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Towards the Entrepreneurial University 2.0: Reaffirming the Responsibility of Universities in the Era of Accountability

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Abstract: Universities have been expected to do more to solve economic and social problems in the knowledge-based society. Many universities have tried to become more entrepreneurial in order to respond to the overloaded demands from external society. However, the notion of entrepreneurial university is still quite vague, and so this paper firstly tries to propose a comprehensive framework describing the entrepreneurial university. Facing the increasing global competition, the national governments have also push universities to do more for the society and to be accountable for their "effectiveness" and "quality", by using the new public management techniques. However, these managerialism approaches have posed serious challenge for the development of entrepreneurial universities. In order to better balance the expectation for being entrepreneurial from the external industry and society, and the managerialism requirement from the government, this paper proposes to reassert the responsibility of universities in the accountability era, moving towards "Entrepreneurial Universities 2.0".

Keywords: entrepreneurial university 2.0; new public management; accountability; responsibility; innovation

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1. Introduction

With the rise of the knowledge-based economy and society, universities have been expected to do more to solve economic and social problems for society. Universities' pursuit of their third mission of socio-economic contribution does not mean their replacement of the traditional university missions of teaching and research. Instead, they need to accomplish all three missions simultaneously, which requires changes in the function and structure of universities [1,2]. Davis introduced the concept of "adaptive and entrepreneurial universities" around three decades ago and claimed that universities need to be adaptive and innovative to respond to the constantly changing needs of the *outside world* [3]. Clark [4] and other authors proposed several organizational strategies for universities to become (more) entrepreneurial [5,6]. Many later studies portrayed the features of entrepreneurial universities and proposed definitions from different perspectives, but it is still not very clear what entrepreneurial universities are [1,7–9]. Based on the previous literature, this paper first proposes a comprehensive framework for defining and understanding entrepreneurial universities.

Since universities are believed to have the potential to do more for society and contribute to economic and social development, national governments expect universities to do so more "efficiently", especially in the context of increased global competition [10]. Autonomy has been offered by governments to encourage universities to deal with external demands more flexibly and entrepreneurially with devolving financial responsibilities to institutions. At the same time, the universities are requested to be accountable for their "effectiveness" and "quality" as a trade-off. A variety of new public management techniques, such as quality evaluations and accountability schemes, have been developed in the higher education field. However, it is questionable whether these management

strategies are beneficial for the development of entrepreneurial universities. It has been found that the external quality evaluations and accountability schemes have triggered compliant behaviors by universities [11,12]. These compliant behaviors in some ways conflict with the propensity of universities for risk-taking and for innovation, which is the most necessary characteristic for entrepreneurial universities. The accountability culture also poses a serious threat to the direct link between universities and external stakeholders and the universities' responsibility for the stakeholders [13,14]. Thus, industry's and society's expectations of universities being innovative, entrepreneurial and responsible in some ways conflict with the managerial requirements of governments. To better balance the conflicting requirements, this paper tries to offer some propositions for universities to become more responsible and move towards the "Entrepreneurial University 2.0": a type of university we believe is more appropriate for the era of new public management and accountability, and a type university contributes to worldwide accepted sustainability goals [15].

2. The Changing External Environment and the Need for Universities to Be Entrepreneurial

The external environment of higher education institutions has changed and is ever-changing [3], and universities have become overloaded with demands [4]. As shown by Gibb et al. [6], governments want universities to do more, but the governments provide them with less public funding; employers not only want the knowledge and basic skills of graduates recruited from universities but also are keen to obtain support from the universities to create innovation and improve competitiveness; for both governments and business sectors, universities are perceived as the engines of innovation, sustainability and technological progress, so they are expected to work as driving forces for economic growth; students want value for money and expect good employment opportunities, etc., e.g., [16]. These factors certainly pose significant challenges to the capability of universities to respond to external demands.

Gibb et al. [6] emphasized that uncertainty and complexity are the key features of the new environments in which universities are embedded. In static environments, things are (more) predictable, so routinised and bureaucratic responses are acceptable. In contrast, when the environments are uncertain, routinised and bureaucratic responses are not acceptable, and more entrepreneurial responses are needed—which can be provided by entrepreneurial universities. The main uncertainty in the higher education environments is derived from the changes in the funding sources. The diminished public financial support has made it imperative for universities to find new available and diversified funding sources. Thus, "the uncertainty resulting from having to seek a greater proportion of funding from other sources is matched by pressure to move away from the simpler, more certain, "autonomous" environment guaranteed by the public purse, within which to pursue individualistic research and teaching" [6] (p. 6). Now, more direct public value must be demonstrated. In this context, the definitions of "good higher education" and "excellence" in research might be changing. Excellence, according to Gibb et al. [6], used to be based on individual curiosity but is now more based on societally shared knowledge and knowledge that is generated in the context of application [17].

