

# Challenges of continuous technological disruption in the broadcasting industry and the search for 'job-fit' talents

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**Abstract:** Job placement is becoming an uphill task for new graduates when they do not have the relevant knowledge to start up on their own. This happens when their education is either sub-standard, rendered obsolete upon graduation or cannot be translated into practice at their respective workplaces. Such a shortcoming in the broadcasting industry is not with the provision of training or the supply of skilled manpower. It is rather the continuous disruption of technology when graduates require more than operational knowledge. In the absence of 'job-fit graduates' the broadcasting industry looks out for the best talents outside of their traditional marketplace. To address this fallout, the industry is looking to recruit new talents with emerging computing knowledge instead of the traditional Mass Communication discipline. This empirical study explores the skills shortage in the broadcasting industry from the perspective of "Challenges of Industrial Revolution 4.0 in higher education (MyHE 4.0). Qualitative data was gathered from stakeholders, training providers and vendors. Two major findings: 1) The need for talents transformation to a modern converged setting in broadcasting; and 2) The establishment of pathways to 'Job-Fit' training in the broadcasting industry, have emerged from the study. The study proposes six recommendations in support of the transformation in the broadcasting industry.

Keywords: Technology disruption, technology fit theory, Job-fit interventions.

## 1 Introduction

In presenting the challenges of industrial revolution 4.0 in higher education (MyHE 4.0), Selamat (2017) argued in appreciation of a digitalization wave that will soon witness an increased use of artificial intelligence, robotics, computing and the Internet of Things (IOT) in most industries. He warned that Digital Disruption is occurring at production and dissemination of media content. As postulated by Manyika, Chui, Bughin and Dobbs (2013), the widespread emergence of new media technologies is disrupting traditional practices of conventional broadcasters compelling them to migrate to newer compatible broadcasting platforms. The rise in user-generated content is further disrupting traditional value chains of content production and delivery.

McKinsey Global Institute (2013) suggest that among 12 disruptive technologies, Internet of Things (IoT) has caused a 300% increase in machine to machine devices usage since 2008 leading to new ways of operation at the workplace. The introduction of such new technologies can affect society and therefore changes in required education must also take place in tandem. Meanwhile the Malaysian Education Blueprint 2015-2025 (Ahmad, 2016) proposes a curriculum that balances the development of ethical values and knowledge & skills as well. The blueprint (MyHE 4.0) strategies include open access to information with learners as constructivist of knowledge. The future of AI in classrooms, claims Kurshan (2016), is lagging behind. She cites the momentum of artificial intelligence in education as fading away again blaming poor strategies and the provision of interconnectedness and accessibility of internet in classrooms. Pointing to the same weakness, Grant (2017) observed that investments in emerging technologies and human connectivity, building digital resilience, as well as institutional capabilities in digital governance and accountability, are key strategies for moving on but was skeptical whether the higher education community is doing enough to adapt.

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Among the major challenges facing the Fourth Industrial Revolution Challenges 4.0, as reported in the 2016 Global Industry 4.0 Survey (Report, 2016) is the lack of a clear digital culture and training policy among custodians of national education providers.

In an effort to redesign higher education, the Ministry of Higher Education (MOHE) via the Malaysia Education Blueprint 2015-2025 (Ahmad, 2016) has put in place follow-through and continuing programs designed to produce holistic graduates. These programs were expected to produce employable graduates with good academic results, experience in the industry and love for the nation. Along those lines, to better prepare students for a balanced studies-work orientation, eight universities initiated the “*Take a break*”, a one-year program believed to inculcate ethical values and social skills. Here students took time off from studies to pursue their interests. In particular they were encouraged to volunteer with agencies such as the uniformed forces especially those under the National Blue Ocean Strategy.

