

# A Study on the Impact of In-Person and Online Formats of University Physical Education Classes on the Acquisition of Life Skills among University Students: Using Japanese University Students as an Example

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## Abstract

**Background and Objectives:** Since December 2019, COVID-19 infections have rapidly spread worldwide. In response to the state of emergency, most universities in Japan started offering online classes, including physical education courses. The purpose of this study was to investigate the subjective evaluations of students (survey) to determine what life skills were acquired through physical education practical classes in 2019 (face-to-face) and 2020 (online).

**Methods:** A survey (1) student attributes, 2) measurement scale for life skills) was conducted on 330 university students (valid responses: 133 pre-semester, 139 post-semester in 2019; 155 pre-semester, 176 post-semester in 2020) at one university in Osaka in 2019 and 2020, and statistical analysis was performed.

**Results:** In 2019, the post-semester scored significantly higher on “knowledge summarization” and lower on “positive thinking,” and “interpersonal manners” than the pre-semester. In 2020, the post-semester scored significantly lower on “leadership”, “planning”, “empathy”, “positive thinking” and “interpersonal manners” than pre-semester. In the future, even as the COVID-19 pandemic subsides, it is expected that offering a mix of face-to-face and online classes for physical education courses, where possible, will be a helpful reference point for education content aimed at promoting life skill acquisition.

## Keywords

Online Classes, Face-to-Face Classes, Physical Education, Life Skills

## 1. Introduction

Since December 2019, COVID-19 infections have rapidly spread worldwide, causing changes in people's daily lives and psychological well-being due to social isolation (Silva-Filho et al., 2020). In April 2020, the Japanese government declared a state of emergency, and educational institutions were forced to implement countermeasures, including changing attendance styles. As a result, most universities started offering online classes, including physical education courses. Previous studies have shown that student status is significantly associated with higher stress levels and anxiety during the COVID-19 pandemic (Wang et al., 2020) and increased risk of mental health problems (Moreno et al., 2020), potentially affecting students' life skills.

Life skills can facilitate the development of psychological abilities required to cope with everyday demands and challenges, inducing positive thinking and intimacy (Danish et al., 1995). The World Health Organization (WHO, 1997) recommends ten essential life skills for all individuals, including problem-solving, decision-making, and creative thinking. Therefore, researchers are interested in how daily activities, including sports, work, and communication, affect life skills during the COVID-19 pandemic.

Studies have shown that sports positively affect the development of perceived autonomy, motivation, and social skills, such as interpersonal relationships, improving patience and strengthening problem-solving abilities (Chen & Tsuchiya, 2016; Dyson, 2001; Wallhead & Ntoumanis, 2004). Understanding the relationship between sports experiences and the acquisition of life skills is critical in sports psychology (Shimamoto & Ishii, 2009). Previous studies have investigated the effects of life skills training in collegiate physical education settings, demonstrating the importance of sports participation in developing life skills for socially vulnerable youth (Hermens et al., 2017). Additionally, in some physical activities, the increase in life skills may result from direct participation in sports (Chen et al., 2020). And Broadbent and Poon reviewed 12 studies and reported that the time-management, effort regulation, and critical thinking were positively correlated within the online environment (Broadbent & Poon, 2015). However, few studies have investigated the difference between online and face-to-face lessons' effects on life skills. Therefore, improving life skills through physical education during the COVID-19 pandemic is a critical issue.

Through the pandemic, the opportunity to communicate online and engage in indirect communication (such as video calls and online classes) has increased in all fields of society. Even after the pandemic, these forms of communication are expected to continue to be utilized in educational institutions. Therefore, this study aimed to investigate the acquisition of life skills through physical education in 2019 (face-to-face classes) and 2020 (online classes) and to examine students' subjective evaluations through a questionnaire survey. All physical education classes in the spring semester of 2019 were face-to-face, but classes were conducted online in the spring semester of 2020. We will analyze questionnaires

