Research Paper

Learning Progression with regard to Cultivating a "Global-Local-Mind": Essential Competencies for the 21st Century

Hyunjung LIM[A], Aya MORIHARA[B]

Abstract: In our rapidly changing society, it is crucial for the education system to respond flexibly and appropriately in order to adapt to the changing social needs. Higher education needs to educate students to acquire the competencies they will need when they start to work such as critical thinking, and collaborative problem solving skills. This paper reports on an educational program conducted in Japan and Korea in 2014 to cultivate "Global-Local-Mind" and practical skills. It also evaluates the program and learning progress of students based on a comparison of students' self-evaluations. The self-evaluations concerned four competencies in total; three competencies were based on "Fundamental Competencies for Working Persons" (METI, 2006), to which we added practical language skills. Self-evaluations were conducted with eight participants three times: at the beginning (pre), immediately after the overseas training (middle), and at the end of the program (post). The result shows improvement at each learning stage. It is assumed most of students recognized their changes after the overseas training where they were required to use four competencies. The results also indicate that it is essential for the program to offer students opportunities to use their acquired skills continuously.
Keywords: "Global-Local-Mind", generic skills, PBL, learning progressions

1 Introduction

To approach regional issues without limiting biases, it is necessary to adopt new mindsets and attitudes, so as to be able to view these common issues as relevant to the situations of each individual. The mindset and attitudes conducive to such a perspective include approaching the issues in various regional communities with a global perspective, and collaboratively creating new values by viewing challenges as opportunities.

In this study, we define such mindsets and attitudes as "Global-Local-Mind" (GLM), and conduct effective Project-based Learning (PBL) to improve skills for cultivating and assessing GLM (i.e., GLM Skills). When people have a GLM, they display the capacity and willingness to approach regional issues from a borderless, global perspective. PBL provides a favorable environment and opportunities for university students, who will play important roles in the global society in the future, to increase their interest in regional communities, and demonstrate creativity and ideas for solving issues by using wider, global perspectives. The study monitors students' learning progressions and examines the effectiveness of fostering human resources who can meet social needs in the 21st century (i.e., education for 21st century skills) by evaluating students' overall achievement throughout PBL.

A: Yamaguchi Prefectural University, Department of Intercultural Studies
B: Yamaguchi Prefectural University, Project for Promotion of Global Human Resource Development

2 Generic skills for cultivating the "Global-Local-Mind"

2. 1 Expected human resources for the 21st century

In a globalized society, the ability to collaborate with one another to solve problems through the sharing of knowledge and information is crucial. In

recent years, in response to a rapidly changing society, skills that promote such collaborative efforts have come to be particularly valued as a human resource. They are defined as "competencies," and educational goals are increasingly being established to develop such competencies in students, while movements to design policies that support such skill development are becoming common throughout the world (Katsuno, 2013). From the perspective of "employability skills" in the global society, "generic skills" are gradually being emphasized more and more in career education (Kubota, 2013). Kawashima (2010) states "Generic skills" are also called "transferable skills", and they are higher-level skills can be applied anywhere to any situation. He also explains that generic skills include creativity, flexibility, independence, team-working skills, communication skills, critical thinking, time management, leadership, planning, and self-management skills.

According to Griffin, McGaw, and Care (2012), The Assessment and Teaching of Twenty-First Century Skills project (ATC21S)[1] asserts that as technological advancements have dramatically changed the nature of social connections, to be successful in the 21st century, learners are now required to develop a new set of skills to better understand each other, and to learn to use technology to work creatively and collaboratively to produce knowledge. After setting and accomplishing their initial goals, learners also need the competency to continuously identify and work towards solving new challenges. The ATC21S project emphasizes "collaborative problem solving" (CPS) and "learning using digital networks" as a part of 21st-century skills, and specifically identifies 10 skills within four categories (Table 1). The ATC21S project framework not only describes each skill, but also examines opportunities for education programs and assessment methods to successfully promote these 21st century skills as a part of their educational goals. Particularly, the ATC21S project

