Rethinking Thai higher education for Thailand 4.0
Prompilai Buasuwan
Department of Education, Kasetsart University, Bangkok, Thailand

Abstract
Purpose – The purpose of this paper is to discuss gaps and key challenges facing higher education in Thailand with reference to the implementation of the policy of Thailand 4.0 adopted by the Royal Thai Government.

Design/methodology/approach – In-depth interviews were conducted with Thai Government officials, university administrators and faculty members to formulate the concept of a creative society in Thailand. Documentary analysis of university policy documents was used to investigate the roles and practices of universities in fostering creativity and innovation. Questionnaire surveys were used to obtain views of university administrators and faculty members on the existing roles and practices of Thai university in promoting a creative society, and their level of expectation toward the roles and practices required to promote a creative society. Priority need index (PNI) and One-way ANOVA were used to identify the gaps and challenges of Thai higher education in promoting a creative society.

Findings – The concepts of the creative society found in this study were in line with the goals of Thailand 4.0, which are to foster creativity, innovation, inclusivity, and sustainability. It was found that development of learning networks, public-private-community engagement, new mind-set and skill-set of lecturers and students, and new technology are required for a successful implementation of Thailand 4.0.

Research limitations/implications – Although the author has identified some progress in Thailand toward achieving the goals of Thailand 4.0, it is clear that key factors that contribute to the fostering of creativity and innovation require further investigation. These factors include socio-cultural factors, creative learning and teaching, mind-set and skill-set, new technology and learning networks, and public-private-community engagement.

Practical implications – The findings of this paper can be used to identify some of the key challenges of Thai higher education in achieving the aims of Thailand 4.0.

Social implications – The findings of this paper have demonstrated that successfully implementation of Thailand 4.0 requires both educational and cultural reform.

Originality/value – This research conducted by the author in 2013-2015 showed that some important reforms are being implemented to achieve some of the aims of Thailand 4.0.

Keywords Creativity and innovation, Education 4.0, Higher education reform, Thai higher education

Paper type Research paper

Introduction
The world is now changing at a much faster rate and has become much more connected than in earlier years, leading to increasing levels of economic competition and socio-political-cultural transformation. The rapid changes in information and communication technology (ICT) are transforming the ways people think, live, learn, and interact. These rapid changes have implications in all spheres of national development and higher education learning. For Thailand to remain competitive in an age of global movement and uncertainty, a knowledge-based society, a society that generates innovations through creativity and shared and utilized knowledge, must be developed.

Learning in the new digital era is changing as students now expect to get most of their information from digital sources rather than from reading books. Because of the interactive nature of the digital technology, students can now become meaning makers and co-creators of knowledge through interactions online with teachers, fellow students and the wider community. However, most Thai students are apparently not able to make effective use of
this new digital technology as just 20 percent of students can seek more knowledge from online media (Saengpassa, 2017). In Thailand 4.0, education would have to be incorporated into communities and students would have to be able to interact constructively with local communities to help solve community problems. In the 4.0 era, it is expected that students would be able to learn beyond classrooms (Saengpassa, 2017).

The future of Thailand’s higher education institutions will depend on how well they can help the nation innovate and survive global challenges. This paper argues that Thai higher education in this new era must place a greater emphasis on fostering human creativity and creating community networks of learning for innovation through partnership and the use of technology. The aim of this paper is to shed light on higher education in Thailand with reference to Thailand 4.0, using some of the findings from a research project “Public and Private Partnership in Higher Education Institution in Promoting a Creative Society” funded by the Thailand Research Fund in 2013-2015. The aim of this research was to identify the gaps and the key challenges that Thai higher education faces if it is to contribute to Thailand 4.0.

Thailand 4.0: background and blueprint for the future

Thailand is a country situated in the heart of South East Asia. It has attained upper-middle-income status in recent times and aspires to reach higher-income status within the next decade. Since the late 1990s, economic growth has been impeded by the internal political climate, global economic shocks, natural disasters, socio-political tensions, and relatively low investment. The economic recession that began in Thailand in 2012 continues, with GDP growth decreasing from 7.2 percent per year in 2012 to 3.2 percent per year in 2016 (Asian Development Bank, 2017) partly as a result of political turmoil. In this political climate, it has been a challenge for Thailand to remain competitive in the global market economy.

Other challenges to growth have included persistent inequality, an aging population, English proficiency and environmental degradation. Inequality in Thailand has worsened in recent years (Vanitcharearnthum, 2017). In Suisse’s Global Wealth Report 2016, Thailand, with 58 percent of wealth controlled by 1 percent of the people (Fernquest, 2016), was ranked 3rd in the list of the most unequal countries in the world, after Russia No.1, India No. 2. Also, the 2013 Household socio-economic survey of the Thailand National Statistical Office reported that children from the poorest 20 percent of households were four times less likely to get into college than the richest 20 percent of households (Tansakun, n.d.). Thailand’s population is an aging one, with a sharp decrease in the number of people of working age. The National Economic and Social Development Board forecasts that in five years the proportion of people over 60 will make up one-fifth of the total population in Thailand (The Nation, 2016). The increase in the proportion of older people will mean that Thailand must increase the productivity of its working population through creativity and innovation. English proficiency of Thai people is also very low. As of 2017, Thailand is ranked 53rd of 80 countries in the world and 15th of 20 countries in Asia on the English proficiency index (English Proficiency, 2017a, b)

