



## A Critical Review of the Demola Framework and Its Applicability in a Low-Income Economy: A Case Study of The Gambia

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### Abstract:

This paper critically reviews the appropriateness of the Demola Framework for adoption in a low-level income country. According to the World Bank, Low-income countries are developing countries with emerging markets or newly industrialized countries (Abubakar et al., 2019). The Demola framework has been developed and used in some European countries such as Finland, Germany, and Spain as a curriculum delivery approach for entrepreneurship education courses (De Carolis, 2019). The framework has been widely used in bridging the gap between the academia and industry, for example in an impact study conducted in Finland, it was established that due to

the frameworks' responsiveness to building synergies between students and industry, 7 polytechnics and other universities have adopted it as part of their curricula delivery approach (Catalá-Pérez et al., 2020). Based on these, its concepts are being tested in The Gambia, a country in West Africa where for the first time in the tertiary and higher education sector, a new policy decision has been rolled out to embed entrepreneurship training as part of the science, technology, and engineering education programme. This programme forms the first stage of a national development initiative to transform one of the public technical training institutions into a University of Applied Science Engineering and Technology that will be entrepreneurial and will be producing business minded graduates.

**Keywords:** *Demola Framework, Embedded Entrepreneurship, Curriculum Delivery, Employability.*

### Introduction

The introduction of entrepreneurship education courses is gaining momentum in institutions of higher learning (Stam, 2021). The delivery of such courses has been supported by frameworks that are implemented to guide the curriculum delivery processes. Key amongst such is the Demola framework (Wraae & Thomsen, 2018), which is anchored on training entrepreneurship within the curricula elective courses across

applied sciences universities in Europe. The framework is a co-creation programme between students and external organizations in delivering challenge-oriented ideas. It was created in 2008 within the innovation ecosystem of Tampere, Finland through the collaboration of municipality, local universities, and the private sector (Kshetri, 2014). Since then, it has been adopted by several institutions as part of supportive framework in the deployment of entrepreneurship education curriculum.



The framework brings together the roles of key stakeholders such as students, educators, institution, community, external organizations, educational processes, and the surrounding society and how they can be coordinated to support the creation of an ecosystems that ensures embeddedness is achieved (Acs et al., 2017).

Based on the framework's output, it has been established to support businesses in getting new ideas, prototypes for new products, and potentially increase the pool of talented employees through the collaboration with industry (Malecki, 2018). Additionally, through these interactions, students are provided an opportunity to apply theoretical knowledge into practice. It has helped universities to have specialists with the experience in real projects as well as countries to promote an enhance the development of national innovation ecosystems.

Based on the frameworks' co-creation approaches, students are given the opportunity to contribute ideas into demos, which is then built together as a project. These interactions promote community spirit, where student teams, active academia members and the project partners form an innovation ecosystem where all participants benefit from the DEMOLA.

In Africa, like the Demola framework, (Chimucheka, 2014) discussed that South Africa introduced an entrepreneurship education programme which relied on a conceptual framework that focuses on in-built entrepreneurial skills, entrepreneurial qualities, and entrepreneurial concepts and awareness education as part of its curriculum. Also, in Nigeria, it has been argued that the entrepreneurship education paradigm focuses more on creating awareness about entrepreneurship with experiential learning (Yatu et al., 2018), whilst in Ghana entrepreneurship clinics are adopted which have been found to be viable pedagogical approaches for experimental education in entrepreneurship in Ghana. These clinics utilizes the Joplin's five-step model which comprises of focusing, taking an action, providing feedback,

and ensuring de-brief within the delivery of the program (Nyadu-Addo & Mensah, 2017).

Despite the use of these programmes in Africa, they have been critiqued for their lack of industry or private sector involvement and engagement with students. Adopting the Demola in a country with similar social economic and environmental factors, these gaps will be built on to ensure there is a closer relation between academia including students with the industry.

The interactive nature of the Demola can be relied on to establish a new framework for entrepreneurship education in The Gambia as part of Science, Technology and Engineering (STE) curricula at the University of Applied Sciences, Engineering and Technology (USET) in The Gambia. This is a national development initiative, as part of the National Development Plan, as well as a key policy pillar for the MoHERST Strategic Plan (2021-2025) to build a critical mass of engineers, scientists, innovators, and entrepreneurs that can contribute effectively to the socio-economic development of The Gambia (Touray & Adesopo, 2022).

