting	17 Social Reports (content analysis), 95 universities' top managers

Table 2. cont.

Study	Country of Study	Scope of research	Methodology	Sample
Low, Samkin & Li (2015)	New Zealand, Australia, UK	Analyze the quality IC voluntary disclosure and to indicate potential trend in IC reporting	Content analysis of IC voluntary disclosure	Disclosures from 90 universities (eight New Zealand universities, 38 Australian universities, and 44 UK universities)
Bezhani (2010)	UK	Analyze the amount and nature of voluntary IC disclosure	Questionnaire divided into two main categories: analysis of current accounting information model in Spanish universities and importance of IC reporting	Disclosure from 30 UK universities for 2005 academic year, 18 directors of finance (15% response rate) submitted valid questionnaires
Leitner & Warden (2004)	Austria and Germany	Analyze various aspects after the implementation of a model for IC reporting in two research organizations	Case study analysis of the implementation and the usage of the model	Two research organizations ARC (Austria) and DLR (Germany), analysis has been conducted after 4 years of model implementation

Source: own elaboration.

Table 3. Main findings and conclusions of empirical research in IC reporting of universities

Study	Findings	Conclusions
Ramírez, Tejada & Manzaneque (2016)	High dissatisfaction with current accounting information practice, low usefulness, not relevant information about universities' activities, low level of universities' activities monitoring, high need of qualitative and quantitative information, like: quality of teaching, research and services, future resource distribution, future plans, high expectations of IC reporting: accounting information model will be more relevant, higher user satisfaction, better image of the university, promotion of public accountability and better comparability among universities	Current accounting model does not provide relevant and useful information for the stakeholders of Spanish universities to monitor adequately and support decision – making process. There is a meaningful necessity for presenting information on IC
Ramírez & Gordillo (2014)	The essential intangible elements for the stakeholders: human capital: academic and professional qualifications of the teaching and research staff, mobility of teachers and researchers, scientific productivity and teaching capacities and competences	The implementation of the proposed model for measure and recognition of IC could help the stakeholders in decision-making process, in addition could be used as a tool for benchmarking analysis and comparative studies
Kuralova & Margarisova (2016)	The average score for IC disclosure quality is 0.57, with the highest score for Relational Capital (0.71) and the lowest for Human Capital (0.47). From students perspective the most important information regarding IC are the cooperation of universities with future employers (Relational Capital), availability of information and communication services (Structural Capital), they find information for Human Capital as the less relevant	Introduction of new IC reporting system to meet stakeholders' needs and to improve future potential, quality and competitiveness of universities
Siboni, Nardo & Sangiorgi (2013)	Emphasis on aspects related to the development of relations with external partners (43.18%). Much attention is driven by the issues related to the increased in efficiency and very little to the customers' need and satisfaction. The most frequent is declarative information (66.12%) and the less – monetary information (0.70%)	All the management challenges suggested by Danish guidelines are reported, however with variable results for number of observations. It should be considered by each of the university to create a strategy for planning IC reporting

Table 3. cont.

Sangiorgi & Siboni (2017)	The most frequent component disclosed regarding IC is structural capital and the less one is human capital research and education. In majority, the top managers represent the good knowledge of IC and the awareness of its benefits. They also support the policy of introducing mandatory IC reporting for Italian universities	Awareness of benefits related to the practices of IC managing and reporting. In framing the content for an IC report seems to be crucial taking into consideration the relevant fields of research to which universities are devoted (different frameworks for technical universities, medical universities, universities of art, etc.)
Low, Samkin & Li (2015)	The average mean of IC disclosure index shows that the highest quality among three countries belong to Australian universities (0.55, where the max value is 1) than New Zealand (0.51) and British (0.42). Regarding the three categories of IC reporting, in all countries the most disclosed one is external capital, than internal capital, followed by human capital. In the longitudinal analysis (three-year period 2009–2011) the quality of IC disclosure has increased in all three countries, however without any significant changes in IC reporting practices	Australia and New Zealand also in previous studies are recognized as countries with high importance of IC reporting. The low level of improvement in the IC reporting quality within time probably is due to the fact that universities have already met the expectation of stakeholders and/or potential costs of improvement are too high for universities. Most information disclosed is narrative in nature
Bezhani (2010)	Results of the questionnaire show, that the IC reporting has more importance for external purposes (like: showing that an institution is innovative), than for internal ones (generating innovation, creating a certain culture). Research (especially publication) is the category with the highest quality of disclosing (37%), followed by relational capital (18%) and human capital (14%). The lowest scored IC categories are knowledge transfer to the public (2%) and commercializing (6%)	The level of quality of IC disclosure is low. Most information has narrative nature. Confirmation of previous findings, that to provide more funds, the most discloses category is research and its quality. There is a scarce connection between IC reporting and universities' performance
Leitner & Warden (2004)	Implementation of an IC measurement system should start with establishing corporate goals and strategies. The crucial issues on the stage of implementation are: defining the exact number of goals and indicators (not too many), confusion of the measures of different things, while using the same resources of information (one indicator can serve for more the one measure of IC)	The IC report can give the opportunity of variety of interpretations

Source: own elaboration.

