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Unraveling the Dynamics of Lifelong Learning in Singapore: A Comparative Study

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Abstract: Lifelong learning is crucial for equipping the workforce to navigate a volatile, uncertain, complex, and ambiguous (VUCA) world. Despite its importance, resistance to enrolling in lifelong learning courses persists. This exploratory study examines the exposure to and engagement with government-sponsored courses among two distinct groups: individuals who opt for these courses and those who select alternative courses. We employed comparative statistical analysis to identify the primary factors influencing course awareness and selection. Our findings underscore the enduring influence of traditional media in promoting course awareness. Additionally, personal interest and availability of subsidies emerged as significant determinants of course selection. Based on these insights, we propose policy recommendations to enhance the effectiveness of these courses. This empirical study contributes to the understanding of the dynamics of lifelong learning in Singapore, providing valuable insights for policy and practice.

Keywords: lifelong learning; skillsfuture; data science; comparative statistical analysis; continuing education and training



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1. Introduction

Fostering lifelong learning is an important aspect of preparing a workforce for the 21st century, where technological disruption happens rapidly. Fung et al. [1] emphasize the role taken by both the public and private sectors in equipping workers with the necessary skills for the future workplace, which is linked to the process of lifelong learning rather than just the acquisition of formal qualifications. The shaping of policy, however, depends on catering to various groups of employees in the workforce (e.g., full-time vs part-time workers, younger vs older workers). There is a rising trend in the uptake of massive open online courses (MOOCs) in recent years [2], which allows for easier access to new courses. The emergence of MOOCs underscores the significance of digital literacy in motivating lifelong learning [3]. This insight is vital for policy development, as the successful application of training in the workforce is largely influenced by individual motivations and the perceived relevance of the courses, among other factors [4,5].

1.1. SkillsFuture's History and Importance

Singapore's lack of natural resources elevates the importance of its human capital and the need for lifelong learning initiatives [6]. The Singapore government perceives lifelong learning as a strategy to enhance the current workforce, as expenditure on lifelong

learning has tripled over the 8 years after 2005 [7]. In this respect, SkillsFuture was launched in 2015 as a national movement to promote lifelong learning and adapt to evolving business needs and job scopes [8]. SkillsFuture's course offerings range from skills in data analytics, finance, cybersecurity, and languages, amongst others [9]. It has been noted that both public and private sectors should communicate and adapt courses to both suit the fostering of personal interest in lifelong learning and also prepare the workforce for vocational training [1,10,11]. This allows educational institutions to provide courses under the continuing education and training framework that cater to business needs while allowing space for adapting courses to make them more appealing for learners.

SkillsFuture's reach extends beyond Singapore to Southeast Asian countries such as Vietnam. Nguyen [12] recognized the need for structured programs for lifelong learning courses in Vietnam and highlighted key events and placement programs for SMEs. The recognition of SkillsFuture as a format for lifelong learning is further enhanced by quantifying unemployment rates for various groups of participants and recommending less emphasis on paper qualifications [13]. SkillsFuture has also been used, as a case study, for multiple studies and seen as an example of lifelong learning in the post-COVID-19 world [14,15]. These attest to SkillsFuture's use as a case study to advance local and international lifelong learning policies.

1.2. Research Aims

Despite this initiative, studies have identified reasons for a low uptake rate of SkillsFuture courses [9,16] and the need for better metrics for measuring its success [17]. In tandem with SkillsFuture as a government initiative, there are course offerings from other parties which do not fall under these subsidies. We define non-SkillsFuture courses as lifelong learning courses which are currently not subsidized under the SkillsFuture movement.

This study aims to examine the media in which individuals are exposed to various lifelong learning courses and their motivations for enrolling in them. Specifically, we aim to understand the reasons behind taking a non-SkillsFuture course and compare them to those of individuals who enrolled in SkillsFuture courses. Such insights can assist in devising targeted interventions to improve the reach of SkillsFuture courses.

2. Methods

2.1. Data Collection

We designed a survey to examine three different groups of learners: those taking non-SkillsFuture courses, those taking SkillsFuture courses for the first time, and those who have taken multiple SkillsFuture courses before. The survey was carried out from January to March 2023.

