

Impact of community-oriented medical education on medical students' perceptions of community healthcare: A qualitative study

Kiyoshi Shikino, Kazuyo Yamauchi, Nobuyuki Araki, Naoto Ozaki, Yu Kamata, Shinya Aoki, Yota Katsuyama, Daichi Sogai, Mai Miyamoto, Kensuke Yoshimura, Takeshi Oki, Shoichi Ito

Submitted to: JMIR Medical Education
on: September 19, 2025

Disclaimer: © The authors. All rights reserved. This is a privileged document currently under peer-review/community review. Authors have provided JMIR Publications with an exclusive license to publish this preprint on its website for review purposes only. While the final peer-reviewed paper may be licensed under a CC BY license on publication, at this stage authors and publisher expressly prohibit redistribution of this draft paper other than for review purposes.

Table of Contents

Original Manuscript..... 5

Supplementary Files..... 36

 Figures 37

 Figure 1..... 38

 Figure 2..... 39

Multimedia Appendixes 40

 Multimedia Appendix 1..... 41

 Multimedia Appendix 2..... 41

Impact of community-oriented medical education on medical students' perceptions of community healthcare: A qualitative study

Kiyoshi Shikino¹ MD, MHPE, PhD; Kazuyo Yamauchi^{1,2} MD, MHPE, PhD; Nobuyuki Araki¹ MD, PhD; Naoto Ozaki¹ MD; Yu Kamata¹ MD; Shinya Aoki^{1,3} MD; Yota Katsuyama^{1,4} MD, PhD; Daichi Sogai^{1,5} MD; Mai Miyamoto^{1,6} MD; Kensuke Yoshimura⁷ MD, MPH, PhD; Takeshi Oki⁸ MD, PhD; Shoichi Ito^{1,9} MD, PhD

¹Department of Community-Oriented Medical Education Graduate School of Medicine Chiba University Chiba JP

²Department of Medical Education, Dokkyo Medical University Tochigi JP

³Shioda Hospital Katsuura JP

⁴Sanbunomori Clinic Sanmu JP

⁵Sanmu Medical Center Sanmu JP

⁶Isumi Medical Center Isumi JP

⁷Center for Next Generation of Community Health Chiba University Hospital Chiba JP

⁸Trinity Neurology Clinic Sakura JP

⁹Department of Medical Education Graduate School of Medicine Chiba University Chiba JP

Corresponding Author:

Kiyoshi Shikino MD, MHPE, PhD

Department of Community-Oriented Medical Education

Graduate School of Medicine

Chiba University

1-8-1, Inohana

Chu-ou-ku

Chiba

JP

Abstract

Background: Physician maldistribution remains a global challenge, with Japan's rural regions facing critical shortages of healthcare providers. Regional quota programs have been implemented to attract medical students to underserved areas; however, their effectiveness in fostering long-term commitment is uncertain. Community-oriented medical education (COME) programs aim to address this issue by developing students' understanding and dedication to rural healthcare.

Objective: In this study, we investigated the impact of an enhanced COME program, featuring increased early clinical exposure and faculty development, on the career perceptions of first-year regional quota medical students at Chiba University.

Methods: We conducted a cross-sectional survey comparing two cohorts of first-year regional quota medical students: 20 students enrolled from the existing COME course (April–December 2021) and 20 from the revised course (April–December 2022). The revised course included an additional day of clinical exposure supervised by COME-trained attending physicians. Students' written reflections were analyzed using qualitative content analysis and categorized according to Fink's Taxonomy of Significant Learning, which includes six domains: Foundational Knowledge, Application, Integration, Human Dimension, Caring, and Learning How to Learn.

Results: In 2021, 311 learning codes were identified, distributed across Foundational Knowledge (128), Application (91), Integration (40), Human Dimension (16), Caring (30), and Learning How to Learn (6). In 2022, codes increased to 385, with notable growth in Caring (58) and Human Dimension (57), alongside increases in Learning How to Learn (15) and Integration (45). Content analysis of students' reports revealed enhanced understanding of patient-centered care, collaboration, and the challenges of rural healthcare. The consistency in Foundational Knowledge underscored a solid base of community healthcare principles.

Conclusions: Enhancements of the COME program, including additional early clinical exposure and faculty development, significantly improved students' perceptions of community healthcare. The increased focus on Caring and Human Dimension aspects, as identified in the content analysis, underscores the role of practical experiences in fostering skills such as collaboration, communication, and patient-centered care. These findings suggest that mentorship by community hospital

attendings, alongside structured clinical exposure, plays a crucial role in shaping medical students' understanding and commitment to rural medicine. Continuous evaluation and refinement of COME programs are essential to mitigate physician shortages in underserved regions.

(JMIR Preprints 19/09/2025:84406)

DOI: <https://doi.org/10.2196/preprints.84406>

Preprint Settings

1) Would you like to publish your submitted manuscript as preprint?

✓ **Please make my preprint PDF available to anyone at any time (recommended).**

Please make my preprint PDF available only to logged-in users; I understand that my title and abstract will remain visible to all users.

Only make the preprint title and abstract visible.

No, I do not wish to publish my submitted manuscript as a preprint.

2) If accepted for publication in a JMIR journal, would you like the PDF to be visible to the public?

✓ **Yes, please make my accepted manuscript PDF available to anyone at any time (Recommended).**

Yes, but please make my accepted manuscript PDF available only to logged-in users; I understand that the title and abstract will remain visible.

Yes, but only make the title and abstract visible (see Important note, above). I understand that if I later pay to participate in <https://preprints.jmir.org/preprint/84406>

No. Please do not make my accepted manuscript PDF available to anyone. I understand that if I later pay to participate in <https://preprints.jmir.org/preprint/84406>

Original Manuscript

Impact of community-oriented medical education on medical students' perceptions of community healthcare: A qualitative study

Kiyoshi Shikino¹, Kazuyo Yamauchi^{1,2}, Nobuyuki Araki¹, Naoto Ozaki¹, Yu Kamata¹, Shinya Aoki^{1,3}, Yota Katsuyama^{1,4}, Daichi Sogai^{1,5}, Mai Miyamoto^{1,6}, Kensuke Yoshimura^{1,7}, Takeshi Oki^{1,8}, Shoichi Ito^{1,9}

¹Department of Community-Oriented Medical Education, Chiba University Graduate School of Medicine, Chiba, Japan

²Department of Medical Education, Dokkyo Medical University, Tochigi, Japan

³Shioda Hospital, Katsuura, Japan

⁴Sanbunomori Clinic, Sanmu, Japan

⁵Sanmu Medical Center, Sanmu, Japan

⁶Isumi Medical Center, Isumi, Japan

⁷Center for Next Generation of Community Health, Chiba University Hospital, Chiba, Japan

⁸Trinity Neurology Clinic, Sakura, Japan

⁹Department of Medical Education, Chiba University Graduate School of Medicine, Chiba, Japan

Corresponding author

Kiyoshi Shikino, MD, PhD, MHPE, AFAMEE

Community-Oriented Medical Education, Chiba University Graduate School of Medicine, Chiba,
Japan

1-8-1 Inohana, Chuo-ku, Chiba City, Chiba Prefecture Japan

Telephone: +81-43-222-7171 (Ext. 5239)

E-mail: kshikino@gmail.com



ABSTRACT

Background: Physician maldistribution remains a global challenge, with Japan's rural regions facing critical shortages of healthcare providers. Regional quota programs have been implemented to attract medical students to underserved areas; however, their effectiveness in fostering long-term commitment is uncertain. Community-oriented medical education (COME) programs aim to address this issue by developing students' understanding and dedication to rural healthcare.