"As knowledge is sought for as the solution for everything, demands of the environment are penetrating higher education" [18] (p. 70). Consequently, "both the higher education institutions and national governments are facing a growing multitude of expectations" [18] (p. 70). In this context, it is necessary for universities to transform. To address the overload of external demands, universities are increasingly being required to engage in entrepreneurial operations, such as commercializing their research results and spinning out new enterprises based on the knowledge they have created, and contributing to the sustainability goals. At the same time, national governments have also transformed their role in higher education governance. This transformation has entailed granting greater autonomy and room to maneuver to higher education institutions to encourage them to be more responsive to the needs of society and the economy. The trade-off is that universities

have become increasingly accountable for their use of public funds and are required to demonstrate "value for money" [19]. Thus, currently, universities endure the simultaneous pressures of responding to the increasing demands of their external environment more entrepreneurially and meeting government accountability requirements.

3. Paths to Becoming an Entrepreneurial University

3.1. The Responses of Universities in Terms of Organisational Structure

Clark [4], probably the most famous scholar in this research field, proposed several paths for universities to follow to respond to demand overload and become entrepreneurial universities. Clark suggested that entrepreneurial universities have the following:

- A strong managerial core, which helps the universities to behave more quickly and flexibly and to be more responsive to external demands;
- An enhanced developmental periphery to surpass their traditional boundaries;
- A diversified funding base to avoid being dependent on government funding;
- A stimulated academic core to react positively to changes in the external environment;
- An integrated entrepreneurial culture to embrace change [4].

Additionally, focusing on the internal organizational characteristics of universities, Goldstein [5] listed the factors that assist universities in becoming entrepreneurial; these factors involve the universities' missions, the universities' internal institutions and the academic units' behaviors. That is, universities should actively become involved in transferring knowledge; their internal regulations and policies, incentives and rewards, and behavioral customs should be able to support the accomplishment of the new work of the universities in terms of knowledge transfer; and their academic units should also become actively involved in the behaviors leading to the commercialization of university-generated knowledge. Similarly, Gibb et al. [6] also indicated the universities' paths to becoming entrepreneurial universities from an organizational perspective. They believed that the innovation of academic units and individuals is very important, so their propositions particularly focused on the freedom to innovate through the variety of academic activities of universities and the related type of leadership. They indicated that entrepreneurial universities should maintain "a strong individual development and initiative focus, empowering individuals at all levels of the organisation to enjoy freedom for action" [6] (p. 20). Boehm's [20] empirical research also suggested that the more freedom researchers have to choose their individual research domains, the more successful their entrepreneurial work is. Guerrero and Urbano [21] described an entrepreneurial university model from the institutionalism perspective. In addition to the structural and cultural features that parallel Clark's [4] proposition, they took the resources (e.g., human capital, financial, physical and commercial) and capabilities (e.g., status and prestige, networks and alliances, and localization) of universities into consideration [21] (p. 46).

3.2. The Strategic Responses of Universities

Etzkowitz [22], another influential scholar working on this topic, proposed a framework describing the concept of entrepreneurial universities. This framework focused on the strategic responses of universities. It particularly considered the relationship between universities and their external partners and the corresponding internal organizational features. He summarized them as interaction, independence, hybridization and reciprocity. That is, (1) Entrepreneurial universities are not isolated from society but interact with the governmental and industrial sectors closely (interaction); (2) entrepreneurial universities are supposed to be relatively independent institutions (independence); (3)the requirements of interaction and independence might conflict with each other in certain situations, so it might be imperative to develop hybrid organizational formats to deal with the two principles simultaneously (hybridization); (4) since the relationship between the universities and the governmental and industrial sectors might change, the internal structure of the universities and the governmental and industrial sectors must be able to change continually (reciprocity).

Additionally, focusing on the strategic responses of universities and their relationships with external partners, Goddard and Chatterton [23] emphasized the importance of establishing a "learning system". They indicated that both universities and regions should work for "integration", where the missions of the universities, including teaching, research and service to the community, can be integrated through internal mechanisms to respond to outside demands [23]. That is, the "third mission" for universities does not work separately but is fully integrated with their traditional missions of teaching and research. In addition, they emphasized that the skills, innovation and culture and community in the context of regional development should also be integrated [23]. The integration of the different missions on both sides will help to establish an effective "university-region value-added management process" [23]. The approach of Goddard and Chatterton [23] is, in our opinion, a regional elaboration of the Etzkowitz [22] framework.