To tackle the economic downturn and the aging population, the present Thai Government, under the Prime Minister General Prayuth Chanocha, has introduced a new national development policy, the so-called Thailand 4.0 policy. This policy follows on previous Thai national and economic development policies which can be divided into stages, as follows. In “Thailand 1.0,” the emphasis was on the agricultural sector. “Thailand 2.0,” it focused on light industries, which helped upgrade the country’s economy from low-income to middle-income status. “Thailand 3.0,” it emphasized the importance of heavy industries for continued economic growth. During this period, Thailand has become stuck in the middle-income trap, a situation in which a country’s growth slows after having reached the middle-income level, and faces disparities and imbalanced development (Luanguepin, 2016).
Striving to overcome the middle-income trap and faced with the challenges of national
development, the Thai Government has embarked on a path to transform its economic model into
a value-based and innovation-driven economy. Under the current administration of Prime Minister
General Prayuth Chanocha, the Thailand 4.0 policy has been introduced which retains a focus on
innovation and consists of three aims: becoming a high-income nation through developing it as a
knowledge-based economy, with an emphasis on research and development, science and
technology, creative thinking, and innovation; moving toward an inclusive society with equitable
access to the fruits of prosperity and development; and focusing on achieving sustainable growth
and development, without destroying the environment (Luanguepin, 2016; Mesinsee, 2017). Thus, Thailand 4.0 places its emphasis on developing a creative economy (Sakworawich, 2016)
based on creativity and innovation and the development of new technologies.

The global innovation index shown in Table I reveals that Thailand’s innovation
capacity has fluctuated, falling to its lowest level in 2016. The high scores during 2011-2015
could be the result of policy initiative of the creative economy introduced as part of the
11th National Economic and Social Development Plan (2011-2015). The slight drop in the
innovation index score in 2016 could be the result of the political transition.

Since Thailand 4.0 aims to take advantage of ASEAN integration, a comparison of
Thailand’s innovation index with other ASEAN member countries is given in Table II.
The table shows that as of 2017 Thailand is ranked below Singapore and Malaysia with an
innovation index score of 37.57, a slight increase from 2016 when its score was 36.51.

Since 2012, Thailand has shown a promising sign of development in innovation with an
increased number of patents registered in the country. However, as indicated in Table III
when considering nationality of registrants and type of patents, most patents registered
by Thai nationals are for product design and most patents for inventions are registered by
nationals from Japan, Europe, and the USA.

In the blueprint for Thai 4.0, the Royal Thai Government outlines five key strategic areas for
supporting the three aims of Thai 4.0 stated above. These areas are: preparing Thai people 4.0 for
becoming a first world country, creating technological clusters and future industries, fostering