In the initial segment of our survey, we gathered participants' demographic information, such as age, gender, and employment status. We then asked participants about their exposure to SkillsFuture. First, we ascertained whether participants were familiar with SkillsFuture courses, to which all respondents answered affirmatively. Next, we queried how many SkillsFuture courses they had undertaken, with responses ranging from 0 to 10, where 0 indicated individuals who had never enrolled in SkillsFuture courses. Subsequently, we inquired whether participants had enrolled in non-SkillsFuture courses. In the survey, we ensured that participants were categorized based on whether they had taken any SkillsFuture course before. From these responses, we divided the participants into three categories:

- Group 1: individuals who had previously enrolled in non-SkillsFuture courses (33 participants);
- Group 2: individuals who were undertaking their first SkillsFuture course (19 participants);
- Group 3: individuals who had enrolled in SkillsFuture courses more than once (15 participants).

Thereafter, we asked each group about how they heard about the courses that they had participated in, and why they enrolled in them. This was achieved via two groups of questions. Firstly, they were asked, “how did you hear about this course/workshop?”. Five options were provided for the participants to choose:

- Word-of-mouth;
- Social media;
- Search engines;
- TV/radio/newspapers;
- Other.

They were then asked to rate the following statements for why they participated in that course/workshop, on a Likert scale of 1 (strongly disagree) to 5 (strongly agree):

- To help in their career progression (“career progression”);
- Because they enjoy learning (“enjoy learning”);
- Because of the available subsidies (“available subsidies”);
- Because the course/workshop was interesting (“interesting content”);
- To fill in their spare time (“spare time”).

2.2. General Properties

A total of 67 participants participated in our study. All participants are Singaporeans or Singapore permanent residents (PRs) above the age of 25, which is the minimum age to be able to use their SkillsFuture credits [18]. This allows for better analysis between the groups as all of the participants are eligible to utilize their SkillsFuture credits.

The participants’ genders were 25 male, 41 female, and 1 identifying as non-binary. The age distribution has a mean of 35.31 and standard deviation of 8.16, with the median of 33 and mode at 25 (D’Agostino-Pearson’s $\chi^2 = 9.65$, $p = 8.03 \times 10^{-3}$) (see Figure 1 for the range). This shows that our survey respondents are generally younger adults. Most of the respondents have an undergraduate degree as the highest level of educational qualification (see Figure 2). A majority of the participants are also fully employed (see Figure 3). With the exception of 2 participants with monthly salaries above SGD20,000, the monthly salary of the remaining participants has a mean of SGD 4923 and a median of SGD 4000 (see Figure 4 for the range).

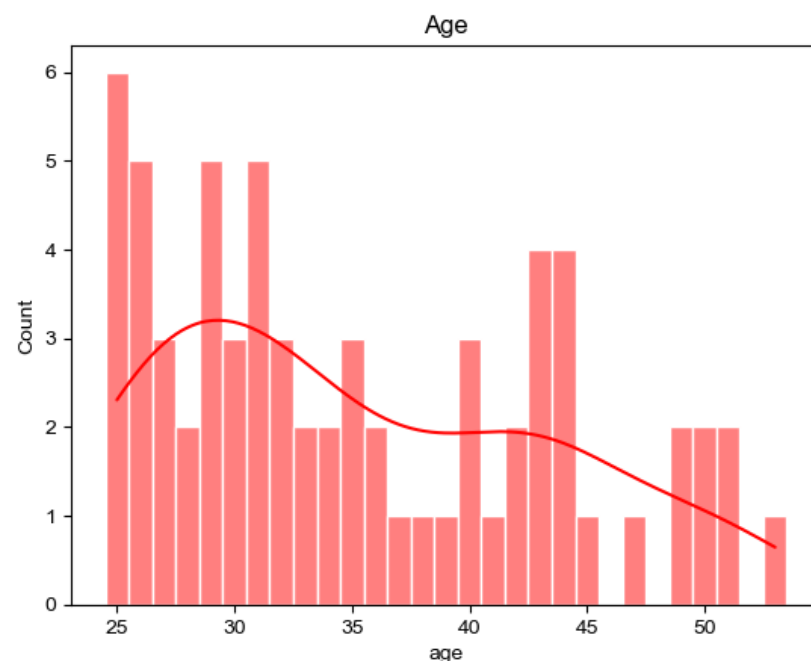


Figure 1. Plot of the ages of the participants.