At the policy level, The Gambia Education Sector Strategy and Policy (2016-2030) recognizes the importance of Science, Technology, Engineering and Mathematics (STEM) as a pre-requisite for skills development, innovation, creativity, entrepreneurship, and employability (MoFEA, 2018).

For example, within the National Science, Technology, and Innovation Policy of the Gambia (2015 – 2024), there is a strategic focus to “streamline entrepreneurship in both formal and informal education systems and create sustainable inter -and -intra public-private sector partnerships for enterprise development”. In the same policy document, there is a strategic focus to “ incorporate entrepreneurship and innovation in school curricula at all the levels of the education system” (Darboe, 2020).

Additionally, the Gambia Investment and Export Promotion Agency (GIEPA) Act 2010 established the Gambia Investment and Export

Promotion Agency (GIEPA) which has the primary responsibility of promoting and facilitating investment, business and export development and support to local industries and regulation of designated export processing zones in The Gambia. This agency supports and promotes the establishment, functioning and sustainability of industries and business ventures in Gambia through the utilization of entrepreneurship education and training (GCCl, 2022). Therefore, the agency relies a lot on educational programmes that can support the growth of industries and businesses.

All these documents have been developed to support social and economic growth and development through harnessing the country's human and natural resources. They promote entrepreneurship development in The Gambia through skills training, business development, and inclusion of incentives for entrepreneurship development, including training and capacity development.

## The Demola Framework in Perspective

The Demola framework uses five dimensions to stimulate and support entrepreneurship training. These includes playing games, using reflections to impact entrepreneurial learning, empathy through developing skills to feel and understand experience, creation of creative skills, and experimentation through communication, problem solving and collaboration (Oosthuizen Jacobus, 2017). These dimensions have been used to complement the existence of entrepreneurship ecosystems, bringing together all the relevant stakeholders.

Despite the Demola Framework being widely used and adopted in many countries in Europe in facilitating the learning process with students and company partners (Wraae & Thomsen, 2018), in promoting entrepreneurship education, for such educational models to be adopted, there is a need to critically review their operability and relevance within the education setup in The Gambia. This makes it relevant, as a researcher to explore measures in understudying the concepts and principles of Demola with a view to how it can be used to connect with the stakeholders needs. Based on this the below operational model of the Demola has been described:

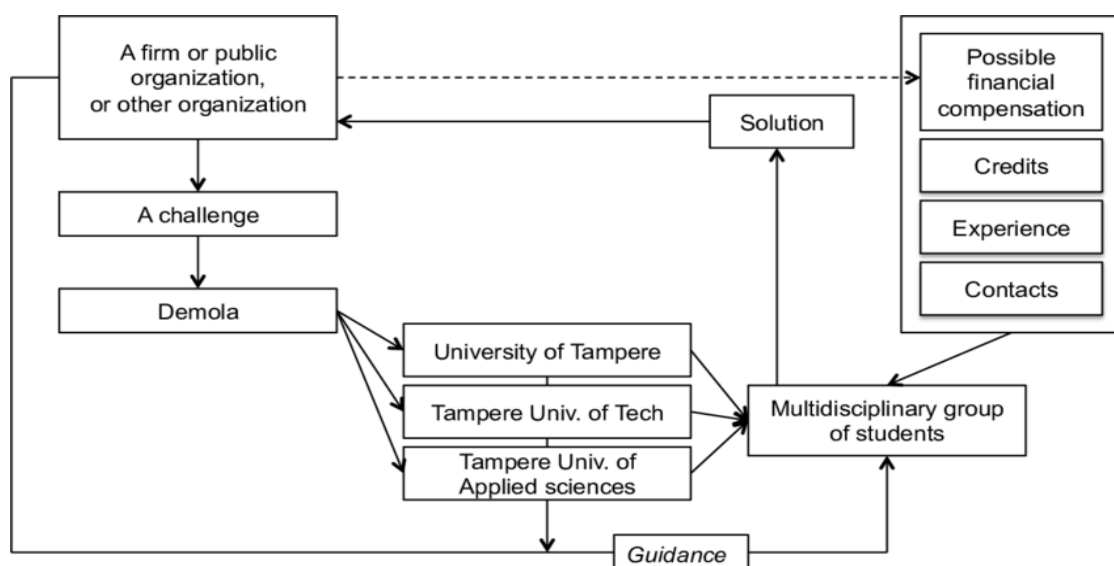


Figure 1. The operative Model of the Demola Framework

Source: Wraae & Thomsen, 2018

As shown in the figure above, the framework adopts a multi-disciplinary approach in which a group of students are subjected to entrepreneurship challenges. Using curriculum delivery approaches such as playing games, entrepreneurial learning, empathy skills to feel and understand experience, creation of creative skills, and experimentation through communication, problem solving and collaboration. Students are given challenges from industries needs and are tasked to come up with solutions, using prototypes and projects that speaks directly and are easily adoptable by the industries. In the process the students establish the relevant industry contacts, experiences, as well as financial opportunities are created.