As proposed by Etzkowitz [24], universities get engaged with industry and government, known as the triple helix of innovation. University, industry and government collaborate based on the belief that their complementarity will reinforce the strength and the gains concerning they partnership [25]. Their collaboration could promote the skilling of the workforce, knowledge diffusion, and sharing with the involvement of the civil society, which is beneficial for open innovation and the development of innovation ecosystem [25]. To play a better role in the innovation ecosystem, universities need to make the relevant strategic responses, as explained above referring to [22,23]. In the innovation ecosystem, a university is not simply serving as a primary engine for economic growth through knowledge transfer and application, but also required to be more responsible for the society [26].

3.3. The Entrepreneurial Activities of Universities

In order to be more entrepreneurial, innovative and contribute to sustainability goals, universities need to move beyond their traditional scope and initiate new activities [27]. Philpott et al. [28] defined a range of entrepreneurial activities of universities, including both "soft" activities, which are nearer to the traditional scope of universities' activities, and "hard" activities, which are closer to the entrepreneurial paradigm. This seems to be one of the all-inclusive works, and it encompasses almost all entrepreneurial activities mentioned by other authors in this field. Combining the work of Philpott et al. [28] and some other authors [1,29,30], the entrepreneurial activities of universities are believed to include the following:

- Teaching and producing high-quality students: to provide the public and private sectors with skilled undergraduates and postgraduates;
- Providing specialized teaching and lifelong learning opportunities: to offer training courses outside of the traditional programs, especially serving employees from the public and private sectors;
- Teaching entrepreneurship: to produce future entrepreneurs;
- Publishing and communicating scientific information: to disseminate knowledge and to communicate through publishing scientific papers, books, etc., after the preservation of intellectual property, and through publishing in informal journals;
- Patenting and licensing: to preserve intellectual property rights to research findings and technology invented within the universities;
- Consulting: to provide consulting services to the public and private sectors to help them improve their operations;
- Conducting contract and collaborative research: to conduct research based on signed contracts in cooperation with the public and private sectors;
- Participating in incubator facilities/science and technology parks: to maintain or participate in social and business incubator facilities and/or science and technology parks with the aim of doing research and creating and developing new ventures;
- Forming spin-off firms: to create firms based on the universities' research findings;

- Maintaining university technology transfer offices (TTOs): to transfer knowledge and technology to new or existing companies.

As discussed above, in a new environment with more uncertainty and complexity, entrepreneurial universities have emerged to respond to the increasing expectations and demands from the external environment and stakeholders. The "third mission" of universities in terms of knowledge transfer and application has received more attention, and the free-market principle has been used more frequently within entrepreneurial universities. Based on the previous literature, the characteristics of entrepreneurial universities can be summarized as having the following three dimensions: (1) the structural reactions of universities as organizations, making the universities more flexible and entrepreneurial [31]; (2) the strategic responses to deal with the relationships between the universities and their external partners (government and industry sectors) more entrepreneurially [32]; and (3) the operational actions that universities are using to respond to the external demands and expectations more entrepreneurially. Figure 1 shows the comprehensive framework describing entrepreneurial universities. The previous research often focused partly on the features of entrepreneurial universities, such as their transformation of organizational structures and operational actions, or assumed that with those operational actions, universities could be defined as entrepreneurial universities. This paper tries to argue that a university must have those entrepreneurial actions and the matching organizational structures and strategies before it can be defined as an entrepreneurial university. An entrepreneurial university is a university that has the mechanisms (S, S, O) in place to play a role in the innovation ecosystem. It is worth mentioning that universities are considered as loosely decoupling organizations and hybrid organizations. Thus, these three aspects can also be applied to certain units/schools/research groups/departments, while others cannot.