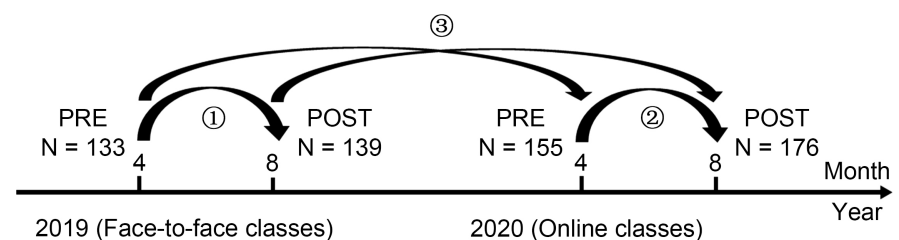
from Japanese university students to assess their knowledge of life skills before and after participating in physical education courses in 2019 and 2020, demonstrating whether there are differences between online and face-to-face classes regarding university students' acquisition of essential life skills.

## 2. Measures & Methods

### 2.1. Participants and Setting

The potential participants were first-year students of a university in Osaka, Japan, in 2019 and 2020. They were enrolled in general physical education courses (N = 150 for pre- and post-semester measurements in 2019, and N = 180 for pre-semester and post-semester measurements in 2020).

Of the 133 valid questionnaires received in April 2019 (89% validity), 63 were from males, and 70 were from females, with a mean age of 19.87 ( $\pm 1.29$  years) for all respondents. For August 2019, 139 valid questionnaires were received (93% validity of the questionnaires), 69 were from males, and 70 were from females, with a mean age of 19.86 ( $\pm 1.27$  years). For April 2020, 155 valid questionnaires were received (86% validity of the questionnaires), 62 were from males, and 93 were from females, with a mean age of 18.63 ( $\pm 0.83$  years). For August 2020, 176 valid questionnaires were received (98% validity of the questionnaires), 87 were from males, and 89 were from females, with a mean age of 18.96 ( $\pm 0.86$  years). There was no difference in the makeup or characteristics between males and females, except for more female participants (**Figure 1, Table 1**).



**Figure 1.** The comparative combination of this study.

**Table 1.** Information for participants.

Year	2019		2020	
Month	April (PRE)	August (POST)	April (PRE)	August (POST)
<b>Number of participants</b>	N = 133	N = 139	N = 155	N = 176
<b>Gender</b>	M = 63	M = 69	M = 62	M = 87
	F = 70	F = 70	F = 93	F = 89
<b>Age (years)</b>	19.87 ( $\pm 1.29$ )	19.86 ( $\pm 1.27$ )	18.63 ( $\pm 0.83$ )	18.96 ( $\pm 0.86$ )

## 2.2. The Surveys Questionnaires

The surveys were administered in April 2019 (pre-semester), August 2019 (post-semester), April 2020 (pre-semester), and August 2020 (post-semester). A QR code image was created from the URL of “Google Forms.” The participants completed the questionnaires anonymously and returned them via “Google Forms.” The survey results were collected online within the designated deadline. We collected information on each participant’s sex, age, and activity level. We also collected information on whether participants had affiliations (**Table 2**).

## 2.3. Life Skills Scales

We utilized the Daily Life Skills Scale for College Students (DLS), developed by Shimamoto and Ishii (2006), to measure the participants’ life skills (**Table 3**). The DLS consists of eight subscales and twenty-four items, each rated on a 4-point scale ranging from 1 (not at all) to 4 (very true). Higher scores indicate higher levels of skill proficiency. The individual skills assessed by the DLS include “planning (PLA),” “knowledge summarization (KNO),” “self-esteem (SEL),” and “positive thinking (POS).” In contrast, the interpersonal skills measured are “intimacy (INT),” “leadership (LEA),” “empathy (EMP),” and “interpersonal manners (INT-MAN)”.

## 2.4. Ethical Review

The Ethics Committee approved the study protocol at University in Osaka.