Ultimately these curriculum approaches create an enabling environment for entrepreneurship development as well as business venture creation by the students involved in this training (Catalá-Pérez et al., 2020). Based on these achievements, many universities and polytechnics in Europe has adopted the model in the process of teaching entrepreneurship education.

## Applicability in Gambia

At a practical point of view, the concepts of the Demola framework (Wraae & Thomsen, 2018) should be the guiding principles for applicability in Gambia. The framework is a co-creation programme between students and external organizations to deliver challenge-oriented ideas. Its relevance in bringing the innovation ecosystem actors through the collaboration of municipality, local universities, and the private sector, is a critical part that can be harnessed to ensure that an innovation ecosystem is established to support the adoption of the framework in Gambia.

For example, playing games, using reflections to impact entrepreneurial learning, empathy through developing skills to feel and understand experience, creation of creative skills, and experimentation through communication, problem solving and collaboration (Oosthuizen

Jacobus, 2017) can all be reflected within the curriculum and course content at theory and practice-base levels to ensure students and industry interacts and engage to come up with solutions to address societal needs.

The curriculum delivery approach concentrates on contributing to facilitating learning and knowledge acquisition to the students as well as all actors of the ecosystem, and this has made it successful in countries such as Denmark, Spain and France in Europe and its concepts and dimensions can be used to enhance the roles of the student as a learner within the ecosystem. The framework is anchored on delivering project base learning and its pedagogical approaches in bridging the gap between training providers and entrepreneurial skills demand by industries have been the basis of its choice of guiding the development of a new framework of teaching embedded entrepreneurship education in STE curricula in Gambia.

Because the framework is Eurocentric and its concepts have rarely been tested in an African setting, it is expected that an attempt to directly transfer the model would be faced with challenges of resistance due to physical, social, and environmental factors. However, as it is deemed theoretically applicable, the concepts could be contextualized to be able to enhance the embedding of entrepreneurship training.

For example, in St. Petersburg, venture companies as part of the Demola have provided students with experiences of managers in relation to innovations and technology transfer (Abubakar et al., 2019). This process attracts students to be more involved in university as well as companies that are interested in cooperation with talented students and participation in new industry projects.

As discussed by (OECD, 2016) to establish such partnerships, there has been five (5) stages being adopted to support this process. These includes prospecting challenge, problem definition and focusing on the need for new ideas and solutions, need of alternatives, need “second opinions” or validation for in-house

development. This is followed by meetings where initial ideas are shared to identify which projects to pursue. On identifying the projects, series of supervised meetings and workshops are conducted aimed at value creation workshop including feedback meetings with innovation team. Once these ideas are established, all-day events are hosted, bringing together all the Demola teams to work on challenges and solutions. This will be concluded by networking amongst team members to successfully implement innovation programmes.

These stages ensures that the Demola is challenge driven, with the project ideas coming from the industry and other organizations. Also, it encourages pathways that allow students' work to be supported by both the industrial and academic partners, whose role is to provide guidance to the student team throughout the project.

The appropriateness for the framework has been anchored on the success factors of strengthening university and business collaboration based on the operation in a worldwide area providing application solutions adopting an interdisciplinary approach. This relates perfectly with Chesbrough's philosophy, that Demola and its platform is based on the crossing of organizational, national, and cultural boundaries providing approaches to support and sustain knowledge flows, boosting the joint development of new ideas and solutions (Bogers et al., 2018).

It is important to recognize that, the platforms created by the framework facilitates the access to knowledge networks, opportunity offering to students (Webb, 2013), as it promotes the development of clear and structured innovation projects that facilitate the identification of touchpoints and solutions, as well as means to pursuing a real co-creation process (Payne et al., 2008). Hence, Demola creates a niche of entrepreneurship actors working closely to ensure the output of academia is achieved. It has been particularly successful in areas where university and business cooperation is hampered by weak collaboration models, therefore it can be relied on to establishing curriculum delivery

approach for business affiliated course such as entrepreneurship education.