Objective: In this study, we investigated the impact of an enhanced COME program, featuring increased early clinical exposure and faculty development, on the career perceptions of first-year regional quota medical students at Chiba University.

Methods: We conducted a cross-sectional survey comparing two cohorts of first-year regional quota medical students: 20 students enrolled from the existing COME course (April–December 2021) and 20 from the revised course (April–December 2022). The revised course included an additional day of clinical exposure supervised by COME-trained attending physicians. Students' written reflections were analyzed using qualitative content analysis and categorized according to Fink's Taxonomy of Significant Learning, which includes six domains: Foundational Knowledge, Application, Integration, Human Dimension, Caring, and Learning How to Learn.

Results: In 2021, 311 learning codes were identified, distributed across Foundational Knowledge (128), Application (91), Integration (40), Human Dimension (16), Caring (30), and Learning How to Learn (6). In 2022, codes increased to 385, with notable growth in Caring (58) and Human Dimension (57), alongside increases in Learning How to Learn (15) and Integration (45). Content analysis of students' reports revealed enhanced understanding of patient-centered care, collaboration, and the challenges of rural healthcare. The consistency in Foundational Knowledge underscored a solid base of community healthcare principles.

Conclusions: Enhancements of the COME program, including additional early clinical exposure and faculty development, significantly improved students' perceptions of community healthcare. The

increased focus on Caring and Human Dimension aspects, as identified in the content analysis, underscores the role of practical experiences in fostering skills such as collaboration, communication, and patient-centered care. These findings suggest that mentorship by community hospital attendings, alongside structured clinical exposure, plays a crucial role in shaping medical students' understanding and commitment to rural medicine. Continuous evaluation and refinement of COME programs are essential to mitigate physician shortages in underserved regions.

Keywords: community healthcare; community-based medical education; community-oriented medical education; physician maldistribution; career perceptions

INTRODUCTION

Physician maldistribution is a global concern affecting many nations [1-6]. In Japan, rural regions are facing a critical shortage of healthcare providers [7,8], due to urbanization [9-11]. To address this issue, numerous Japanese medical schools have introduced regional quota programs designed to motivate students to practice community or rural medicine [7,8,12]. These programs offer scholarships tied to service agreements in designated regions, addressing the scarcity of physicians. As of 2015, 70 out of 79 Japanese medical schools offered regional quota programs, enrolling 1,541 students [7].

However, the effectiveness and ethical implications of these programs are debatable. Students assigned to regional quotas may become less inclined to work in their designated regions as they progress through their academic programs [8]. Therefore, it is essential to develop community-oriented medical education (COME) courses that not only impart knowledge but also cultivate students' commitment to serving in underserved communities [13].

The Japanese government has high expectations for community-based medical education (CBME) and has made it a compulsory component of medical training [13-15]. Through direct participation in CBME, medical students and resident physicians can acquire practical skills, knowledge, and attitudes pertinent to clinical practice [16]. Nonetheless, questions remain regarding the long-term sustainability and impact of these programs, including student retention in rural areas [14]. Thus, continuous evaluation and enhancement are critical to effectively mitigate healthcare provider shortages in rural areas in Japan [8].

In this study, we aimed to investigate the impact of educational strategies provided by physicians proficient in COME principles on the career perceptions of first-year regional quota medical students at Chiba University. We hypothesized that such education would improve students' career decision-making and promote the adoption of qualities associated with outstanding professional role models.

METHODS

Study Design

A cross-sectional survey was conducted to assess the influence of a COME program, designed by the Chiba University School of Medicine, on medical students' career perceptions. This study encompassed two cohorts: 20 first-year regional quota medical students from April to December 2021, representing the existing course structure, and 20 students from April to December 2022, representing a revised course with additional early clinical exposure. Prior to participating in the COME program, the students had already completed the Interprofessional Education (IPE) Step 1 course, earlier on in the academic year, which may have influenced their perceptions and learning outcomes in the COME program.

Participants and Settings

Participants were first-year medical students enrolled in Chiba University under a regional quota system, participating in a year-long COME program. This program included didactic sessions and practical experiences designed to enhance students' understanding of and commitment to community healthcare.

Selection Process for Regional Quota Students

Students Applying to Chiba University School of Medicine must choose between applying under the general admission track or the regional quota track. Admission decisions are based on the scores from the Common Test for University Admissions, a written examination, and an interview.

Students admitted under the regional quota track are obligated to work within Chiba Prefecture for 9 years after graduation, fulfilling a service agreement. In return, they receive financial support through educational subsidies as an incentive. This system is intended to attract and retain healthcare

professionals in underserved areas of the prefecture.

COME at Chiba University

Chiba Prefecture is one of the regions in Japan with a significant disparity in the geographical distribution of physicians creating an urgent need to ensure the retention of medical professionals in community healthcare settings. In response, the COME program was introduced to address this issue through targeted human resource development. The program aims to cultivate medical students' understanding of and commitment to practicing in underserved areas, thereby contributing to sustainable healthcare solutions in the region.

Facilities and Roles of Community Hospital Attendings

In 2022, the COME program was implemented across four facilities, each staffed with attending physicians dedicated to community-based medical education. These community hospital attendings play a critical role in educating medical students and creating an optimal learning environment.

Additionally, they participate in weekly collaborative faculty development (FD) sessions at Chiba University integrating practical experience in community healthcare with theoretical frameworks, ensuring a comprehensive approach to medical education in underserved areas.

IPE Step 1 Course

Prior to participating in the COME program, all students had completed the IPE Step 1 course which establishes the necessary professional attitudes for healthcare practitioners and develops their ability to communicate effectively with patients, service users, and students from other faculties. At the end of the course, students are expected to reflect on the requirements for their professional growth, contribute effectively to team efforts, and respect interprofessional collaboration. These competencies likely influenced students' perceptions and learning outcomes in the subsequent

COME program.

