

# iCGPA, IR4.0 AND GRADUATE EMPLOYABILITY FROM THE LENS OF THE ACADEMICS

Faizah A Majid

*Faculty of Education, Universiti Teknologi MARA*

[faiza404@uitm.edu.my](mailto:faiza404@uitm.edu.my)

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## ABSTRACT

This paper focuses on heated issues in the Malaysian public universities of late. Specifically, the paper uncovers the perceptions of a group of lecturers in a selected public university regarding iCGPA, IR4.0 and Graduate Employability. In eliciting relevant data, series of semi-structured interview were conducted. A total of ten lecturers from a faculty volunteered as participants. In collecting the data through the semi-structured interview, saturation stage was achieved at the end of the 5<sup>th</sup> participant. Anticipating no new themes could emerge from the subsequent interviews upon the saturation stage, it was decided that the research findings would be derived from the relevant excerpts from the existing five interviews. The interviews were done separately, and each lasted between 45 minutes and an hour. In ensuring the trustworthiness of the research findings interpretations, member-checks and an inter-rater were done. The salient findings include frustration over iCGPA implementation and a vague understanding of IR4.0 among the participants. The findings however revealed the participants' awareness of graduate employability. Most importantly, the findings concluded that though the participants were clear with the importance of graduate employability, they were unsure about iCGPA's role in enhancing graduate employability and how IR4.0 could be embedded in their syllabus to promote graduate employability. All in all, this paper has confirmed a potential gap between the three main aspects namely; iCGPA, IR4.0 and graduate employability. The implications include the need to revisit the existing curriculum in complementing the training needs of IR4.0 skills, to re-skill lecturers in their teaching approaches and to examine the implementation of iCGPA as a platform to indicate IR4.0 skills and to promote graduate employability. Various parties could benefit from the research findings such as the curriculum developer, the lecturers themselves and most importantly the policymakers.

**KEYWORDS:** *iCGPA, IR4.0, Graduate Employability, Higher Education*

## INTRODUCTION

Malaysian higher education has witnessed the various transformations in the past decade. Contributing to the changing landscapes in higher education include the most recent Malaysian Higher Education Blueprint (2015-2025) Ministry of Education (2015) and World Economic Forum (2016). While the Malaysian Higher Education Blueprint (MHEB) (2015-2025) emphasizes on the ten shifts, the World Economic Forum (WEF) (2016) introduces higher education to Industry Revolution 4.0 (IR4.0). The first shift in MHEB (2015-2025) addresses

the need to produce holistic, entrepreneurial and balanced graduates. Complementing this shift is the major concern raised by the WEF (2016) on future job market in IR4.0.

In targeting higher statistics in their graduate employability rate, every public university in Malaysia has been tasked to initiate collaborations with the industries and to expose the students to IR4.0. On top of this is the Ministry's directive on the training of the learning domains identified in the Malaysian Qualification Framework (MQF) and by the Ministry of Higher Education (MOHE) then. These two major factors have contributed to several initiatives implemented in the universities such as the inclusion of IR4.0 aspects in the curriculum and the implementation of Integrated Cumulative Grade Point Average also known as iCGPA.

These initiatives are quite new and since they are directive, many universities impose the need for students' exposure to IR4.0 and the need to assess the identified learning outcomes. While the two directives are acceptable and well understood, it is the teaching approaches that were supposed to expose students to IR4.0 and the assessment and reporting of the identified learning outcomes done through iCGPA that are yet to be confirmed satisfactorily if not effectively. The current status of the lecturers' approaches in exposing IR4.0 to the students and their implementation of iCGPA remain unknown to many. It is with this argument in mind that the present study was conducted.