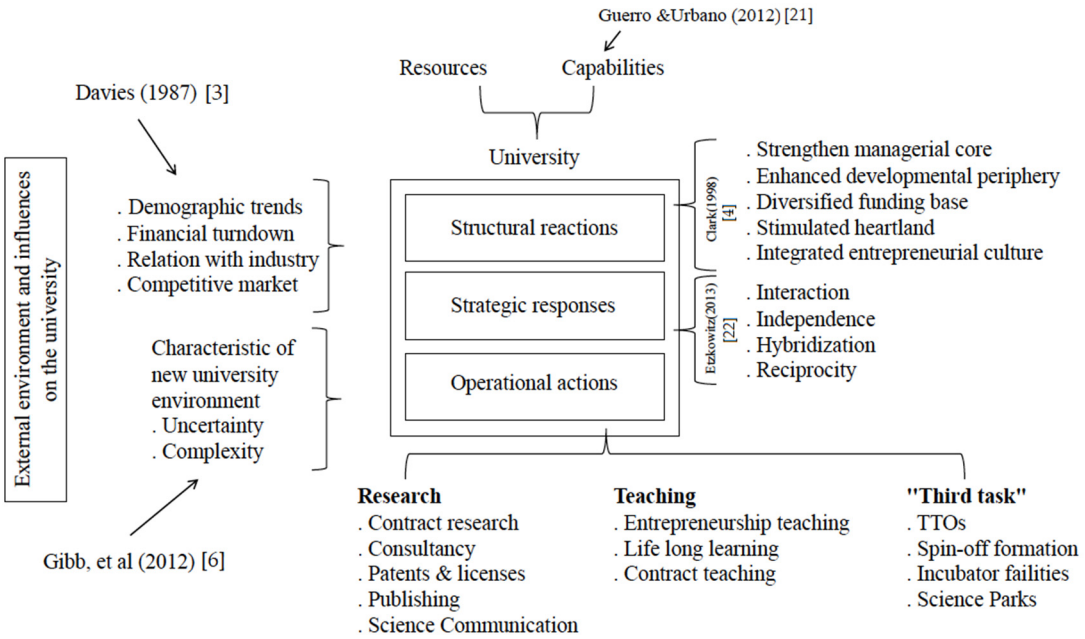

Figure 1. The framework of entrepreneurial universities.

Approximately three decades after Davies's [3] proposed concept, most universities have developed entrepreneurial activities, but clearly not all of them can be described as entrepreneurial universities. Overall, the increasing expectations and demands from the external environment for knowledge transfer and application and the decline in public financial support have pushed universities to become entrepreneurial to a variety of degrees.

4. New Public Management in Higher Education and Its Implication for Entrepreneurial Universities

As described by Lorenz [33], "neoliberal policies in the public sector—known as New Public Management (NPM)—are characterised by a combination of free market rhetoric and intensive managerial control practices. This combination explains the most important characteristics of NPM organisations." (p. 599). The economic imperatives of neoliberalism incorporated with the technologies of new public management have also brought significant changes to higher education institutions, such as devolving financial responsibilities to institutions and the promotion of entrepreneurship within the sector, as mentioned above. At the same time, management strategies such as quality evaluation and accountability have been increasingly adopted to reform the higher education sector, assess the performance of institutions and improve the productivity of individuals [34]. Audit culture and performativity have also emerged in the process. In this context, universities are requested to do more, to be efficient and to be accountable for their "effectiveness" and "quality".

The practice of new public management has broken up public sector organizations into separately managed units, introduced measurable indicators of performance and used predetermined standards to measure output [33]. These strategies have been commonly used in the forms of quality evaluations and accountability schemes in the higher education sector. To meet these external requirements, universities have tended to pursue "excellence" and "quality" that are hardly defined but are measured by specific performance indicators. The conformity of the universities has been enforced by coupling university funding with the fulfilment of these output indicators. To obtain funding, universities have tended to focus only on those indicators being measured and made measurable. For example, universities have paid more attention to the number of patents for technical transferring than to the innovation and business value of the knowledge [35]. In regard to entrepreneurship education, the number of classes and students might be easily measured, but the real teaching quality, such as the classroom interaction between the teachers and students, might be neglected. Similarly, the entrepreneurial spirit and social responsibility of the students might receive less attention. Academics have focused more on the number of publications (even salami publications) than their contributions to the body of knowledge and their public value. In this process, goal displacement has been quite common. Better performance on the indicators instead of real "quality" has become the universities' main goal. This might be related to the characteristic of universities that their purposes are intangible and hardly defined [36]. As argued by Warner and Havens [37], the existence of intangible purposes has made goal displacement more likely to occur. Furthermore, through these quality evaluation and accountability schemes, the normative questions of "what is good higher education" and "what should universities truly do" have been externally defined. The seemingly neutral performance indicators have actually implicitly defined "excellence" and "quality" (that is, neutrally, "what is good higher education") and driven universities to follow those definitions. As a result, universities have in some ways lost the chance to construct these definitions and their own missions. Gibb et al. [6] argued that new external environments with uncertainty and complexity have triggered the transformation of "excellence" in higher education from "individual curiosity-based excellence" to "societally shared knowledge-based excellence". At the same time, it has been found that with the new public management strategies, excellence in higher education has become externally determined, that is, it has become "predetermined criteria-based excellence". In the process of pursuing the "predetermined criteria-based excellence", the independence of universities might have been harmed.