MOHE believed it was important to harmonise public and private higher learning institutions as a single entity that adhered to a strict set of regulations that will ensure their quality (New Straits Times, 2017). Hence, ACT 555 was enacted in 1996 to regulate the operations of 487 Private Higher Education Institutions (PHEIs) in the country (Laws of Malaysia, 2006). With that students will benefit from a dedicated network for research and learning with its own separate and independent gateway to the Internet known as Myren-X. Students will afford an increases bandwidth capacity to a maximum of 100 gigabits per second (Gbps) and for other institutions under the MOHE, up to 10 Gbps. The provision of increase accessibility is expected to facilitate new ways and methods of teaching and learning such as collaborative online learning, virtual classrooms and Massive Open Online Courses.

## 1.2 Statement of Problem

The fourth industrial revolution 4.0 has rightly identified the lack of clear digital culture and training as the biggest problem inhibiting operational capabilities experienced by industries. This realization applies directly to the current technology disruption experienced by the broadcasting industry. The technology disruption is so overwhelming that the next generation of broadcasters is bound to experience a ‘job-fit’ challenge if stakeholders delay in ensuring their talents were ‘Tech Savvy’. The speed of digital transformation and disruption has impacted human operational capacity at work requiring new critical skills for interaction with fellow workers and technology. Broadcasters who prefer to operate in ‘silos’, have now to merge their resources to meet new industry standards. To institute interventional strategies which are able to deliver these new skills, training providers have to better understand the future needs of their potential talents. In this regard, the study observes that the industry has failed to provide for some types of training needs that support continuous and supplementary training rather than relying on formal tertiary education. At the same time, collaboration between the universities and professional broadcast training providers have been nil or minimal at the best.

## 1.3 Objective

The study explores the state of skills shortage in the broadcasting industry at a time of continuous technology disruption in an exponentially growing multimedia environment.

## 1.4 Research Questions

- RQ.1. Why is there challenges to ‘Job-fit’ talents in the broadcasting industry?
- RQ. 2. How is the broadcasting industry responding to the challenges of the industrial revolution?
- RQ.3. What recommendations are being offered to relief the skills shortage?

## 1.5 Significance of Research

An exploration of technology disruption related to the provision of education by the higher education services and training by the broadcasting industry is of great importance at this time. The areas of digital transformation and recommendations described in the study offers value for aspiring broadcasters and education providers from a practical perspective.

## 2 Literature Review

The model we use in this research is based on Task Technology fit theory (TTF) (Barki, Titah, and Boffo, 2007), (Baloh, 2007), (Cane, and McCarthy, 2009). This theory argues that information system use and performance benefits are attained when an information system is well-suited to the tasks that must be performed. Furneaux B. (2012) presented an overview of the diverse range of research contexts and

methodologies that have been used to test and extend TTF theory. Key outcomes of interest to TTF researchers are also examined as are the various approaches that researchers have used to operationalize the notion of TTF.

In the developing nations, educators are clamoring to provide additional skills through new strategies. Agbo, Onaga, and Omeje (2018) raise their concern and are skeptical about the availability of opportunities in e-learning for effective technical and vocational education and training (TVET) programmes. In their absence they recommended that teachers be sent on capacity building programs to get acquainted with the skills to exploit the availability of e-learning opportunities in higher institutions.

Elsewhere Chimpololo (2017), points out the lack of teachers with critical skills in technical, entrepreneurial education and training (TEVET) skills citing the limited supply of quality and quantity of experts available in the job market. Well- equipped teachers would enable graduates to perform multiple-related functions once they are employed. To close the glaring mismatch in the demand and supply of technical, entrepreneurial, vocational education and training (TEVET) Skills, the study suggests the facilitation of academia-industry linkages to promote harmonious working relationships which would ensure that curricula are informed by industrial needs.