## **Graduate Employability**

TalentCorp Malaysia released a report that indicated Malaysian graduates are generally ill-informed of employers' expectations. This report landed an important national agenda driven by the then Ministry of Higher Education known as 'graduate employability'. This national agenda was further amplified by the CEO of Malaysian Qualifications Agency (MQA) who claimed that in recent years the industries are getting 'the bodies' but are unable to recruit high quality employees (as cited in Goon, 2014). In turn, it is quite acceptable why 'graduate employability' becomes one of the Key Performance Indicators (KPIs) of all public universities in Malaysia. Graduate Employability Blueprint (2012-2017) was launched in realizing the then Ministry of Higher Education's aspiration of minimum 75% graduates securing employment upon graduation.

Yorke (2006) has defined graduate employability as a set of skills and knowledge that makes an individual more likely to secure and be successful in their chosen occupation(s) to the benefit of themselves, the workforce, the community, and the economy. This definition has also espoused an important aspect of employability that is employability is secured because one's competencies to meet new needs in a changing workplace. It is important to note that the competencies comprise both knowledge and skills. According to the Malaysian Graduates Tracer Study (MOHE, January 2018), over 200,000 students graduate annually and that one in every five graduates remain unemployed. In other words, the percentage of graduate unemployment to date is 35%.

At this juncture, when addressing graduate employability, universities need to ensure the students are trained well to acquire the relevant knowledge and skills. Since academics are experts in their field of knowledge and subject matter, confirming the training of the relevant knowledge is quite easy. However, the academics may need to take a step back and consider their approach in training students the relevant skills as expected by the employers. As reported in the Graduate Employability Blueprint (2012-2017), there are several 'characteristics'

required by the industries namely strong command of English, the right attitude, and the ability to solve problems (as cited in Goon, 2014). The high rate of unemployability among the graduates confirmed that they lack these skills. Quek (2005) stated that the lack of teamwork, innovation and creativity as well as problem-solving skills further cause unemployment among the graduates. All these claims are further supported by a report done by JobStreet.com (2018) which stated that some of the factors contributing to unemployment are i) poor character, attitude or personality (58%), ii) poor command of English language (52%) and iii) poor communication skills (49%).

Hence, though the graduates may be knowledgeable, they may lack the desired skills. The training of the desired skills might have not been effective unlike the training of the relevant knowledge in their field of discipline. Asma and Lim (2000), Quek (2007), Goon (2014) and Ang (2015) have all agreed on similar findings from their research. These research findings are quite alarming since it had been discovered that despite the awareness of such issue over the years, similar issue still arises. There has been a claim made on the deficiencies of such skill training in the universities that contributed to poor graduate employability in Malaysia (Ang, 2015).

#### **IR4.0**

The fourth industrial revolution or also known as IR4.0 captures the importance of cyber physical systems unlike the previous industrial revolution era that capitalizes on water power and steam (first industry revolution), electricity (second industry revolution) and computer and automation (third industry revolution). IR4.0 capitalizes on digital technology, automation, and artificial intelligences. Revolving from the third industry revolution, IR4.0 works around the concept of automation and data exchange through the digital mediums, i.e., cyber-physical systems, the internet of things (IoT) and cloud computing.

There are several characteristics of IR4.0 as proposed by PwC's 2016 Global Industry Survey (retrieved from [www.pwc.com/industry40](http://www.pwc.com/industry40)) namely; interconnection, data, integration, innovation and transition. Terms such as artificial intelligence, industrial internet, industrial cloud computing, industrial big data, industrial robot, 3D printing, knowledge work automation, industrial network security and virtual reality are synonymous to IR4.0. Gray (2016) and WEF (2016) summarized that the advancement of digital economy, robotics and autonomous transport, artificial intelligence and machine learning, cutting-edge materials, biotechnology and genomics are the identity of IR4.0.