<table>
<thead>
<tr>
<th>Year</th>
<th>Innovation index</th>
<th>Ranking</th>
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<tbody>
<tr>
<td>2016</td>
<td>36.51</td>
<td>52</td>
</tr>
<tr>
<td>2015</td>
<td>38.10</td>
<td>55</td>
</tr>
<tr>
<td>2014</td>
<td>39.28</td>
<td>48</td>
</tr>
<tr>
<td>2013</td>
<td>37.63</td>
<td>57</td>
</tr>
<tr>
<td>2012</td>
<td>36.90</td>
<td>57</td>
</tr>
<tr>
<td>2011</td>
<td>37.63</td>
<td>48</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>Country</th>
<th>Score (0-100)</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Singapore</td>
<td>58.69</td>
<td>7</td>
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<tr>
<td>Malaysia</td>
<td>42.72</td>
<td>37</td>
</tr>
<tr>
<td>Thailand</td>
<td>37.57</td>
<td>51</td>
</tr>
<tr>
<td>Brunei Darussalam</td>
<td>32.89</td>
<td>71</td>
</tr>
<tr>
<td>Philippines</td>
<td>32.48</td>
<td>73</td>
</tr>
<tr>
<td>Indonesia</td>
<td>30.10</td>
<td>87</td>
</tr>
<tr>
<td>Cambodia</td>
<td>27.05</td>
<td>101</td>
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Source: Dutta et al. (2017)
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<td>39</td>
<td>1,173</td>
<td>1,212</td>
<td>52</td>
<td>1,586</td>
<td>1,638</td>
<td>67</td>
<td>1,455</td>
<td>1,522</td>
<td>62</td>
<td>2,099</td>
<td>2,151</td>
<td>61</td>
<td>2,098</td>
<td>2,159</td>
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<tr>
<td>USA</td>
<td>124</td>
<td>123</td>
<td>247</td>
<td>143</td>
<td>121</td>
<td>264</td>
<td>139</td>
<td>118</td>
<td>257</td>
<td>145</td>
<td>135</td>
<td>280</td>
<td>196</td>
<td>136</td>
<td>332</td>
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<tr>
<td>Europe</td>
<td>198</td>
<td>191</td>
<td>389</td>
<td>184</td>
<td>240</td>
<td>424</td>
<td>212</td>
<td>214</td>
<td>426</td>
<td>228</td>
<td>402</td>
<td>630</td>
<td>293</td>
<td>406</td>
<td>699</td>
</tr>
<tr>
<td>Japan</td>
<td>544</td>
<td>425</td>
<td>969</td>
<td>661</td>
<td>645</td>
<td>1,306</td>
<td>718</td>
<td>524</td>
<td>1,242</td>
<td>817</td>
<td>847</td>
<td>1,664</td>
<td>1165</td>
<td>814</td>
<td>1,979</td>
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<tr>
<td>Asian</td>
<td>9</td>
<td>12</td>
<td>21</td>
<td>7</td>
<td>21</td>
<td>28</td>
<td>16</td>
<td>29</td>
<td>45</td>
<td>20</td>
<td>45</td>
<td>65</td>
<td>19</td>
<td>44</td>
<td>63</td>
</tr>
<tr>
<td>Others</td>
<td>94</td>
<td>183</td>
<td>277</td>
<td>102</td>
<td>245</td>
<td>347</td>
<td>134</td>
<td>137</td>
<td>271</td>
<td>91</td>
<td>193</td>
<td>284</td>
<td>103</td>
<td>257</td>
<td>360</td>
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<tr>
<td>Total</td>
<td>1,008</td>
<td>2,107</td>
<td>3,115</td>
<td>1,149</td>
<td>2,858</td>
<td>4,007</td>
<td>1,286</td>
<td>2,477</td>
<td>3,763</td>
<td>1,363</td>
<td>3,711</td>
<td>5,074</td>
<td>1,837</td>
<td>3,755</td>
<td>5,592</td>
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**Source:** National Science Technology and Innovation Policy Office (http://stiic.sti.or.th/stat/ind-pt/)
entrepreneurship and networks through innovation, building economic strength from within
through 18 clusters and 77 provinces, and connecting Thailand to the global community through
ASEAN Integration. This blueprint recognizes various forms of creativity and innovation such as
STEM, culture, digital technology, services, and social innovation.

However, how effective the Thailand 4.0 development agenda will be in reigniting
growth will depend on how well Thailand’s youngsters upgrade their skills (ADB, Online).
With this in mind, the Thailand 4.0 policy also outlines the desirable characteristics that
Thai citizens should have and the educational reforms that will be required. However, there
is still a lack of clear guidelines on how the “Thai 4.0 citizen” can be created, and this
remains a challenge if Thailand 4.0 is to succeed (Bunchanont, 2017).

Higher education toward Thailand 4.0
In recent years, Thai higher education has undergone reforms in a quest for excellence and to
increase the proportion of young people who enroll in higher education. The numbers of Thai
higher education institutions and student enrollments have increased, and in 2016 there were,
as indicated in Table IV, a total of 171 universities and colleges enrolling 2,003,993 students.

For the purposes of quality assurance, the Thai Ministry of Education has categorized Thai
higher education institutions into four groups: community colleges, universities focusing on
undergraduate studies, special expertise universities which comprise undergraduate and
graduate levels, and research universities focusing on graduate level (Ministry of University
Affairs, 2008). In order to develop strong research-based universities to support innovation and
a knowledge-based society, the government has nominated nine universities as “research
universities.” In 2017, all of these research universities were listed in the top ranking of Asian
universities and three were also listed in world university rankings (QS Top Universities, 2017).

As shown in Table V, patents filed by universities have increased over the years.
However, only a few of these were granted and most were in product design (see Table III).

<table>
<thead>
<tr>
<th>Types of HEIs</th>
<th>Purpose/Degree focus</th>
<th>Number of institutions</th>
<th>Number of students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Closed Public University</td>
<td>Bachelor to graduate</td>
<td>10</td>
<td>120,917</td>
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<tr>
<td>Autonomous University</td>
<td>Bachelor to graduate</td>
<td>23</td>
<td>562,489</td>
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<tr>
<td>Public Open University</td>
<td>Bachelor to graduate</td>
<td>2</td>
<td>322,462</td>
</tr>
<tr>
<td>Private University</td>
<td>Bachelor to graduate</td>
<td>41</td>
<td>258,132</td>
</tr>
<tr>
<td>Rajabhat University</td>
<td>Provincial university offering bachelor to graduate</td>
<td>38</td>
<td>522,535</td>
</tr>
<tr>
<td>Ratchamongkol University</td>
<td>Technological university offering high diploma to graduate</td>
<td>9</td>
<td>151,811</td>
</tr>
<tr>
<td>Technological University</td>
<td>gradient</td>
<td></td>
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</tr>
<tr>
<td>Private College</td>
<td>Mainly bachelor</td>
<td>19</td>
<td>28,505</td>
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<tr>
<td>Private Institute</td>
<td>Mainly Bachelor</td>
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<tr>
<td>Community College</td>
<td>Community college</td>
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<td>Total</td>
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<td>171</td>
<td>2,003,993</td>
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**Source:** Data derived from Office of the Higher Education Commission (www.data3.mua.go.th/dataS/)