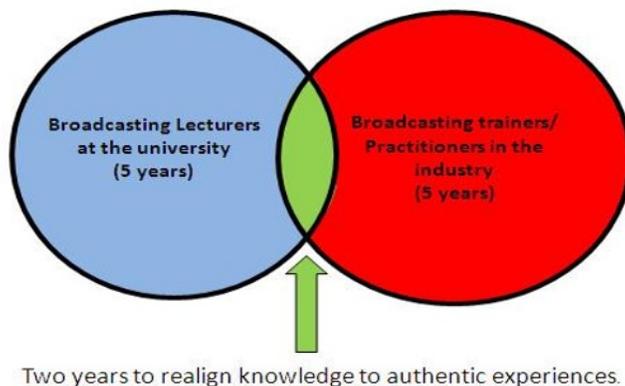
Zahraa, S., Sisodiab, R. and Mathernea, B. (1999) pose two perspectives to exploit links between competitive and technology strategies. They espouses that a company's competitive strategy and internal capabilities jointly determine its technological choices. And that technology is strategic to pursue its competitive goals. The interdependence between technology and competitive strategies emphasizes the importance of organizational learning and exploiting the knowledge required in this process. In the case of the broadcasting industry, it is new technology disruption requiring strategic educational interventions within the organization.

Media Planet (2018) in its latest report identifies three strategies to solve the skills mismatch existing in the media industry. First it is to solve the divide between the skills and credentials held by talents looking for work and the qualifications employers are saying they need. Next, jobs in the future will require post-secondary education, which are career-focused programs including apprenticeship training. The third strategy is the partnerships between job-seekers in the job market and skills training providers. With an uncertain job market, Students must be encouraged to explore the full range of post-secondary programs available. Job seekers ought to pursue programs that best fit their strengths and aptitudes to land jobs that best fit their skills and expertise

The idea of 'job-fit' is dependent on how individuals negotiate their tasks. Parkes (2012) experimented with the task–technology–individual fit model into three two-way interactions and ascertain how these interactions affect user attitude and performance.

The results demonstrated that user attitude (*behaviour*) is affected by the fit between individual (*broadcaster*) and technology (*machine processes*) whereas technology or the machine process in the case of broadcasting performance is affected by the fit between task and technology, and task and individual. Users of technology fitted to them as an individual can perceive it as more useful than it actually is, in terms of improving task performance. Finally, technology performance translates into task performance.

In suggesting innovations to broadcasting curricula to meet workplace expectations, Ponnann and Ambalavanan (2014) pointed to the need for academia to discuss the expectations of practitioners on developing evolving curricula that accommodate changes in the industry.



**Figure 1:** Aligning knowledge to authentic experiences

They put forward the idea that lecturers may be provided with sabbatical opportunity to work in the industry for two years after every five years of teaching and vice versa (see figure 1). Their study suggested classroom and lab work would effectively be current and challenging when they undertake project-based learning initiatives or collaborative projects involving the industry. Students and lecturers who return from internship and sabbatical should further identify worthwhile collaborative projects to continue with the same company, to create opportunities to revisit them to demonstrate new skills for hire.

A survey by the International Association for Broadcasting and Media (IABM, 2017) on staff employment in the Broadcasting Industry in the Asia-Pacific Region including Malaysia (2016-2017) informs the study briefly.

Only 20% of trained staff in the broadcast industry is due for retirement in five years. A shortage of staff has not reached crisis level yet as is the general assumption. That the average age of broadcasters on their feet now is 46, however, it is unclear if the succeeding cohort of broadcasters would be the ICT savvy generation of broadcasters.

**Table 1:** Nature of staff employment in the Asia-Pacific survey region (IABM 2017)

Selected Related Survey Items	Results
Well trained broadcasters on demand are working as expatriates	22%
A third of staff is self-employed	30%
Self-employed in broadcasting as primary occupation	14%
Self-employed in broadcasting as part-timers	17%
School leavers with shorter tertiary education	20%
Employees have Bachelor’s degree	71%
Receive training from internal academies	51%
The average age of broadcasters on their feet now is 46 in the Asia-Pacific region. 45 years	55 years

### 3 Methodology

The study conducted face-to-face interviews with assistance from the HR department of two broadcasting organizations. As a result seven well informed experts were identified as informants from the broadcasting industry. Additionally, one broadcasting vendor, one independent training provider, one formal training provider and nine university students and one lecturer were also interviewed. A detailed breakdown is given below.