Lasi, Fettke, Kemper, Feld, Hoffmann (2014) confirmed that IR4.0 has marked a new quantum leap in how the industries work and what they produce. In relating to job markets in IR4.0, WEF (2016) has stated that students of today need to be prepared for jobs that centred on the use of digital equipment and the IoT. Yet more challenging for the universities is the need to prepare the students for jobs that are yet to be created. Hence, it is easy to comprehend why WEF (2016) proposes the training of thinking skills such as critical and creative thinking, problem-solving thing, design thinking aside the training of communication, teamwork and collaboration skills.

## **iCGPA**

The implementation of iCGPA as directed by the then MOHE has great influence from Shift One of the MHEB (2015-2025) that is to produce holistic, entrepreneurial and balanced graduate. In realizing Shift One, universities have been directed to train the identified skills as proposed by MOHE and MQF. In brief the eight skills or also known as the eight learning domains are 1) knowledge, 2) practical skills, 3) social skills and responsibilities, 4) professional skills, ethics and values, 5) communication, leadership and teamwork, 6) problem-solving skills and scientific thinking, 7) information management and life-long learning, and 8) entrepreneurship and management (MOHE, 2016). In providing indications of the students' performance or abilities in the eight learning domains, an assessment and its reporting platform was developed known as iCGPA. The key concept behind this platform is the integrated and holistic mechanism for assessing and reporting the students' development and performance. The creative aspect of iCGPA is the final reporting which is illustrated in a radar graph resembling a spider web that signifies the eight learning domains' achievement.

According to the iCGPA Rubric Learning Outcomes Assessment Guide (MOHE, 2016), the implementation of iCGPA begins with a clear understanding of the Outcome-based Education (OBE). In OBE, the respective academic programme's learning outcomes (PLOs) are identified which then guide the formation of the individual course learning outcomes (CLOs). The developed CLOs are referred to when deciding the course assessment plan. However, in developing the radar graph, i.e., the spider web, each course instructor is required to assess each student's performance in the identified eight learning domains. An online system was developed as the assessment mechanism. At this juncture, the technical know-how strategies are required to ensure a smooth keying-in of the relevant scores for each learning domain by the course instructor. Once the process is completed, the radar graph is automatically formed signifying the student's achievements of the learning domains (MOHE, 2016).

iCGPA was proposed with both the graduates and the future employers in mind. First, iCGPA is said to assist students' professional development focusing on the predetermined learning domains. Second, the predetermined learning outcomes are claimed to be the relevant skills well sought after by future employers. The assessment of the graduates' performance in the eight learning domains and the final spider web, which illustrates the graduates' overall performance, could be referred to by the industries in recruiting new employees among the fresh graduates (MOHE, 2016).

## **Research Purpose and Research Questions**

The paper addresses three main issues; iCGPA, IR4.0 and graduate employability and lecturers' perceptions of them. It is believed that a clear understanding of lecturers' perceptions of iCGPA, IR4.0 and graduate employability could extend the university's effort in strategizing greater graduate employability statistics among the graduates at both macro (policy making) and micro (curriculum) levels. Hence, the following research questions are formed to guide the research in achieving its purpose.

- a) How do the selected lecturers perceive iCGPA, and IR4.0?
- b) How do the selected lecturers relate iCGPA and IR4.0 with graduate employability?

## METHODOLOGY

A qualitative research approach was applied in deciding the best research design for the present study. Based on the research purpose and questions, a descriptive and narrative research data was seen as best to elicit the relevant findings to the research questions (Merriam, 1998). Hence, a series of semi-structured interview was chosen as the research instrument. The semi-structured interview was guided by an interview protocol as listed below;

- a) Describe what you know about graduate employability.
- b) Is graduate employability important to you as a lecturer? If not, why? If yes, how?
- c) Describe what you know about iCGPA.
- d) Could iCGPA promote graduate employability? If not, why? If yes, how?
- e) What do you suggest we could do with iCGPA?
- f) Describe what you know about IR4.0.
- g) Could IR4.0 be related to graduate employability? If not, why? If yes, how?
- h) Could IR4.0 be embedded in your classes? Why? If not, why? If yes, how?