Enhancements to the COME Program

In 2021, the COME program consisted of five lecture sessions, one day of early clinical exposure, and subsequent reflection sessions (Figure 1). In 2022, the program was enhanced with an additional day of clinical exposure, orchestrated by COME-trained attending physicians serving as community preceptors. Early clinical exposure allowed students to learn directly from physicians who served as supervisors and educational leaders. Before clinical exposure, attending physicians engaged in targeted mentorship through personalized communication via email or online conferences to understand each student's individual needs and learning objectives. The FD program, consisting of 40 sessions annually, equipped these physicians with pedagogical skills to provide personalized guidance throughout the medical education process. These attending physicians, strategically positioned in regions with physician shortages, underwent comprehensive faculty development. This development entailed 40 sessions annually, each lasting two h, and covered various pedagogical topics, including educational technology, simulation teaching, and assessment methodologies. These sessions were part of a broader faculty development program to enhance the physicians' overall educational capabilities and equip them to provide personalized guidance throughout the students' medical education. These enhancements aimed to provide students with practical experiences and mentorship that deepen their understanding of community healthcare and address the challenges faced in underserved areas [17].

Data Collection

Students' Reports

A qualitative inquiry was conducted. To measure the educational impact, we analyzed students'

reports from 2021–2022 as qualitative data. These reports addressed four key questions regarding students' understanding of community medicine, healthcare challenges, their envisioned role in local healthcare, and the competencies required for these roles (Supplementary file 1).

Fink's Taxonomy of Significant Learning

Fink's Taxonomy [18] is distinct in its categorization of cognitive domains, offering a broader scope than Bloom's Taxonomy [12,19-21]. It emphasizes the “Human Dimension”—students' self-awareness as learners; “Caring”—the development of new interests and concerns; and “Learning How to Learn”—the adaptation and improvement of students' learning approaches (Figure 2 and Supplementary file 2) [18].

Data Analysis

Content Analysis

Content analysis was conducted using Fink's Taxonomy of Significant Learning to evaluate students' perceptions of community healthcare. This taxonomy categorizes cognitive process dimensions into various categories and sub-categories [22,23]. One author independently read and coded all transcripts. Subsequently, the descriptors were discussed, identified, and agreed upon by KS, KY, and NA. Similar codes were then grouped into categories and subcategories as they emerged from the data. These categories and sub-categories were regularly reviewed and discussed by authors experienced in qualitative research to ensure the credibility of the findings [24]. The authors discussed and reached a consensus on all further changes, achieving code saturation.

Concepts for each cognitive process dimension in Fink's Taxonomy [20] were analyzed, and the number of units of analysis for each concept was counted. The researchers then grouped similar codes into themes and checked to see which dimension of the cognitive process they corresponded to.

Additionally, to enhance the rigor and transparency of our qualitative analysis, we complemented the human coding process with a generative AI tool (ChatGPT 5, OpenAI). The AI-assisted analysis was used to identify potential patterns and alternative categorizations within the data, which were then critically reviewed, refined, and confirmed by the research team [25,26]. This complementary use of generative AI provided triangulation and strengthened the credibility of the findings, while all final interpretations and coding decisions were made exclusively by the human researchers [27].

Reflexivity

We conducted a qualitative study using content analysis to determine the effectiveness of the newly developed program in 2022 on students' perceptions of community healthcare. In qualitative research, researchers' backgrounds can significantly influence the data interpretation and the construction of findings and conclusions, necessitating careful reflexivity. Reflexivity was employed to account for researchers' potential biases.

In this study, all authors were clinical educators with experience in COME, providing the necessary expertise to understand and interpret the data accurately. The authors were trained in educational theory (KS, KY, and SI) and primary care (SA, YK, DS, MM, and TO), enabling them to approach the analysis from a well-rounded perspective. This dual expertise ensured a comprehensive understanding of the educational and clinical aspects of community-oriented medical education programs. This reflective approach aimed to ensure the credibility and reliability of our findings and provide valuable insights into the factors contributing to successful training programs.

Ethic approval and consent to participate

This study was approved by the Ethics Review Committee of the Graduate School of Medicine, Chiba University (3425). All work involving research on human subjects complied with

the Declaration of Helsinki. The procedures for obtaining informed consent were explained to the medical students, who were also informed that this study would not affect their grades. The researchers explained to the participants and obtained their informed and voluntary consent.

RESULTS

Content analysis of the reports from first-year regional quota medical students revealed distinct patterns across the academic years 2021 and 2022, categorized according to Fink's Taxonomy of Significant Learning (Tables 1 and 2).

For the academic year 2021, 311 codes were identified. In the Learning How to Learn category, six codes were noted: practical experience and participation in activities (2), improvement of skills and knowledge (2), improvement of communication skills (1), and continuous learning and understanding of the community (1). The Caring category included 30 codes, highlighting areas such as contribution to and involvement in community healthcare (9), personal growth and learning (8), patient-centered healthcare (7), communication and collaboration (5), and personal motivation and awareness (1). The Human Dimension category had 16 codes, emphasizing patient-centered healthcare and communication (6), understanding and importance of community healthcare (5), general practice and broad knowledge (3), and realization of the community healthcare field (2). The Integration category comprised 40 codes, addressing challenges and responses in community healthcare (13), improvement of knowledge and skills (11), communication and cooperation (9), and collaboration with the community (7). The Application category contained 91 codes, focusing on improvement of knowledge and skills (20), practice and problem-solving in community healthcare (18), communication and trust-building (15), necessity and outlook of community healthcare (13), improvement of prevention and health awareness (9), utilization of information and communication

technology (7), environmental preparation and collaboration in community healthcare (5), and general practitioners and multi-disciplinary knowledge (4). Finally, the Foundational Knowledge category included 128 codes, covering specific initiatives in community healthcare (48), challenges and the current state of community healthcare (38), the definition and role of community healthcare (26), and the aging population and community healthcare (16).

In comparison, the academic year 2022 had 385 codes. The Learning How to Learn category expanded to 15 codes, covering the acquisition of broad knowledge (5), activities to broaden knowledge (4), interest and training (3), mandatory community healthcare training (2), and improvement of communication skills (1). The Caring category rose significantly to 58 codes, with emphasis on communication and collaboration (15), contribution and involvement in community healthcare (12), patient-centered healthcare (11), personal growth and learning (10), and personal motivation and awareness (10). The Human Dimension category also increased to 57 codes, focusing on patient-centered healthcare and communication (26), challenges and improvements in community healthcare (21), and the importance and current state of community healthcare (10). The Integration category contained 45 codes, addressing medical resources and collaboration (15), sustainability and technology in healthcare (12), patient-centered care methods (10), and ethics and communication (8). The Application category contained 82 codes, emphasizing improvement of medical knowledge and skills (20), practice and problem-solving in community healthcare (20), communication and trust-building (15), community healthcare policy and support (8), execution ability and motivation (8), importance of community healthcare (6), and utilization of information and communication technology (5). Finally, the Foundational Knowledge category remained consistent with 128 codes, focusing on the quality and supply of healthcare (51), shortage of physicians and medical resources (41), importance of communication and consultation (23), and aging population and community healthcare (13).