**Table 2:** Breakdown of Informants

Broadcasters	University
HR placement officer -1	Internship placement officer 1
Decision makers -1	Final year students 2
Executives interacting with interns -1	Students during internship 2
Engineers -2	Students after internship 2
Producers -2	Students after graduation 2
Vendors -1	Lecturers 1
Training providers – 2	

Literature reviewed informed the study on the current state of technological disruption affecting broadcasters in the developed and developing countries. Their action plans helped to inform the recommendations in this study. Content analysis of official government and university portals also provided perspectives on how they viewed their current needs and formulated action plans.

### 4 Findings

Changing broadcasting landscape as a result of convergence of technologies and digitalization has led to distinct technology disruptions. Two major findings have emerged from the study: 1) The need for talents transformation to a modern converged setting in broadcasting; and 2) The establishment of pathway to ‘Job-Fit’ training in the broadcasting industry.

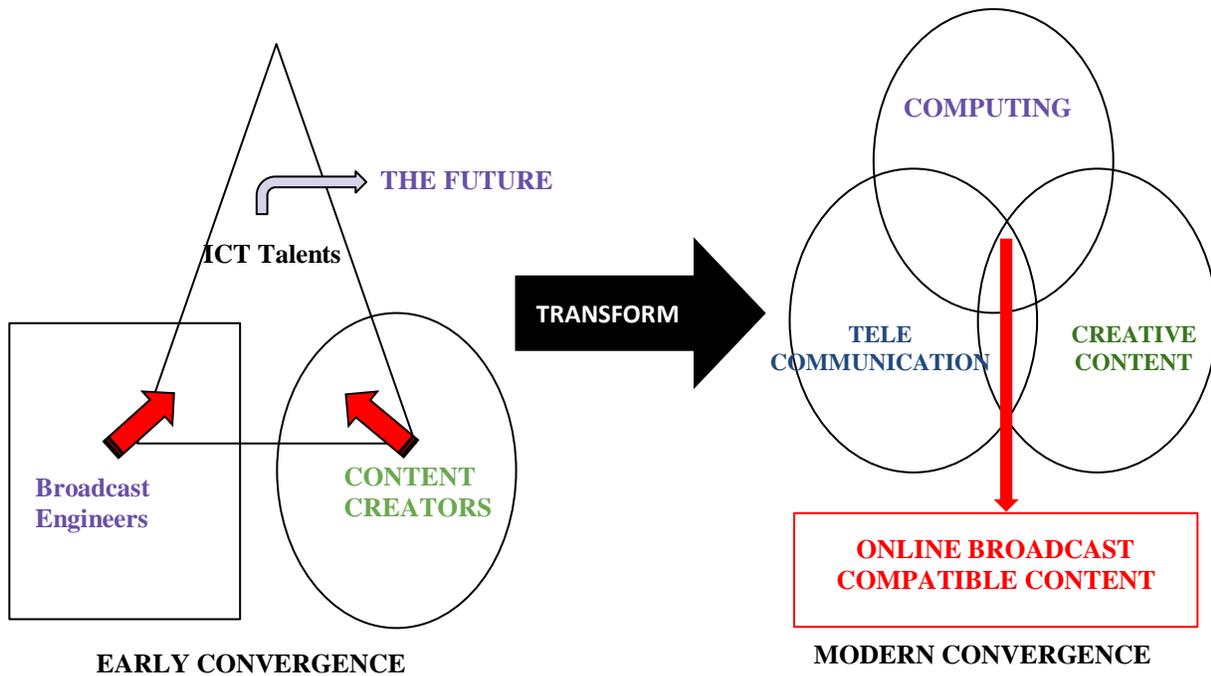
#### 4.1 Transformation to Modern Converged setting

Informants have dispelled the notion of critical shortage for skilled talents but confirmed the technology disruption experienced by the industry. Hence the need for talents transformation to a modern converged setting in broadcasting

As a senior engineer put it, “we remain ‘siloes’ in our respective job functions, particularly between creative, operational and engineering functions. We need to be more coordinated and collaborative, and have a broader focus on management of our core businesses”.