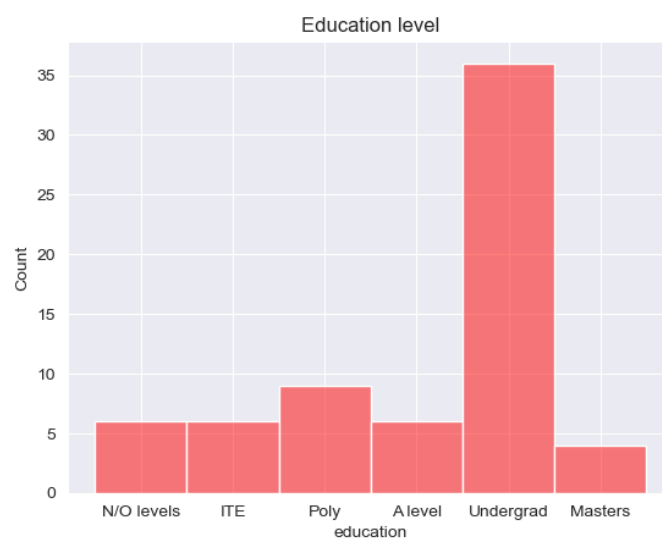


Figure 2. Plot of the education levels of the participants.

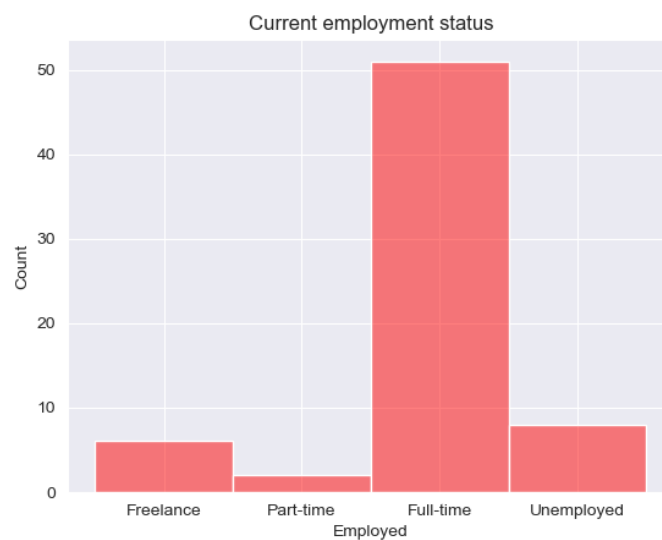


Figure 3. Plot of the employment levels of the participants.

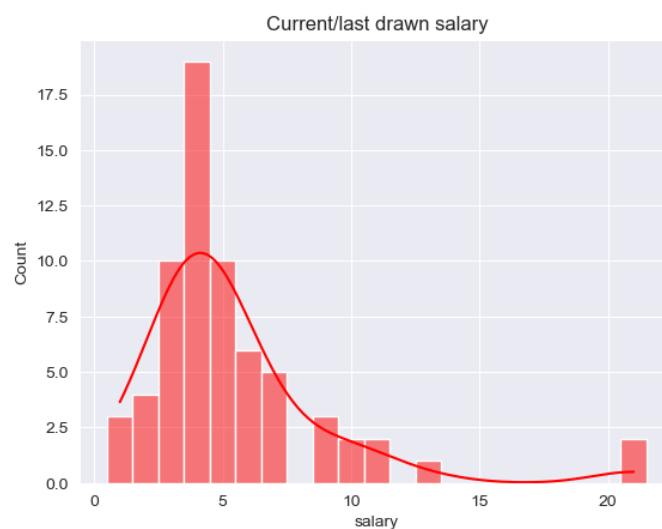


Figure 4. Plot of the salary levels of the participants, in thousands of Singapore dollars.

3. Results

3.1. Exposure to the Courses

For the first section of the survey, we inquired about the methods through which respondents discovered their respective courses. This was to better understand how the participants were obtaining the information and access to these courses, ideally allowing us to analyze the reach of these courses. The options are described in Section 2.1.

3.1.1. Non-SkillsFuture Course Takers

The first group comprises respondents who have participated in non-SkillsFuture courses before. The results are shown in Figure 5. In total, 21 of the participants had only taken one non-SkillsFuture course, while 12 had previously taken more than one non-SkillsFuture course before.