Comparing the data from two years, a notable increase was observed in the total number of

codes, particularly in the Caring and Human Dimension categories in 2022. This suggests that the revised course, featuring early clinical exposure and enhanced faculty development, effectively deepened students' understanding of and engagement with the human and caring aspects of community healthcare. The consistent emphasis on foundational knowledge indicates a solid base in community healthcare principles, while the expanded focus on Learning How to Learn reflects a growing interest in continuous education and skill acquisition. These findings highlight the positive impact of practical experiences on medical students' perceptions and understanding of community healthcare.

DISCUSSION

We aimed to evaluate the impact of a COME program on first-year regional quota medical students at Chiba University in Japan. Analysis of students' reports highlighted significant differences in their perceptions and understanding of community healthcare.

Comparison of 2021 and 2022 Results

Our findings indicated a substantial increase in the total number of codes from 311 in 2021 to 385 in 2022. This increase suggests that the enhancements made to the COME program, including additional early clinical exposure and faculty development, effectively contributed to improved learning outcomes. The observed code growth reflects a heightened understanding of community healthcare and greater engagement with critical aspects such as patient-centered care and communication.

For example, an increase in codes related to “Caring” and the “Human Dimension” categories indicates that students developed a deeper appreciation for the importance of empathetic interactions

with patients and the role of effective communication in healthcare delivery. Specific examples from student reports include remarks such as “collaboration among healthcare providers enhances patient care” and “addressing community challenges requires continuous improvement efforts” which highlight the students' growing awareness of teamwork and adaptability as key components of successful healthcare practices.

Learning How to Learn

In 2021, this category had only six codes, focusing on practical experience and continuous learning. In 2022, this category expanded to 15 codes, emphasizing acquiring knowledge, participating in activities to broaden knowledge and training. This shift indicates a growing recognition of the importance of continuous education and professional development among students [27-29]. For instance, one student noted, "acquiring a broad range of knowledge is important for comprehensive healthcare," highlighting the importance of diverse learning experiences. Another student emphasized, "ongoing interest and training in healthcare are essential for professional development," underscoring the need for continuous education.

Caring and Human Dimension

The Caring category significantly increased from 30 codes in 2021 to 58 in 2022 highlighting enhanced focus on communication, collaboration, and personal growth in the revised course. Students' recognition of the importance of these aspects is crucial for their development as empathetic and effective healthcare providers [30-32]. One student remarked, "collaboration among healthcare providers enhances communication and patient care," indicating the importance of teamwork in healthcare settings. Another student stated, "patient-centered healthcare ensures that the

care provided meets the needs of the patient," reflecting a deepened understanding of patient-centered care.

Similarly, the Human Dimension category increased from 16 to 57 codes, reflecting a greater emphasis on patient-centered care, understanding community healthcare challenges, and the importance of effective communication [33]. This enhancement suggests that the revised course successfully addressed the need for students to develop interpersonal and communication skills essential for effective healthcare delivery [34,35]. One student noted, "addressing the challenges in community healthcare requires continuous improvement efforts," highlighting the need for ongoing efforts to improve healthcare delivery. Another student remarked, "patient-centered healthcare prioritizes effective communication with patients," demonstrating an increased awareness of the importance of communication in patient care.

Integration and Application

The Integration category increased modestly from 40 to 45 codes, while the Application category slightly decreased from 91 to 82 codes. The Integration category's growth indicates an improved understanding of medical resources, sustainability, and ethics [36,37]. For example, one student noted, "collaboration between medical institutions is essential for optimizing resources," emphasizing the need for effective resource management. Another student stated, "sustainable healthcare practices and modern technology can improve patient outcomes," highlighting the importance of sustainability and technology in healthcare.

However, the slight decrease in the Application category suggests a potential area for further enhancement in terms of practical problem-solving and community healthcare policy support [38]. Despite this, students still recognized the importance of practical skills. One student noted, "Healthcare providers must be adept at problem-solving to address diverse community health

issues," underscoring the need for problem-solving abilities in healthcare.

Foundational Knowledge

The Foundational Knowledge category remained consistent with 128 codes in both years, emphasizing the quality and supply of healthcare, challenges in community healthcare, and the aging population. This consistency indicates a solid foundational understanding of community healthcare principles among students [39,40]. One student commented, "ensuring high-quality healthcare is critical for meeting community needs," reflecting the importance placed on healthcare quality. Another student remarked, "many rural areas face significant shortages of doctors and medical resources," highlighting the ongoing challenges in rural healthcare.

Implications for Medical Education

These findings highlight the positive impact of practical experiences on medical students' perceptions and understanding of community healthcare. The enhanced focus on Caring and Human Dimension aspects suggests that early clinical exposure and faculty development are crucial in cultivating students' dedication to serving underserved communities [41]. For example, the increase in "Caring" codes from 30 in 2021 to 58 in 2022, and the rise in "Human Dimension" codes from 16 to 57, illustrate how these program enhancements deepened students' understanding of patient-centered care and their ability to communicate effectively with patients and peers. Student remarks, such as "collaboration among healthcare providers enhances communication and patient care," underscore the importance of these experiential components in fostering essential competencies. Further, our findings indicate the need for continuous evaluation and improvement of COME programs to ensure that they effectively address the evolving challenges in community healthcare.

[42].

Comparison Between COME and University Hospital Early Clinical Exposure

The COME program differs from early clinical exposure conducted within university hospitals in several critical ways. Unlike university hospital placements, which often focus on specialty-based care in controlled environments, the COME program emphasizes community-oriented, generalist education tailored to the unique challenges of underserved areas. This regional focus allows students to gain practical skills relevant to primary care and community engagement.

Additionally, the COME program provides opportunities for students to interact with community hospital attendings, who serve as educators and mentors in a real-world, resource-limited setting. These experiences enable students understand the importance of resource optimization, adaptability, and building trust within the community—skills that are less emphasized in traditional hospital-based training. One student highlighted this difference, noting, "learning from physicians embedded in the community provided valuable insights into the challenges and rewards of rural healthcare."

Implications of Code Increases

The increase in the number of codes, particularly in the “Caring” and “Human Dimension” categories, underscores the program's success in fostering student empathy, communication skills, and a sense of responsibility. This suggests that the enhanced early clinical exposure and targeted mentoring by faculty development-trained attendings effectively addressed key educational gaps. By bridging theoretical knowledge with practical experience, the COME program increased students’ interest in community healthcare and cultivated their professional identities.

These findings align with existing literature suggesting that immersive, community-based educational programs are pivotal in shaping medical students' perceptions and career choices. However, further studies are required to determine whether these changes persist over time and translate into increased retention of physicians in underserved areas.