## 2.5. Data Analysis

To analyze the differences in the average scores of sub-scales measuring life skills between face-to-face classes (conducted in 2019) and online classes (conducted in 2020), an unpaired two-variable Mann-Whitney *U* test was performed using the SPSS statistical software version 26 (IBM). The test was conducted to verify the differences in the acquisition levels of each aspect of life skills between 2019 year and 2020 year.

**Table 2.** Overview of university physical education classes in 2019 (face-to-face classes) and 2020 (online classes).

Format	Face-to-face classes	Online classes
Year	2019 (April-August)	2020 (April-August)
Frequency	1 - 15 sessions	1 - 15 sessions
Content focus	Acquiring life skills	Acquiring life skills
Exercise form	Group (about 30 people/class)	Individual or several
Student confirmation of exercise participation	YES	NO

**Table 3.** Survey content: The daily life skills scale for college students (english version).

- 1) I can easily talk to friends about any problems I may have.
- 2) In a discussion, I can summarize everyone's opinions into one.
- 3) I can see and plan for the future.
- 4) When I see someone in trouble, I lend a hand.
- 5) I can take information and make something move valuably (data, etc.).
- 6) I like everything about myself.
- 7) If something bad happens, I don't let it get me down.
- 8) I can conduct myself respectfully in front of my superiors.
- 9) When I need help, I can go to close friends for advice.
- 10) In group activities, I feel comfortable taking the lead.
- 11) When I have homework, I can make deadlines, etc.
- 12) I find joy in others happiness.
- 13) I can take a lot of information, and pick up what I need.
- 14) I am satisfied with my life so far.
- 15) When I have a problem, I can think optimistically.
- 16) I can use respectful language to my seniors.
- 17) I feel comfortable talking to my friends about any subject.
- 18) I can inspire people by my actions.
- 19) I can organized and quickly accomplish tasks.
- 20) I feel empathy for those who are sad.
- 21) I can organize my thoughts based on a lot of information.
- 22) I am confident in my words and actions.
- 23) When I fail, I think that I am worthless.
- 24) When I meet people for the first time, I can consciously pay attention to my own words.

### 3. Results

First, the Mann-Whitney  $U$  test revealed the changes in the acquisition of life skills pre- (April) and post- (August) semesters in 2019 (**Table 4**). The post-semester (KNO: median = 9, mean rank = 146.12; POS: median = 8, mean rank = 107.85; INT-MAN: median = 9, mean rank = 124.48) scored significantly higher on KNO ( $U = 7628.00$  ( $Z = -2.39$ ),  $p < 0.05$ ) and lower on POS ( $U = 5261.00$  ( $Z = -6.16$ ),  $p < 0.001$ ) and INT-MAN ( $U = 7572.50$  ( $Z = -2.54$ ),  $p < 0.05$ ) than the pre-semester (KNO: median = 8, mean rank = 124.23; POS: median = 9, mean rank = 164.84; INT-MAN: median = 10, mean rank = 147.19) (**Table 4**). One explanation may be that the first-year students who entered in April 2019 can be smoothly executed during university life through KNO, POS,

and INT-MAN skills.

Next, **Table 5** showed the changes in the acquisition of life skills before (April) and after (August) semesters in 2020. The post-semester (LEA: median = 7, mean rank = 149.59; PLA: median = 8, mean rank = 151.02; EMP: median = 9, mean rank = 156.40; POS: median = 8, mean rank = 155.45; INT-MAN: median = 9, mean rank = 154.61) scored significantly lower on LEA ( $U = 10751.50$  ( $Z = -3.39$ ),  $p < 0.01$ ), PLA ( $U = 11004.00$  ( $Z = -3.08$ ),  $p < 0.01$ ), EMP ( $U = 11950.50$  ( $Z = -2.02$ ),  $p < 0.05$ ), POS ( $U = 11783.50$  ( $Z = -2.23$ ),  $p < 0.05$ ), and INT-MAN ( $U = 11634.50$  ( $Z = -2.40$ ),  $p < 0.05$ ) than pre-semester (LEA: median = 8, mean rank = 184.64; PLA: median = 9, mean rank = 183.01; EMP: median = 9, mean rank = 176.90; POS: median = 8, mean rank = 177.98 ; INT-MAN: median = 10, mean rank = 178.94). However, no significant differences were observed for the other sub-scales (**Table 5**). It can be inferred that the rare opportunities for group discussions in classes with tens of students resulted in decreased LEA, PLA, EMP, POS, and INT-MAN skills.