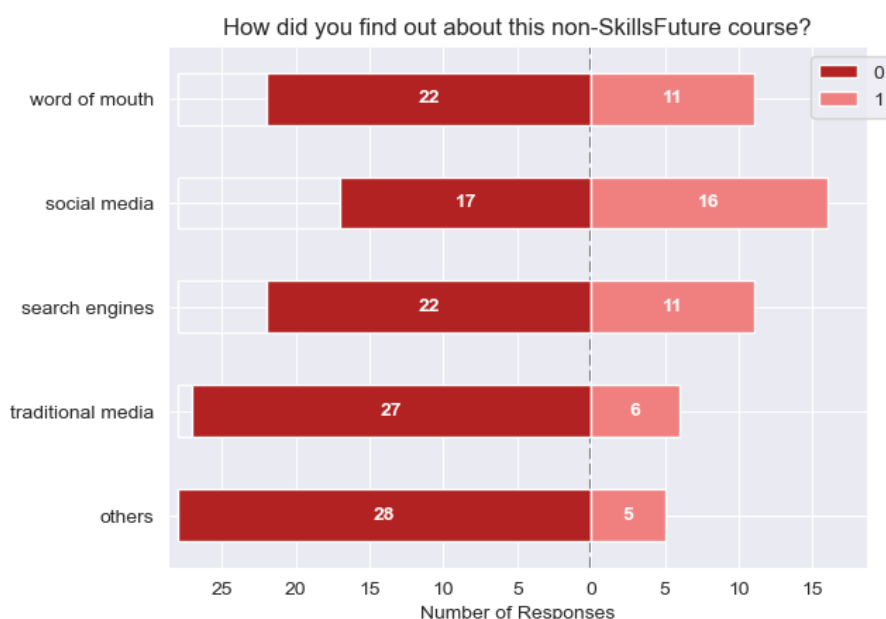


Figure 5. How the participants learned about the non-SkillsFuture course. This was a true/false section, with 0 being false and 1 being true.

Most participants heard of the courses via social media, while word-of-mouth and search engines tied for second place. The “others” value consisted of participants who learned about the course through their workplace. In addition, we asked for the reasons why the participants pursued a non-SkillsFuture course/workshop. This was an optional open-ended question (i.e., not all the participants responded), but the responses are informative:

- Sponsored by their company (5);
- Not entitled for SkillsFuture subsidies (7);
- SkillsFuture courses not interesting/relevant/accessible (7).

One even mentioned that they were not familiar with the SkillsFuture portal. These responses highlight issues in the accessibility of SkillsFuture courses and subsidies, which is a potential area for targeted intervention. These proposals will be further discussed in Section 4.

3.1.2. Skillsfuture Course Takers

For SkillsFuture participants, there were 19 who had taken one SkillsFuture course before, and 15 had taken multiple ones. Similar to the non-SkillsFuture group, social media ranked first, with word-of-mouth coming in second. Word-of-mouth and search engine

exposure ranked very closely together. Participants who selected “others” learned about the course at their workplace. The results are shown in Figure 6.

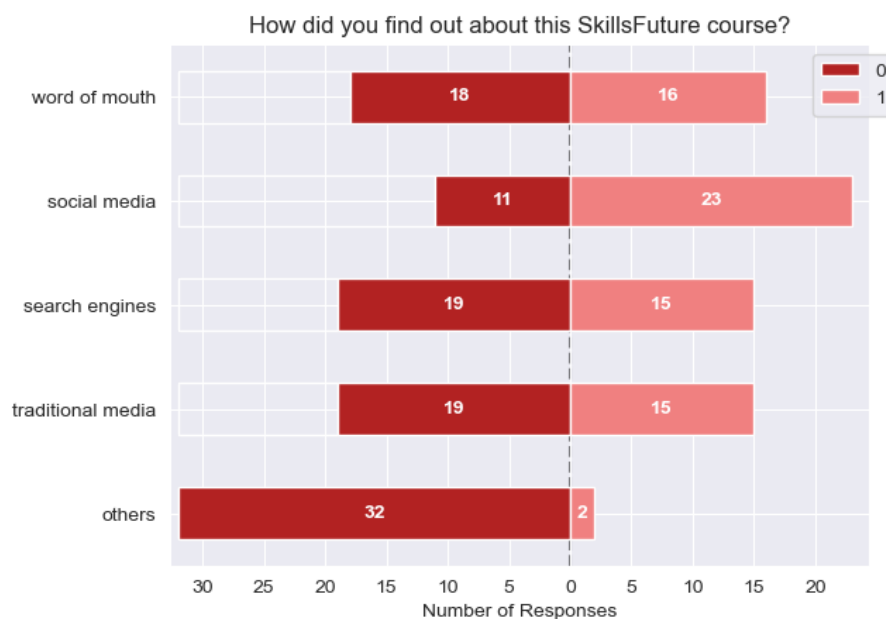


Figure 6. How the participants learned about the SkillsFuture course(s). This was a true/false section, with 0 being false and 1 being true.