Limitations

This study has some limitations. The sample size was limited to first-year regional quota medical students at a single institution, affecting the generalizability of the findings. Additionally, the study relied on self-reported data, which may be subject to bias. The qualitative nature of the content analysis may also limit the reproducibility of the results, as it involves subjective data interpretation. Furthermore, the study did not include a control group, making it difficult to attribute the observed changes solely to enhancements in the COME program. Another limitation is the short duration of the study, which spanned only two academic years; longer-term studies are needed to evaluate the sustained impact of the program on students' career choices and retention in rural healthcare settings. Finally, the study did not account for external factors that may have influenced students' perceptions, such as their personal experiences or socioeconomic backgrounds.

Future Research

Future research should include a larger and more diverse sample, and longitudinal studies, to assess the long-term impact of COME programs on students' career choices and retention in rural healthcare settings. Comparative studies with control groups would also help determine the effects of different educational interventions. Additionally, integrating quantitative measures with qualitative analyses could provide a more comprehensive evaluation of the program's effectiveness.

In conclusion, Enhancements to the COME program at Chiba University, including additional early clinical exposure and the involvement of community hospital attending physicians, significantly enhanced first-year regional quota medical students' understanding of and engagement in community healthcare practice. The increase in caring and human dimension codes reflects a positive shift toward patient-centered care and effective communication. These findings highlight the role of mentorship and experiential learning in cultivating students' skills and dedication to serving underserved communities. Continuous evaluation and improvement of COME programs are essential to ensure they effectively mitigate the healthcare provider shortage in Japan's rural areas. Future research should focus on long-term outcomes and broader applicability to enhance the effectiveness of community-oriented medical education.

Acknowledgments

None.

Clinical trial number

Not applicable.

Funding

None.

Conflict of interests

None declared.

Data Availability

The dataset used and/or analyzed during this study is available from the corresponding author upon reasonable request.

Authors' Contributions

KS, KY, YK, and SI planned, designed, and conceived the study. KS drafted the manuscript. KS, KY, YK, and SI recruited participants. KS, KY, NA, YK and IS interpreted the data. KY, NA, YK, SA, YK, DS, MM, KY, TO, and SI revised the manuscript. KS, KY, NA, and SI performed qualitative analyses. All authors taught participants and read and approved the final manuscript.

Abbreviations

COME, community-oriented medical education; CBME, community-based medical education; FD, faculty development; IPE, interprofessional education

REFERENCES

1. Karan A, Negandhi H, Nair R, Sharma A, Tiwari R, Zodpey S. Size, composition and distribution of human resource for health in India: new estimates using national sample survey and registry data. *BMJ Open*. 2019 May;9(4):e025979. doi:10.1136/bmjopen-2018-025979

2. Morris S, Sutton M, Gravelle H. Inequity and inequality in the use of health care in England: an empirical investigation. *Soc Sci Med.* 2005 Mar;60(6):1251-1266. doi:10.1016/j.socscimed.2004.07.016
3. Guttmann A, Shipman SA, Lam K, Goodman DC, Stukel TA. Primary care physician supply and children's health care use, access, and outcomes: findings from Canada. *Pediatrics.* 2010 Jun;125(6):1119-1126. doi:10.1542/peds.2009-2821
4. Mick SS, Lee SY, Wodchis WP. Variations in geographical distribution of foreign and domestically trained physicians in the United States: 'safety nets' or 'surplus exacerbation'? *Soc Sci Med.* 2000 Jan;50(2):185-202. doi:10.1016/s0277-9536(99)00183-5
5. Winkelmann J, Muench U, Maier CB. Time trends in the regional distribution of physicians, nurses and midwives in Europe. *BMC Health Serv Res.* 2020 Oct;20(1):937. doi:10.1186/s12913-020-05760-y
6. Wu J. Measuring inequalities in the demographical and geographical distribution of physicians in China: generalist versus specialist. *Int J Health Plann Manage.* 2018 Oct;33(4):860-879. doi:10.1002/hpm.2539
7. Ishikawa T, Fujiwara K, Ohba H, Suzuki T, Ogasawara K. Forecasting the regional distribution and sufficiency of physicians in Japan with a coupled system dynamics-geographic information system model. *Hum Resour Health.* 2017 Sep;15(1):64. doi:10.1186/s12960-017-0238-8
8. Koike S, Okazaki K, Tokinobu A, Matsumoto M, Kotani K, Kataoka H. Factors associated with regional retention of physicians: a cross-sectional online survey of medical students and graduates in Japan. *Hum Resour Health.* 2023 Oct;21(1):85. doi:10.1186/s12960-023-00871-z
9. Kobayashi Y, Takaki H. Geographic distribution of physicians in Japan. *Lancet.* 1992 Dec;340(8832):1391-1393. doi:10.1016/0140-6736(92)92569-2
10. Toyabe S. Trend in geographic distribution of physicians in Japan. *Int J Equity Health.* 2009 Mar; 8:5. doi:10.1186/1475-9276-8-5

11. Tanihara S, Kobayashi Y, Une H, Kawachi I. Urbanization and physician maldistribution: a longitudinal study in Japan. *BMC Health Serv Res*. 2011 Oct;11:260. doi:10.1186/1472-6963-11-260
12. Yahata S, Takeshima T, Kenzaka T, Okayama M. Long-term impact of undergraduate community-based clinical training on community healthcare practice in Japan: a cross-sectional study. *BMC Med Educ*. 2020 Oct;20(1):337. doi:10.1186/s12909-020-02258-3
13. Fukui S, Nishizaki Y, Shimizu T, Yamamoto Y, Kobayashi H, Tokuda Y. Association between regional quota program in medical schools and practical clinical competency based on General Medicine In-Training Examination score: a nationwide cross-sectional study of resident physicians in Japan. *Postgrad Med J*. 2023 Oct;99:1197-1204. doi:10.1093/postmj/qgad059
14. Shikino K, Tago M, Hirata R, et al. Educational strategies for general medicine education in accordance with the model core curriculum for medical education in Japan. *J Gen Fam Med*. 2023 Apr;24(4):272-273. doi:10.1002/jgf2.619
15. Medical Education Model Core Curriculum Coordination Committee, Medical Education Model Core Curriculum Expert Research Committee. Model core curriculum for medical education. AY 2022 revision. 2023. https://www.mext.go.jp/b_menu/shingi/chousa/koutou/116/toushin/mext_01280. Html [access November 23, 2023]
16. Ohta R, Ryu Y, Sano C. The contribution of citizens to community-based medical education in Japan: a systematic review. *Int J Environ Res Public Health*. 2021 Feb;18(4):1575. doi:10.3390/ijerph18041575
17. Sandhu VK, Jose DM, Feldman CH. Underserved communities: enhancing care with graduate medical education. *Rheum Dis Clin North Am*. 2020 Feb;46(1):167-178. doi:10.1016/j.rdc.2019.09.009
18. Taxonomy of Significant Learning. The Peak Performance Center.