Worse are the externally defined and standardized criteria of "quality" and "excellence", which often have been exemplified by measurable performance indicators and have not allowed or tolerated creativity and diversity. For example, academics have been pushed to publish in the mainstream journals, and with the constant pressure for accountability, ground-breaking research has not been encouraged [11]. Uncertainty is the inherent char-

acteristic of the production of science and knowledge in universities [38], but universities currently have less motivation to tolerate it, with competing pressures in the contexts of accountability and audit culture. Therefore, the inclination of universities towards risk-taking and real innovation has deteriorated, which is clearly contrary to the entrepreneurial spirit of universities. Moreover, the standardized and externally defined criteria of "quality" and "excellence" have also become globalized. The Western-defined quality criteria have been accepted without challenge by the universities in other regions [39]. In the context of globalization, the pressure of national competition and the "anxiety" of developing countries to "catch up" have pushed many countries to concentrate funding on building "world-class" universities; at the same time, local scholarship and contributions to the diverse needs of national and regional development have been somewhat ignored [40]. All of these results are clearly contrary to the approach of universities to develop entrepreneurship and to accomplish their new mission of contributing to social and economic development. That is, to respond to an external environment that is (more) complex and uncertain, universities are encouraged to become entrepreneurial by making themselves more flexible and innovative. In contrast, the new public management approaches adopted by governments have standardized output criteria and associated resource allocation are predictable, so the responses from universities tend to be routinised, standardized and compliant. These responses are believed not be beneficial for the development of entrepreneurial universities.

Furthermore, the new public management techniques have also harmed the interaction between universities and the community, which is not beneficial for the universities in meeting the demands of external society. As argued by Biesta [13], accountability and management pressures have in some ways changed the relationships between universities and their stakeholders. Higher education has been redefined as a public service, and in this arrangement, accountability is indirect. Direct accountability tends to take place between the universities and the state. The role of stakeholders in the "accountability loop" is only indirect, in that the government can ultimately be held accountable for the "quality" of the public services that it provides [13]. The accountability loop is as follows. Internal members of universities (academics) are accountable to the universities, the universities are accountable to the state, and the state is supposed to be accountable to the public (taxpayers, consumers and other stakeholders), instead of the internal members of the universities being directly accountable to the public. That is, the new public management approach assumes that governments and their agents, such as evaluation and accreditation agencies, can represent the voices and interests of other stakeholders. As a consequence, direct dialogue between universities and their stakeholders to discuss what the universities should teach and what research is more appropriate for society has become unnecessary. However, the direct dialogue between universities and their stakeholders seems imperative for entrepreneurial universities because it can help them to know the expectations of the stakeholders and to respond to the constantly changing demands of the external environments.

The new public management approaches have also redefined the relationships between the internal members of the universities and the universities and distanced the individual academics from their stakeholders. The pressures of accountability and managerialism have eroded the professionalism of academics [33]. Organizational objectives are more important for them now than before [41]. Academics are required to be responsible for the objectives of the institutions (university) instead of the objectives of their own professions, such as teaching and creating and transmitting knowledge. The good performance of a university is based on the good performance of all the staff members, and what counts as performance is determined by the management approaches instead of the professions, so staff members are also required to work for measurable outputs. As indicated by Lorenz [33], through individualized contracts and performance-related pay, financial incentives to enforce organizational conformity with output criteria can eventually be translated to individual staff members. In the process, the autonomy and freedom of individual staff members to do what they want might be eroded, which is not beneficial for

universities in developing entrepreneurship, as emphasized by Gibb et al. [6]. At the same time, academics' professional ethics and direct responsibility for their stakeholders—their students, science communities, and all outside communities—have been weakened. As argued by Evetts [41], the professional control of the practitioner-client interaction has been replaced by organizational objectives, so their service ethic is prevented. That is, the professional responsibility of academics has been eroded, and they are increasingly required to work for the organizational objectives of their universities. As mentioned before, universities are directly accountable to the state, while the governments (and the evaluation and accreditation agencies) have declared that they are evaluating the public service to make them accountable to the public. The indirect accountability and the eroded professionalism have greatly distanced universities and individual academics from their stakeholders and have deteriorated the universities' and individual academics' responsibility for them. This situation in the higher education sector echoes the argument of Dose and Klimoski [42], that is, accountability and responsibility cannot co-exist.

In summary, the new public management approaches have affected higher education institutions. First, the predetermined criteria of excellence have been used to assess the operational actions of universities, and the universities have become more compliant with these criteria. This is not beneficial for the innovation of universities. Second, managerialism value has also influenced the structural dimension of universities. Individual autonomy has been reduced. The individual members of universities are required to work for the organizational objectives and thus feel more controlled. Third, in terms of strategies, universities have become more compliant with the externally determined criteria of excellence, and the independence of universities has deteriorated. The new public management approaches have also harmed the interaction between universities and the community, and the direct responsibilities of universities and their internal members to external stakeholders have been de-valued.