The Demola approach is very flexible and due to the constant interaction inside the teams, the outputs may significantly differ from the original inputs, as the research priorities may change (Webb, 2013). It provides solution in the wider setting of the network and validate it or develop it in a different environment and for adapted purposes.

The framework delivery approaches support the protection of intellectual property rights (IPR) as it encourages Open Innovation by providing for ownership of work, maintaining the background materials for the innovation in the property of the innovating enterprise or organization (OECD, 2016). It assigns the rights to a clearly identifies set of actors and companies need to accept the openness of the innovation model, as well as the property rights. The IPR considerations of the framework enhances trust amongst the different actors including large enterprises, as well as provides a pathway for national contextualization of the framework.

The Demola model assumes that university is the centre of innovation activity in the modern society, and for this reason it ensured its synergy with industry by implementing R&D projects and becomes the government's main tool for promoting innovation.

As discussed by (Gebhardt, 2022) and in line with Henry Etzkowitz narratives, for creation and development of innovation, one must learn from the lessons of institutionalizing national parks in Germany as part of university-industry linkages to foster innovation and commercialization through entrepreneurship education in the center of activities for innovation to occur.

Based on these positive lessons, entrepreneurship education is increasingly being adopted in low-income economies as a driver for socio-economic development. However, different approaches are being used to infuse this training as part of the curriculum of respective countries. These includes playing games, using reflections to impact

entrepreneurial learning, empathy through developing skills to feel and understand experience, creation of creative skills, and experimentation through communication, problem solving and collaboration.

In The Gambia, prior to the introduction of the embedded entrepreneurship education in STE curricula, all other courses taught in entrepreneurship were just stand-alone modules delivered outside the core engineering curricula, making it impossible to have a formalized or standardized framework for delivering entrepreneurship education.

In implementing the embedded entrepreneurship in STE education, attempting to adopt the concepts of the Demola Framework should critically assess the ecosystem to ensure that enabling factors are put in place to support the delivery of courses on entrepreneurship which will support bridging the gap between the student learners and industry actors.

For instance, one must ensure that synergies are established amongst academic and relevant industry players that will support in the curriculum challenges as well as entrepreneurial reflections of students to ensure they deliver effectively as part of the programme. The key lessons of implementation learnt from this framework in Europe, in replicating them should be analyzed based on the key elements and actors of the ecosystem.

Since the framework involves a co-creation of programmes between students and external organizations to deliver challenge-oriented ideas. For the case in Gambia, the innovation ecosystem involving actors from the public sector, local universities, and the private sector needs to be engaged in the development and delivery of the entrepreneurship programme.

In adopting and contextualizing Demola, students will be grouped based on interest areas and be linked with industry partners in the related sectors of mechanical, electrical, electronic, and civil engineering fields, where in they will be provided with entrepreneurial challenges and interactions that will form part of

their programme, as well also be providing solutions to those industries.

These industry actors in the other end, will be provided the opportunity to interface with students during the process of taking up these challenges, supporting them with skills needs and labour market information that can guide their activities as entrepreneurship students. This ultimately establish an effective relationship where in the university and industry players are brought together speaking same language and complimenting each other from their respective ends.

This university – industry synergy will rely on the five dimensions of the Demola framework to inculcate as part of the curriculum delivery aspects of playing games, entrepreneurial learning, creative skills, and experimental learning (Oosthuizen Jacobus, 2017). These dimensions promote theory and practice-based learning including engagements with students and industry. The method concentrates on contributing to facilitating learning and knowledge acquisition to the students as well as all actors of the ecosystem by bringing industry closer to academia and ensuring solutions and business ideas are developed together.

In adopting such a curriculum approach in The Gambia, the academic component of the entrepreneurship programme should put great emphasis on project base learning in bridging the gap between training providers and entrepreneurial skills demand by the local industries, hence guiding the development of a new framework of teaching embedded entrepreneurship education in STE curricula in Gambia. This should include formalization of the programme through national accreditation and quality assurance standards and tools, to ensure relevance and effectiveness.