The results presented in both tables above review the findings of empirical research concerning IC reporting practices in universities in eight countries worldwide, namely Spain, Czech Republic, Italy, New Zealand, Australia, UK, Austria and Germany. The research aims in all the analyzed cases were similar, however all slightly different: they analyzed the relation between IC reporting and transparency, the amount and nature of voluntary IC disclosure, the quality IC voluntary disclosure and to indicate potential trend in IC reporting as well as the IC disclosure in relation to the needs of stakeholders. The methodology applied in analyzed studies was also different: it contained content analysis, questionnaires and interviews (or different compilations of those mentioned above). The benchmarks for the analysis were IC indexes, elaborated usually individually by the researchers, however usually drawing on experience of OEU, DATI or other benchmarks. The empirical analysis reviewed in this study embraced the results of 687 questionnaires conducted with the management of the universities and 595 with students. There were all together 209 documents disclosed by universities that were analyzed in the empirical research presented in the tables above. The general findings indicate that in the majority of countries the most highly disclosed component of IC is relational / structural capital. The lowest level of disclosure on average concerns the human capital. Our analysis confirms the need of the fourth stage of IC research need. The quality of disclosure among different countries in the analysis varies. As the methodology and indexes applied are different it is also difficult to compare in details the outcomes in the international context. The empirical results presented in the literature appeal also in the majority of cases to the one-year observation. Therefore, also comparability within one country but in time is also impossible. There is a lack of consistency, continuity and comparability. Therefore also transparency and accountability may be questioned. The conclusions of the empirical research indicate the problems concerning the lack of information orientation on the needs of stakeholders o IC reports. In some studies it was also underlined that the level of quality of IC disclosure is low, the information disclosed is mainly narrative, and it gives the opportunity of variety of interpretations. Many of the stakeholders that were interviewed and questionnaire indicated the awareness that the proper IC reporting framework application may have a great impact on the improvement of future potential, quality and competitiveness of universities.

SUMMARY

Today universities must compete for qualified lecturers, talented researchers and determined knowledge lusting and world curious students. Ongoing changes in the higher education institutions worldwide, their globalization and internationalization, together with their greater autonomy, require major strategic changes in the institutional communication systems that should become tools of transparency, accountability and allow for better governance. IC reporting may be treated as the response to these needs. It focuses on the identification of intangible assets and tries to link them to the outcome of the universities, which is a new idea in the context of universities in the context of the long history of assessing results of research and education (Leitner, 2002, p. 13). ICU reporting leads to differentiation and is an answer to the challenges of increased national and international competition, transparency and accountability. Within the analysis of the empirical research concerning the IC reporting practices in universities it may be observed that the stakeholders of universities are generally aware of these facts. They are generally not satisfied in the level ad quality of information disclosed by universities and they express the need of more coherent and transparent information on universities performance. The implementation of an IC reports on a greater scale in the international context should definitively improve the information on values, inputs, outcome, efficiencies, development and performance of universities to the broad public and could help university management to better manage its previously invisible intellectual capital.

The theoretical research on IC reporting in universities is developing, but there is a necessity of the more profound insight into the practices of universities. It is also necessary to boost the awareness of universities to disclose the information on their IC. This may encounter many difficulties and barriers. The common framework could be useful in the context of benchmarks, comparisons and competition, however cultural and institutional factors may impede application of one international approach. The human factor is also very important; the human part of IC is usually the lowest scored in the IC of universities. It should be improved but at the same time it may encounter the strongest prejudices and objections as the well-educated and autonomous representatives of academic world may oppose to any set of indicators evaluating their

performance. Still IC reporting in universities is a challenge. However, because of its importance more intensified efforts are necessary both in the area of developing a reporting framework as well as in the analysis of their implementation in practice. This could improve the quality of a Higher Education system; make it more transparent and more accountable in the context of the current changes and requirements concerning universities. These conclusions are consistent with opinion of Michalak et al. (2018, p. 162) that "more research in the area of IC management in the field of efficient operationalizing strategies and development of skills is needed to manage IC at universities efficiently". They also fall in line with Dumay and Garanina's (2013) call for the third stage of IC research, concerning the intensified investigation needs to explore how IC measurement and reporting is used for managing IC e.g. in universities as well as with Bisogno et al. (2018) fourth-stage studies concerning the the social dimensions of universities' IC.