Table 1 ATC21S framework based on KSAVE

Categories	Skills
Ways of thinking	1. Creativity
	2. Critical thinking, problem solving, decision-making
	3. Learning and innovation
Ways of working	4. Communication
	5. Collaboration
Tools for working	6. Information and communications technology (ICT)
	7. Information literacy
Living in the world	8. Citizenship
	9. Life and career
	10. Personal and social responsibility

(Griffin, McGaw, and Care Ed., 2012)

suggests a framework to evaluate 21st-century skills based on the perspectives of Knowledge, Skill, Attitude, Value, and Ethics (KSAVE) (Binkley et al., 2009). It also emphasizes the importance of "knowledge-building environments" that can be used to cultivate 21st-century skills through the creation of valuable new knowledge, products, and ideas. Knowledge-building environments are expected to bring out learners' potential, and they may significantly influence current educational systems and assessments.

Along with the trend of nurturing human resources for the 21st century, Japan also puts emphasizes transferable competencies and many other skills; and even though these skills are called by different names, the concepts remain similar and have the same roots (Kajiwara, 2011). The Central Education Council (2008) states that generic skills are not only "important skills for both academic and career education" but are also "transferable." Yamaji (2012) claims the contents of generic skills are diverse. Shimizu (2012) explains what generic skills are considered more relevant with "employability" or social skills, depending on the country. He also states that "Diploma Policy," "Employability skills," and "Fundamental Competencies for Working Persons" in Japan can be considered as generic skills. The "University Reform Implementation Plan" for the 21st century

(2013) clearly demonstrates that the ideal skill sets required for success in the 21st century would educate students to be proactive, lifelong learners, and to be able to "communicate independently of languages, generations, status, or positions." It also states that in order to cultivate students' abilities to think proactively and respond effectively to diverse situations, it is essential for teachers to communicate effectively with students and modify current educational approaches to include an active learning style based on solving problems, so that students can grow intellectually by inspiring each other. In other words, higher education institutions, such as universities, are strongly encouraged to promote not only basic academic skills and specialized knowledge and techniques, but also versatile ideas and social skills, motivations, and attitudes.

As described above, the movement towards 21st-century skills and assessment has attracted attention from researchers, governments, and national organizations over the world (Griffin, McGaw and Care Ed., 2012; Griffin and Care Ed., 2015). However, the implementation of programs to help students acquire these 21st-century skills has been limited (Bennet and Gitomer, 2009), especially as the associated educational models and assessment methods at both the local and international levels are still evolving.

2. 2 Skills to cultivate the "Global-Local-Mind"

This study introduces a trial program and assessment for generic skills for both local and international levels as skills to cultivate GLM. As generic skills, we include 15 skills in four distinct areas: 12 skills of "Fundamental Competencies for Working Persons" and three skills of "practical language." "Fundamental Competencies for Working Persons" (the Ministry of Economy, Trade, and Industry, 2006) consist of the "Action: ability to step forward" (initiative (I), ability to influence (AI), and execution skills (E)), "Thinking: ability to think through processes" (ability to detect issues (AD), planning skills (P), and creativity (C), and "Team work: ability to work in a team" (ability to deliver messages (ADM), ability to listen closely and carefully (ALCC), flexibility (F), ability to grasp situations (AGS), ability to apply rules and regulations (AARR), and ability to control stress (ACS). According to a recommendation from the Language Upbringing Cooperation Council (2007), language proficiency is defined as "the competency to deepen individual thinking and the ability to communicate with others by using a language based on knowledge and experiences, critical thinking, senses, and feelings." This study adopts the definition of practical language proficiency, as the "capacity to establish relationships with others and create meaning by using a foreign language." Thus, "Practical language" includes the three skills of "language learning (LL)," "language production (LP)," and "spoken language interaction (SLI)." Figure 1 outlines the framework of the 15 skills to cultivate GLM.