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<tbody>
<tr>
<td>IP application</td>
<td>164</td>
<td>229</td>
<td>261</td>
<td>332</td>
<td>327</td>
<td>341</td>
<td>408</td>
<td>572</td>
<td>646</td>
<td></td>
</tr>
<tr>
<td>IP granted</td>
<td></td>
<td>32</td>
<td>155</td>
<td>63</td>
<td>152</td>
<td>234</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Percentage</td>
<td>9.38</td>
<td>37.99</td>
<td>11.01</td>
<td>23.53</td>
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**Source:** Data derived from National Science Technology and Innovation Policy Office (http://stiic.sti.or.th/stat/ind-pt/)

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**Source:** Data derived from National Science Technology and Innovation Policy Office (http://stiic.sti.or.th/stat/ind-pt/)

**Table IV.** Types of HEIs and student enrollment

**Table V.** Comparing University IP application and IP granted 2007-2016
Due to the pivotal role of the universities in developing a knowledge society in Thailand, the importance of the “knowledge-transfer” functions of the universities, primarily teaching, has increased sharply (Neubauer, 2011). Office of the Higher Education Commission is in the process of drafting the 3rd Framework of the 15-Year Long Range Plan (2017-2031) which places University 4.0 at its heart and addresses the changes required within the core missions of Thai higher education, namely, teaching, student development, research, academic services, and cultural preservation.

In its development of the 3rd Framework of the 15-year long Range Plan (2017-2031), Office of the Higher Education Commission (OHEC) has suggested a number of key changes that are required in Thailand 4.0. Since the future of the nation rests on the quality of its people, “Thai people 4.0” are the prime focus of the blueprint of Thailand 4.0. Future generations should aspire to be knowledgeable, highly skilled, socially responsible, maintain their Thai identity, and be able to use technology. Related to these desirable characteristics are new teaching and learning paradigms which emphasize: purposeful learning: active, passion-driven, and personalized learning; generative learning: edgeless, idea-based, out-of-the-box, and mentoring; mindful learning: sharing of values, mutual creativity, and sharing of incentives; and result-based learning: problem-based, project-based, outcome-based, and career-based learning. For research and innovation, a multidisciplinary infrastructure, hands-on learning and research, innovation projects, and demand-led research are the focus. Public-private-community partnerships will be used as a key strategy to enhance the effectiveness of university academic services so as to make them more responsive and efficient. Digital higher education such as MOOCs, digital content, open lectures, flipped learning, etc., are also highlighted in this new long-range plan (Pawawimol, 2017).

Thus, the blueprint for Thailand 4.0 also proposes new approaches to education, but the extent to which Thailand will be able to overhaul its education remains a challenge. Most of the lecturers currently teaching in higher education institutions have been trained in the use of traditional approaches, and can have difficulty adapting to the new approaches discussed in the previous paragraph that will be required to educate new generations. A change of mind-set and a revolution in teaching practices will be pivotal to the success of Higher Education 4.0.

Literature review

Creativity and innovation

Creativity and innovation have become increasingly important determinants of national competitiveness and longer-term survival. Knowledge-based societies employ creative thinkers to transform knowledge and make information useful (Resnick, 2007). Whereas creativity has been conceived of as the generation of novel and useful ideas, innovation has generally been argued to be both the production of creative ideas as the first stage and their implementation as the second stage (Amabile, 1996; Shalley and Zhou, 2008).

Based on literature reviews by Anderson et al. (2014), many authors have attempted to identify factors affecting creativity and innovation. Core factors found include relevant knowledge, cognitive ability and thinking skills, personality and motivation, interactions between individuals, and culture. The effect of social networks on individual creativity and innovative behavior has attracted increasing research attention (Baer, 2010; Zhou et al., 2009). A growing body of work is being generated on the joint effects of social networks on individual creativity. Also, this research shows that socio-cultural factors have a significant impact on learner creativity (Dacey and Lennon, 2000; Hennessey and Amabile, 1998; Robinson, 2006).
A policy framework is also needed in order to support creativity and innovation. However, due to an often narrow view of creativity and innovation, innovation policies tend to emphasize science and technology. The recent emergence of the creative economy has led to calls for a wider policy framework with regards to creativity and innovation. For example, in the Lisbon strategy, Europe has developed a strong policy framework to support innovation which recognizes the cross-sectoral and multidisciplinary aspects of “creativity,” blending elements of “culture-based creativity,” and “economics” as well as “technological innovation.” The EU has outlined a creativity policy that stimulates and encourages creativity and provides individuals, society, public institutions, and enterprises with incentives to build on culture for social and economic renewal (KEA European Affairs, 2009).

The extent to which Thailand 4.0 can be successfully implemented would largely depend on the extent to which individual creativity can be fostered and spills over to the whole society through the creation of creative and innovative culture. Clearly, education has a major role to play in transforming both the mind-set and skill-set of future generations.