ACKNOWLEDGEMENT

This article was written with the support of the project of the Ministry of Science and Higher Education, entitled "Organizational Excellence of the University of the Future UNIFUT.PL", Jagiellonian University, HEI Management Department in cooperation with the University of Social Sciences – a project carried out within the framework of the DIALOG programme, No. 0146/2017.

REFERENCES

Arbo, P. & Benneworth, P. (2007). *Understanding the Regional Contribution of Higher Education Institutions: A Literature Review*. OECD Education Working Paper, 9, 78.

Asemah, E., Okpanachi, R. & Olumuji, E. (2013). Universities and corporate social responsibility performance: An implosion of the reality. *African Research Review*, *7*(4), 195–224.

Bercovitz, J. & Feldman, M. (2006). Entpreprenerial universities and technology transfer: A conceptual framework for understanding knowledge-based economic development. *The Journal of Technology Transfer*, *31*(1), 175–188.

Bezhani, I. (2010). Intellectual capital reporting at UK universities. *Journal of Intellectual Capital*, *11*(2), 179–207.

Bisogno, M. et al. (2018). Identifying future directions for IC research in education: a literature review. *Journal of Intellectual Capital*, *19*(1), 10–33.

Brown, R. (2004). *Quality Assurance in Higher Education: The UK Experience Since 1992*. London: Routledge Falmer.

Bueno, E., Morcillo, P. & Rodríguez, J. (2002). Intellectual capital and scientific-production of the Madrid Research Centres. Autonomous University of Madrid, 25–26 Nov, Madrid, Spain. In: *Proceedings of the International Conference "The Transparence Enterprise"*.

Carayannis, E.G. & Campbell, D.F.J. (2011). Open innovation diplomacy and a 21st century fractal research, education and innovation (FREIE) ecosystem: Building on the quadruple and quintuple helix innovation concepts and the "Mode 3" knowledge production system. *Journal of the Knowledge Economy*, *2*(3), 327–372.

Charles, D. & Benneworth, P. (2002). *Evaluating the Regional Contribution of an HEI: A Benchmarking Approach*. Bristol: Good Practice.

Chatterton, P. & Goddard, J. (2000). The response of higher education institutions to regional needs. *European Journal of Education*, *35*(4), 475–496.

Clark, B. (1998). *Creating Entrepreneurial Universities: Organizational Pathways of Transformation*. Oxford: Pergamon.

Cortese, A. (2003). The critical role of higher education in creating a sustainable future. *Planning for Higher Education*, *31*(3), 15–22.

Córcoles, Y.R. & Ponce, Á.T. (2013). Cost-benefit analysis of intellectual capital disclosure: University stakeholders' view. *Revista de Contabilidad*, *16*(2), 106–117.

Ćulum, B., Rončević, N. & Ledić, J. (2013). Facing new expectations – Integrating third mission activities into the university. In: B.M. Kehm, U. Teichler (eds.). *The Academic Profession in Europe: New Tasks and New Challenges* (pp. 163–195). Dordrecht: Springer Netherlands.

DATI (2003). *Intellectual Capital Statements – The New Guideline*. Copenhagen: Denmark.

Dumay, J. & Garanina, T. (2013). Intellectual capital research: A critical examination of the third stage. *Journal of Intellectual Capital*, *14*(1), 10–25.

Dumay, J. (2013). The third stage of IC: Towards a new IC future and beyond. *Journal of Intellectual Capital*, *14*(1), 5–9.

Enders, J. & Fulton, O. (2002). Blurring boundaries and blistering institutions: An introduction In: J. Enders & U. Teichler (eds.). *Higher Education in a Globalising World* (pp. 1–14). Dordrecht: Springer.

Etzkowitz, H. & Leydesdorff, L. (1995). *Universities and the Global Knowledge Economy: A Triple Helix of University–Industry–Government Relations*. Amsterdam: Amsterdam University Press.

Etzkowitz, H. & Zhou, C. (2006). Triple Helix twins: Innovation and sustainability. *Science and Public Policy*, *33*(1), 77–83.