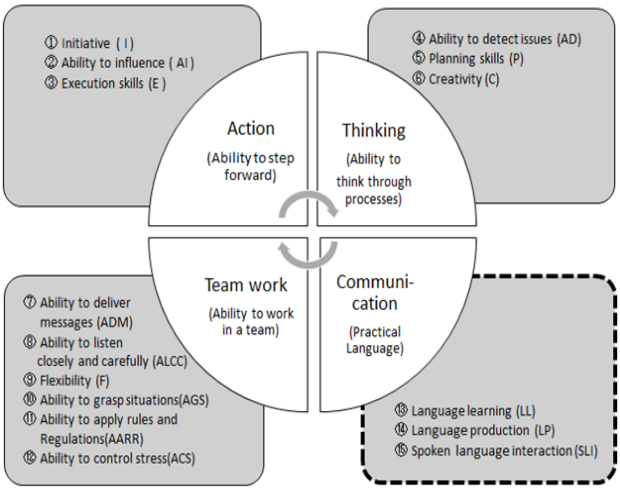

Fig.1 15 skills to cultivate GLM

3 Approaches to cultivating the "Global-Local-Mind"

This study uses PBL as a learning style to implement the program at both the regional community level and global level. To allow students

acquire overall competency, it is essential to establish a system for students to learn and evaluate themselves. PBL emphasizes a learning process that promotes specific learning goals. Tsuda (2010) reports that PBL is effective for motivating students to acquire skills using self-learning techniques.

3. 1 Study participants and schedule for the PBL

The study was conducted over a period of seven months, from June to January 2014, and consisted of the following activities: pre-learning preparations, local learning activities in Korea for eight days, and post-learning activities that included a presentation and a final report. Eight students participated in the program. Each of these students had studied Korean as a foreign language, and had participated in Korean society classes at Yamaguchi Prefectural University (YPU); one senior had studied in Korea for a year, and the remainder of participants included one junior, five sophomores, and one freshman. According to the Common European Framework of Reference for Languages (CEFR) scale (2014) for Korean as a foreign language, six students were at B1 (intermediate) and two students were at C1 (Advanced) levels.

Table 2 Schedule of the PBL

<table>
<tr><th>Time</th><th>Theme</th><th>Learning Goals</th><th>Contents</th><th>Details</th></tr>
<tr><td colspan="5">Self-evaluation (Pre-learning)</td></tr>
<tr><td rowspan="2">Jul.–Aug.</td><td rowspan="2">Pre-Learning (Preparation)</td><td>Exploring regional issues</td><td>Researching for introducing Yamaguchi Precinct</td><td>Creating original brochures to introduce regional resources</td></tr>
<tr><td>Reviewing relevant regional resources and history to create new value</td><td>Preparing and rehearsing of presentations to introduce Yamaguchi in a foreign language</td><td>Creating display posters and presentations</td></tr>
<tr><td rowspan="4">Sep. 23-29</td><td rowspan="4">Field Learning (Activities in Korea)</td><td rowspan="2">Considering regional issues from a global perspective</td><td>Seminar with Korean and Japanese students on the theme:</td><td rowspan="2">Commitment to taking action for the betterment of society</td></tr>
<tr><td>“Creating a lively community” through community development and reconstruction</td></tr>
<tr><td>Delivering regional values to the world</td><td>Participating in the “community market”</td><td rowspan="2">Analysis of surveys on the “community market” and “experiencing Japanese culture”</td></tr>
<tr><td>Communicating by transcending the barriers of language, generations, and status</td><td>Experiencing Japanese culture</td></tr>
<tr><td colspan="5">Self-evaluation (Mid-learning)</td></tr>
<tr><td rowspan="2">Oct.–Jan.</td><td rowspan="2">Post-learning (presentations and final reports)</td><td rowspan="2">Continuing to be actively involved in community development and regeneration</td><td rowspan="2">Developing ideas for regional development and developing a presentation to demonstrate these ideas</td><td>Continuing to develop ideas for regional development, delivering a presentation about these ideas, and</td></tr>
<tr><td>writing a final report about project activities</td></tr>
<tr><td colspan="5">Self-evaluation (Post-learning)</td></tr>
</table>