Curriculum and innovative teaching and learning
Learning in the twenty-first century has moved toward innovative, open, and flexible learning environments which are supported by research carried out by the Organisation for Economic Cooperation and Development (2006, 2013), concerned with educational innovations that will help prepare the knowledge workers of the future (see e.g. Sinlarat, 2009; Panich, 2012). These educational shifts are intertwined with curriculum development, through policy and practice (Abbis, 2015).

Karakas and Manisaligil (2012) proposed five transformations that are changing the learning landscape in the creative digital age: virtual collaboration, technological convergence, global connectivity, online communities, and digital creativity. These transformations will require future higher education to use technology enhanced and collaborative models of curriculum design that enable working in partnership to offer better value to the learner (Comrie, 2011).

According to Comier (2010), the curriculum in the age of creative economy should be problem based, integrated, and draw on people and the community as a kind of learning network (Buaswan and Rassameethes, 2015; Araya, 2010). Learning in the digital age, through network learning, helps build a “learning community” (Cheng, 2013). Interactions among various actors produce synergies (Desai, 2010) from which ideas can be extended to the tangible and intangible assets of various actors of value networks (Desai, 2010; Carlson, 1995). The interactions of diverse actors in the value network are productive agents of creativity and learning (Allee, 2008).

Public-private-community engagement for Higher Education 4.0
Given the complexity of learning in this borderless and changing society, higher education alone cannot educate the new generation but needs to reach out and collaborate with all sectors in order to provide better value education to students and leverage national development through innovation. Recognizing the power of working together for social transformation, Public-private-community partnership is put forth as one of the key strategies for Thailand 4.0.

There is an extensive body of research supporting the university-industry partnership (e.g. Chan and Mok, 2015; Mok, 2015). According to Chan and Mok (2015, p. 135), in order to deepen cooperation between universities and industry, institutional structures need to be redesigned for such objectives and more importantly the core values of the university should also shift to adapt to these needs. Chan and Mok also argue that individuals should develop entrepreneurship because having such skills or...
capacity can create more employment opportunities and help in driving the advancement of local communities.

One example of a university-industry partnership is the work-based learning program. The research findings during the past decade have generally supported the notion that work-based learning activities can invigorate the learning process and act as a positive force for students in academic, vocational, and technical education programs (Swail and Kampits, 2004). Workman et al. (2011) showed in their study that work-based learning is effective in enhancing innovation and creativity in teaching and learning. Community-based, problem-based learning, and service learning are also learning approaches that can enhance students' creativity and innovatory competences in real-life situations (Dailey-Hebert and Donnelli, 2010; Hardwick, 2013).

In Thailand 4.0, there is an increased emphasis that university research and innovation should also contribute to the wider society (Franco, 2015; Buasuwan and Rassameethes, 2015). As Hannongbua argued (cited in Saengpassa, 2017), Thailand 4.0 research should not just involve raising Thailand’s competitiveness on the international stage but it should also include research and development which, for example, encourages locals to efficiently utilize local resources.

**Research methodology**

Although the notion of the creative society has been used in Thai society to promote a perceived “desirable” society, there has been no clear operational definition. The study on “Public and Private Partnership in Higher Education Institutions in Promoting a Creative Society,” conducted in 2013-2015 by the present author, employed a mixed-research methodology to formulate a conception of a creative society in the Thai context, and to propose new roles and practices for higher education in order to promote a creative society. The study used three main research methods, namely, in-depth interviews, document analysis, and questionnaires.

In-depth interviews and document analysis were used to formulate the concepts and challenges of a creative society. The in-depth interviews were conducted with people who were in a position to implement national socio-economic development plans. The interviewees included high-ranking administrators from six of the universities nominated as creative academies[1], social critics, and high-ranking officials in government, industry, private organizations, and non-governmental organizations. Documentary analysis was carried out on university policy documents and quality assurance reports in order to investigate the roles and practices of the six Thai creative academies in fostering creativity and innovation. Domain analysis, taxonomic analysis, and constant comparison were used for the analysis of the in-depth interviews and for the documentary data analysis.

Questionnaire surveys were administered to a sample of 100 respondents selected by quota sampling. The respondents included university administrators, deans, and lecturers from universities that offer programs from undergraduate to graduate degree levels. The questionnaires were designed to obtain the views of the respondents on the existing roles and practices of universities in promoting a creative society and on their level of expectation of the roles and practices of a university in promoting a creative society. Priority need index (PNI) was used to identify the need assessment gap between the current state of practices and the expectations of the respondents. One-way ANOVA was used to test mean differences between university types, disciplines, and job positions in terms of current university practices and their level of expectations regarding the promotion of a creative society. Some key findings from the study are presented and discussed below.