<https://thepeakperformancecenter.com/educational-learning/thinking/blooms-taxonomy/taxonomy-of-significant-learning/> [access September 13, 2025]

19. Anderson LW, David R. A taxonomy for learning, teaching and assessing: a revision of Bloom's taxonomy. New York, NY: Longman; 2001.
20. Bloom BS. Taxonomy of educational objectives, the classification of educational goals, Handbook I: Cognitive domain. 1st Ed. New York, NY: Longmans, Green, and Co.; 1956.
21. Morton DA, Colbert-Getz JM. Measuring the impact of the flipped anatomy classroom: the importance of categorizing an assessment by Bloom's taxonomy. *Anat Sci Educ*. 2017 Mar;10(2):170-175. doi:10.1002/ase.1635
22. Elo S, Kyngäs H. The qualitative content analysis process. *J Adv Nurs*. 2008 Apr;62(1):107-115. doi:10.1111/j.1365-2648.2007.04569.x
23. Graneheim UH, Lindgren BM, Lundman B. Methodological challenges in qualitative content analysis: a discussion paper. *Nurse Educ Today*. 2017 Sep;56:29-34. doi:10.1016/j.nedt.2017.06.002
24. Granero LAL, Ezequiel ODS, Oliveira IN, Moreira-Almeida A, Lucchetti G. Using traditional or flipped classrooms to teach "Geriatrics and Gerontology"? Investigating the impact of active learning on medical students' competences. *Med Teach*. 2018 Dec;40(12):1248-1256. doi:10.1080/0142159X.2018.1426837
25. Yue Y, Liu D, Lv Y, Hao J, Cui P. A practical guide and assessment on using ChatGPT to conduct grounded theory: tutorial. *J Med Internet Res*. 2025 May;27:e70122. doi:10.2196/70122
26. Bijker R, Merkouris SS, Dowling NA, Rodda SN. ChatGPT for automated qualitative research: content analysis. *J Med Internet Res*. 2024 Jul;26:e59050. doi:10.2196/59050
27. Marceau M, Vachon LÉ, Lambert D, et al. Assessment practices in continuing professional development activities in health professions: a scoping review. *J Contin Educ Health Prof*. 2024 Jul;44(2):81-89. doi:10.1097/CEH.0000000000000507

28. Main PAE, Anderson S. Evidence for continuing professional development standards for regulated health practitioners in Australia: a systematic review. *Hum Resour Health*. 2023 Mar;21(1):23. doi:10.1186/s12960-023-00803-x.
29. Institute of Medicine (US) Committee on Planning a Continuing Health Professional Education Institute. Redesigning continuing education in the healthcare profession. Washington (DC): National Academies Press (US). 2010. PMID:25032352
30. Steinmair D, Zervos K, Wong G, Löffler-Stastka H. Importance of communication in medical practice and medical education: an emphasis on empathy and attitudes and their possible influences. *World J Psychiatry*. 2022 Feb;12(2):323-337. doi:10.5498/wjp.v12.i2.323
31. Kerasidou A, Bærøe K, Berger Z, Caruso Brown AE. The need for empathetic healthcare systems. *J Med Ethics*. 2020 Jul 24;47(12):e27. doi:10.1136/medethics-2019-105921.
32. Moudatsou M, Stavropoulou A, Philalithis A, Koukouli S. The role of empathy in health and social care professionals. *Healthcare (Basel)*. 2020 Jan 30;8(1):26. doi:10.3390/healthcare8010026
33. Kwame A, Petrucka PM. A literature-based study of patient-centered care and communication in nurse-patient interactions: barriers, facilitators, and the way forward. *BMC Nurs*. 2021 Sep 3;20(1):158. doi:10.1186/s12912-021-00684-2
34. Gilligan C, Powell M, Lynagh MC, et al. Interventions for improving medical students' interpersonal communication in medical consultations. *Cochrane Database Syst Rev*. 2021 Feb 8;2(2):CD012418. doi:10.1002/14651858.CD012418
35. King A, Hoppe RB. "Best practice" for patient-centered communication: a narrative review. *J Grad Med Educ*. 2013 Sep;5(3):385-393. doi:10.4300/JGME-D-13-00072.1
36. Munthe C, Fumagalli D, Malmqvist E. Sustainability principle for the ethics of healthcare resource allocation. *J Med Ethics*. 2021 Feb;47(2):90-97. doi:10.1136/medethics-2020-106644

37. Lewis S, Damarell RA, Tieman JJ, Trenerry C. Finding the integrated care evidence base in pubmed and beyond: a bibliometric study of the challenges. *Int J Integr Care*. 2018 Aug;18(3):11. doi:10.5334/ijic.3975
38. Institute of Medicine (US) Committee on Using Performance Monitoring to Improve Community Health; Durch JS, Bailey LA, Stoto MA, editors. *Improving health in the community: a role for performance monitoring*. Washington (DC): National Academies Press (US). 1997. PMID: 25121202
39. Mitchell P, Cribb A, Entwistle V. Vagueness and variety in person-centred care. *Wellcome Open Res*. 2022 ;7:170. doi:10.12688/wellcomeopenres
40. Haruta J, Ando T, Fujishima S. How do medical students learn in an online community diagnostics program? *BMC Med Educ*. 2023 Jan;23(1):15. doi:10.1186/s12909-023-04007-8
41. Ewnte B, Yigzaw T. Early clinical exposure in medical education: the experience from Debre Tabor University. *BMC Med Educ*. 2023 Apr;23(1):252. doi:10.1186/s12909-023-04221-4
42. Ghanbari-Afra L, Adib-Hajbaghery M, Dianati M. Human caring: a concept analysis. *J Caring Sci*. 2022 Aug;11(4):246-254. doi:10.34172/jcs.2022.21

TABLES

Table 1. The Result of Content Analysis for 2021 Report

Fink's Taxonomy of		Subcategory	Quote
Significant Learning			
Learning	How to	Practical experience and	<i>"Practical experience enhances learning."</i>
Learn (6)		activity participation (2)	
		Improvement of skills and	<i>"Continuous learning improves skills."</i>
		knowledge (2)	
		Improvement of	<i>"Providers should develop communication skills."</i>
		communication skills (1)	
		Continuous learning and	<i>"Providers should engage in continuous learning."</i>
		understanding of	
		community (1)	
Caring (30)		Contribution and	<i>"Providers should contribute to community health."</i>
		involvement in community	
		healthcare (9)	
		Personal growth and	<i>"Personal growth is important for healthcare</i>
		learning (8)	<i>providers."</i>
		Patient-centered healthcare	<i>"Patient-centered care focuses on patients' needs."</i>
		(7)	
		Communication and	<i>"Effective communication is essential for collaboration."</i>
		collaboration (5)	
		Personal motivation and	<i>"Personal motivation is important for providers."</i>
		awareness (1)	
Human	Dimension	Patient-centered healthcare	<i>"Patient-centered care focuses on patient needs."</i>
(16)		and communication (6)	
		Understanding and	<i>"Understanding community healthcare is essential for</i>
		importance of community	<i>providers."</i>
		healthcare (5)	
		General practice and broad	<i>"General practitioners should have broad medical</i>
		knowledge (3)	<i>knowledge."</i>
		Realization of community	<i>"Community healthcare is a vital field."</i>
		healthcare field (2)	
Integration (40)		Challenges and responses	<i>"Addressing healthcare provider shortages is a major</i>
		in community healthcare	<i>challenge."</i>
		(13)	