The PBL was carried out in Changwon City, Korea, over a period of nine days in September 2014. This fieldwork evaluated the study's effectiveness for cultivating GLM. Changwon City was chosen because of its sister city partnership with Yamaguchi City in the Yamaguchi Prefecture. The city shares similar problems (such as depopulation and hollowing) with Yamaguchi City. To promote successful and sustainable community development, the mindsets and attitudes taught to students using PBL were important. Both Japanese and Korean university students who were living in those cities shared their regional problems while taking into account global perspectives, and focused their efforts on activities that would promote community development and reconstruction. Table 2 outlines a detailed schedule of the PBL. (Please refer to Lim, Morihara, and Yoshida, 2014 for more details.)

3.3 Assessment of GLM Skills in the Learning Process

Assessment becomes meaningful when its purpose is to develop the capacity of learners (Griffin, McGaw and Care Ed., 2012). To strengthen regional community relationships, it is crucial to include assessment methods that monitor the learning process (Earl, 2003; Earl and Katz, 2006). Furthermore, the assessment makes it possible to achieve improved results by challenging students to ensure that their performance exceeds previous performances, rather than simply narrowing the gap between learners' current performance and the achievement of learning goals (Griffin, McGaw and Care Ed., 2012).

Considering assessment as a tool for cultivating skills, this study uses student self-evaluations to assess how GLM Skills are acquired at various learning stages of a project. The assessment involved 45 skills: each skill contains three descriptions. Specific skill descriptions are outlined in Appendix 1. Student rated themselves based on these 45 skills using the following five-point scale: "strongly agree" (2), "agree" (1), "neutral" (0), "disagree" (-1), and "strongly disagree" (-2). Higher points indicated higher rated abilities.

3.4 Assessment of GLM Skills in the Learning Process

The perspectives of "Portability," "Dependability," and "Sustainability" are essential for setting learning goals. According to Miyake & Pea (2007), "Portability" refers to the ability of learners to "transport" their learning outcomes into real-world situations when required. "Dependability" refers to learners' ability to consistently use their learning outcomes appropriately, and "Sustainability" refers to learners' ability to develop their skill sets by adjusting learning outcomes to current situations and needs.

In this study, the final self-evaluation comprised three questions about "Portability," "Dependability," and "Sustainability." These questions were (1) "Will you use these experiences by participating in projects for other classes and workplaces in the future?" (Portability) (2) "Will you use the skills you learned in this project (e.g., teamwork, research skills, output skills, and presentation skills) in daily life, other classes, and in the workplace when dealing with new issues in the future?" (Dependability)" and (3) "Do you consider the issues and outcomes in this project as your own problems, and do you plan to continue to put effort into solving these problems?" (Sustainability) The specific learning activities below are applicable to each question: (1) studying the Korean model for community rebuilding and applying solutions to students' own communities; (2) introducing student knowledge to Japanese and Korean regions, and using the Korean language in real situations; and (3) continuing project activities after training is complete (e.g., suggesting how to apply ideas developed during the project in their own communities as a part of post-learning activities).