The distribution of choices is similar to those of the non-SkillsFuture courses, which shows that there are some overlaps in how both courses are achieving exposure. However, the largest difference is in traditional media (TV/radio/newspapers, etc.), where there is a larger share of SkillsFuture participants. This might be one possible area for improvement in SkillsFuture course reach. Even for the top two spots, the proportion of people who were exposed by social media and word-of-mouth was more in the SkillsFuture case.

3.2. Reasons for Taking Up the Course(s)

In the next section, we asked respondents why they took up their respective courses. This was to understand their reasons for choosing the course, and to examine why they took one course over another. We performed non-parametric statistical testing (Kruskal–Wallis H and Mann–Whitney U tests) to compare between the non-SkillsFuture group and the two SkillsFuture groups listed above, and also one combined SkillsFuture group. This gave us a more even distribution for both groups to allow us to draw greater insights. In this way, we can see the significance on both first-time and repeated SkillsFuture takers, while also examining why people choose to take up SkillsFuture courses in general.

The options are described in Section 2.1. Career advancement, personal enjoyment, filling up free time, available subsidies, and personal interest in the courses were chosen as the relevant factors for our study. This allows us to identify the reasons why people took up the courses and how the reach of the courses could be improved.

3.2.1. Non-Skillsfuture Courses

For the group which took up non-SkillsFuture courses, participants showed a higher level of positive responses towards career aspirations, enjoyment of learning, and interest in the courses. Specifically, the highest positive response was observed in the aspect of “enjoy learning”, indicating how interesting the course is as a relevant motivation for taking up the courses. In addition, career advancement was also identified as a significant factor in the decision to enroll in non-SkillsFuture courses, which is consistent with the findings that company sponsorship was a reason for taking such courses. The results are shown in Figure 7.

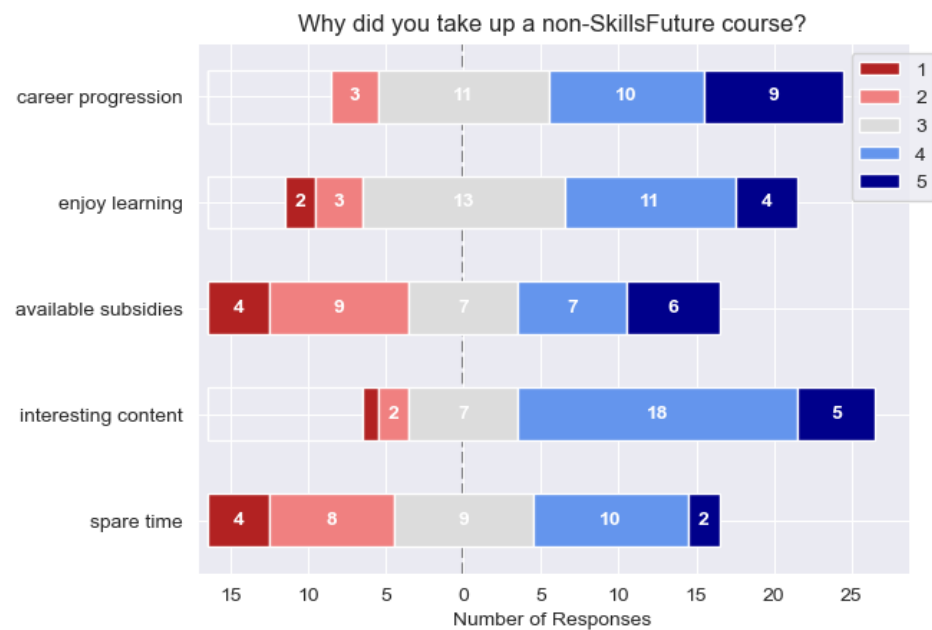


Figure 7. Why the participants took up the non-SkillsFuture course. Participants were asked to rate the statements on a scale of 1 (strongly disagree) to 5 (strongly agree).

3.2.2. Skillsfuture Courses

Individuals engaging with SkillsFuture for the first time primarily enroll in courses for two reasons: the potential for career advancement and a personal interest in the subject matter. However, the available subsidies and personal interest are the most important factors for participants who have taken up more than one SkillsFuture course previously. However, due to the relatively small sample size for each group, we combined both SkillsFuture groups since there was an almost even split of the participants between the SkillsFuture and non-SkillsFuture groups in the sample size. This was carried out with the understanding that this will not affect the descriptive statistics [19]. The results for first time SkillsFuture takers, previous SkillsFuture takers, and the combined group are shown in Figures 8–10.