	Improvement of knowledge and skills (11)	<i>"Continuous education is essential for healthcare providers."</i>
	Communication and cooperation (9)	<i>"Effective communication is essential for healthcare delivery."</i>
	Collaboration with the community (7)	<i>"Community collaboration improves healthcare delivery."</i>
	Application (91)	Improvement of knowledge and skills (20)
	Practice and problem-solving in community healthcare (18)	<i>"Problem-solving skills are essential for managing patient care effectively."</i>
	Communication and trust building (15)	<i>"Effective communication is essential for building trust with patients."</i>
	Necessity and outlook of community healthcare (13)	<i>"Community healthcare is necessary for addressing health disparities."</i>
	Improvement of prevention and health awareness (9)	<i>"Health education programs are essential for improving health awareness."</i>
	Utilization of information and communication technology (7)	<i>"Telemedicine services can improve access to healthcare in remote areas."</i>
	Environmental preparation and collaboration in community healthcare (5)	<i>"Collaboration with environmental agencies is essential for community health."</i>
	General practitioners and multi-disciplinary knowledge (4)	<i>"General practitioners should have a broad knowledge of different medical fields."</i>
	Foundational Knowledge (128)	Specific initiatives in community healthcare (48)
	Challenges and current state of community healthcare (38)	<i>"Healthcare providers must be able to identify and address health problems in the community."</i>
	Definition and role of community healthcare (26)	<i>"Community healthcare is essential for ensuring access to healthcare for all."</i>
	Aging population and community healthcare (16)	<i>"Community healthcare is important for health equity."</i>
		<i>"Community healthcare is necessary for supporting aging populations."</i>

*() number of codes

Table 2. The Result of Content Analysis for 2022 Report

Fink's Taxonomy of		Subcategory	Quote
Significant Learning			
Learning Learn (15)	How to	Acquisition of broad knowledge (5)	"Acquiring a broad range of knowledge is important for comprehensive healthcare."
		Activities to broaden knowledge (4)	"Engaging in activities that broaden knowledge can enhance healthcare delivery."
		Interest and training (3)	"Ongoing interest and training in healthcare are essential for professional development."
		Mandatory community healthcare training (2)	"Mandatory training in community healthcare ensures that providers are well-prepared."
		Improvement of communication skills (1)	"Improving communication skills is critical for effective patient interactions."
Caring (58)	Dimension	Communication and collaboration (15)	"Collaboration among healthcare providers enhances communication and patient care."
		Contribution and involvement in community healthcare (12)	"Active involvement in community healthcare initiatives is crucial for success."
		Patient-centered healthcare (11)	"Patient-centered healthcare ensures that the care provided meets the needs of the patient."
		Personal growth and learning (10)	"Healthcare providers should focus on personal growth and continuous learning."
		Personal motivation and awareness (10)	"Personal motivation and awareness are key drivers for effective healthcare delivery."
		Patient-centered healthcare and communication (26)	"Patient-centered healthcare prioritizes effective communication with patients."
		Challenges and improvements in community healthcare (21)	"Addressing the challenges in community healthcare requires continuous improvement efforts."
Human (57)	Dimension	Importance and current state of community healthcare (10)	"Understanding the current state of community healthcare is essential for making improvements."
		Medical resources and collaboration (15)	"Collaboration between medical institutions is essential for optimizing resources."
		Sustainability and modern	"Sustainable healthcare practices and modern

	technology in healthcare	<i>technology can improve patient outcomes."</i>
	(12)	
	Patient-centered care	<i>"Patient-centered care focuses on the individual needs</i>
	method (10)	<i>and preferences of patients."</i>
	Ethics and communication	<i>"Ethical considerations are paramount in healthcare</i>
	(8)	<i>communication and decision-making."</i>
Application (82)	Improvement of medical	<i>"Continuous education and training are essential for</i>
	knowledge and skills (20)	<i>improving medical knowledge and skills."</i>
	Practice and problem-	<i>"Healthcare providers must be adept at problem-solving</i>
	solving in community	<i>to address diverse community health issues."</i>
	healthcare (20)	
	Communication and trust	<i>"Building trust through clear and compassionate</i>
	building (15)	<i>communication is key in healthcare."</i>
	Community healthcare	<i>"Effective policies and support systems are necessary for</i>
	policy and support (8)	<i>sustaining community healthcare."</i>
	Executing ability and	<i>"Healthcare providers need both the ability and</i>
	motivation (8)	<i>motivation to execute their duties effectively."</i>
	Importance of community	<i>"Community healthcare plays a vital role in ensuring</i>
	healthcare (6)	<i>equitable access to medical services."</i>
	Utilization of information	<i>"ICT can enhance healthcare delivery, especially in</i>
	and communication	<i>remote areas."</i>
	technology (5)	
Foundational	Quality and supply of	<i>"Ensuring high-quality healthcare is critical for meeting</i>
Knowledge (128)	healthcare (51)	<i>community needs."</i>
	Shortage of physicians and	<i>"Many rural areas face significant shortages of doctors</i>
	medical resources (41)	<i>and medical resources."</i>
	Importance of	<i>"Effective communication between healthcare providers</i>
	communication and	<i>and patients is crucial for accurate diagnosis and</i>
	consultation (23)	<i>treatment."</i>
	Aging population and	<i>"The aging population increases the demand for</i>
	community healthcare (13)	<i>community healthcare services."</i>

*() number of codes

FIGURE LEGENDS

Figure 1. Program of community-oriented medical education (COME) in Chiba University (FY2021 and FY2022)