Table 3 Assessment of GLM Skills in a learning process

ANOVA of Self-evaluation of GLM Skills

		project learning stages									
		Pre(n=8)		Middle(n=8)		Post(n=8)		合計			
GLM Skill		*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*F-statistic*	*Multiple comparison*
Action (Ability to step forward)	1)I	3.46	0.94	3.96	0.45	3.92	0.53	3.78	0.69	1.35	
	2)AI	3.46	0.56	3.88	0.67	4.00	0.50	3.78	0.60	1.91	
	3)E	3.67	0.96	4.21	0.43	4.08	0.50	3.99	0.68	1.43	
Thinking (Ability to think through process)	4)AD	3.25	0.30	3.92	0.50	3.96	0.63	3.71	0.58	5.21*	pre Middle post
	5)P	3.21	0.71	3.71	0.68	3.75	0.66	3.56	0.70	1.56	
	6)C	3.33	0.84	3.88	0.56	4.29	0.60	3.83	0.76	4.02*	pre Middle post
Teamwork (Ability to work in a team)	7)ADM	3.25	1.04	3.63	0.63	3.79	0.56	3.56	0.77	1.04	
	8)ALCC	3.50	0.96	4.08	0.53	3.83	0.53	3.81	0.72	1.39	
	9)F	3.67	0.50	4.13	0.75	4.00	0.50	3.93	0.61	1.25	
	10)AGS	3.83	0.50	4.21	0.43	3.92	0.43	3.99	0.47	1.49	
	11)AARR	3.79	0.85	4.21	0.59	3.92	0.66	3.97	0.70	0.73	
	12)ACS	3.75	0.56	4.04	0.65	4.08	0.68	3.96	0.62	0.66	
Communication	13)LL	3.79	1.04	4.08	0.75	4.21	0.47	4.03	0.77	0.59	
	14)LP	3.63	1.05	3.88	0.71	4.04	0.70	3.85	0.82	0.51	
	15)SLI	3.04	1.20	3.75	0.71	3.88	0.59	3.56	0.92	2.12	

*p<.05; All degrees of freedom(df)(2, 21)

The GLM skills learned were also assessed using the aforementioned five-point scale. Additionally, to assess the transfer of skills as "Preparation for Future learning," when students chose "strongly agree" (2), or "agree" (1), they were asked how they specifically plan to use those skills. The assessment of GLM Skills in the learning process and a comprehensive assessment of GLM Skills regarding its transferability are examined in greater depth below.

4 Analysis and results

4.1 Assessment of GLM Skills in a Learning Process

Table 3 contains an analysis of self-evaluations during the three learning stages for the 15 GLM Skills. The results of analysis of variance indicates that (4) AD (ability to detect issues) and (6) C (creativity) had 5% of significant differences. The results of multiple comparison (5% levels) using Tukey test showed that the average score of (4) AD increased in the middle stage from the pre-learning stage, and significantly increased in the post-learning stage from the middle stage. (4) AD has three descriptions: "is able to clarify the issues being researched," "knows how to collect and analyze information to detect problems and issues," and "seeks the opinions of others to clarify pertinent issues." This indicates that in this PBL exercise, students were considering through the whole program what they could do for regional vitalization. On the other hand, (6) C shows significant differences only in the pre-learning and post-learning stages. In C, three skills are included: "is able to blend various things (e.g. items, ways of thinking, and techniques) to create a new thing," "is able to shift from common knowledge and traditional ideas to create new ideas and solutions," and "can discover something new by paying attention to areas not focused on before." A comparison of the averages of pre-learning (M = 3.33) and post-learning (M = 4.29) showed a difference of 0.96, and these skills improved the most. An analysis of the results in the context of

these learning activities showed that the above results are most likely due to the fact that students made original brochures about the community during pre-learning activities, and made suggestions to the community as a part of post-learning activities. Focusing on each of the identified 15 skills, self-evaluation rankings of all skills at the mid-learning and post-learning stages appeared to be higher than the rankings at the pre-learning stage. However, the averages of (1) I, (3) E, (8) ALCC, (9) F, (10) AGS, and (11) AARR do not show a consistent trend of post- > middle > pre-. This might be because the contents and activities before middle and post evaluation are different. This PBL required students to active interact with local residents, and in the post learning stage, participants focused more on "writing a final report" and making a presentation. Depending on the contents and activities, the PBL exercise had a strong influence on students' self-evaluations.