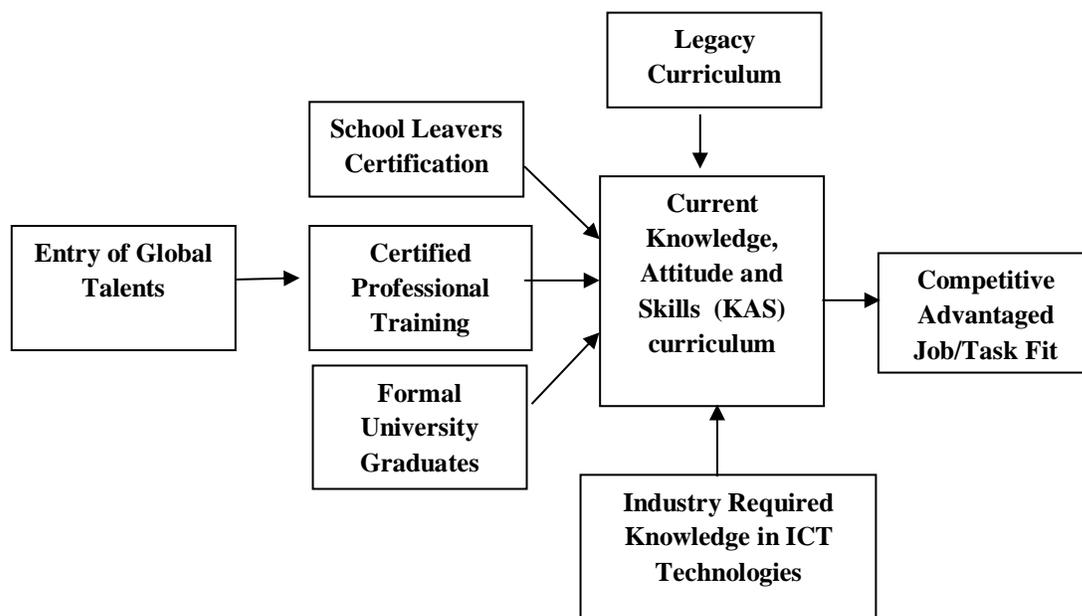
The first illustration in figure 2 shows broadcasters performed tasks in their respective domains. Engineers in their engineering services, producers engaged in production and ICT talents providing complementary services. As convergence of technologies brought together the three entities of creative content producers, the traditional broadcast engineers and the advent of new ICT talents, they transformed and evolved into the second illustration working collaboratively. In the second illustration all three entities or services, creative production, telecommunication engineering and computing technology, converge to produce online compatible content for the internet enabled multimedia broadcasting. Broadcast technologies are constantly evolving to achieve online compatible content for broadcasting in the modern converged setting. It has now become inevitable for the new generation of broadcasters to be ICT savvy.

**Figure 2:** Talents Transformation to Modern Converged setting



**4.2 Pathway to ‘Job-Fit’ training in the broadcasting industry.**

Stakeholders in the industry, who are cautious in decision making, expect the best from their staff but do not invest in the right human capital development. To get the right talents, our way of identifying the right talents have to change. Talents with passion may be better than the person with an on-paper qualification.



**Figure 3:** Entry Levels of Talents and pathway to ‘Job-Fit’ training in the broadcasting industry.

The study identified three entry levels of talents as pathway to ‘Job-Fit’ training beneficial for the broadcast industry. Namely, i) School Leavers Certification, ii) Certified Professional Training, iii) Formal university studies in broadcasting. For school leavers technical education by the government is in place (PADU, 2013).

PADU delivers and monitors the government's aspiration to develop world-class education that will better prepare young school leavers for the needs of the 21st century. Certified Professional Training is provided within the organization but is mostly self-funded training offered by vendors and commercial training providers. This is meant for up-skilling talents in the industry. There is great need to up-skill about 1,300 registered vendors in the creative content sector who rarely take up any form of training so much so their products face quality control rejection. Next, formal university broadcasting graduates land the higher level jobs in the industry. Nevertheless, they too need supplementary education to upskill themselves to fill in the gap where they lack optimal operational knowledge. All three levels of talents walk into the regular 'KAS' training curriculum but soon discover the need to relearn new tools and technologies as a result of technology disruption. Apart from local talents there is a flow of global experts in the industry now filling in the void created by technology disruption. These training initiatives have one challenge though. The burden of cost is gradually being shifted to individuals and broadcasters.