Additionally, **Table 6** showed the results of comparing the mean scores for life skills acquired during the “pre: pre” and “post: post” semesters in 2019 and 2020. According to **Table 6**, the pre-semester of 2020 (KNO: median = 9, mean rank = 155.33) scored significantly higher on KNO ( $U = 8318.50$  ( $Z = -2.73$ ),  $p < 0.01$ ) than the pre-semester of 2019 (KNO: median = 8, mean rank = 129.50). Moreover, there was a significantly higher score of POS ( $U = 6255.00$  ( $Z = -5.75$ ),  $p < 0.001$ ) for the pre-semesters of 2019 (POS: median = 9, mean rank = 173.25) than the pre-semester of 2020 (POS: median = 8, mean rank = 118.35). No significant differences existed for the other sub-scale factors (**Table 6**). This suggests that the acquisition of life skills may be influenced by the changes in the living environment of the COVID-19 era.

**Table 4.** Comparison of life skills before and after the semester in 2019.

Factors	2019 Year (PRE, N = 133)						2019 Year (POST, N = 139)						U-value	Z-value	Wilcoxon (PRE/POST)
	Average	SD	Percentile			Mean Rank	Average	SD	Percentile			Mean Rank			
			25	Median	75				25	Median	75				
INT	8.91	1.93	8	9	10	140.30	8.67	1.60	8	9	9	130.97	8475.50	-1.01	<i>n.s.</i>
LEA	8.03	1.72	7	8	9	141.49	7.80	1.51	7	8	9	129.85	8319.50	-1.25	<i>n.s.</i>
PLA	8.07	1.86	7	8	9	130.61	8.17	1.69	7	9	9	140.10	8464.50	-1.02	<i>n.s.</i>
EMP	9.02	1.62	8	9	10	137.89	8.87	1.60	8	9	10	133.24	8791.00	-0.50	<i>n.s.</i>
KNO	8.11	1.76	7	8	9	124.23	8.44	1.50	8	9	9	146.12	7628.00	-2.39	*
SEL	7.92	2.04	7	8	9	133.95	8.02	1.59	7	8	9	136.96	8901.50	-0.32	<i>n.s.</i>
POS	9.08	1.43	8	9	10	164.84	8.06	1.30	8	8	9	107.85	5261.00	-6.16	***
INT-MAN	9.75	1.31	9	10	11	147.19	9.40	1.49	9	9	10	124.48	7572.50	-2.54	*

1) \*:  $p < 0.05$ , \*\*:  $p < 0.01$ , \*\*\*:  $p < 0.001$ ; 2) INT: “intimacy”, LEA: “leadership”, PLA: “planning”, EMP: “empathy”, KNO: “knowledge summarization”, SEL: “self-esteem”, POS: “positive thinking”, INT-MAN: “interpersonal manners”.

**Table 5.** Comparison of life skills before and after the semester in 2020.

Factors	2020 Year (PRE, N = 155)						2020 Year (POST, N = 176)						U-value	Z-value	Wilcoxon (PRE/POST)
	Average	SD	Percentile			Mean Rank	Average	SD	Percentile			Mean Rank			
			25	Median	75				25	Median	75				
INT	8.37	2.20	7	9	10	176.61	7.99	1.94	7	8	9	156.65	11995.00	-1.93	<i>n.s.</i>
LEA	7.96	1.67	7	8	9	184.64	7.25	1.79	6	7	9	149.59	10751.50	-3.39	**
PLA	8.23	1.97	7	9	9	183.01	7.56	2.02	6	8	9	151.02	11004.00	-3.08	**
EMP	9.11	1.49	8	9	10	176.90	8.80	1.25	8	9	9	156.40	11950.50	-2.02	*
KNO	8.57	1.38	8	9	9	182.26	8.15	1.33	7	8	9	151.68	11119.00	-3.03	<i>n.s.</i>
SEL	8.15	1.93	7	8	9	170.95	8.03	1.57	7	8	9	161.64	12872.00	-0.90	<i>n.s.</i>
POS	8.20	1.27	8	8	9	177.98	7.93	1.10	7	8	9	155.45	11783.50	-2.23	*
INT-MAN	10.11	1.38	9	10	12	178.94	9.74	1.27	9	9	11	154.61	11634.50	-2.40	*