4.2 A comprehensive assessment of transferable GLM Skills

As mentioned previously, only in the pre-learning activities was the survey of "Portability," "Dependability," and "Sustainability" conducted. The results were analyzed to assess the program overall. The results are shown in Figure 2.

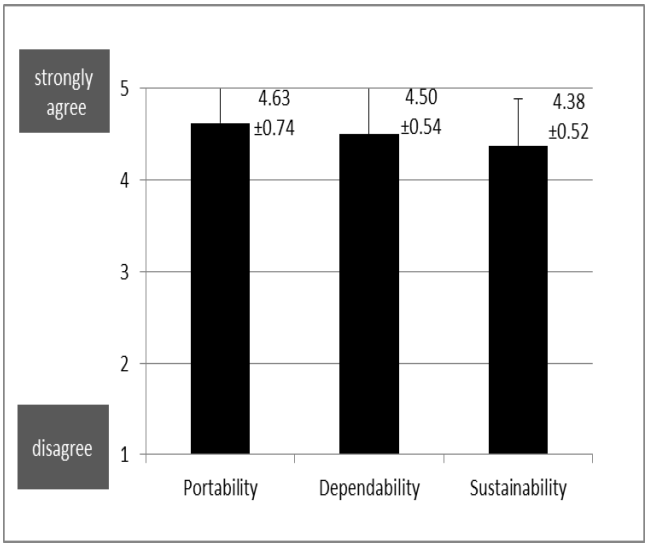

Fig. 2 A comprehensive assessment for transferable GLM Skills [2]

The average of "Portability (M=4.63, SD=0.74)," "Dependability (M=4.50, SD=0.54)," and "Sustainability (M=4.38, SD=0.52)" increased by 4.0, indicating that participants feel "Dependability." With "Portability," the highest average, skills were transferable. Some comments by participants were as follows: "I would like to use the skill to grasp the overall situation and understand my role in preparing and conducting activities," "I would like to continue applying my research and using skills I have learned," and "I would like to be involved in community development activities while studying abroad."

For "Dependability," many participants answered "presentation skills," "I would like to see information through another person's perspective," and "I would like to use the ability to influence and involve others to accomplish projects as a team."

For Sustainability, participants made comments such as "I found it important to continue my involvement in similar activities, instead of only participating in this project," "I would like to keep learning about Yamaguchi and contribute to community activities that will make it better," and "By sharing these regional issues, we can interact deeply at both regional and international levels." Many of the comments indicated that participants planned to conduct extensive activities in the future.

5 Conclusion

The study introduced a program for cultivating skill competencies that meet the needs of the 21st century. Two types of assessments were used: self-evaluations at various learning stages, and a comprehensive assessment from a holistic perspective that considered the continued transference and application of these skills.

The results can be examined from three perspectives. First, PBL was the method used to focus the learning process, and it proved effective in conveying GLM Skills and achieving learning goals.

Second, it is possible to visualize GLM Skills and provide a meta-cognition of these skills. Third, the results indicate that there are gaps between individual student learning, depending on the proficiency level of each participant. From those findings, it can be interpreted that it is important to offer scaffolding, which supports individual learning that is matched to student's proficiency levels. The results also clarify that skill development does not necessarily increase through learning activities; however, the nature of learning activities at various stages of learning influences the effectiveness of skills acquisition. The limitation of the study was that only eight students participated in it. In future research, we need to include more participants in order to explore the concept of self-consciousness in learning experience, the degree of experience required by students, and the types of activities that are effective. A formative assessment with rubrics and portfolios is also needed.

Footnotes

[1] The ATC21S project was formed with 250 researchers to help teachers and education systems improve student learning in essential skills for 21st century. (http://www.atc21s.org/)

[2] The line graph shows the averages of all participants, and the standard above the bar graph.

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