5. Towards the Entrepreneurial University 2.0

The external environment of uncertainty and complexity has required universities to become more entrepreneurial to respond to external demands in a flexible and innovative manner. Within the same environment, governments have also tried to push universities to do more, with more efficiency, by employing the new public management techniques, which has brought more control to universities. As discussed above, there seem to be contradictions between the entrepreneurial culture and the managerialism culture [6]. Accountability and management pressures are not beneficial for the development of entrepreneurial universities. They are also not helpful for universities to respond to the demands of external environments and to fulfil their responsibility to the community directly. Scholars have proposed some suggestions to revise the external accountability and evaluation schemes to make them less controlling, such as developing professional accountability instead of bureaucratic accountability [43], developing horizontal accountability to balance with hierarchical accountability [44] and using progressive accountability rather than conventional accountability [42]. The reforms of these new management techniques are definitely very important, while it is equally important to reflect on what universities could do to face the management pressure and the imperative to become entrepreneurial, which have made the university environment even more complex.

First, it is clearly not right for universities to be totally controlled by external management approaches. Instead, universities should keep the autonomy to innovate, to flexibly deal with environments filled with uncertainty and complexity and to pursue "real quality" and "excellence" rather than focus only on the externally defined output criteria. To maintain autonomy, universities should diversify their funding resources and decrease their dependence on public funding, as suggested by Clark [4]. At the same time, universities should also focus on their own missions and purposes. Biesta [13] criticized universities for being busy with proving and improving their effectiveness (or cost-benefit) but tend to neglect the key questions: what is good higher education and good research

and what should universities truly do? Many universities tend to focus on the technical and managerial questions of how to improve the efficiency and effectiveness of education and research processes, but ignore the normative questions of what is good education and good research and what these efficient and effective processes are supposed to be for [13]. The answers to the normative questions of good education and research might be constantly revised to respond to the changing demands and expectations from external environments. Thus, it is not appropriate to define what is good education and good research and what universities should truly do by the management approaches that use predetermined performance indicators. Instead, the answers should be constructed by the universities and their stakeholders, including lecturers, students, business partners and others, based on an open and equal dialogue and direct interaction between them. Through these interactions, the universities can obtain better knowledge of the real expectations and demands from their internal and external stakeholders and find the appropriate way to respond to these demands.

Second, as discussed before, accountability does not necessarily lead to responsibility. Thus, when facing management pressures, it is important for universities to reassert their responsibility to their stakeholders. As indicated by UNESCO in the United Nations Decade of Education for Sustainable Development for the period 2005 to 2014, education is a foundation for the establishment of a sustainable human society [15,45]. Thus, universities are supposed to establish their missions and purposes based on their responsibility for a better world. Especially in a time when universities are expected to do more for society, they should pay more attention to the outcomes they have produced for their stakeholders and communities instead of focusing on performance outputs. They should keep considering "what is good higher education", especially for their stakeholders and the whole community. To avoid goal displacement [46], universities should work towards the real purposes of higher education. As scholars have emphasized before [47], universities should incorporate responsibility principles while conducting both teaching and research activities and community engagement activities. This can be done only when the demands and expectations of their stakeholders are taken into full consideration [45].

Moreover, the direct responsibility of universities and their internal members to their external stakeholders should be emphasized. As argued before, in the accountability scheme, the voices and interests of various stakeholders are represented by the government and the evaluation and accreditation agencies. Thus, an accountability loop emerges: the individual staff members are accountable to their universities, the universities are accountable to the government and evaluation agencies, and the government and evaluation agencies are accountable to the public (including taxpayers and other stakeholders of the universities). The indirect accountability distances universities and individual staff members from their stakeholders, and it deteriorates the universities' and staff members' responsibility to them. Moreover, when looking inside the organization, a "floating responsibility" may arise [48]. This means that "everyone has procedural accountabilities, but no one has responsibility for wider consequences (moral or instrumental). In such situations an accountability system that connotes blind instrumentality may actually disconnect organizational members from wider concerns related to the effectiveness of the organisation" [49] (p. 252). In the university setting, the responsibility of the internal staff members to the stakeholders might be missing. Thus, this paper tries to emphasize the role of the individual staff members in accomplishing the missions of their universities and the staff members' direct responsibility to the stakeholders.