1) \*:  $p < 0.05$ , \*\*:  $p < 0.01$ , \*\*\*:  $p < 0.001$ ; 2) INT: “intimacy”, LEA: “leadership”, PLA: “planning”, EMP: “empathy”, KNO: “knowledge summarization”, SEL: “self-esteem”, POS: “positive thinking”, INT-MAN: “interpersonal manners”.

**Table 6.** Comparison of Pre × Pre-semester and Post × Post-semester Life Skills for 2019 and 2020.

Factors	2019/2020 Year (PRE/PRE)					2019/2020 Year (POST/POST)				
	Mean Rank		U-value	Z-value	Wilcoxon (PRE/PRE)	Mean Rank		U-value	Z-value	Wilcoxon (POST/POST)
	2019 Year PRE	2020 Year PRE				2019 Year POST	2020 Year POST			
INT	153.04	135.44	8902.50	-1.82	<i>n.s.</i>	176.12	143.69	9714.00	-3.22	**
LEA	145.32	141.96	9914.00	-0.35	<i>n.s.</i>	171.87	147.05	10304.50	-2.45	*
PLA	137.69	148.41	9392.00	-1.11	<i>n.s.</i>	174.71	144.80	9909.50	-2.95	*
EMP	140.82	145.76	9801.50	-0.52	<i>n.s.</i>	161.68	155.09	11720.00	-0.67	<i>n.s.</i>
KNO	129.50	155.33	8318.50	-2.73	**	172.83	146.29	10171.00	-2.69	**
SEL	139.19	147.14	9588.50	-0.82	<i>n.s.</i>	160.08	156.36	11942.50	-0.37	<i>n.s.</i>
POS	173.25	118.35	6255.00	-5.75	***	167.11	150.81	10966.00	-1.65	<i>n.s.</i>
INT-MAN	134.27	151.3	8943.00	-1.80	<i>n.s.</i>	147.35	166.41	10751.00	-1.96	*

1) \*:  $p < 0.05$ , \*\*:  $p < 0.01$ , \*\*\*:  $p < 0.001$ ; 2) INT: “intimacy”, LEA: “leadership”, PLA: “planning”, EMP: “empathy”, KNO: “knowledge summarization”, SEL: “self-esteem”, POS: “positive thinking”, INT-MAN: “interpersonal manners”.

In addition, post-semester of 2019 (INT: median = 9, mean rank = 176.12; LEA: median = 8, mean rank = 171.87; PLA: median = 9, mean rank = 174.71; KNO: median = 9, mean rank = 172.83; INT-MAN: median = 9, mean rank = 147.35) scored higher on the sub-scale factors of INT ( $U = 9714.00$  ( $Z = -3.22$ ),  $p < 0.01$ ), LEA ( $U = 10304.50$  ( $Z = -2.45$ ),  $p < 0.05$ ), PLA ( $U = 9909.50$  ( $Z = -2.95$ ),  $p < 0.05$ ), KNO ( $U = 10171.00$  ( $Z = -2.69$ ),  $p < 0.01$ ) and lower on

INT-MAN ( $U = 10751.00$  ( $Z = -1.96$ ),  $p < 0.05$ ) than the post-semester of 2020 (INT: median = 8, mean rank = 143.69; LEA: median = 7, mean rank = 147.05; PLA: median = 8, mean rank = 144.80; KNO: median = 8, mean rank = 146.29; INT-MAN: median = 9, mean rank = 166.41).