**Creative society for Thailand 4.0: concepts and challenges**

Based on the findings from the in-depth interviews and document analysis, a creative society in Thailand encompasses socio-cultural, economic, and political dimensions, and
can be summarized in the following three desirable characteristics: a society that uses creativity as a basis for sustainable social development; economic development of creative industries; and a society that promotes equality, justice, inclusivity, and freedom of thought. Many respondents viewed the creative economy as a stepping stone toward a creative society, as a creative economy can spill over to other social dimensions. The concepts of a creative society that emerged from this study are in line with how Thailand 4.0 conceptualizes a creative society and with its aim of sustainable development and social inclusivity through the use of creativity and innovation. The results of this study can therefore be used as a framework with which to analyze the key challenges of Thai Higher Education 4.0.

The in-depth interviews and documentary analysis suggested that the key challenges to Thailand becoming a creative society, and therefore to the success of Thailand 4.0, are social structure, cultural values, and educational practices. For example, inequalities in the socio-economic structure embedded in Thailand’s patronage system and in Buddhist beliefs about Karma were regarded by some respondents as major impediments to Thailand becoming a creative society. In addition, cultural values of seniority, obedience, and cultural preservation or political censorship could obstruct freedom of thought, self-confidence, and open expression.

Many respondents suggested that a conceptualization of a creative society that views creativity as inherent to every human being regardless of race, age, gender, or socio-economic status, can harness human creativity more effectively. Many studies have supported this view of the respondents that diversity and divergence promote creativity (see e.g. Stahl et al., 2009). The respondents saw some important features of Thai culture that contribute to this wider view of creativity. For example, Thailand is a country of diversity with different cultures, traditions, and lifestyles co-existing, and historically Thai people have been good at adopting and integrating different cultures to their own. Thai people are also flexible, have a sense of fulfillment, and like to have fun (Mesinsee, 2017).

Thai higher education for a creative society: impediments and need assessment

This section is based on the in-depth interviews which were used to identify the impediments in higher education to the development of a creative society and to the analysis of the responses to the questionnaires which were used for the need assessment.

There was overall agreement among respondents that Thai education generally focuses on the transmission of knowledge, testing, and accreditation, all of which are found to obstruct creativity, meaningful learning, and the courage to think and act differently. Some argued that in order to foster a creative society, creative education is needed. Many respondents saw students in higher education as products of basic education and believed that creativity should be nurtured at a young age and that beginning to focus on creativity and innovation at university level is too late. Many respondents also viewed the stricter quality control systems that the government put in place in response to low quality and a market-driven economy in higher education as actually obstructing the integrated curriculum design and learning that they believed are required to foster creativity and innovation. The in-depth interviews also showed that the respondents had a range of different views on the concepts of creativity and innovation and that they perceived these differences as a barrier to an inclusive society. For example, responses from the government officers and university administrators tended to value creative ideas in the sciences and technology as important because of their economic value, whereas respondents in the fine arts, social sciences, and humanities viewed creativity in wider areas as also being important in a creative society.

We will now discuss the need assessment results from the questionnaire survey.
Desirable characteristics of Thai students

Based on the survey results, current practices in Thai universities are seen as average ($\bar{X} = 3.35$) with regards to inculcating characteristics among Thai students which promote a creative society. At the same time, expectations of university are very high ($\bar{X} = 4.64$), with the most commonly cited being: inculcating social responsibility and values of social justice and sustainable development; and developing the qualities of openness, perseverance, and respect for differences. The three highest PNI items were being creative (0.45), having the courage to challenge norms and traditions (0.37), and having the ability to present original ideas (0.37).

Teaching and learning

Overall results from the questionnaire survey for the current practices in Thai universities were at average level ($\bar{X} = 3.19$) with work-based/ work-integrated and service learning being the only item ranked at a higher level in current practice ($\bar{X} = 3.62$). One explanation is that work-integrated learning has been widely promoted in Thai higher education for many years and its success has gained global recognition. The lowest item ranked was integrated learning programs and customized programs for individualized learning ($\bar{X} = 2.67$), which was also the highest PNI score item (0.67). The item which scored the lowest in terms of PNI was the use of ICT for teaching and learning and the creation of network learning (0.27).

Research and innovation

The questionnaire analysis results for research and innovation were as follows. Current practices in Thai universities with regards to R&D to promote a creative society were found to be average ($\bar{X} = 2.89$) but, as with teaching and learning, expectations were very high ($\bar{X} = 4.54$). The item with the highest PNI score was developing entrepreneurial competencies for lecturers and researchers (0.65), followed by conducting applied knowledge research for value creation (0.61), and conducting research that integrates knowledge of science and technology and social science and humanities for new knowledge creation (0.60).

Community network engagement

With regards to engaging in community networks to promote a creative society, the findings from the questionnaire survey showed current practices in Thai universities to be average ($\bar{X} = 2.88$) and expectations, by contrast, are high ($\bar{X} = 4.47$). The two top items in terms of PNI score were bringing the knowledge and innovation that was co-created with community of practice to intellectual property for shared benefits of utilization (0.71) and adding value to the experiences and knowledge of community of practice through knowledge management (0.60). These two items also received the highest PNI scores overall.