Figure 2. Fink's Taxonomy of Significant Learning

Supplementary files

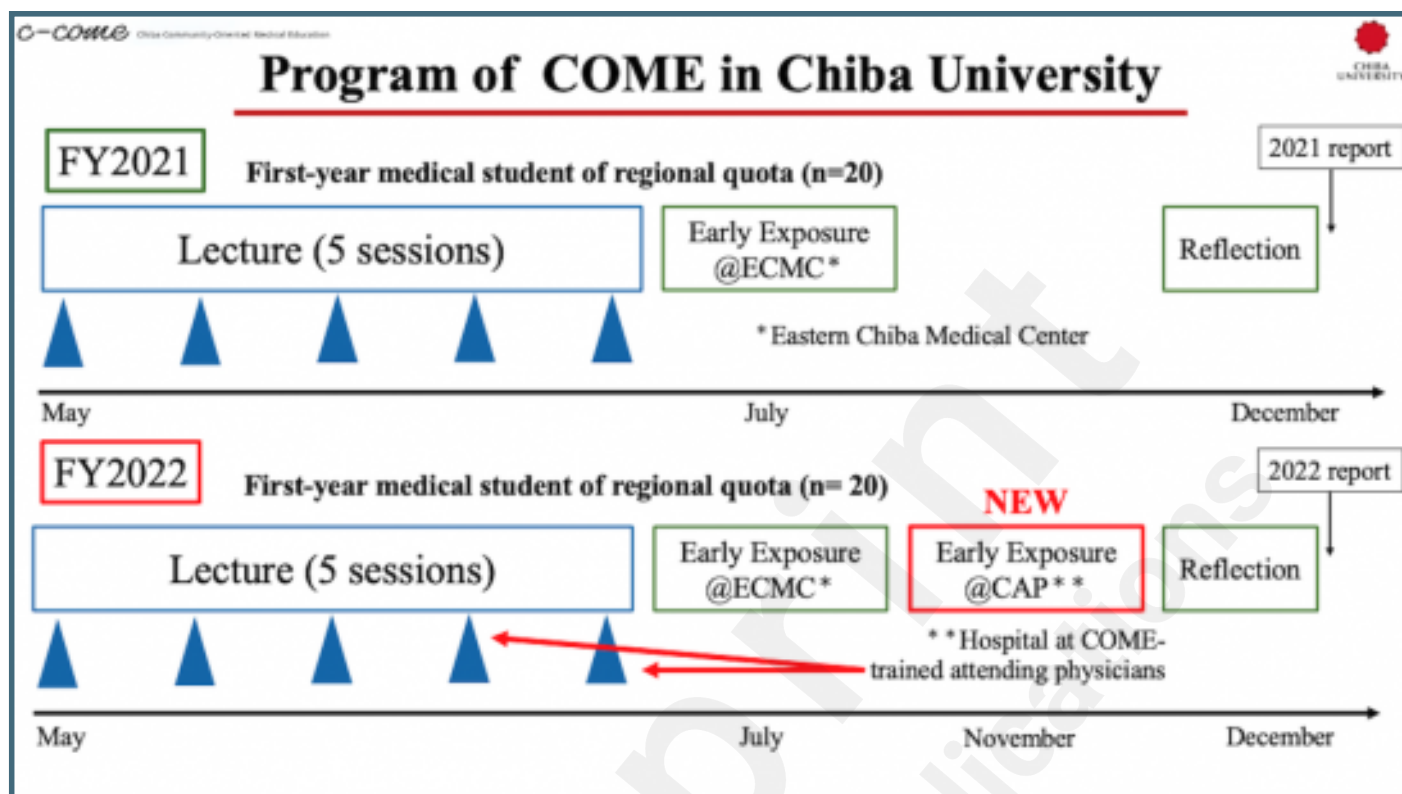
Supplementary file 1. Students' Reports

Supplementary file 2. Fink's Taxonomy of Significant Learning

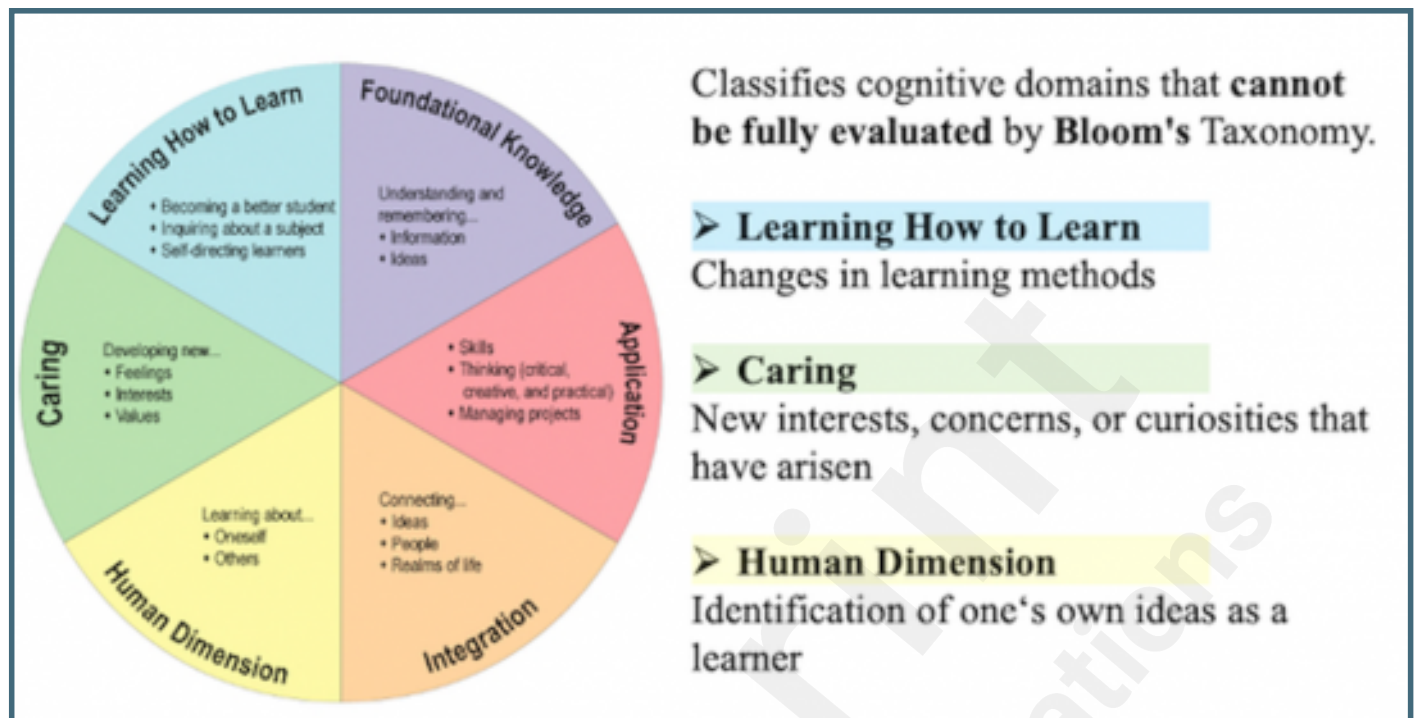
Supplementary Files

Figures

Program of community-oriented medical education (COME) in Chiba University (FY2021 and FY2022).



Fink's Taxonomy of Significant Learning.



Multimedia Appendixes

Students' Reports.

URL: <http://asset.jmir.pub/assets/55db7fe6861f58d1adcf9a1d1f56778.docx>

Fink's Taxonomy of Significant Learning.

URL: <http://asset.jmir.pub/assets/31969974f24402b3bf7f93382e661060.docx>