However, there were no significant differences between the scores for the sub-scale factors of EMP ( $U = 11720.00$  ( $Z = -0.67$ ), n.s.), SEL ( $U = 11942.50$  ( $Z = -0.37$ ), n.s.), and POS ( $U = 10966.00$  ( $Z = -1.65$ ), n.s.) between the post-semesters of 2019 and 2020 (**Table 6**). These results indicated that life skills could be promoted more effectively after taking physical education face-to-face rather than online.

Through a questionnaire survey, this study clarified the characteristics of LS acquisition by face-to-face or online form for physical education. There is a significantly different observed in the level of INT, LEA, PLA, KNO skills (higher), and INT-MAN skills (lower) acquisition through face-to-face than online classes. These results indicated a possibility of a combination of face-to-face and online classes to increase LS for physical education.

## 4. Discussion

### 4.1. Comparison of Life Skill Acquisition by Students before and After Taking Face-to-Face Classes in 2019

In 2019 (face-to-face classes), the average scores for only one sub-scales, KNO related to students' acquisition of life skills, were significantly higher after the semester than before. Previous studies have reported that face-to-face classes broaden students' perspectives through interactions with classmates and instructors and that experiential learning in building relationships helps develop social skills (Hattori et al., 2022). From this, it can be inferred that the first-year students who entered in April 2019 and were the subject of this study exhibited skill KNO, which involves the ability to collect and summarize information necessary for their studies throughout their university life up to August, thereby demonstrating fundamental behaviors that can be smoothly executed during university life. By showing this skill, it is speculated that they gained psychological "leeway" for their future academic life, leading to deterioration for POS and INT-MAN.

Kusurkar et al. (2011) investigated the effects of motivation on academic performance in medical students and found that the sensation of familiarity may lead to negative emotions. Li et al. (2019) studied academic burnout in college students and found that as interest in learning decreases, motivation also decreases, learning feels monotonous, and a sense of habituation occurs. Additionally, an increased sense of familiarity was found to lower self-esteem and increase the risk of academic burnout. These findings are believed to support the results of the current study. Specifically, it is suggested that as students learned the content of their face-to-face classes in 2019, they gradually became accustomed to the learning environment and their classmates, leading to lower levels



of positive thinking and interpersonal skills, which in turn may have resulted in poor academic performance.

However, no significant difference was observed between pre- and post-semester regarding INT, LEA, PLA, EMP, and SEL. For new university students who have just started university life, physical education classes can be imagined as the ideal place where classmates gather and enjoy moving their bodies and communicating in a relaxed atmosphere. However, it is anticipated that after transitioning from high school to university, students may need to be more accustomed to socializing with intimacy and may not immediately exhibit leadership or empathy when engaging actively with unfamiliar peers in group activities, such as physical education classes. Furthermore, it is speculated that new students may have difficulty acquiring proactive skills such as PLA, which involves considering the priority of tasks. This tendency may be rooted in the “lack of confidence” of many first-year university students. As reported by Araragi (1992), higher levels of self-esteem are associated with better adaptation to new environments, and this study’s findings support the results of this previous research.

#### **4.2. Comparison of Life Skill Acquisition by Students before and After Taking Online Classes in 2020**

It has been reported that the psychological impact on students during the epidemics (Cao et al., 2020; Aristovnik et al., 2020) and the economic stressors of COVID-19 affect daily life are positively associated with anxiety levels (Cao et al., 2020). Although after taking the physical education courses online, there was a decrease in life skills except for INT, KNO and SEL during this period. In a previous study, physical education online classes need timely and quality feedback (Yu & Jee, 2021). Students could not get feedback immediately in our online physical education classes, resulting in anxiety about the accuracy of exercise posture and their grades. Moreover, the students participating in this research are from Japan’s top-level universities. Many consider studying abroad, reducing and canceling the international issues during the COVID-19 epidemic, and increasing future anxiety. As a result, the students’ PLA and POS skills were lower than before the semester. Additionally, it is the first time for students who have just entered university to live independently. And the chances of interaction with new friends have significantly reduced during the COVID-19 pandemic. The situation makes it more challenging to understand the other person’s feelings. Therefore, students’ EMP skills decreased after the semester. As the opportunity to communicate with outsiders is reduced, it is difficult to get a chance to organize events, resulting in deterioration in LEA skills. Maladaptive behaviors are one of the psychological reactions to pandemics (Taylor, 2019; Cullen et al., 2020), therefore, with the extension of the epidemic time, people have gradually adapted to this situation, and everyone will pay less attention to expressions such as smiles. While everyone wears a mask, it isn’t easy to understand others’ facial expressions, leading to a limited focus on INT-MAN skills.