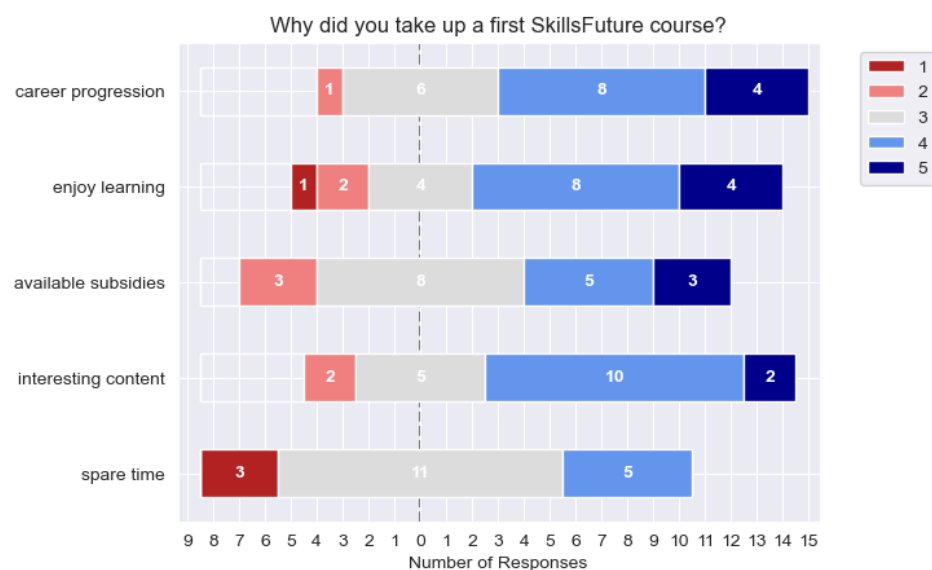


Figure 8. Why the participants took up their first SkillsFuture course. Participants were asked to rate the statements on a scale of 1 (strongly disagree) to 5 (strongly agree).

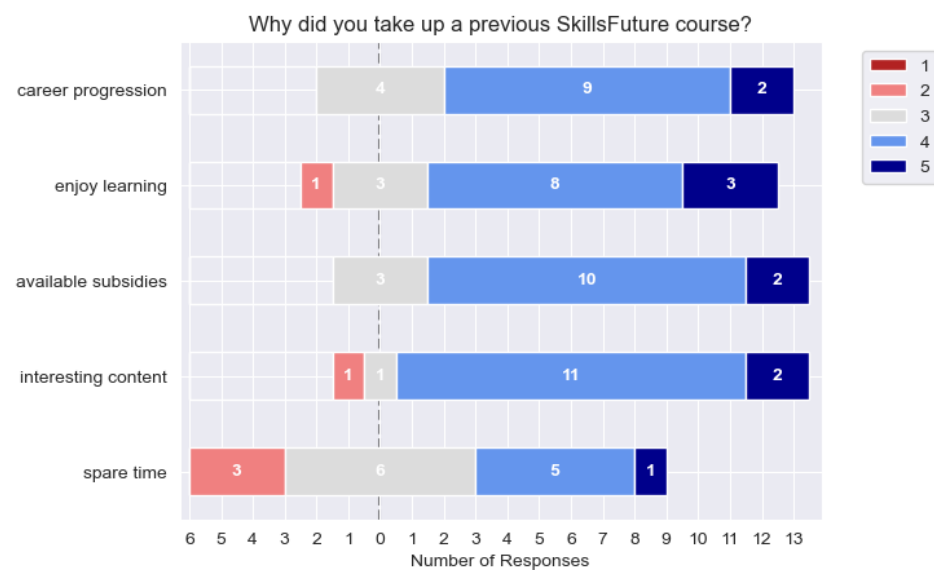


Figure 9. Why the participants took up previous SkillsFuture course(s). Participants were asked to rate the statements on a scale of 1 (strongly disagree) to 5 (strongly agree).