Partnership/collaboration with public-private-community partnership

The findings from the questionnaires also revealed that most Thai universities (98 percent) collaborate with other universities in sharing teaching and learning resources and research projects. There are also high levels of collaboration with governmental agencies (95 percent), mostly in the areas of teaching and learning and knowledge network. Collaboration with industries and private business organizations (95 percent) is mostly in the form of consultancy and academic services. Collaboration with lower levels of educational institutions (91 percent) and with non-governmental organizations (88 percent) is again mostly in consultancy and academic services. Collaboration with research funding agencies (88 percent) involves mainly managing research projects.
Comparing current practices and expectations of Thai HEIs in promoting a Creative Society

Based on ANOVA results used in comparing current practices and expectations of Thai HEIs in promoting a creative society based on: disciplines of sciences and technology and social sciences and humanities; types of universities; and job positions, it was found that there was no statistical differences of mean scores in the practices of Thai HEIs in promoting a creative society. However, there were statistical differences between deans, associate deans, assistant deans, and lecturers on the level of expectations of Thai HEIs in promoting a creative society. The levels of expectation were: lecturers \( \bar{X} = 4.61 \), deans/associate deans/assistant deans \( \bar{X} = 4.21 \), and vice presidents/assistant presidents \( \bar{X} = 4.72 \).

Discussion: implications for Thai Higher Education 4.0

Educational transformation is synonymous with cultural transformation (Hallinger and Bryant, 2013), and there is a need to reassess the effect of Thai cultural norms on creativity and individuality in the light of the accelerating pace of change (Power, 2015). For Thailand 4.0 to achieve its goals, the socio-cultural and higher educational impediments identified from the in-depth interviews, document analysis, and questionnaires in our study need to be discussed in detail.

Socio-political-cultural implications

The findings of the study revealed that socio-cultural aspects of Thai society will play major roles in the success or failure of Thailand 4.0. These findings support Anderson’s argument (Anderson et al., 2014) that relevant knowledge, thinking skills, personality and motivation, interactions between individuals, and culture are core factors affecting creativity and innovation. These findings are also supported by earlier studies which suggest that factors such as the collective nature of Thai society, the strong attachment to traditional ways of thinking (Mulder, 1996), and the effects of high-power distance relationships (Hofstede, 1991), social hierarchical based on age, gender, and level of education, acceptance of inequality as a norm, have limited the imaginative capacity of Thai people (Power, 2015; Rojanapanich and Pimpa, 2011). The political turmoil of the past decades has also restricted freedom of expression and acted as an impediment to creativity and innovation (see e.g. ISpace Thailand, 2017).

While there are many aspects of Thai social structure and culture obstructing creativity, there are also some that can contribute to creativity. Many studies support the idea that diversity and divergence promote creativity (Stahl et al., 2009). As noted previously, Thailand is a country of diversity with different cultures, traditions, and lifestyles co-existing, and historically Thai people have been good at adopting and integrating different cultures to their own. Thai people are also flexible, have a sense of fulfillment and like to have fun (Mesinsee, 2017). Although Thailand is a country with a constitutional monarchy with a lese-majeste law, which to many foreigners might signify social inequality and suppression of freedom of thought and creativity, the late King Bhumipol was an inventor and supporter of creativity and innovation who was a beloved role model to many Thais in applying a problem-based approach to sustainable development, agricultural reform and the welfare of the Thai people.

Rethinking Thai higher education: addressing the gaps

Existing educational practices were also found in the study to be major impediments to the promotion of Thailand’s creative society with evidence supporting that creativity is found mostly in young children and that it noticeably deteriorates once formal schooling begins
A new approach to higher education requires a higher percentage of Thai academics who are actively seeking to increase their knowledge and are prepared to embrace new mind-sets and acquire new skillsets in addition to their traditional roles of transmitting knowledge to their students.

Although most respondents expressed the view that Thai students should have more courage to challenge norms and traditions and have more ability to present original ideas, these desirable characteristics are obstructed by various factors. A culture of too much respect for seniority, teachers, and higher authority can obstruct freedom of thought and expression. In general, Thai students are expected to be docile and to be subservient to elders. Challenging social structure and traditions are not favored. Although students might appear to be encouraged to express their own thoughts, this is often only up to a level that does not harm the existing social structure of Thai society or institutions (see e.g. www.matichon.co.th/news/648777). If these cultural norms or institutions are hindering necessary reforms, then this restriction on freedom of thought and open expression will be harmful to the development of Thailand and to a creative and innovative society. The Thailand 4.0 policy aims to create Thai 4.0 citizens who will maintain a Thai identity. It is therefore important to further investigate characteristics of Thai identity that are conducive or non-conducive to fostering a creative society or Thailand 4.0. For example, too much respect for higher authority and elders might prevent the risk taking which is required for creativity and for the future development of Thailand.

For teaching and learning, although the survey results revealed that respondents recognized the importance of developing integrated learning and customized programs and think Thai universities should be doing more in this area, increasing pressures such as quality assurance, demands for greater efficiency and increased research output are effectively discouraging creativity and innovation in higher education (Jackson et al., 2006). Low level of English proficiency also poses a challenge for Thailand if the country is to increase the level of innovation ability as many studies have found that countries with a high level of English proficiency tend to have high levels of innovation (see e.g. EF, Online).