Etzkowitz, H. (1998). The norms of entrepreneurial science: Cognitive effects of the new university – industry linkages. *Elsevier*, *27*(8), 823–833.

Gibbons, M. (1999). Science's new social contract with society. *Nature*, *402*(6761 suppl.), C81–C84.

Guan, J. & Zhao, Q. (2013). The impact of university – Industry collaboration networks on innovation in nanobiopharmaceuticals. *Technological Forecasting and Social Change*, *80*(7), 1271–1286.

Guthrie, J., Ricceri, F. & Dumay, J. (2012). Reflections and projections: A decade of intellectual capital accounting research. *The British Accounting Review*, *44*(2), 68–82.

Habersam, M., Piber, M. & Skoog, M. (2013). Knowledge balance sheets in Austrian universities: The implementation, use, and re-shaping of measurement and management practices. *Critical Perspectives on Accounting*, *24*(4–5), 319–337.

Harkavy, I. (2006). The role of universities in advancing citizenship and social justice in the 21st century. *Education, Justice, Citizenship and Social Justice*, *1*(1), 5–37.

Heller, M. & Eisenberg, R. (1998). Can patents deter innovation? The anticommons in biomedical research. *Science*, *280*(5364), 698–701.

Jongbloed, B., Enders, J. & Salerno, C. (2008). Higher education and its communities: Interconnections, interdependencies and a research agenda. *Higher Education*, *56*(3), 303–324.

Kapetaniou, C. & Lee, S.H. (2016). A framework for assessing the performance of universities: The case of Cyprus. *Technological Forecasting and Social Change*, *123*, 169–180.

Kuralova, K. & Margarisova, K. (2016). Intellectual capital disclosure at Czech Public Universities in relation to the stakeholder information need. *Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis*, *64*(6), 1989–1998.

Laredo, P. (2007). Revisiting the third mission of universities: Toward a renewed categorization of university activities? *Higher Education Policy*, *20*(4), 441–456.

Leitner, K. (2002). Intellectual capital reporting for universities: Conceptual background and application within the reorganisation of Austrian universities. In: *The Transparent Enterprise. The Value of Intangibles. Autonomous University of Madrid*, Nov 25–26, Madrid.

Leitner, K. et al. (2005). Data envelopment analysis as method for evaluating intellectual capital. *Journal of Intellectual Capital*, *6*(4), 528–543.

Leitner, K.H. & Warden, C. (2004). Managing and reporting knowledge-based resources and processes in research organisations: Specifics, lessons learned and perspectives. *Management Accounting Research*, *15*(1), 33–51.

Leitner, K.H. (2004). Intellectual capital reporting for universities: Conceptual background. *Research Evaluation*, *13*(2), 130–140.

Leitner, K.-H. et al. (2014). *A Strategic Approach for Intellectual Capital Management in European Universities. Guidelines for Implementation*. Bucharest: UEFISCDI.

Low, M., Samkin, G. & Li, Y. (2015). Voluntary reporting of intellectual capital: Comparing the quality of disclosures from New Zealand, Australian and United Kingdom universities. *Journal of Intellectual Capital*, *16*(4), 779–808.

M'Gonigle, M. & Starke, J. (2006). Planet U, Sustaining the World, Reinventing the University. [Nanaimo]: New Society Publishers.

MERITUM (2002). *Guidelines for Managing and Reporting on Intangibles, Intellectual Capital Report*. Madrid: Vodafone Foundation.

Michalak, J. et al. (2018). Intellectual capital management in public universities. In: J. Guthrie et al. (eds.). *The Routledge Companion to Intellectual Capital* (pp. 149–164). London: Routledge.

Molas-Gallart, J. et al. (2002). *Measuring Third Stream Activities. Final Report to the Russell Group of Universities*. Brighton: SPRU, University of Sussex.

Mouritsen, J. et al. (2005). Intellectual capital and the discourses of love and entrepreneurship in new public management. *Financial Accountability and Management*, *21*(3), 279–290.

OECD (2007). *Higher Education and Regions: Globally Competitive, Locally Engaged*. Valencia: OECD.

OEU, O. of the E.U. (2006). *PRIM E – OEU Guide (Nov)*. Brussels: European University Association.

Olcay, G.A. & Bulu, M. (2017). Is measuring the knowledge creation of universities possible? A review of university rankings. *Technological Forecasting and Social Change*, *123*, 153–160.

Parker, L. (2011). University corporatisation: Driving redefinition. *Critical Perspectives on Accounting*, *22*(4), 434–450.