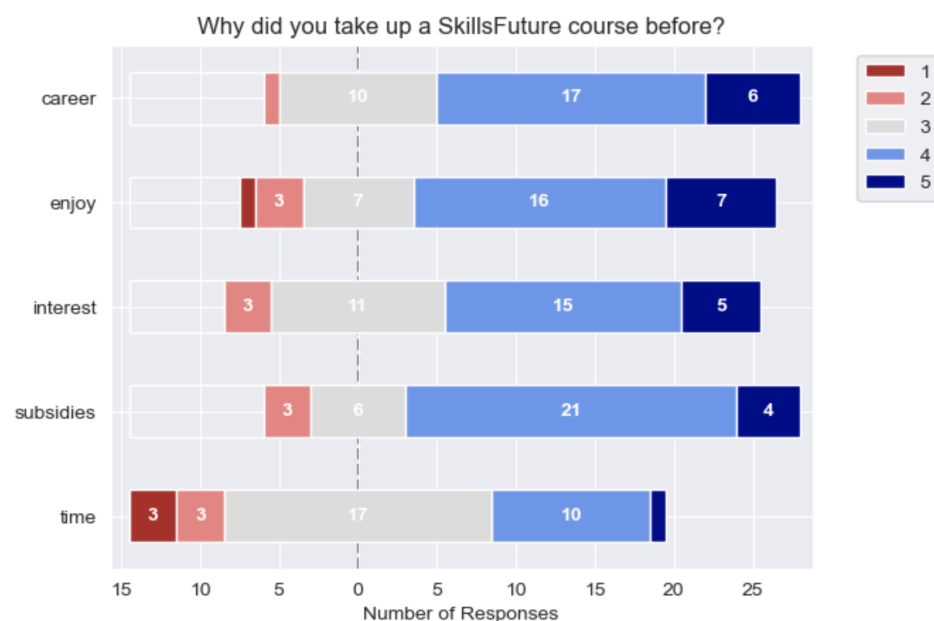


Figure 10. Why the participants took up SkillsFuture course(s) (be it first time or multiple times). This is a combination of the previous two datasets for SkillsFuture courses. Participants were asked to rate the statements on a scale of 1 (strongly disagree) to 5 (strongly agree).

3.2.3. Comparative Statistics

We performed statistical tests [20] to compare between the groups and their reasons for taking up the courses. This was carried out to see whether there was a statistical difference between the groups, so that targeted intervention can be recommended accordingly. With the relatively small sample sizes and the use of ordinal (ranked) survey data, we used non-parametric tests for our analysis. The Kruskal–Wallis H test tests the equality of the medians of two samples, while the Mann–Whitney U test tests the equality of means, providing an approximation of the one-way ANOVA and t -tests, respectively. This allows us to determine the extent of overlap between the two distributions, thereby identifying significant differences between the groups based on various factors. The results are shown below in Tables 1–3. As an exploratory study, we set the threshold level for statistical

significance at $\alpha = 0.1$ for all the tests in order to detect potential effects or trends. A higher alpha compensates for the smaller sample size, which reduces the power to detect significance. In our case, it is reasonable to tolerate a slightly increased risk of Type I errors, also known as false positives [21].

Table 1. Comparison of non-SkillsFuture takers and first-time SkillsFuture takers.

	Kruskal-Wallis H Test		Mann-Whitney U Test	
	<i>H</i>	<i>p</i>	<i>U</i>	<i>p</i>
Career progression	0.01	0.92	309	0.93
Enjoy learning	1.09	0.30	261	0.30
Available subsidies	1.01	0.31	262	0.32
Interesting content	0.29	0.59	340	0.59
Spare time	0.01	0.94	310	0.94

Table 2. Comparison of non-SkillsFuture takers and participants who have taken more than one SkillsFuture courses.

	Kruskal-Wallis H Test		Mann-Whitney U Test	
	<i>H</i>	<i>p</i>	<i>U</i>	<i>p</i>
Career progression	0.12	0.73	233	0.74
Enjoy learning	2.82	0.09	176	0.10
Available subsidies	4.98	0.03	151	0.03
Interesting content	0.62	0.43	217	0.44
Spare time	0.75	0.39	210	0.39

Table 3. Comparison of non-SkillsFuture takers and combined SkillsFuture takers.

	Kruskal-Wallis H Test		Mann-Whitney U Test	
	<i>H</i>	<i>p</i>	<i>U</i>	<i>p</i>
Career progression	0.07	0.80	542	0.80
Enjoy learning	2.68	0.10	437	0.10
Available subsidies	3.71	0.05	413	0.05
Interesting content	0.001	0.94	556	0.95
Spare time	0.30	0.59	520	0.59

There was no significant difference between the non-SkillsFuture and first-time SkillsFuture participants in terms of their responses to any of the reasons. This could be due to the sample size for first-time SkillsFuture participants being small. However, for both the multiple SkillsFuture course takers and the combined group, there was a significant difference in terms of the available subsidies and personal enjoyment of learning. This is evident in *p*-values of 0.03/0.05 for both tests for subsidies and 0.9/0.10 (rounded off) for personal enjoyment in the combined group.