The participants for the present study were identified through a call for volunteers as research participants. The announcement included information about the present study and how the volunteers would be involved in the data collection. Most importantly, those who volunteered needed to confirm that they had experienced the completion of iCGPA in their courses. A total of ten lecturers from a faculty signed up. However, as the saturation stage was achieved with the fifth participant, it was decided the interview ended with her. The interviews were done separately at a place most convenient to the participants. The interview protocol was referred to during the interview that lasted between 45 minutes and an hour.

The following table depicts the profile of the five participants involved in the present study. It is important to note that all the participants came from the same faculty and they have all experienced implementing iCGPA.

Table 1  
*Interview Participants' Profile*

Item	Details	Total
Gender	Male	2
	Female	3
Teaching experience	Between 5 and 10 years	1
	Between 10 and 15 years	3
	More than 15 years	1
Age range	Between 25 and 35 years old	1
	Between 35 and 45 years old	4

In order to ensure the trustworthiness of the research findings, member-checks and an inter-rater were done (Yin, 2002). In member-checks, the participants were asked to confirm the researcher's interpretation of their interview feedback. This was done with each participant after his or her respective interview session. The inter-rater was done at the final stage of data analysis when a colleague of the researcher was asked to confirm her agreement with the researcher's final data analysis.

## RESULTS

In discussing the research findings, a re-visit to the research questions is a must. The following discussions on the findings will be based on the research questions.

- a) How do the selected lecturers perceive iCGPA and IR4.0?

Basically, the participants confirmed that they are aware of iCGPA, IR4.0 and graduate employability. The participants agreed that they received the relevant information from various sources such as the Vice Chancellor's Mandate, Minister's Mandate, Staff meeting and their yearly appraisal exercise. Interestingly, they also commented that in the recent curriculum review, they were asked to include elements of IR4.0 in their syllabus by the respective department that overlooks the university's curriculum affairs. This somewhat had caused a stir in the faculty. The following are some of the excerpts taken from the interviews.

*"...they [the department] wanted us to include elements of IR4.0 in the curriculum review. For example, they wanted us to include things like 3D printing, data analytics and cloud computing. This idea is quite ridiculous. They don't understand our syllabus. We could not simply put those things in the syllabus..."*

(Male 01)

Another participant commented;

*"..I admit I am upset, angry in fact...suddenly there is this need to include IR4.0.."*

(Female 02)

There were several reasons why the directive to include IR4.0 in the revised curriculum caused anxiety among them. First, the participants claimed that they were not well versed with IR4.0 and that what they know was based on their own reading and interpretation. According to the participants, there was no clear guidance from the department about integrating IR4.0 in the curriculum and that the department changed their instructions each time the documentation of the revised curriculum was submitted in which new criteria were introduced resulting in the faculty having to re-work on the existing documentation. One of the participants commented;

*"... I take the idea with a stride...we are lecturers, so we need to learn and re-learn...I took the initiative to read about IR4.0...luckily the university hosted some sessions on IR4.0 and I attended..."*

(Female 03)

Another participant stated;

*"...it seems like an order from them...there is a need to highlight IR4.0 in our curriculum. But what is it and how do we do it in our own syllabus? I am lost."*

(Female 01)

Her comment was concurred by one of the participants who claimed;

*"... Frankly, I don't think they [the department] are clear with what they want us to do. When we submitted the documentation and we had corrected the earlier version to follow their comments, it still needed more work. Seems they discovered something new and wanted us to put that in...it was not mentioned before..."*

(Female 03)

The participants perceived the implementation of iCGPA differently. While one claimed that iCGPA is the way forward in preparing the students for the industry, the other four participants commented that despite the noble intention of iCGPA, it suffered poor assessment method and reporting. The mechanism in iCGPA was too technical that it defeated the original purpose. The following excerpts confirmed these perceptions.