#### **4.3 Tech savvy talents**

Students returning from internship discovered that the broadcasting industry required usage of unfamiliar technology in areas they were less comfortable such as Cybersecurity and Cloud. The gap between past practices and current expectations in the industry is the technology disruption that is rendering interns incapacitated at their workplace. They ask that future students be better prepared with skills in these areas.

Decision makers in the broadcasting industry are wondering if broadcasting is beginning to become more like the IT industry. Traditional content production has now moved on to include many technical features, especially for live, liner and OTT multimedia consumption. The technology disruption is so overwhelming that the next generation of broadcasters is bound to experience a 'job-fit' challenge if it delays in equipping itself to be 'Tech savvy' with skills in:

- "IT & IP, especially in the area of coding"
- "IT Security & Networking"
- "Internet Streaming Formats - HEVC+HDR/WCG – DRM Technology"
- "DAM workflows"
- "Better Computing skills such as programming"

#### **4.4 Learning needs in the technology disruption era**

Emanating from the interviews of training providers, broadcasters, university students and lecturer, content analysis on strategies and action plans, several consistent themes on skills shortages, learning needs and interventions became visible to the study as a result of talents migration to a converged setting. Four areas of technology change were identified as being particularly disruptive:

Education and training needs' analysis of the industry is mainly situated in the workforce and the machine. The technology disruption is an urgent matter to be understood completely to understand the skills needs at the digital workflow, from acquisition to The move from an analogue to digital workflow have remained substantially the same, and so have the workforce in their silos remained the same too. Challenged by changes in technology and in work culture we will need to assess how new digital culture can evolve. Five technology change were identified as being particularly disruptive:

a) IT and IP for workflows: IT has change the face of broadcast technology. IP will further allow for different production and distribution models, as in the case of non-liner, VoD and OTT providers. The need for thorough technical knowledge is one of the skills-needs areas.

b) Cyber Security: there is a need for enhanced Cyber Security skills in the production process that prevents unauthorized manipulation of content, preventing malicious attacks on broadcast systems and ensuring security of data is completely maintained. This is a need that goes beyond an 'anti-virus' software and the need to the need for protection at every stages of the workflow.

c) Cloud: The use of cloud computing, storage and distribution is where there may be huge differences in the accessibility of cloud infrastructure. With good telecommunications infrastructure, the use of cloud is a viable option as part of an overall infrastructure strategy. The skills required for this type of infrastructure management are different from those required to manage an on premise broadcast technology operations.

d) Media Assets Management (MAM): Digital disruption has changed Media assets management even further with the advent of IT, IP and Cloud into broadcast technology. This too has raised the need for continuous training in media management for new forms of content management and deliverables.

e) The last area of learning needed is in the coordination of creative, operational and engineering functions in a more coherent way as in figure 2. The workforce here does not 'speak the same language'.

Broadcasters cannot afford this model to continue as it will impede them from getting new creative ideas, putting them at a competitive disadvantage. In the past, each department has tended to focus on workflows in their respective area, but in the future, management will need to consider what will work best across an end-to-end digital workflow. This can only happen through supporting internal collaboration and organizational learning.

## 5 Solutions as Recommendations

In developing potential solutions the study proposes six recommendations as viable approaches in support of the transformation in the broadcasting industry that will address the short supply of 'job-fit' graduates for the industry.

### 5.1 Recommendation 1

A skills Survey to assess training needs and gaps accurately in required skills should provide for the lack of quality data on skills levels in the industry. For the moment there is no single consistent dataset provided by the job market beyond company needs. A critical skills issue is having a good understanding of the base level of skills and where the gaps are. Such evidences are collated only periodically during summits. Support for regular data collection would provide good regional and national assessment of skills levels, provision, trends and gaps. This skills survey would provide vital data for broadcast industry stakeholders.