As a result, the INT-MAN score in online mode is higher before than after the semester.

### **4.3. Comparison of Student's Acquisition of Life Skills between "Pre: Pre-Semester" and "Post: Post-Semester" in 2019 and 2020**

This study compared university students' average rank for life skill acquisition pre-COVID-19 (2019) and in the COVID-19 era (2020). As the results, the pre-semester of 2020 showed higher score of KNO skill and lower score of POS skill compared to the pre-semester of 2019. This suggests that the changes in the living environment due to the COVID-19 pandemic may have influenced the acquisition of life skills. For example, students may have placed more emphasis on collecting and summarizing information due to the need to participate in online classes. In addition, from April 2020, the spread of the novel coronavirus gradually expanded within Japan, and during this time, university students may have perceived the situation negatively, thinking "It's unclear when COVID-19 will come to an end." Therefore, in terms of positive thinking, the scores in 2020 were significantly lower than those in 2019.

Additionally, higher scores were obtained in INT, LEA, PLA, and KNO skills, but lower score of INT-MAN in the post-semester of 2019 than 2020. On the other hand, there was no significant difference in the scores for EMP, SEL, and POS skills between 2019 and 2020. These results suggest that the participants in this study, who were likely to have had fewer opportunities to interact with Japanese society and others due to the restrictions on daily activities during the COVID-19 pandemic in 2020, may have been significantly affected in their acquisition of life skills. However, despite this situation, in the post-semester of 2020, skills related to INT-MAN, which are required in interpersonal situations, had higher scores than in the post-semester of 2019. This means that this skill has become more critical during the pandemic. One reason may be the increase in "screen-mediated" situations due to changes in the media environment that indirectly mediate communication during the pandemic. In this case, manners and friendly ways of interacting with others, among other skills, may be more critical as the focus is on the face and appearance on the computer screen (Chen et al., 2021).

### **4.4. Summary and Future Challenges**

During and even after the pandemic, online learning is expected to continue being utilized in educational institutions. This study aims to investigate the life skills of college students in physical education courses and examine how different instructional formats impact these skills. It holds significant academic importance as it sheds light on the potential for innovative forms of physical education classes in the post-pandemic era.

In this study, the scores for KNO were significantly higher, and the scores for

POS and INT-MAN were significantly lower after the face-to-face classes in 2019 than before. And in 2020 during online classes, the scores for LEA, PLA, EMP, POS, and INT-MAN were significantly lower after the course compared to before. However, there were no significant differences in other lower-level measures. Although the results suggest that in-person classes are more desirable than online classes for physical education, both instructional formats have their own advantages and disadvantages. Therefore, a hybrid approach that combines online and in-person instruction may be necessary for future “health and physical education” classes, as it has the potential to foster healthier life skills.

Additionally, it should be noted that other factors, such as other classes, extracurricular activities, and various aspects of daily life, may have influenced the results. For example, it is speculated that when conducting the questionnaire, the subjects may have understood that they were only evaluating changes in life skills through physical education classes and may not have been able to control their activities outside of class in their daily lives. Therefore, it is crucial to consider that the different forms of university physical education classes are only one of these factors. In order to clarify the impact of university sports classes on the development of “life skills,” practical research should be conducted that considers variables beyond university physical education classes, such as other courses, extracurricular activities, and social activities in general.

### Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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