*“...iCGPA is good, I know it is to help the students’ professional development so they can become more ready for the industries.”*

He further commented,

*“...yes, the template is technical. But I have done it. It can be done, but technical. The lecturers need the training to use this template.”*

(Male 02)

Another participant who basically agreed with Participant Male 02 had the following comment;  
*“...I had to spend many, many man hours to complete the template...and if I made a mistake, I had to go through all over again, straight from the beginning...it is killing me...”*

(Female 02)

Participant Female 03 concurred with Participant Female 02 but further stated;

*“...can you confirm the industries will appreciate the iCGPA reporting? I know one person from this one industry who commented that they will not. I happened to have research collaboration with them. They trust us to train and asses the graduates with the content knowledge, but not with the skills such as ethics...they (the industries) once asked me how do I measure ‘ethics’?”*

(Female 03)

Additionally, not all lecturers were trained about assessment and most importantly the iCGPA template. This could raise a question on the reliability and validity of the whole assessment done through iCGPA. Some of the participants’ comments include;

*“... we were trained about educational assessment and yet we still struggle to understand the logic behind iCGPA template and its reporting. You ever wondered how the lecturers from other faculties feel, especially when they were never trained about assessment?”*

(Male 02)

*“...I have heard it from my industry counterpart. They wondered why we assess some of the things we need to assess in iCGPA. I am now re-thinking the same question. Is this the correct way to do it?”*

(Female 03)

All in all, all the participants agreed that the initiatives of introducing iCGPA and IR4.0 were related to increasing graduate employability although they were uncertain what it means to have IR4.0 exposure in their classes and how certain learning domains needed to be asses and reported in iCGPA.

The following table summarizes the themes and sub-themes that emerged.

Table 2  
*Participants' perceptions of iCGPA and IR4.0*

Item	Themes	Sub-themes	Sub sub-themes
iCGPA	Positive	Prepare industry-ready graduates	
	Negative	Poor assessment method & reporting Mechanism too technical No training given	Issues on reliability & validity of assessment
IR4.0	Embedded curriculum	in High anxiety	Not well-versed  No guidance given Inconsistent directive

b) How do the selected lecturers relate iCGPA and IR4.0 with graduate employability? The participants agreed that graduate employability is the university's main KPI. In addressing their students' graduate employability, the participants commented that they needed to be abreast with the changing needs in the industry especially in the era of IR4.0. However, there are two interesting views given by the participants when relating IR4.0 and their students' graduate employability. The first view saw their students' IR4.0 readiness through the training of the relevant skills required by IR4.0 such as communication, critical and creative thinking and collaboration skills. The second view on the other hand, saw the need to prepare their students for IR4.0 by exposing them to the use of the Internet and digital applications. Most popular responses include the application of Massive Open Online Courses (MOOCs) and blended learning via the university's Learning Management System (LMS). Interestingly, all the participants concurred that they were uncertain whether what they do in class would be sufficient in integrating their syllabus with IR4.0 elements. They admitted that they needed the training on this. The following excerpts depict the participants' opinions.

*"...From what I read and what I heard in the talks on IR4.0, we need to train the 4Cs in the 21st century; communication, critical and creative thinking and collaboration. Seems easy but when I tried to train these skills, I had problems trying to make the skills relevant with my contents. I think I might have done a lot more than I should."*

(Male 02)

*"...I think I am already integrating IR4.0 for a long time. I encouraged my students to use Google when we discuss. I allowed my students to use the Internet in class. And yes, the university wants us to use iLearn [the LMS]. This is part of IR4.0, right...?"*

(Female 01)



In addressing iCGPA and graduate employability, all the participants seemed to agree that it was intended for a good reason, i.e., to increase graduate employability rate. However, they also agreed that they are anxious with its implementation for several reasons that include spending too much time completing the reporting template and assessing some of the learning domains. Above all, the participants noted that they had confusion in assessing certain learning domains especially those which are qualitative in nature such as learning domain number 3 (social skills and responsibilities), number 4 (ethics and values), number 5 (leadership and teamwork), number 7 (information management and life-long learning) and number 8 (entrepreneurship and management). They claimed that not all their syllabus could highlight all these learning domains hence assessing them seemed almost impossible. Some of their comments include;