### 5.2 Recommendation 2:

Ministry of Higher Education (MOHE), *Institute Penerangan Penyiaran Tun Abdul Razak* (IPPTAR), the Asia-Pacific Institute for Broadcast Development (AIBD) should create an annualized skills survey in the region, which can be reviewed in a session during their respective summits such as the Asia Media Summit by AIBD. MOHE should extend an existing commitment to their official portal to include the curation of industry needs.

### 5.3 Recommendation 3

Master Skills Model for Broadcasting: A skills model that can be used to communicate with university students, government bodies, industry organizations, broadcasters and technology vendors is essential to address skills provision in the industry. Each organization makes its respective calls for training. No one addresses skills need as a master skills model for broadcasting, and none was particularly successful. Referring to figure 3, three levels of talents certification can be planned as the national broadcasting curriculum. The nature of intervention organized should be in consultation with the industry stakeholders and all education and training providers.

Local training providers currently provide training out of a commitment to the industry. IPPTAR, AIBD and elsewhere in Australia, Bangladesh, India, Pakistan, and Media Industry Technologist Certification have obtained the support of the government. The certification process is informally recognized for jobs application in the industry.

Despite the initial support from broadcasters and government, MOHE or rather the qualification Agency (MQA) does not equate such certifications for onward qualifications in universities. Such inhibition causes frustration among talents. These talents then seek self-funded but low-cost entry-level skills training, offering low-risk means of self-certification within specific areas. For example, the IT community used Cisco Certification process as a mandatory indicator of competence and capability in network technology. Create a 'Graduate Career Path' that would guide graduates' career progression. The industry needs to create an over-arching model for aspiring broadcasting talents that enables them to develop and learn with the industry.

### 5.4 Recommendation 4:

MOHE, IPPTAR to collaborate with qualified organizations globally such as the AIBD to design Master Skills Model for careers in broadcast and media technology that defines required training programs for the Industry. MOHE, IPPTAR and AIBD should consider how to support informal regional 'Workflow Innovation' style groups made up of broadcasters, academics, and training providers, to encourage the sharing of practical experience

### 5.5 Recommendation 5

Role of Higher Education: The study has identified the need for greater collaboration between the industry and educational institutions. Broadcasters and vendors would benefit from access to innovation from institutions and that educational staff would benefit from a practical understanding of broadcast operations as seen from figure 1. (Ponnan and Ambalavanan, 2014). Another proposition that could be considered was co-operation around commercial ventures or specific products from IT companies for university lecturers and

students. A starting point for university lecturers could also be an R&D joint product development project, with broadcasters providing oversight. Technology disruption has created the need for new metadata indexing process and stringent technical quality control using machine learning focused on workflow innovation in the operations control room. This is an exploratory endeavor, and expectations should not be set too high. It is about starting on a simple but practical way with a view for stronger and more formal co-operation.

#### **5.6 Recommendation 6**

Universities, MOHE, IPPTAR and AIBD set up exploratory session to identify areas for co-operation between media industry, academic institutions and training providers.

## **6 Conclusions**

In conclusion, globalization and the global movement of talents are bound to change broadcasting landscape especially in developing countries that are slow in implementing changes in tandem with the rest of the industry. For broadcasters to work collaboratively to make broadcasting a viable industry through engagement with non-traditional broadcasters, the intervention of educationists and training providers cannot be over-emphasized. The need for talents transformation at the modern converged setting in broadcasting; and the establishment of pathway to 'Job-Fit' training in the broadcasting industry are worthy of action considering that the successful digitalization and eminent analog shut down, will further cause technology disruptions. Six recommendations are proposed for transformation in the broadcasting industry that will address the 'job-fit' requirements among current broadcasters and fresh entrants. In that way, the study is hopeful that MyHE 4.0 will fulfil shortcomings by further technical disruptions.

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