To facilitate the individual staff members' accomplishment of their responsibilities, first, it is believed that individual autonomy and professionalism should be respected. As described by Gibb et al. [6], when science and technology parks and technology transfer offices conduct the work of transferring scientific knowledge, the personal academic interface is believed to be highly important, even more important than the factors of physical and administrative structures. Gibb et al. [6] also emphasized the importance of individual freedom for developing entrepreneurial universities. At the same time, professional ethics

and principles, which are particularly important in the relationship between staff members and the stakeholders of universities, should be supported by university managers. Of course, the responsibility of the individual staff members involves the exercise of discretion, which requires them to be responsible both to the organizational objectives and to the demands and expectations of their stakeholders. Second, universities should provide sufficient support for individual staff members to have equal dialogue and direct interaction with university stakeholders. Habermas [50] commented on organizational systems and found that large firms and other influential organizational systems increasingly dominate contemporary society; thus, meanings and values are less likely to be generated through direct social interaction and traditional democratic situations. According to Habermas [50], such "interaction" is essential to generate common understandings and ethical legitimation. In the context of higher education, the direct interaction between the individual staff members of universities and their stakeholders is also imperative. The interaction and dialogue between individuals (including among individual academics, between academics and students, between managers/academics and business partners, etc.) will help university members determine what their stakeholders need and generate a common understanding of what universities truly should do. Thus, universities should try to establish the platform and supporting systems to enable their internal staff members to have equal dialogue and direct interaction with their stakeholders. The process is interactive between universities and their stakeholders. As argued by Sabzalieva [51] (p. 123), "universities do have responsibilities to their wider communities, and that those responsibilities should be managed in a way that is not solely dictated by the university". With a common understanding among internal members of universities and their stakeholders, universities can truly be responsible to their communities, and contribute to the social, economic and sustainable development.

Overall, increasing accountability and management pressures have created new challenges for entrepreneurial universities. In this context, it is necessary for universities to clarify their missions and purposes and to confirm their responsibility to the community. To ensure universities' accomplishment of their missions and responsibilities, first, their operational actions should be entrepreneurial to respond to the complex and uncertain external environment and to maintain their responsibility to stakeholders. At the same time, universities have to operate more transparently to make themselves accountable and trustworthy [44]. Second, the responsibilities of universities should be accomplished based on efforts at the individual level. Thus, it is necessary for universities to offer sufficient autonomy to their individual members in terms of the structure of entrepreneurial universities. Third, in terms of the strategic response of universities, their independence and interaction with the industrial sector and society were suggested by Etzkowitz [22] (and have been harmed by the pressure of new public management, as discussed before). At the same time, equal dialogue and direct interaction between individual members of universities and their stakeholders should be encouraged. With these factors, we believe it is possible for universities to balance the different demands of government management approaches in terms of quality, efficiency and accountability and the increasing expectations of the industry and society in terms of knowledge transfer and application. Universities are expected to establish a better relationship with their external environment. We define entrepreneurial universities with the features described above as "Entrepreneurial Universities 2.0", as shown in Figure 2.

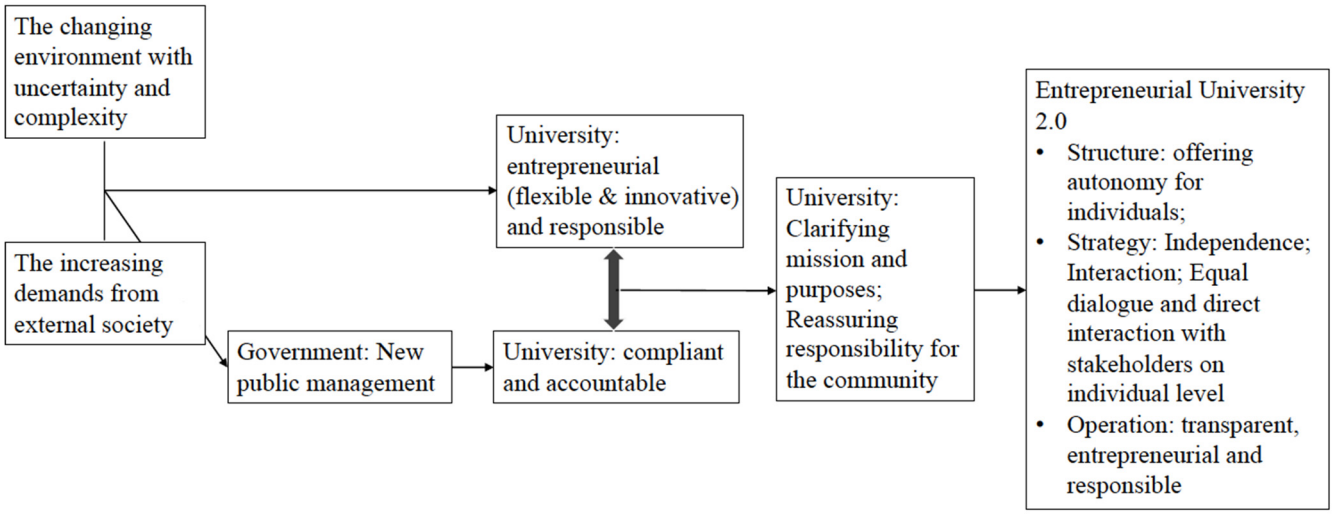

Figure 2. Entrepreneurial University 2.0.