The survey results showed that a majority of respondents thought that there had already been an increased use of ICT in teaching and learning (see also Makaramani, 2013) and that a further increase was not required. However, these views could hinder the educational reforms required to implement Thailand 4.0. For example, Karakas and Manisaligil (2012) have argued that in the new digital age of the fourth industrial revolution the increased use of ICT and the development of new teaching and learning approaches will be required and that ICT should be used to maximize active and individualized learning. Traditional forms of learning delivery are also being challenged by new technologies of learning which will require not only students but also lecturers to acquire technological competences. Although Office of the Higher Education Commission has encouraged universities to develop MOOCs programs, very few MOOCs courses stimulate creativity, innovation, and network of learning, many focusing on content and not learning design.

The survey results showed that respondents are aware of the importance of cross-disciplinary research, research and innovation for commercialization, and the importance of an entrepreneurial mind-set and skills. Chan and Mok (2015) have suggested that in order to increase cooperation between academics and industry, it will be necessary to develop the necessary institutional structures and, more importantly, for the core values or culture of the university and skills of individuals to adapt to the needs of cooperation. Most research funding agencies now encourage cross-disciplinary research and include “research utilization” and “potential for commercialization” in research proposal criteria for evaluation. These actions by the agencies increase the awareness of university lecturers and researchers that at least some of their research should have immediate applications. However, the lecturers and researchers who are mostly trained for specific academic content...
can have difficulty in developing the entrepreneurial and interdisciplinary mind-set and skills required to carry out successful applied research.

The survey results show that networks of learning in the form of professional communities need to be recognized (see also Franco, 2015; Buasuwan and Rassameethes, 2015; Pawawimol, 2017). The results show that there is a demand for using the experiences and knowledge of community of practice for knowledge co-creation and development of intellectual property. Although the Thailand 4.0 policy gives high recognition to public-private-community partnership, the methods of achieving this partnership have not been clearly discussed in the policy document. To summarize, the university can no longer be an ivory tower whose primary role is to transfer knowledge but for Thailand 4.0 it will need to co-create knowledge with students and community.

The findings of the survey revealed that there was already a high level of collaboration between universities and the public-private-community partnership. This could be the result of a decrease in financial support by the government which has led many universities to search for external financial resources through consultancies for industry, financial institutions, and government departments. Also, as delineated in the 15-year long-range plan, Office of the Higher Education Commission aims to encourage universities to create linkages with industry and community for the purpose of knowledge transfer. Many university networks have now been created both by OHEC and by universities themselves to meet these aims (Buasuwan and Rassameethes, 2015). Although many of these collaborations are in the form of project-based or activity-based services, universities have also leveraged their collaboration to a legally-recognized partnership level which is more goal oriented and has shared benefits.

With regards to the role of public and private partnership and the changes required in education management to promote a creative society, the survey results were as follows. The items with the highest mean scores were: promotion of ICT usage in creating learning networks and sharing knowledge; support in the form of resources for and easing policy restrictions on interdisciplinary learning and research; creating systems for knowledge exchange and knowledge sharing among universities, public organization, NGOs, and the community (e.g. James, n.d.); and organizing platforms for sharing knowledge and showing the innovations of public and private organizations. All of these items suggest that the boundaries of higher education need to be more fluid and that higher education needs to reach out for collaboration and partnership with industries, public organizations, and professional and local communities. However, the survey results showed that there was a statistically significant difference in the level of expectation of respondents on whether the changes required in educational practices and management to promote a creative society could be made. It was found that university administrators and lecturers had a higher expectation that the changes could be made than the deans and associate deans of the faculties. This difference in expectations could pose challenges to the successful implementation of Thai 4.0 in higher education institutions.

Conclusion
The success of higher education institutions in promoting the creative and innovative society of Thailand 4.0 will require socio-cultural-institutional transformation. Despite successive Thai Governments acknowledging the importance of creativity and innovation in promoting the strategic objectives of Thailand 4.0, the path to its success remains a challenge. Although there have already been some important successes, there are still many reforms that will be necessary for Thailand to develop the innovation, lifelong learning, and knowledge-based society required for it to remain competitive in an age of global movement and uncertainty. Although the aim of this paper has been to identify reforms that will be required in higher education institutions and the challenges that will be faced in
implementing these reforms, it is clear that reforms will also be required at the political, socio-cultural, and economic levels. At the political levels, there should be a stronger emphasis on the importance of freedom of expression. At the economic level, it will be necessary to reduce the gap between the rich and the poor. Finally, how well the balance can be struck between socio-political-cultural-institutional preservation on the one hand and challenging old practices and being open to new ideas on the other, all of which are still neglected in the government policy documents of Thailand 4.0, will determine the success of Thailand 4.0.

Note
1. During Former Prime Minister Apisith’s administration, seven Thai universities were nominated as “Creative Academies.”

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Further reading


Corresponding author
Prompilai Buasuwan can be contacted at: prompilai.b@ku.th