It is expected that an attempt to directly transfer the model would be faced with challenges of resistance due to physical, social, and environmental factors. These factors range from learning resources such as putting in place the right innovation hub in the university to serve as an entrepreneurship niche. Also, establishing the appropriate relationships with industry and

academia to ensure that there is mutual respect and symbiosis in this new pedagogical approach, as well as ensuring that the interest of the other societal actors and beneficiaries are considered. In doing this, one must not forget the impact that the outcome of any project or prototype may have on the environment as it is taken up to a commercialization or business level.

Hence, the replicability of the framework would need a domestic approach, as it has been rated as Eurocentric as has only been used in European countries such as Finland, Germany, and Sweden and that its core concepts have rarely been adopted in a low-income economy. This is why the implementation and delivery approach should be critically reviewed to ensure that the framework is adopted based on the local needs of the ecosystem.

In domesticating it, the framework should be used to bring together students, educators, institution, community, external organizations, educational processes, and the surrounding society by putting in place mechanisms that can coordinate their respective roles in supporting the delivery of the programme (Acs et al., 2017).

The core concepts of the framework should be introduced to the staff of both KNUST who are delivering the engineering courses as well as the DMU staff who are infusing the entrepreneurship modules. Hence the curriculum should be developed in a manner that ensures students are exposed to challenge-oriented ideas. This means that the curriculum content should ensure practice base and these students should interact with industry in providing them with entrepreneurship solutions.

The peculiar factor in this whole programme is the PhD students being mentored as lecturers to take up teaching roles. In the mentorship process, they will be exposed with principles of how the framework can be used to enhance teaching and learning as well as promote collaboration amongst the different actors in supporting the curriculum delivery.

In adopted and the validated entrepreneurship curriculum, the concepts of the framework should be included in lesson plans as well as

practical teaching sessions. This will ensure that the innovation hub at the USET will be used as the anchor with the collaborative industries of the ecosystem. This will support the effective delivery of the internship programme, as it will be developed with the operations of the innovation lab.

The industry actors in the process of co-creation should provide adequate resources to the institution that will help finance student business ideas as well as support them in creating new ventures.

## Implications for Adopting the DEMOLA Framework

As discussed earlier, the adoption of such a framework requires consideration for the political, economic, social, and technological (PEST) preparedness within the USET to provide an understanding on effectively diffusing the concepts of the framework.

The political commitment has been shown by the upgrading of GTTI into USET, as well as introducing embedded entrepreneurship training in STE education. This coupled with the efforts of establishing and innovation hub that will support the adoption of the Demola concepts withing the USET.

The USET has already established relationships amongst actors within the entrepreneurship ecosystem and this will be used to consolidate and complement efforts in introducing this curriculum approach. The appropriate equipment being installed at the innovation hub to support the teaching of the programme can be used to enhance the adoption of the concepts of the Demola.

Programmes for education institutions of this nature must survive on vibrant economic conditions, meaning that the right resources such as funding the projects being done by students and the right prototypes equipment and teaching aides to enhance the curriculum delivery, in addition to the state-of-the-art 3D printing services that are in USET. These would support and enhance experiential learning and

prototype development within the confines of the framework being adopted for use in the USET curriculum delivery approach.

The industry and other stakeholders are key in supporting the adoption of this new framework in USET; thus, it is important to provide these actors a better understanding on the Demola concepts and how it can be used to enhance teaching and learning. This means that educative sessions of engagements should be provided to these actors to ensure they are educated and better informed on the operability of the Demola. It promotes ownership of the new programme, and it will facilitate improvements in case there are challenges faced during the process of implementation.

## Conclusions

As discussed above, this paper has reviewed the appropriateness and relevance of the key concepts and theories of the Demola framework for implementation in The Gambia higher education system, more specifically, the University of Applied Science Engineering and Technology.

Based on the concepts and principles of the framework and in line with the USET readiness to embed entrepreneurship training as part of core STE curricula, lessons of how the Demola has been effectively implemented in some universities in Europe has been relied on to provide an analysis on how to adopt the programme in the USET.

It is expected that, since it is a new framework that has rarely been tested in an Africa education setup, there might be challenges of implementation and acceptance amongst actors. However, based on the policy and institutional readiness of the USET, plans would be in place to ensure these are averted and remedied to have the new curriculum approach become the best, and be replicated in other institutions of higher learning in Gambia.

Finally, it is recommended that, a review of the adopted framework be done after some years to assess its relevance and appropriateness as a

curriculum delivery tool for the USET, and other institutions of higher learning.

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