Compared with the traditional entrepreneurial university, "Entrepreneurial University 2.0" is believed to able to address the challenges of new public management imposed by the governments in the era of accountability more efficiently. In addition to being innovative and accountable, the direct responsibility of universities and internal members to the stakeholders are particularly emphasized. "Entrepreneurial University 2.0" encourages equal dialogue and direct interaction with stakeholders on the individual level and pays more attention to the needs of their stakeholders and the whole society rather than complying with the criteria of excellence defined by the external accountability schemes. With these, it is believed to be able to meet the more complex demands from the external environment.

6. Concluding Remarks

The changing external environment with more uncertainty and complexity and increasing expectations has pushed universities to become more entrepreneurial with the aim of responding to the external requirements and contributing to social and economic and sustainable development. This paper has proposed a comprehensive framework describing the entrepreneurial university, including the structural reactions, strategic responses and operational actions. At the same time, the complex environment has also created pressure for universities to become more efficient and accountable, mainly from the government. However, as discussed before, accountability pressures in some ways are not beneficial for universities in becoming entrepreneurial and in fulfilling their third mission of contributing to social, economic and sustainable development. In this context, the concept of "Entrepreneurial University 2.0" was proposed, which emphasizes the responsibilities of universities and individual members to their stakeholders at large. It is believed that "Entrepreneurial University 2.0" offers autonomy to individual staff members, establishes equal dialogue and direct interaction between the internal members of universities and their stakeholders, and embeds the operational actions with entrepreneurship, transparency, and responsibility.

This research has contributed to the field of entrepreneurial universities both theoretically and practically. As mentioned above, the previous studies use different frameworks to describe entrepreneurial universities, while this paper has proposed a more comprehensive and coherent framework to address this issue. Furthermore, it has proposed the conception of "Entrepreneurial University 2.0" to respond to the pressures caused by new public management and accountability schemes. In reality, the establishment and success of "Entrepreneurial university 2.0" also depend on the support from government actions. If the funding agencies and governments encourage universities to purse "good higher education" and to make more contribution to the society by offering more autonomy instead of focusing on those measurable performance indicators, it might push universities

to fulfil their responsibilities to the stakeholders and to contribute better to social, economic and sustainable development.

Recently, with the COVID-19 pandemic, universities have been facing more pressures and expectations. It is widely reported that financial shortages will become a serious problem for universities in many countries as a result of the economic recession caused by the pandemic [52,53]. At the same time, the knowledge produced by universities and other research institutes is expected to help solve social problems and crises, and achieve sustainability goals more efficiently. In this context, universities might have more motivation to conduct entrepreneurial activities to increase their financial resources. At the same time, with the tighter public budget, governments could expect universities to "do more with even less" and increase the accountability pressure on universities. Thus, universities might need to adopt new attitudes and approaches to deal strategically with the somewhat conflicting requirements for being entrepreneurial and accountable. "Entrepreneurial universities 2.0", being more entrepreneurial and responsible, might be solution way forward in this context. When it comes to the development of "Entrepreneurial universities 2.0", the value, impact and benefit of research outcomes might be increasingly emphasized by the funding agencies and governments in the future to respond the increasing demands from the external society for universities for knowledge transferring and application. For example, UK's Research Excellence Framework included research impact outside academia in its assessment. This would probably push universities to pay more attention to the needs of their stakeholders and the whole society. On the other hand, in the context of financial shortage, the competition among higher education institutions for better performance has become increasingly fierce. This situation might exacerbate the pressure on internal members of universities to serve organizational goals, and so universities may not be necessarily willing to offer autonomy to individuals, and the possibilities of direct interaction with the external stakeholders on individual level might be weakened. This is, of course, not beneficial for the development of "Entrepreneurial university 2.0". Since this paper mainly focuses on developing the framework of "Entrepreneurial university 2.0", the other factors facilitating and hindering the development of "Entrepreneurial university 2.0" might need to be further explored in the future studies.

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