PRIME Project (2006). *Methodological Guide, Final Report of the Observatory of the European University*. Brussels: European University Association.

Puukka, J. (2008). Higher education for sustainable development Mobilising higher education for sustainable development – lessons learnt from the OECD study. In: *Proceedings of the 4th International Barcelona Conference on Higher*

Education. Higher Education for Sustainable Development GUNI – Global University Network for Innovation, vol. 7. Barcelona: Global University Network for Innovation.

Ramírez, Y. & Gordillo, S. (2014). Recognition and measurement of intellectual capital in Spanish universities. *Journal of Intellectual Capital*, *15*(1), 173–188.

Ramírez, Y., Lorduy, C. & Rojas, J.A. (2007). Intellectual capital management in Spanish universities. *Journal of Intellectual Capital*, *8*(4), 732–748.

Ramírez, Y., Tejada, A. & Manzaneque, M. (2016). The value of disclosing intellectual capital in Spanish universities: A new challenge of our days. *Journal of Organizational Change Management*, *29*(2), 176–198.

RICARDIS (2006). *Reporting Intellectual Capital to Augment Research, Development and Innovation in SMEs. Report by an Expert Group*. Brussels: European Comission.

Sánchez, M.P., Elena, S. & Castrillo, R. (2007). The ICU report: An intellectual capital proposal for university strategic behaviour. IMHE "What Works" Conference Paris (September). Paris: OECD, 1–13.

Sánchez, M.P., Elena, S. & Castrillo, R. (2009). Intellectual capital dynamics in universities: A reporting model. *Journal of Intellectual Capital*, *10*(2), 307–324.

Sangiorgi, D. & Siboni, B. (2017). The disclosure of intellectual capital in Italian universities: What has been done and what should be done. *Journal of Intellectual Capital*, *18*(2), 354–372.

Schoen, A. & Theves, J. (2006). *Strategic Management of University Research Activities, Methodological Guide. PRIME Project Observatory of the European University*. Brussels: European University Association.

Secundo, G. et al. (2016). Managing intellectual capital through a collective intelligence approach: an integrated framework for universities. *Journal of Intellectual Capital Journal of Intellectual Capital Journal of Intellectual Capital*, *17*(2), 298–319.

Secundo, G. et al. (2017). An intellectual capital framework to measure universities' third mission activities. *Technological Forecasting and Social Change*, *123*, 229–239.

Secundo, G., Margherita, A., Elia, G. & Passiante, G. (2010). Intangible assets in higher education and research: Mission, performance or both? *Journal of Intellectual Capital*, *11*(2), 140–157.

Shavit, Y. & Blossfeld, H. (1993). *Persistent Inequality: Changing Educational Attainment in Thirteen Countries*. Boulder: Westview Press.

Siboni, B., Nardo, M.T. & Sangiorgi, D. (2013). Italian state university contemporary performance plans: An intellectual capital focus? *Journal of Intellectual Capital*, *14*(3), 414–430.

Talwar, S., Wiek, A. & Robinson, J.B. (2011). User engagement in sustainability research. *Science and Public Policy*, *38*(5), 379–390.

Trencher, G. et al. (2014). Beyond the third mission: Exploring the emerging university function of co-creation for sustainability. *Science and Public Policy*, *41*, 151–179.

Venditti, M., Reale, E. & Leydesdorff, L. (2011). *The Disclosure of University Research for Societal Demand: A Non-market Perspective on the "Third Mission"*. Unpublished Paper Proposal.

Vorley, T. & Nelles, J. (2008). (Re)conceptualising the academy. *Higher Education Management and Policy*, *20*(3), 1–17.

Vught, F.V., Ziegele, F. & File, J. (2011). *U-Multirank: Design and Testing the Feasibility of a Multidimensional Global University Ranking. Brussels: Consortium for Higher Education and Research Performance Assessment CHERPA-Network*.

Whitmer, A. et al. (2010). The engaged university: Providing a platform for research that transforms society. *Frontiers in Ecology and the Environment*, *8*(6), 314–321.

Wright, M., Birley, S. & Mosey, S. (2004). Entrepreneurship and university technology transfer. *The Journal of Technology Transfer*, *29*(3/4), 235–246.

Yusuf, S. (2007). *From Creativity to Innovation*. The World Bank.

Zomer, A. & Benneworth, P. (2011). The rise of the university's third mission. In: J. Enders, H.F. de Boer & D.F. Westerheijden (eds.). *Reform of Higher Education in Europe* (pp. 81–101). Rotterdam: SensePublishers.