4. Discussion

4.1. Course Exposure

In terms of course exposure, our analysis reveals that social media and word-of-mouth remain the most effective channels for promoting both SkillsFuture and non-SkillsFuture courses. This finding is consistent with prior research on opinion dynamics, which suggests that individuals tend to shift towards positive attitudes when they are allowed to freely interact with one another [22]. Consequently, we propose the promotion of increased engagement among individuals who have successfully completed SkillsFuture courses. This could be achieved through various strategies such as organizing interactive roadshows

or collaborating with social media influencers who have first-hand experience with these courses. Such initiatives would not only create a platform for sharing experiences but also foster a positive perception of SkillsFuture courses. We anticipate that these efforts would cultivate a more favorable attitude towards these programs, ultimately leading to a higher enrollment rate.

This approach aligns with the broader objective of enhancing lifelong learning, a key aspect of policy-making for future skills development. It is noteworthy that traditional media sources (TV/radio/newspapers) played a more significant role in informing participants about SkillsFuture courses compared to non-SkillsFuture courses. This means that these media still play an important role in garnering interest for SkillsFuture courses, and are what differentiates it from the reach of non-SkillsFuture courses. This is also an area of improvement for the organizers of non-SkillsFuture courses—to tap on the power of traditional media for better reach.

4.2. Reasons for Taking up the Courses

As for the reasons for taking up the courses, the two most important factors for people taking up the courses are the enjoyment of the course content and the available subsidies. This aligns with one of the reasons for not choosing a SkillsFuture course. Participants who selected non-SkillsFuture courses often did so because they were ineligible for SkillsFuture subsidies due to factors such as age or the course not being available for SkillsFuture subsidies. Additionally, some found the courses not sufficiently interesting or relevant to their work. Furthermore, the reasons for taking up non-SkillsFuture courses support our analysis, with company sponsorship and not being entitled to SkillsFuture subsidies for their courses of choice. These can be remedied by increasing the offerings of SkillsFuture courses to include more industry-relevant courses and increasing the scope of subsidies to cover more groups of people. Industry experts could also be invited into SkillsFuture courses to increase their relevance to best industrial practices [23]. This concurs with prior research from Greece [24] and the USA [25], highlighting the significance of course design, internships [26], and workplace support in motivating adults towards lifelong learning courses.

As part of our future work, we could explore the opposite end of the motivational spectrum, namely, the reasons why individuals may not be inclined to enroll in lifelong learning courses. These reasons could range from time constraints, high costs, or limited availability of courses, as some of the factors noted in the current study. This would address potential gaps in our study and provide a more comprehensive understanding of the landscape. With a larger sample size and survey questions encompassing a broader range of factors, such as age, gender, and digital literacy [27], further studies could potentially investigate the effects of these variables on an individual's motivation for lifelong learning. Moreover, it is important to exercise caution when generalizing these findings to other contexts. The present study only comprises a sample from Singapore, focusing solely on SkillsFuture courses and a restricted range of reasons for course exposure and motivation.

5. Conclusions

By examining the exposure of adults to lifelong learning courses and their motivations for enrolling in them, this study has identified significant factors that can be addressed to improve these courses, namely, providing better course subsidies and cultivating personal interest in lifelong learning. In the age of digital literacy, social media remains the primary means of exposure for both types of courses. However, we also found that for government-subsidized SkillsFuture courses, traditional media remains relevant, playing a more pronounced role in awareness and exposure. Moreover, personal interest in learning and the availability of subsidies were crucial factors in course enrollment, which underscore the need to improve course offerings in the bid to foster lifelong learning. There is a need for holistic and targeted approaches to adult learning that encompass not only the content and structure of lifelong learning courses but also the channels used for course promotion

and the financial subsidies supporting potential participants. More work should also be carried out on the integration of online tools in education, both in terms of reach and implementation [28]. This research complements previous work conducted in other countries concerning the motivations and reasons undertaken by adult learners, and has the potential to serve as a starting point for further investigation into enhancing the appeal of lifelong learning in Singapore.

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Institutional Review Board Statement: This study was approved by the Institutional Review Board of Singapore University of Technology and Design (IRB-22-00499) on 2022-04-18.

Data Availability Statement: The survey questions can be found at Open Science Framework (OSF) Archive: OSF Archive https://osf.io/s9k7x/?view_only=d4f0a335abc845b2a62325fa34bf6e31.

Conflicts of Interest: The authors declare no conflict of interest.

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