*“...it is funny when we have a quantitative tool to measure qualitative domains such as ethics and leadership...”*

(Female 01)

*“..how do you assess things like leadership, life-long learning and entrepreneurship? I am not sure I have assessed my students correctly...and the template doesn't help much.”*

(Female 03)

It was also discovered that the participants seemed not to be confident in relying on iCGPA as a tool to promote graduate employability especially as a document to be referred to by future employers as discussed earlier.

The following table provides the themes and sub-themes that emerged.

Table 3

*Participants' perceptions of how iCGPA and IR4.0 relate with Graduate Employability*

Item	Themes	Sub-themes	Sub sub-themes
iCGPA	Positive	Increase graduate employability	
	Negative	Irrelevant learning domains Difficult to measure learning domains qualitative in nature Ineffective tool to gauge graduate employability	
IR4.0	Positive	Train the relevant skills Expose students to internet & digital applications	MOOCs, BL, LMS
	Negative	No training	Uncertain on ability to integrate IR4.0 in class

## CONCLUSION

Several findings have been derived from the present study. In brief, the following is the summary of the salient findings;

The respondents have confirmed that they

- a) are aware about graduate employability and their role in promoting graduate employability
- b) are uncertain how to include aspects of IR4.0 in the classes besides the use of Information and Communication Technology (ICT) such as the use of the internet and digital applications; and Instructional Technology (IT) such as blended learning and Massive Open Online Courses (MOOCs)
- c) have high anxiety when completing iCGPA
- d) found iCGPA to be technical in its procedure that it defeats the purpose of showcasing students' ability in the relevant learning domains especially the qualitative in nature
- e) question the ability of iCGPA as a reliable form of reference by the future employers
- f) found it difficult to assess certain learning domains in their courses due to the nature of the courses

Hence, several implications could be derived from the salient findings as listed below.

- a) The policy to promote graduate employability could be maintained as lecturers agree that it is the ultimate goal of their profession as an academic in the university
- b) There is a need for the re-skilling and re-tooling of the lecturers in their teaching approaches; the lecturers seem to be confused with aspects of IR4.0 as they associated IR4.0 with the application of ICT and IT in their classes
- c) There is a need to expose the lecturers to the IR4.0 skills and how the skills could be trained regardless of the courses they teach
- d) Autonomy should be given to the faculty in deciding i) which learning domains are most relevant to them; ii) how to assess the identified learning domains and iii) how to report their students' achievement of the identified learning domains
- e) iCGPA needs a total revamp and there should also be flexibility in assessing and reporting the targeted skills as proposed in (d)

This paper discusses issues close to the heart of every lecturer in Malaysian public universities. The discussions are even more interesting as the country is undergoing major transformation in higher education. Graduate employability is made one of the university's Key Performance Indicators (KPIs). Some of the current initiatives to promote graduate employability included exposure to IR4.0 to the students and a form of assessment which indicates the students' performance in eight learning domains thought to be well sought after by the students' future employers. The salient findings from the present study have indicated that while graduate employability is important to the lecturers, they are not certain how iCGPA could be referred to by the future employers let alone iCGPA to be a reliable report of the students' performance in skills difficult to observe and measure. In addressing IR4.0, the lecturers are comfortable to claim that their courses are relevant for IR4.0. However, while it is important to address IR4.0 in the classes, the lecturers seem to grapple in the dark when searching for relevant teaching approaches to relate to IR4.0. The findings from the present study have provided more rooms for improvements in the current teaching approaches and curriculum. The implementation of iCGPA has been discovered to need total revamp. Further research could be done to further examine the teething issues.

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